Financialization within the Port Economy
An Empirical analysis of The Port of Rotterdam

Master Urban Port and Transport Economics

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Abstract

As once quoted by the economist Lawrence Summers, "financial markets do not just oil the wheels of growth, they are the wheels."

This thesis discusses the concept of financialization and its connection to the port economy. The concept of financialization has been described by academics as a trend that finds its origins in the 1970s and that according to Lawrence Summer (former Dean of Harvard University and Secretary of Finance) is the wheel of fortune in contemporary capitalism. Although academics describe financialization in different manners they agree on the most common explanation, which is the increasing role of financial institutions and financial actors in non-financial industries. Financialization has made it ways into the port economy. This thesis presents the case of financialization in the Port of Rotterdam. For this thesis, the ownership of companies in the port economy of Rotterdam will indicate cases of financialization. Online databases have provided information that within the Port of Rotterdam, 140 companies are owned by non-industrial related companies, such as financial holdings, insurance companies, family funds, and governments. Of these 140 companies, 74 of them have owners from foreign countries. Financialization has crossed borders and industries and is also present in the Port of Rotterdam. Although financialization has created possibilities for acquiring large sums of capital, in the long run, port actors may just become another portfolio asset that can be dropped if not deemed profitable anymore.

Introduction

On 2 December 2009, a press release states that Barclays Capital will launch a liquefied natural gas service division. With this service division, the bank wants to create solutions towards risk management problems and hedging problems for the multiple actors in the market. One of these services consists of the buying and selling of LNG shipments for clients (Reuters, 2009).

On 10 March 2017, a press release states that three parties will be cooperating together on a new maritime investment fund called Fund I. Capital from this investment fund will be used to lease, buy and build vessels for the container, oil, chemical, and offshore sectors. The capital investors behind this fund are PensionDanmark, Danica and Navigare Capital Partners and are investing a total of 300 million Dollars. (Langmack, 2017).

On 2 July 2018, a press release states that the Bank of Communications Financial Leasing has ordered one Suezmax vessel at Hyundai Samho Heavy Industries. This increases their inventory of Suezmax tankers to nine in total. In addition to these nine vessels, the bank has ordered 12 additional medium-range product tankers. These tankers will be granted to Trafigura, a Dutch commodity-trading group. This is a common concept in China that these lessors will fill the gap in finance for shipbuilders and other actors under sale-leaseback agreements (Li, 2018).

These are examples of financialization of the maritime, ports and shipping economy. But what is financialization? Research conducted by academics such as Eturk (2008) and Epstein (2001) indicates that a shift is happening within the non-financial industries such as the port economy and how certain actors are receiving finance. Eturk (2008) describes that since the 1980's the financial sector had become interlinked to every other industrial sector on a global basis. The financial sector gained interests in non-financial sectors due to the demand for capital. This led to an increase in importance for financial institutions such as pension funds, insurance companies, and other financial investors.

Epstein (2001) has formulated the most global definition of the concept of financialization: the ever-increasing importance of financial markets, financial institutions and financial elites in the operation of the economy and its governing institutions. This covers both the domestic levels and the global levels. These financial markets, financial institutions and financial elites have gained importance across multiple economies

Searching the web for the term ‘financialization’ on Google Scholar provides 37.400 results. The concept is widely discussed and forms a cornerstone in our understanding of contemporary capitalism. By searching the online database of Google Scholar for articles since the start of 2018 with the term financialization in the title (Searched 15 November 2018), will provide roughly 3.700 results. This is just the year 2018 and thus indicates that this concept is highly written about. However, by narrowing the search range to the years between 1990 and 1995, the database only provides 38 results over those five years. This roughly indicates that the rise of financial economic logic within contemporary economies from the early 1990s onwards resonated with an expanding, critical academic literature on the very essence of finance within globalized economies.

Finance is the cornerstone of modern economies. Finance understood as providing credit lines through the valuation of assets, property rights and the securitization of money thus has an important utility in the advancement of entrepreneurial –and industrial economies. Yet even in the old days the role of finance had its dark side: destructive speculation. Examples of this are the Tulip Crisis in the Dutch economy in the 17th century, the financial crisis of the 20th century and the housing crisis of the 21st century. These crises are similar due to the large sums of capital that were invested into assets what deemed as highly profitable. But when the markets became less profitable and it became clear that capital had been invested into assets that deemed less investment-worthy than initially speculated, financial investors would retreat. This happened in non-financial industries (Krugman, 2009).

Eturk (2008) and Epstein (2001) have indicated that there is a global shift happening of finance crossing into other industries, but why the port economy? Port economies contain assets that are run by actors such as terminal operating companies, oil refineries, and port authorities. So why would a bank or a pension fund invest in liquefied natural gas service division or fund 12 medium range product tankers? Is the financial sector calling the shots in the physical port economy?

Research aim and questions

The research aim of this thesis is *to provide an overview of the academic understanding and interpretation of the concept of financialization in order to apply these empirically to the port economy of Rotterdam.* This information will be useful to stakeholders operational within the port economy, such as a port authority. Providing further empirical and theoretical knowledge on financialization allows for a deeper understanding on the rationality behind investment decisions within port economies of actors that are not traditionally considered as part of the port economy, and that might have divergent interests than that of the port authority.

This thesis will make use of one main research question and four sub-questions.

The main research question of this thesis is formulated as:

How can we understand financialization in a port economy such as that of Rotterdam?

By conducting interviews with actors familiar with the concept of financialization it will be possible to obtain information about what financialization is, where the concept originates, and how it influences non-financial industries. Research from academic papers will add to the information provided by interviews. The gathered information will be used to answer the sub-questions 1 and 2.

As multiple researchers have discussed the concept of the port economy in numerous academic papers, it will be possible to use that research on providing answers on what the port economy is in sub-question 3. Combining information from sub-questions 1,2 and 3, it will be possible to make a link between financialization and the port economy and provide information regarding sub-question 3.1.

Financialization has many forms, such as the number of securitizations, the number of stock buybacks, the total market of financial derivatives and ownership. This thesis will narrow its view on the ownership of companies, as this is the most measurable of the forms. By researching the ownership behind certain port operations, we can see who the owners are and if they have maritime industry related backgrounds. Ownership can be determined through information provided by online databases, such as Orbis. The ownership data collected from these online databases will be presented in sub-question 4 and contribute to the main research question.

The four sub-questions are as followed:

**1 What is financialization and why does it occur?*
**2 How does financialization influence non-financial industries?*
**3 What is the port economy?*
**3.1 Financialization within the port economy*
**4 The case of the Port of Rotterdam*

Methodology

The research questions are divided into three categories: what, how and why. The sub-questions are thus divided in a descriptive manner, which will be necessary to discover the underlying factors of the case of financialization within the port economy. The research in this thesis shall be done in a qualitative form.

To find evidence of financialization within the port economy of Rotterdam, this thesis will aim at researching information about the true ownership behind certain port companies. Ownership is the most measurable fact and will therefore, will be used to measure financialization in this thesis. The research of ownership will be done through online databanks such as Orbis. By collecting this information, an overview can be made of the true ownership behind certain port operations. As stated before, financialization is the increasing role of financial actors in non-financial industries. If the research will show that there are indeed multiple financial actors active in the industry with no port related background, it will be possible to provide evidence of financialization within the port economy of Rotterdam.

To understand the concept of financialization, interviews have been conducted with individuals Manuel Aalbers, a professor at The Katholieke Universiteit Leuven and David Bassens a professor at the Vrije Universiteit Brussel. These two individuals have extensive knowledge concerning the concept of financialization and its connection with non-financial sectors. Their contribution to this thesis shall be extremely valuable. Interviews shall have the preference above surveys for this thesis, as individual perspectives concerning financialization are more valuable towards providing evidence.

Surveys do give the opportunity of providing large data sets and make it possible to perform a quantitative research but for this thesis quantitative research is not useful towards the main research question.

The structure of this thesis is as followed. The first part is to describe the two main concepts used in the thesis. This is done through a literature review, interviews, and other available information. The first main concept is financialization, which is defined as the increasing role of financial institutions and financial actors in non-financial industries.

The second main concept is the port economy. This covers the operations and companies active within a port economy and the complete port economy seen as a form of infrastructure. This does not cover operations outside the geographical location of the port. The two main concepts shall be connected and information shall be provided concerning the relationship between financialization and the port economy.

With this connection established, the scope of the thesis shall be narrowed to the Port of Rotterdam. Part one shall finish with presenting cases of financialization in the port economy of Rotterdam. Part two will continue with cases of financialization within the Port of Rotterdam collected from data.

The second part is dedicated to presenting the data collected from the online data banks. The research will be set at a NUTS-III Level. The NUTS-II Level of the Netherlands is set province level, in this case, Zuid-Holland. Within the Zuid-Holland Province, the research will be conducted specifically in the regions known as the NUTS-III Levels of Groot-Rijnmond and Zuidoost-Zuid-Holland, as this is the geographical location where the port is situated.

Information presented in the first –and the second part of the thesis will be used to answer the sub-questions and the main research question. Conclusions, limitations, and recommendations will be presented in the following of the second part of the thesis.

Part 1.1 Understanding financialization: A literature review

Financialization is a trend that is deeply embedded in national –and global economies. Understanding financialization will give a better insight into how companies operate within domestic and non-domestic markets and the influence of large financial institutions within these markets. Financialization can be traced across multiple economies including the port economy. In order to understand the case of financialization in the port economy of Rotterdam and answering the sub-questions it is crucial to gain insight on the trend called financialization. This part is dedicated to discussing the existing literature on financialization.

The concept of financialization

As discussed in the introduction there are multiple academic researchers that have discussed the concept of financialization. Through these papers, different explanations of financialization have been formulated. Boyer describes financialization as a macroeconomic phenomenon, representing a systematic shift in capitalism and marking the emergence of a new finance-driven regime of accumulation (Boyer, 2000). Epstein refers to financialization as the ever-increasing importance of financial markets, financial institutions and financial elites in the operation of the economy and its governing institutions. This concerns both national –and international levels (Epstein, 2001). Other economists such as Blackburn view financialization in a different manner. Blackburn views financialization as the growing power of financial institutions and the creation of financial instruments. This enables individual households and corporations to identify themselves as profit –and cost making mechanisms (Blackburn, 2003). A concept described as the financialization of daily lives.

Karl Marx and spatial expansion of accumulation

One of the earliest economists to discuss the concept of financialization was Karl Marx. As he did not broadly discuss the concept or even label it as financialization, Marx did discuss one of its main factors, the spatial expansion of accumulation in his Communist Manifesto in 1848. Spatial expansion of accumulation can be translated to the global concept of industries investing in other industries in which they have no related knowledge or background. In this case the financial sector investing in non-financial sectors. This forms the most fundamental concept behind financialization that is still seen today in other literature.

Sweezy and Magdoff and the start of financialization

Although most authors have different views of financialization they do all agree that the concepts cover the deepening and widening of financial objectives through agencies, geographical places and that it creates new financial actors and systems. In a broad sense, financialization can thus be described as financial actors and institutions investing and operating in industries of which they do not have any original background. An example of this can be a Japanese pension fund buying shares of a Canadian coalmine company. The concept of financialization can be dated back to the Great Depression in the United States starting in 1929. Shifting away from production and moving towards finance characterized this era.

Authors such as Sweezy and Magdoff argue that capitalization has endured three major trends since the Second World War. The first trend is the overall slowing down of economic growth. The second trend is the global up rise of monopolistic –and oligopolistic multinational corporations and the third trend is the financialization of accumulation of external capital. These three trends are evidently linked to each other.

The effects of monopolization will lead to increased profits for major global corporations and will at the same time reduce the need for additional investments in the markets that these global corporations already control. This leads to a situation in which a few amounts of corporations hold an increasing amount of capital surplus. Accompanied by fewer investment opportunities. This causes the economy to slow down.

These capitalists will seek opportunities outside their own industries to invest this surplus. From the 1970s onwards these corporations came with the solution of expanding their financial products. The financial supply side of the economy would create new financial instruments in the form of futures, options and hedge funds. A collective term for these financial instruments is a financial derivative. This led to one of the largest economic terms still used to this day: financial speculation (Foster, 2007).

Parameswaran and financial derivatives

A financial derivative is a financial security that has a certain value. This value is derived from the values of other assets. A derivative is a contract that is agreed upon two or more parties. This contract is based on the value of these assets. The origin of a financial derivative is the exchange market but has made its leap to the financial markets. It became possible to write off derivatives to products such as commodities.

What used to be a physical trade was now being transformed into a financial trade. Large companies started to invest their capital surplus into these derivatives obtaining shares in foreign markets, for example in commodities such as coffee, grain, ore or gold (Parameswaran, 2011). As certain industries were extremely capital intensive such as trade industries, energy industries, and manufacturing industries, it became increasingly more attractive for non-industrial related companies to invest in the industries.

Pike & Pollard and economic geographies

To fully comprehend financialization it is important to understand economic geographies. Economic geographies cover the different industries within a national economy and across economies on a global scale. Economists such as Andy Pike and Jane Pollard argued that due to the up-rise of derivatives and other financial instruments, financial institutions have gained more power in reshaping the socio-economic spheres of corporations. Finance became more important across the multiple economic geographies. The increase of importance of finance led to the increase of terms such as uncertainty, volatility, and risk across the economic geographies (Pike & Pollard, 2010).

The research of Pike and Pollard consisted out of three analytical themes. The first is the reach of the increased risk and volatility of financial institutions and –instruments across economic geographies. The second is the generation of risk, volatility and uncertainty and the transmission of this. The third is how these themes led to the unevenness of political, material and social factors across these economic geographies.

The research gave multiple outcomes. As the reach of these financial institutions and –instruments expanded on a global scale, new actors and sites were attracted to these financial mechanisms. This led to the adding and redeveloping of roles for actors within the global financial institutions. This in turn expanded the reach of these financial mechanisms. National financial operations became part of an international string of financial actors. These operations became part of the global finance.

This concept is supported by the theory of financialization of everyday life, as described by Blackburn. In an article written by Martin Sokol, financialization is explained through three approaches, regulation theory, critical social accountancy approach and the financialization of the everyday life. This approach states that financialization creates increased financial roles for everyday workers, individuals, households, and companies. These actors become absorbed into global financial circuits and become financial subjects of the system (Sokol, 2015).

Corporations became encouraged by financialization to embark in this trend across countries leading to the retreat of national governments. This is in line with the concept of neo-liberalization of the market. It is argued by some that financialization and neo-liberalization form together one economic concept. Financial Times commentator Martin Wolf has described the process of financialization and neo-liberalization as "hegemonic model of the market economy" (R, GL, J, & A, 2009).

Pollard, Oldweld, Randalls, Thornes and weather derivatives

Pollard, Oldweld, Randalls, and Thornes argue that derivatives contributed to the unevenness of political, materials and social factors across economic geographies. Financialization made it possible for derivatives to gap these economic geographical boundaries. Examples of this are weather derivatives. First used in The United States at the end of the 20th century, it created contracts between parties to manage risk and uncertainty concerning the weather. Restaurants and wine gardens were now able to hedge against wet –and dry periods. The energy industry was also able to acquire derivatives from a so-called winter hedge, which would still guarantee profits if a winter would be warmer than predicted.

These weather derivatives are perfect examples finance crossing economic geographies into economies with little affiliation with finance. The deregulation of the American energy sector in the late 1990s created the possibilities for these derivatives to be formed (Pollard, OldWeld, Randalls, & Thornes, 2008). These derivatives made it possible for the energy companies to hedge certain risks. At the same time, the government would distribute information concerning weather forecasting. This made it widely possible to forecast the weather as a corporation or even as an individual household and to invest in such derivatives. Financialization made it possible for capital markets to create and reshape connections with industries that had none to little affiliations with the financial markets.

Rodrigue, Notteboom, Pallis and financialization and embeddedness

Certain aspects of corporations change with the increase of financialization. As external investors become embedded in these corporations, strategic choices will change and with that certain consequences will arise, such as the importance of shareholder value and the increasing return on investment. As Sokol stated, financialization can be viewed through three approaches (Sokol, 2015). One of these approaches is the critical social accountancy approach. This approach states that through financialization firms focus their company goals on increasing shareholder value and short-term financial goals instead of focusing on long-term production goals.

As these investors are not familiar with the industry in which there are investing, it could possibly lead to a new relation between the amount of risk taken and the amount of industry embeddedness an investor has. Risk assessment is essential for management when considering new investments. This risk assessment is interlinked with the embeddedness. Embeddedness can be defined as the level of interaction between two or more actors of different industries and the amount of knowledge between them concerning strategic actions.

Higher levels of embeddedness will not lead to lower levels of risk but it will enable the actors to assess the risk more efficiently. Thus creating the relationship that higher levels of risk will demand higher levels of embeddedness and vice versa. If these relations are off it could lead to the increase of recklessness and the possible failure of investments.

The financial sector has always been characterized as a sector that is reckless. As the financial sector often has low embeddedness with non-financial sectors, the risks will increase. These risks are in the form of capital and currency risks, market risks, energy cost risks, political and regulatory risks, market specialization risks and moral hazard risks (Rodrigue, Notteboom, Pallis, & A., 2011).

French, Leyshon, Wainwright and Regulation Theory

Regulation theory drives on the idea that the financial system serves to break certain systems of accumulation. Boyer adds to this regulation theory that financialization is based on a long-term accumulation that has led to new financial institutions. The main building blocks of these financial institutions consist of capital mobility and governance. Governance that looks after factors such a shareholder value. To sustain the corporate advantage, these corporations are subject to shareholders and their ideas about strategies. Managers need to form strategies according to shareholder power (French, Leyshon, & Wainwright, 2011).

The second outcome of their research concerns the generation of risk and volatility and the transmission of this in large financial institutions. As shareholders provided more capital, the amount of participation in investments by shareholders increased. Large institutions were not able to adjust strategies as easily as they had done before due to the increase of this shareholder power. The regulation school of finance backs up this theme.

Manuel Aalbers and Financialization

Many academics that research the trend of financialization, agree upon that financialization has found its roots in the economy during the start of the 1970s. Manuel Aalbers a professor at The Katholieke University of Leuven stated in an interview that he also agrees with this view. According to Aalbers, there are a few factors that contribute to the emergence of financialization. One of these factors is the dismantling of the Bretton Woods financial economical agreement. The Bretton Woods agreement was originally installed in 1944 between 44 countries and consisted of fixed exchange rates between different currencies.

When this system was dismantled, currencies began to fluctuate once again which led to financial speculation. Companies would buy goods in one currency and sell them in another currency as they could earn money not only over the goods but also over the exchange rate. Another factor contributing to the rise of financialization is the deregulation of the financial sector, leading to a decrease in government influence. This led to a larger freedom among financial companies for investment choices and an increase in competition. Financial institutions could now seek investments in other industries that deemed highly profitable and capital intensive. During those years an oil crisis arose. Due to increasing oil prices, certain oil-producing countries such the Texas, Norway, and Mexico benefited from this and led to an increased attractiveness for investment from financial institutions.

Some academics see financialization as the result of globalization, neo-liberalization of internationalization. Aalbers explains that these economical trends are a combination of each other. They are used to explain different economic events, but are not the result of each other. They are a theoretical combination to explain large economic trends. Each economical generation is labeled by one of these trends as the 1990s were known as the globalization age and this current decade is known as the financialization age.

Due to the retreat of governments, semi-privatized companies were in search of new forms of finance. An example of such a company is the housing corporation Vestia. Vestia acquired new finance in the form of financial derivatives. This was nothing special as multiple companies' acquired finance in the form of derivatives. This was a common thing to do, as derivatives would form a type of insurance for the high amount of debt these companies had. However, instead of Vestia using this finance for company purposes, they used the finance to enlarge their capital by investing it. Using borrowed finance to create more finance, which led to a large scandal. This may be an exceptional case but the concept of governments retreating and semi-privatized companies finding new ways of finance is not.

This was also the case in car manufacturing industries, farming industries, and port industries. According to Aalbers, a possible way of measuring financialization is by investigating how companies are earning their money. Is a company creating capital through the selling, distributing and trading of products and services, or is a company also engaged in financial deals. If financial deals are a form of creating capital for a company, this could be seen as a form of financialization (Aalbers, 2018).

Literature summary box

Figure 1 presents the multiple articles and interview discussed. This overview presents three columns. Columns 1 and 2 present the authors and the main information provided in their research and the 3rd column presents authors who also support the same view in their research.

Authors	Article/ Interview Information	Supported by
Karl Marx	Spatial expansion of accumulation	• Pike and Pollard: Economic geographies • Parameswaran: Financial Derivatives
Sweezy and Magdoff	The uprise of three major economic trends and the outcome of these trends, the financial derivative	• Parameswaran: Financial Derivatives • Pallard, Oldweld, Rendall, and Thornes: Weather Derivatives
Parameswaran	Provides information concerning financial derivatives	• Pallard, Oldweld, Rendall, and Thornes: Weather Derivatives • Sweezy and Magdoff: Start of financialization
Pike and Pollard	How finance has crossed economical boundaries and gained an important role in other industries	• Blackburn: Financialization of the daily life • Pallard, Oldweld, Rendall, and Thornes: Weather Derivatives
Pallard, Oldweld, Rendall, and Thornes	Provides the perfect example of financialization emerging in non-financial industries, the weather derivative	• Pike and Pollard: Economic geographies • Parameswaran: Financial Derivatives
Rodrique, Notteboom, and Pallis	Provides information concerning the consequences of financialization	• Sokol: Social accountancy approach • French, Leyshon, Wainwright: Regulation Theory
French, Leyshon and Wainwright	Concerning the regulation theory of financialization	• Sokol: Social accountancy approach • Rodrique, Notteboom, and Pallis: Financialization and embeddedness
Manuel Aalbers	Factors contributing to the emergence of financialization	• Sweezy and Magdoff: Start of financialization • Pike and Pollard: Economic geographies

Figure 1: A literature overview

Part 1.2 The Port Economy

Ports are not a stand-alone concept but are part of a global supply chain that consists of numerous actors. Ports are the nodes of these global supply chains and have multiple functions. Stopford defines a well-known textbook term for a port. A port is a location where ships can dock and offload their cargo, usually situated in a deep-water area (Stopford, 2009). This part is dedicated to describing the concept of the port economy.

Ports and their functions

There are many different concepts of what a port is, but in all different concepts, a port is defined as a logistics hub within a supply chain. Ports form important areas for value adding economic activities. These value-adding activities may consist of the handling of ships and cargo, storage, trade, industrial activities, the forwarding and transporting of cargo and other activities.

Ports are classified into three types of functions: a port as a transport node, a port as a location for industrial activities and a port as a location for logistics activities. Every type of port has a different range of actors. The geographical scope of competition also differs per port. An overview of these functions is provided in figure 2 beneath.

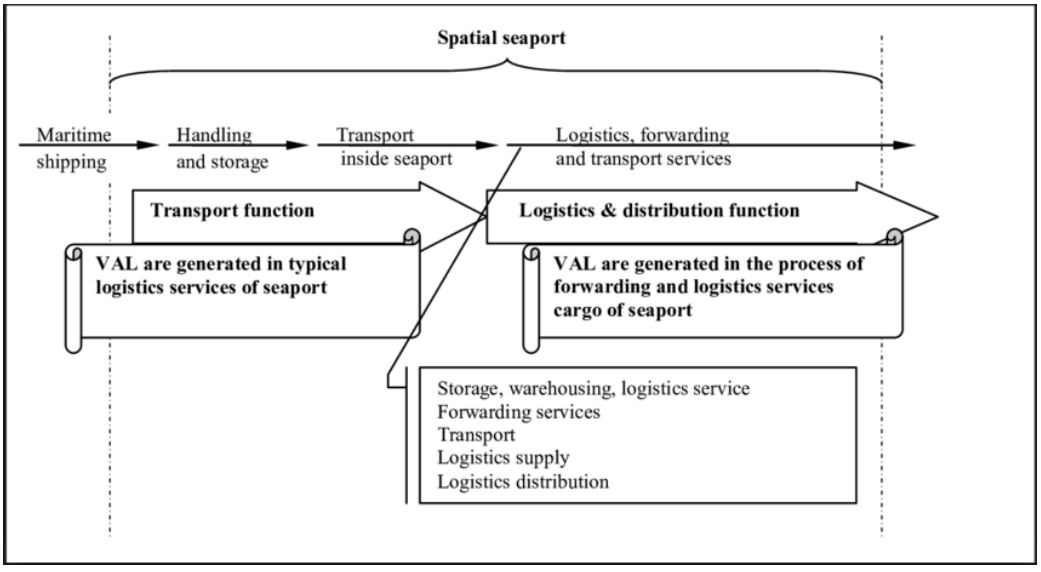

Figure 2 Source: (Geerling, Kuipers, & Zuidwijk, 2017)

Port as a transport node

A port that functions as a transport node has three main functions: the handling of cargo, the storing of cargo, and the trading of cargo. The competitiveness of a port is determined by its location on a geographical scale. How the port is situated towards other ports and how the port is situated towards the hinterland, where other industrial complexes are located. The hinterland can be defined as the area located land inwards behind a port. As the port evolves mainly around the activities connected to cargo, another important determinant in competition between ports is the performance of nautical service companies and terminal operators. Their performance can be measured in two manners. The first manner is the amount of turn-around time. Turn-around time consists of the time it takes for a vessel to enter the port, to have their cargo off-loaded, new cargo loaded and to leave the port. The lower the turn-around time for a port the higher the attractiveness for vessel operating companies.

The performance of a port can also be measured in the throughput in tons. This will act as a comparison level with other ports. Ports have different manners in handling cargo and have connections with different types of industries. Industries that often differ per country where the port is located (Nijdam & Van der Horst, 2018).

Port as a location for industrial activities

The industrial revolution starting in the 1920s had positive influences on port economies worldwide. The increase of industrialization led to an increase of industrial activities in ports. Raw materials were essential for industrial activities and needed to be sourced on a global scale and this was done through shipping. Companies specialized in the handling and shipping of these raw materials situated themselves in port industries. During the 1950s there was again a global economic boom and there emerged a global demand for oil and other petrochemicals. The industries specialized in oil and petrochemicals now needed to fulfill an increasing demand from other uprising industries and therefore sought locations that had access to global transport. Ports deemed excellent locations for the installation of refineries, storage and other installations needed for this industry.

Due to the growth of demand for oil, refineries sought ways of transporting larger volumes at once to seek economies of scale. This led to the creation of supertankers. Supertankers could carry a large volume of oil and other chemicals but had a downside, the increased size led to an increased depth. This meant that some ports were situated in too shallow waters to handle these vessels. Oil refineries and other petrochemical companies would invest in ports where the waters were deep enough for these supertankers. An example of such a port is The Port of Rotterdam. The port of Rotterdam with its draught of 24 meters formed a suitable location for these refineries and industry related companies.

Important determinants for port competition in these industrial ports are the nautical accessibility, the availability of land and with it the price of land, the investment climate, the access to labor and the size of demand of the national market. Main competitors of industrial ports are based on a more global level, namely industrial sites around the world (Nijdam & Van der Horst, 2018)

Port as a location for logistic activities

At first, ports had the function of a transport node, this developed into ports also holding the function of an area for industrial activities. This later evolved into ports also holding the function of being a location for logistics activities. A larger development in the trading industry contributing to this was the invention of containers in the 1960s. This enlarged the efficiency of intermodal transport, as the whole supply chain would make use of a common form of transport. A container could be transported from one type of transport to another type of transport with little disruption and more efficiency. Ports became areas for intermodal transport. Other contributions towards the creation of ports being logistic hubs were the emerging of environmental concerns and the increasing energy crisis (Van Klink & Van den Berg, 1998). These factors restrained the demand for oil –and other petroleum products and gave room for new actors in the port economies.

These actors were the container terminal operating companies. Activities such as warehousing, the grouping of cargo and value-added activities for shippers and vessels would take place at these terminal operating companies. The activities will range from containerizing, packaging, palletizing, weighing to filling, un-filling, forwarding and much more. These activities performed at terminal operating companies formed key logistic activities within ports.

The competition level was set at national levels, at which logistic ports would compete with other logistic sites situated in the same geographical zones or with ports in the same range. Key to performance and competitive levels was the availability of transport and infrastructure to distribute cargo to the hinterland (Nijdam & Van der Horst, 2018).

The industries within a port economy

In order to understand the port economy, this part will describe the different industries located in a port economy. The industries that will be discussed are the shipping industry, the terminal operating industry and the port as an industrial complex. These industries within a port economy are part of the maritime industry.

Types of Cargo

Types of cargo may consist out of bulk cargo that is transported in large quantities and is not stored in packages or containers. Bulk cargo can be split up into liquid -and dry cargo. Dry bulk can consist out of grain, iron or coal. The liquid bulk cargo is split up into two groups: crude oil and refined oil. The more general type of cargo is called break bulk. Break bulk is a general concept for cargo that can be transported in drums, on pallets or in crates. Examples of break bulk are metal and wood. Another type of cargo is containers. Containers range from 20 feet to 40 feet and are used for a large variety of goods. Roll-on and roll-off cargo is the type of cargo that can make use of wheels to enter and leave a vessel, such as cars and trucks. A special type of cargo is called project cargo. Project cargo consists of all types of cargo ranging from airplanes to wind turbines. Project cargo covers all types of cargo that need a form of special transport.

Shipping industry

The shipping industry is a collection of multiple types of shipping. Different types of vessels deliver different types of cargo. The six main shipping types within the shipping industry are oil tanker shipping, chemical tanker shipping, gas tanker shipping, dry bulk carrier shipping, container shipping, and reefer shipping.

Oil tanker shipping

Oil tanker shipping can be split up into two categories: crude oil shipping and product oil shipping. Crude oil shipping is the shipping of unrefined oil from oil extraction sites to the oil refineries. Product oil shipping is the shipping of the finished product to points of consumer markets. There are multiple designs of oil tankers, shown in figure 3.

The general types of tankers

- Small range product tankers: Carrying between 10,000 and 60.000 DWT
- Panamax tankers: Carrying between 60.000 and 78.000 DWT
- Aframax tankers: Carrying between 78.000 and 120.000 DWT
- Suezmax tankers: Carrying between 120.000 and 200.000 DWT
- VLCC (Very Large Crude Carrier): Carrying between 200.000 and 320.000 DWT
- ULCC (Ultra Large Crude Carrier): Carrying between 320.000 and 550.000 DWT

Figure 3 Source: (Chakraborty, 2017)

*DWT: Deadweight tonnage

The VLCC and the ULCC were built as the result of increasing demand and supply of oil in the 1970s. To lower the average costs per voyage, these ships were built to carry enormous amounts of oil. For twenty years these ships proved to be extremely valuable but due to increasing oil prices at the end of the 20th century, the amount of oil being traded over sea decreased which in turn led to a decrease in demand for these types of vessels.

This led to an overcapacity of tanker capacity in the oil shipping industry. Due to this excess capacity, the retained earnings were low. For VLCC's the average daily earnings were at $6000, and for Suezmax carriers, the average daily earnings were just above $10.0000 at the beginning of 2018. Just a year earlier these daily average earnings were at $60.000 and $40.000.

Chemical tanker shipping

Chemical tankers are designed to transport a wide variety of chemicals. These ships are built to maintain the consistency of the chemicals on board. In recent years the amount of trade has globally increased for chemicals and with this the demand for vessels that can transport chemicals. Modern chemical tankers are specifically built for the type of chemical they will transport. These vessels are identified by their codes, IMO type I tanker, IMO type II tanker, IMO type III tanker. The IMO type I tanker will transport the most hazardous type of chemicals. Type II and III tankers are the most commonly used (Research, 2016).

Gas tanker shipping

Gas carriers are vessels that have been specifically designed to transport the numerous types of liquefied natural gases (LNG) and the different types of liquefied petroleum gasses (LPG). These ships are built with tanks of a normal shape, cylindrical shape or a spherical shape. Depending on the load and destination these ships are able to carry from 3.500 m3 to 150.000 m3 of gases. Gas tanker ships can be classified into three types: fully pressurized, semi-pressurized and semi-refrigerated and fully refrigerated.

Fully pressurized ships are vessels that have the capability of carrying up to 3.500 m3 of gases. These ships are designed with tanks of cylindrical or spherical shapes. Semi-pressurized and semi-refrigerated ships are built with semi-refrigerated plates and high-pressure tanks capable of transporting up to 5.000 m3 of gases. These ships are built with cylindrical tanks and are mostly used for transporting propane gas. Fully refrigerated ships are vessels that are able to carry up to 150.000 m3 of gases. These vessels are suitable for long voyages. Gases such as LPG, ammonia, butane, and propane are mostly transported with these vessels (Karan, 2016).

Dry bulk shipping

A dry bulk carrier is a vessel designed to transport large amounts of bulk goods such as ore, grain, and coal that are not packaged in containers or crates. Due to the rise of industrialization at the beginning of the 20th century, there was a global increase in demand for coal and ore. Dry bulk carriers were designed to transport these materials across the seas. Of all the vessels sailing across the globe around 35% are of the dry bulk carrier category.

Container shipping

Container vessels are vessels that carry multiple types of cargo in a standardized way, namely in a container. These containers are universal of design and are the result of containerization. A container ship can be measured in the amount of twenty-foot equivalent units it can transport. A twenty-foot equivalent unit is a standardized type of container (TEU). 90% of worldwide cargo that is not bulk cargo is transported in containers. The largest vessels are able of carrying around 20.000 TEU. Container ships are divided into seven categories: small feeder vessels, feeder vessels, feedermax vessels, panamax vessels, post-panamax vessels, new-panamax vessels and ultra-large vessels. Due to overcapacity within the container-shipping world the prices for new and used vessels dropped. Since 2008, the price for a new vessel dropped by 19%-33%. Prices for used vessels dropped by 47%-69%.

Reefer shipping

The term reefer is used for the cargo that is refrigerated and for vessels that have refrigerated applications. Types of cargo are often perishables such as fruit and vegetables. Key elements of reefer ships are that they are often smaller in size than container ships and need certain technological provisions on board to create energy for the cooling of the cargo. This enables these vessels to bypass cooling storages upon arrival in a port. The reefer shipping market is still expanding each year by 4%-5% and is predicted to continue growing up to 2020.

Container terminal operating industry in the port

Terminal operators are operators within the maritime industry that are active in the handling of containers. These companies form facilities where containers are transshipped from one type of transport to another type of transport. These companies are part of a global wide network that has grown during the recent years due to internationalization. Internationalization came in three waves. The first wave was when the companies Hutchison Ports, P&O Ports, and SSA Terminals increased their operations into new markets worldwide. The second wave consisted of the companies: PSA, Eurogate Terminals and CSX World Terminals following the successes of the first wave. The third wave consisted of container carrier companies entering the terminal operating industry to protect their core product. The market was formed into three major groups: Stevedore operating terminals with profit as the main goal, integrated carrier companies that operate terminals with cost center motivations and container carriers companies entering the terminal operating industry.

Not all three types expanded on an international scale at the same pace. Only due to financial opportunities created by financial holdings, pension funds and investment companies could these companies expand on a global scale. These financial parties would buy assets in terminal operating companies and would operate them through indirect management approaches, meaning that the terminal operating companies would remain in charge of business operations.

Drewry maritime research and consulting services have formed a forecasting report for 2020. In this report, the company has predicted who the main global terminal operating companies will be and what the ranking of these global terminal operating companies will be in 2020. Table 1 provides an overview of this forecast.

Terminal operating company	Capacity rank years	
	2020	2016-2018
Cosco-China Shipping *	1st	4th and 8th
APM Terminals **	2nd	2nd
PSA International	3rd	3rd
Hutchinson Port Holdings	4th	1st
DP World	5th	5th
Terminal Investment Ltd	6th	6th
CMA CGM **	7th	9th

Table 1 Source: (Drewry, 2016)

*: The merger between Cosco and China shipping taken into account

**: APM Terminal has acquired Grup Maritim TCB

***: CMA CGM has acquired APL Ocean Carriers

The forecast predicts that Cosco-China shipping will become the largest container terminal operator by 2020 as result of the merger between the two companies. Global investors willing to invest in these terminal operating companies explore the investment return possibilities, the intra-port competition, the growth possibilities and the cargo capacity of the facilities. To increase capacity, the global terminal operators will indulge in mergers and acquisitions, creating larger facilities and global coverage. Global terminals operators situate themselves in ports where there are multiple forms of transportation and positive throughput prospects.

Global terminal operators have increased operations in developing regions such as Southeast Asia. In these regions, they invest in facilities to handle larger vessels and higher cargo throughputs. These companies do this by expanding their role in the supply chain and by acquiring assets through mergers and acquisitions. An example of this is the acquiring of TCB terminals by APM Terminals. This creates a stronghold for APM terminals in Spain.

Industrial complexes in the port

Within a port, there are multiple industrial actors operative. Ports form attractive locations for these industrial actors to locate themselves due to the large availability of land located next to multiple transport infrastructures. As a result of the geographical relocating of port offices to the cities, pieces of land came available. Combined with the increase in demand for petroleum, chemicals, and asphalt after the Second World War with the rise of automobiles, industrial companies situated themselves in port areas to operate on a global scale. These industrial industries are of high value for ports. 50% of the direct-value for the Port of Antwerp originates from industrial activities in the port. Chemical activities form the largest share (Kuipers, 2017). This is the same case for the Port of Rotterdam. According to key figures presented by the Port, the industrial cluster is responsible for 55% of port revenues and is accountable for 20% of the added value of the tot Dutch industrial cluster.

The rise of these industrial clusters within international ports was made possible by four technological innovations. The first was the increasing size of vessels used to transport industrial products. These large vessels increased the economies of scale and enlarged cost advantages. The second innovation contributing was the mechanization of cargo handling operations. This was correlated with the third type of innovation, which were innovations in water dredging, locks, and sea docks. This increased the possible scale of operations for industrial complexes. The fourth innovation is the interrelated pool of technological innovations based on the discoveries of engines, oil, and the phone. These three innovations connected industrial complexes worldwide.

With the increasing innovations in the chemical sector in correlation with chemical production facilities such as refining and cracking technology, ports gained increasing importance as locations for these activities. Sites as petrochemical production complexes became extremely integrated within a port industry where oil refineries are part of a supply chain, linked to producers and mediators. These complexes became known as Maritime Industrial Development Areas, short known as MIDAs. These MIDAs form great importance to ports worldwide. During the period of 1995 to 2015, the added value of the Port of Rotterdam to the Dutch economy stood at a stable 0.8%.

Three factors contribute to the strong economic position of industrial complexes in ports. The first is the locations of these international ports. These locations create logistic costs advantages, as they are located in sites with multiple forms of transport. The second factor contributing is the continuous investment in the petrochemical sector. Global companies such as Shell have invested in multiple projects to increase productivity. A recent investment by Shell was the construction of a major unit at the Pernis refinery in 2015. The third factor contributing is the up rise of biochemical operations within these industrial complexes. Biochemical operations began at the start of the 21st century and are the transition of petrochemicals towards bio-based chemicals (Kuipers, 2017).

Biochemical Complex

The biochemical industry is an industry where products are created from biomass. The biomass industry is shaped like a pyramid. The bottom of the pyramid is filled with products that are created in large quantities but consist of little biomass. The top of the pyramid consists of products that are produced in small quantities but consist of a high level of biomass. Examples of this are biofuels. The biomass industry focuses on products from the top of the pyramid due to their added value.

Ports form attractive sites for the activities connected with the biomass industry. Biomass inputs are mainly transported from overseas locations and arrive in bulk. Ports have already installed mechanisms to handle such bulk. Ports already consist of logistic assets for the handling and of transporting biomass bulk. Following these logistic assets, there is also the already available skilled labor within the port facilities for refining the biomass (Kuipers, 2017).

Another reason for the attractiveness of ports for biochemical complexes is the location advantages. The existing feedstock, the availability of national markets in combination with logistical advantages form important decision criteria for the location of a commercial biochemical investment.

Part 1.3 Financialization and the Port Economy

The multiple actors within in a port economy are part of an industry. This industry is labeled as the maritime industry. As both concepts have been explained, the relation between them must now be elaborated. This is done through describing the history of finance in the maritime sector and how this has evolved into modern forms. The jurisdiction of a port will also be discussed to explain why ports as a whole are attractive investments for financial institutions. This following part is dedicated to linking the concepts of financialization and the port economy.

Traditional Banks and Maritime Finance

Although the concept of financialization is new to certain industries such as the technology industry, financialization has roots in the maritime industry that go back to the 17th century and 18th century. An example of this is the Dutch shipping and trading companies. During the 19th century, financial institutions in The Netherlands provided capital to the shipping and trading industry in order to build ships and to buy cargo. This would decrease the financial risks for the shipping and trading industry and once the trade had been made and the cargo was sold, the financial institutions would be reimbursed. This created the first concept of shipping financial insurance institutions. With this, a form of hedging arose in which options on cargo could be bought before a ship would reach its destination.

The geographical distance between financial institutions and the shipping and trading companies was not far. Both institutions would operate in the same geographical locations, namely on waterfronts of international cities such as Rotterdam and London. This lowered the investment risk between these institutions. However, this changed during the beginning of the 20th century. Due to industrialization other industries emerged that deemed to be more capital intensive on a national level and more financially attractive.

Financial institutions started investing in such industries. This led to office operations geographically moving away from the known waterfronts and with them the management of companies. The maritime industry became a more marginal component in the portfolio of the financial institutions but still remained an important one.

During the 1950s there was an increase in global trade. This created a string of new opportunities for the maritime industry. With this increase of trade came a new concept, containerization. Containerization created enormous multiplying effects because the industry is extremely capital intensive. This renewed the connections between the financial institutions and the maritime industry (Rodrigue, Notteboom, Pallis, & A., 2011). The main financial institutions were characterized as traditional banks. The maritime industry wanted to grow with the new global trade and this required large sums of capital, capital that these traditional financial institutions were willing to provide.

The reason for the increasing role of financial institutions in the maritime industry is explained by the economic thought that capital accumulates in the sectors that are expected to have the highest returns. Traditional banks seek out these sectors to create opportunities for increasing their capital through investments. As the maritime industry is capital intensive, it forms an attractive sector for financial institutions. Certain actors in the maritime industry are extremely interesting for these financial institutions such as the terminal operating companies.

With the increasing international trade, terminals and other actors within the maritime industry became highly profitable. This profitability is not characterized in the rate of return but is characterized by the volume of this return. Ports also have numerous underlying assets such as cranes and terminals that are of large value that are capital intensive.

During the 1990s, the rise in global trade was starting to reach a peak. Most of the invested capital remained in Europe and The United States in terminal operating companies. At the same time, growth started to occur within this industry in Asia. Terminal operating companies in The United States and in Europe were utilizing most of the growth, between 60% and at most 90%. Within ports, the threat of congestion increased. Terminal operating companies began looking for growth opportunities to counteract this congestion threat.

This led to new aggressive strategies such as mergers, acquisitions. These mergers and acquisitions were extremely capital intensive. As a result of this, a new era was entered by the maritime shipping industry. An era characterized by the global terminal operating companies. Large sums of capital would be needed for these global terminal operating companies. Utilizations rates were stabilized on a global level however, these new global terminal operating companies sought new ways to capture profit and growth in external markets. The outcome of these strategies was the further disconnection between the maritime industry and the traditional banks leading to new forms of finance.

Maritime Finance and the rise of new financial institutions

All though finance and the maritime industry have a common history, since the recent crisis, the amount of finance provided by banks has decreased. The maritime industry is characterized by high levels of uncertainty and has experienced large drops in market value. The financial crisis has affected the investment portfolio of banks and they have become more cautious with investing capital and have started minimalizing their portfolios in this industry. Actors within the maritime industry such as the vessel-building companies have therefore sought alternative forms of finance. This has resulted in two trends with obtaining finance.

The first trend is the shifting of bank finance. Traditionally European banks form the main channel for maritime finance. But due to the crisis, the Asian –and Australian banks are overtaking this role. Since the crisis the European Central Bank has increased the amount of risk management policies, meaning that European banks have been forced to divest. European banks have roughly decreased around 30% of their vessel portfolios, from 373 billion Dollars in 2010 to 254 billion Dollars in 2015 (Sea, 2017). At the same time, the German KG funds collapsed, which resulted in German Banks only investing domestic maritime actors and divesting in foreign maritime actors.

Vessel building companies sought new forms of finance and Asian –and Australian banks offered solutions. While European banks were decreasing their portfolios, Asian –and Australian banks were increasing their portfolios by 9%. Vessel portfolios increased from 66.4 billion Dollars to 128.3 billion Dollars in just 5 years. Government policies from Australia and other Asian countries supported the wide increase of maritime sector making it possible for these banks to increase their portfolios.

Another factor is China's Belt & Road Initiative, aiming at creating a 21st century Silk Road, which supports vessel building within the maritime industry. Figure 4 provides an overview of these vessel portfolios. The blue line shows the declining vessel portfolios of banks in Europe and the green line shows the increasing vessel portfolios of the Asian and Australian banks.

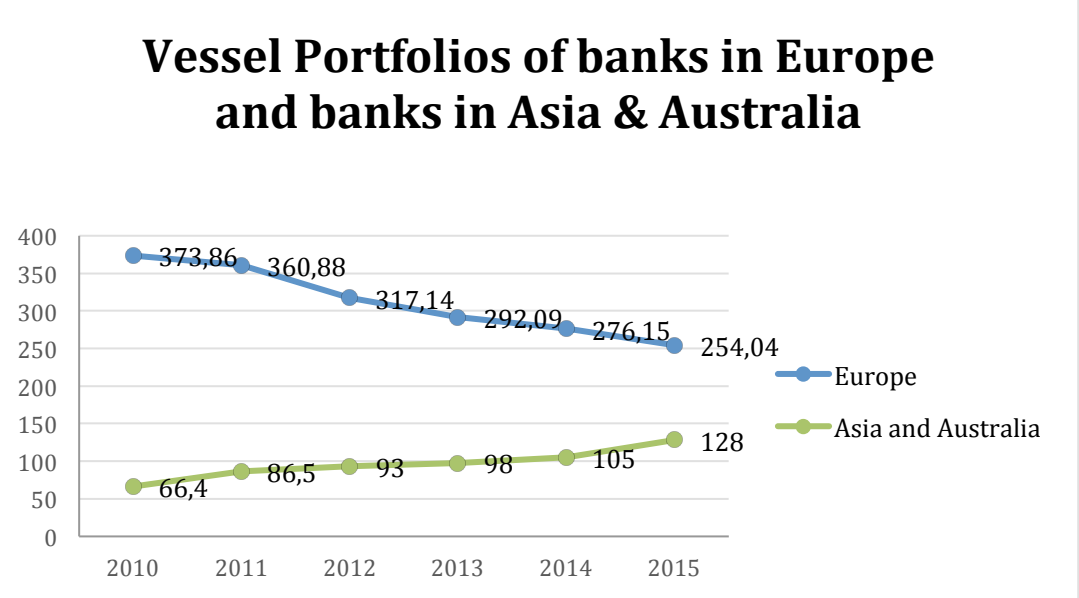

Figure 4 Source: (Sea, 2017)

Y-axis in billions of dollars and x-axis in years

The second trend is the result of the decrease in finance provided by banks, the emerging of other financial institutions such as pension funds and insurance institutions with large capitals. This was mostly the case with small –and medium-sized maritime companies, as the new management risk policies only lets traditional finance lenders focus on large maritime companies. These small –and medium companies stopped receiving finance. These companies within the maritime industry were in need of finance. Pension funds, insurance companies and other financial investors overtook the roles of the traditional banks. The new financial institutions offered finance in the form of transactions such as bonds, convertible debts, and other financial derivatives.

These new financial transactions originate from United States capital markets and Norwegian Capital markets. The Norwegian bond market became the most common financial system of acquiring finance. Since the start of the crisis, the London capital market also became more attractive as a manner of finance. ECAs (Export Credit Agencies) gained increased importance during the switching of maritime finance through direct lending from co-financing agreements or in the form of guarantees from insurance policies.

Other financial institutions entering the maritime industry were the private equity funds. Prior to the financial crisis, private equity funds would invest their capital through financial institutions such as banks. But since the banks had engaged in new management risk policies and interests on investments had decreased, this manner of investing had decreased in attractiveness for such funds. The maritime industry deemed high in attractiveness for private equity funds due to their demand for extremely high amounts of capital. Private equity funds have also started buying loans from traditional banks that originate from the maritime industry with large discounts. This offered immediate profits for these funds and increased in attractiveness for others.

The most recent financial institutions that are entering the maritime industry are small financial institutions that target small –and medium-sized companies within the maritime industry. Capital often originates from individuals, families or small firms such as financial holdings and small insurance companies. The cost of this form of finance is often higher than other forms of finance and thus not as attractive. But the advantage of this form of finance is due to its long-term approach, as they do not only target a single actor but a whole structure within the maritime industry. Their investments are characterized as creative investments involving leasing agreements, forms of private equity and also loans (Miliotis, 2017).

The jurisdiction of the port economy

David Bassens, a professor at the Vrije Universiteit in Brussels in the field of Economic Geography explained that the jurisdiction of ports is a factor of influence when a financial institution is willing to invest into an asset or infrastructure in a port economy. A distinction must be made between the port economy as a whole, such as the infrastructure and waterways that are maintained by the port authority and the private companies operating within a port economy. A connection can be made by the jurisdiction of the port authority to large-scale investments done by financial institutions in the infrastructure of a port. This section covers the attractiveness of the port economy as a whole.

Jurisdiction can be defined as the amount of sovereignty the governments and local authorities have over the ports. 30 years ago most port sectors were considered strategic assets for complete nations. However, this has shifted to phases of institutional reform characterized by forms of commercialization and privatization. The less sovereignty a government has within a certain port, the more likely that financialization will occur in that certain port (Bassens, 2018). This view overlaps that of Epstein over neo-liberalism. Due to the retreat of national governments, the number of economic transactions with financial institutions will increase (Epstein, 2001).

Liberalization within ports is the process whereby the initial power of the government is reduced and boundaries for the market entry by private companies are removed. In the long run, these boundaries will even be converted into regulations that support entry and competition. The most aggressive form of liberalization of ports is privatization. Privatization consists of transferring ownership shares of a port from the public sector to the private sector. The private sector will gain participation in management, development, and operations.

This privatization creates an enlarged attractiveness for investing by external investors. An example of this is when the Japanese terminal company made the choice to invest in the port of Jacksonville. Mitsui O.S.K. Lines states that one of the main reasons behind their 230 million Dollars investment in the port in Jacksonville was due to their jurisdiction structure (Company, 2009).

Full privatization of the port is almost never the case as the government holds a certain degree of participation. Ports are a type of infrastructure. Bassens (2018) explains that infrastructure is seen as high yielding assets by institutional investors. As certain parts of infrastructure become outdated and need large capital investments, governments are not always in the economic position of providing this finance (Bassens, 2018).

This creates a situation in which governments are in search of external finance. As these projects are of long-term nature, financial institutions such as pension funds would form a strategic fit. Pension funds find these infrastructure projects attractive for investments as it gives them access to high yielding assets that are of long-term and can secure cash flows with linkage to inflation. Either due to contracts or certain regulations, prices of infrastructure assets are linked to inflation, which allows the prices to rise when the inflation rises. This forms an attractive attribute that little assets groups in an economy can provide. As these infrastructures are of high economic importance for a country, the government has a high involvement in securing the success of these projects. This in return forms government guarantees for financial institutions that will reduce the investment risk (KPMG, 2018). Larissa van der Lugt a senior researcher at the Erasmus University agrees with this view as to why financial institutions find the port infrastructure projects attractive for investment. In an interview, she stated that due to the long-term continuity of these projects in combination with the low volatility, high stability, and continuity, financial institutions are willing to invest in such port infrastructure projects (Lugt, 2018).

Possible implications of financialization in the port economy

The financialization of industries will lead to implications at a certain point. Manuel Aalbers stated in an interview that possible implications of financialization are the retreat of financial institutions (Aalbers, 2018). Financial institutions such as banks, pension funds, and insurance companies have the return on their financial investments as primary goals. Once the amount of financial return decreases, the attractiveness of an investment decreases and the attractiveness of other financial investments in other sectors may increase. In a situation where companies within a port economy experience multiple terms of declining growth, the investment attractiveness of companies situated in the port industry declines.

The amount of investment may decline and with that the capital needed for the companies in port economies to function. As explained earlier, companies in the port economy are capital intensive and financial institutions are one of the few actors capable of providing such large sums of capital. This may lead to two outcomes. The first outcome is that these companies will go bankrupt due to the decline of capital needed to continue multiple operations. The other outcome is the intervention of the state. The state will buy the financial institutions out of the company and become a majority shareholder (Aalbers, 2018).

Rodrigue, Notteboom, and Pallis explain in an article that the relationship between financial institutions and the port economy has always been inverted. Originally trade prospects were the outcome of operations in the port economy, but due to financialization, the desired outcomes became finance. An economical mindset arose in the port economy that consisted of to create demand for cargo and other operations; large sums of capital must be injected into the port economy. This mindset led to five main consequences.

The first consequence is a disconnection between financial institutions and maritime operations. Due to the increase of financial advisors and consultants a decline of market specific knowledge emerges. Maritime operations become financial assets instead of operational bodies. The second consequence is the emergence of rent-seeking strategies that companies focus primarily on financial outcomes instead of focusing on production outcomes. Aalbers, Sweezy, and Magdoff also mention this consequence, as does the critical social accountancy approach

The third consequence is the creation of an industry with low contestability. As the port industry is a capital-intensive industry, the entry barrier increases with the increase of capital. Meaning that fewer companies are entering, leaving fewer companies to compete. The fourth consequence is the inflation of assets and high amortization created by the increasing expected future growth. Increased investment in port operations such as terminals combined with declining returns are the premises of a bubble if they are under the assumption of increased future growth.

The last consequence is the growing discontent and lack of regional embeddedness. As explained in the introduction by the same academics, financial institutions investing in port operations are often situated in a different region of a country. This may possibly have negative outcomes for local environments due to the ever-increasing economic activities (Rodrigue, Notteboom, Pallis, & A., 2011). An overview of these consequences is found in figure 5 below.

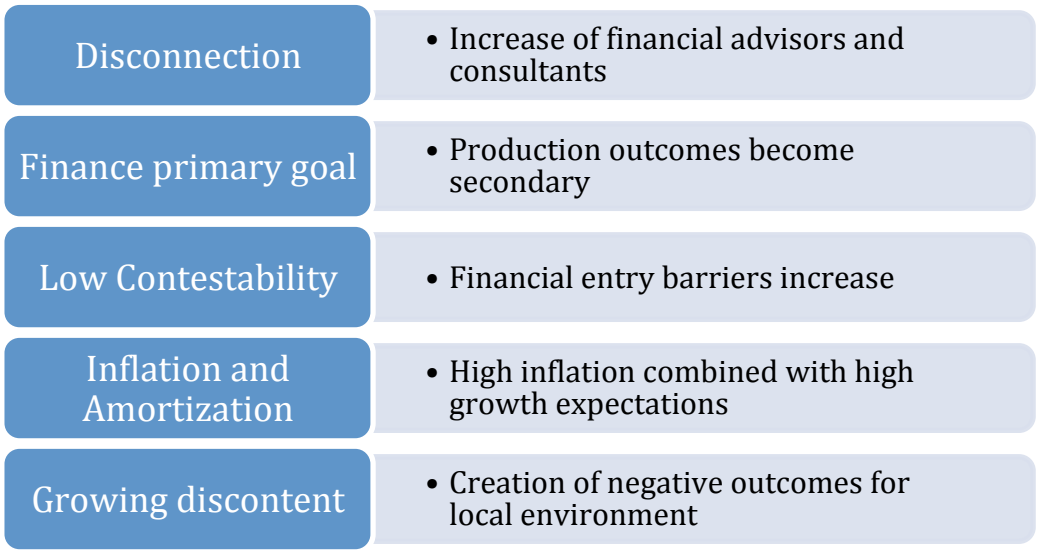

Figure 5

Part 1.4 The Port of Rotterdam

In the parts above, the concepts of financialization and the port economy have been discussed. The link between the concepts has been explained and the evolution of this link. This part shall present cases of financialization found in newspaper articles and after this further cases of financialization will be presented from collected data.

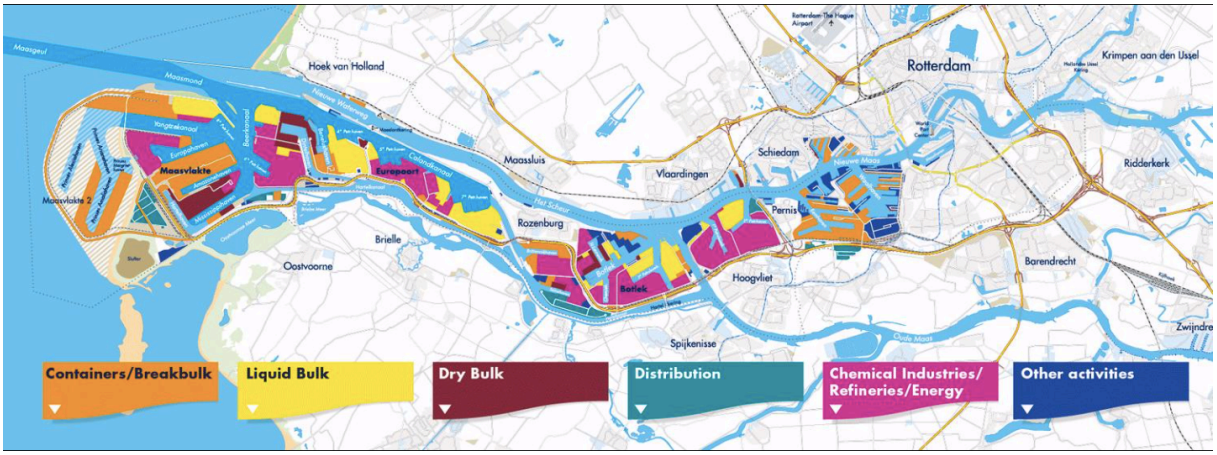

Figure 6 Source: (Rotterdam, Map of Rotterdam, 2018)

Facts and figures

The Port of Rotterdam is the largest seaport and industrial complex of Europe and the number 10 on a global scale. In the year of 2017, the port handled 467,4 million tons of cargo. That cargo consisted of 80,2 million tons of dry bulk, 214,3 tons of wet bulk, 142,6 million tons of containers and 30,3 of roll on and roll off cargo combined with rest cargo. This cargo was shipped on a total of 29.646 deep-sea vessels and on 105.000 barges. The port handled a total amount of 8.194.232 containers and 13.734.334 TEU in 2017. The port has an estimated economic added value of 21 billion Euros, which is 3% of the GDP of the Netherlands (Rotterdam, 2017).

Cases of financialization within The Port of Rotterdam

July 2018, the Odjell Terminal in the Port of Rotterdam is the most recent transaction whereby a financial institution has bought equity in port companies. The buyer of the terminal is the company Koole terminals. In the beginning of 2018 Koole terminals was sold off to the private equity funds of Goldman Sachs and the Australian bank Maquarie. Even though there is a worldwide energy transition from fossil fuels to biofuels, oil terminals in the Port of Rotterdam remain investment wise attractive for private equity funds and other financial institutions.

This is due to the fact that the port remains the largest oil port in Europe. In 2017 the port handled a total of 183,4 million tons of crude oil and mineral oil products. Compared to the Port of Antwerp with 58,9 million tons and the Port of Amsterdam with 44,7 million tons. The Port of Rotterdam has a combined storage capacity of 28 million cubic meters for crude oil and mineral oil products. According to Rob Luijendijk who is a consultant at the consultancy firm Downstream, due to geopolitical struggles on a global scale, the Port of Rotterdam forms the most stable hub with its capacity and connectivity with its hinterland.

Rotterdam is part of the ARA region (Antwerp, Rotterdam, and Amsterdam). This is one of the world's most important oil hubs. Rotterdam is accessible for the largest oil tankers (ULCC) and has oil pipelines connected with refineries in Belgium and Germany. The port of Rotterdam also forms the most important bunker station for vessels in Europe. These multiple factors add to the continuity of oil terminals in the Port of Rotterdam and generate stable cash flows for the institutional investors.

The Port of Rotterdam has come into a certain 'last man standing' position, due to its capacity, accessibility and location. This last man standing position is generated by two terms: backwardation and contango. Backwardation is when the current price of oil is higher than the future price and contango is when the future price of oil is higher than the current price. In the event of backwardation, the storage tanks in Rotterdam will be the last to be emptied. In the event of contango, they will the first to be filled. This creates high stability for the amount of oil in the port. These multiple factors add to the continuity of oil terminals in the Port of Rotterdam and generate stable cash flows for the institutional investors. Although the transition towards biofuels is inevitable the storage tanks in Rotterdam will remain filled with fossil fuels until 2040 or 2050 according to Luijendijk. A transition will even form an advantage for the port, due to its position and extremely large existing infrastructure for the handling of fossil fuels (Lalkens, 2018).

Just recently Aviva Investors announced that they will invest in the Rotterdam World Gateway (RWG) container terminal in the port. RWG was opened in 2015 but due to a large increase in container operations, the company will need to expand their facilities. Aviva has agreed upon refinancing the container terminal. Aviva is willing to invest due to the high capital intensiveness needed for the expansion and due to their desire to expand future operations within infrastructure sectors. The high capital intensiveness within infrastructural sectors matches their clients' investment requirements (Limited, 2018).

Part 2.1 Data concerning ownership in the Port of Rotterdam

The previous part has provided information and cases of financialization within the Port of Rotterdam; this part will continue on those cases and provide other cases of financialization within the port economy. As stated in the introduction, financialization can be stated as the increasing role of financial institutions and financial actors in non-financial industries. For this thesis, the financial actors are defined as the owners with non-industry related backgrounds. This part of the thesis is dedicated to providing data on ownership of port companies within the Port of Rotterdam. By researching the ownership, it will be able to provide evidence of the case of financialization within the port economy of Rotterdam in addition to the previous information.

Research Levels

Information provided by online databases such as Orbis can give insight if there are indeed non-port industrial companies embedded in the port economy of Rotterdam. The databases can provide information on global levels, but for staying in line with the research purpose of this thesis research shall be performed within national levels classified as NUTS II-Levels. For the Netherlands, the NUTS-II level is set at province level, in this case the Zuid-Holland Province. Within the Zuid-Holland Province, it is possible to search within different regions of the province set at NUTS-III levels. The regions relevant to the research in this thesis are Zuidoost-Zuid-Holland and Groot-Rijnmond. The chose is made for these regions as the Port of Rotterdam is geographically situated in these regions. Other sections within the Zuid-Holland province will not be selected, as other industries are more abundant there than the port-related industries of Rotterdam. Investigating these sections will not give a clear image of financialization of the port economy and will be left out the research.

Using the database Orbis, the first filter is set at the NUTS-II Level of South-Holland within the Netherlands. The second filter is then set at NUTS-III regions of Zuidoost-Zuid-Holland and Groot-Rijnmond. Within the industries in these regions, a choice is made to use the industries: *Water Transportation Industry, the oil and gas extraction industry, the petroleum bulk stations and terminal industry and the marine cargo handling industry*.

The choice has been made to research these industries, as they are the largest industries within the Port of Rotterdam. When the results are presented by the database, a new type of information is presented: the global ultimate ownership. The global ultimate ownership information provides an overview of which companies own shares of companies situated in the selected regions and operate within the selected industries.

Water Transportation Industry

The first level of research covers the water transportation industry. This industry consists of both types of water transportation in the Netherlands. The first type of transport consists of deep sea, coastal and great lakes water transportation. The second type consists of inland water transportation. The NUTS-II level is set at the Zuid-Holland province and the regions are set for Zuidoost-Zuid-Holland and Groot-Rijnmond.

After applying these filters, a group of 2051 companies remains within the selected regions. Table 2 provides an overview of 66 companies within the *Water Transportation Industry* with owners with non-industry related backgrounds.

Name	Global Ultimate Ownership	Land of Origin	Type of Company	Stock listed
1. **Chemship B.V.**	Bank Hapoalim BM	Israel	Commercial Bank	Yes
2. **ATIC services logistics**	Riverstone Holdings	United States	Energy and Power focused Investment Company	No
3. **P&O North Sea Ferries**	Government of Dubai	United Arab Emirates	Government	No
4. **Groenendaal Shipping B.V.**	D.P.J. Peter Holdings B.V.	The Netherlands	Financial and Insurance Company	No
5. **M.S. Anne Marie B.V.**	Leunis Van der Vliet Holding B.V.	The Netherlands	Financial Holding Company	No
6. **Laurentia Rijn B.V.**	Danser Group B.V.	The Netherlands	Financial Holding Company	No
7. **Marla B.V.**	Danser Group B.V.	The Netherlands	Financial Holding Company	No
8. **O. Slokkers Maritiem B.V.**	Stichting Aandeel Trium Virates	The Netherlands	Financial Investment Company	No
9. **Zwaansdelta Barging B.V.**	Flowmax B.V.	The Netherlands	Financial and Insurance Company	No
10. **Chemgas Shipping B.V.**	Jaegers Holding GMBH & CO.KG	Germany	Technical Holding Company	No
11. **Atlantic Schepen Exploitatie Maatschappij**	Sea Oil Holdings	Nigeria	Investment Company	No
12. **UAL Universal Americas Line B.V.**	Lordswood Investments Limited	Cyprus	Financial Investor	No

13.	**Smit Lamnalco**	Rezeyat group	Saudi Arabia	International Enterprise across multiple industries	No
14.	**Hal Scheepvaarthuis B.V.**	1. Hal Trust Committee Limited 2. DVB Bank SE	1. Curacao 2. Germany	1. Management Consulting Service Company 2. International Transport Finance Company	1. Yes 2. Yes
15.	**Nijverheid B.V.**	Familienstiftung von rantzau essberger	Lichtenstein	Family Fund	No
16.	**Anthony Veder Group N.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
17.	**Anthony Veder Gas Carriers B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
18.	**Cefetra Shipping B.V.**	BayWa	Germany	Global Sourcing and Trade Network Company	Yes
19.	**CHL Shipping**	Maritime Investment Holding	Marshall Islands	Investment Group	No
20.	**Maiden B.V.**	International Maritime Finance Management SA	The Netherlands	Financial Company	No
21.	**Mammoet Maritime B.V.**	Fentener van Vlissingen Family	The Netherlands	Family Holding	No
22.	**ARA Bulk B.V.**	Interrijn Holding B.V.	The Netherlands	Financial and Insurance Company	No
23.	**J. Bergsma Shipping 3 B.V.**	JB Hobby Holding B.V.	The Netherlands	Financial Holding Company	No
24.	**Oceanwide Yachting Group B.V.**	Aman & ZN B.V.	The Netherlands	Management Company	No
25.	**Muller Zwaar Transport B.V.**	Tidewater B.V.	The Netherlands	Investment Company	No
26.	**Rederij T. Muller B.V.**	Tidewater B.V.	The Netherlands	Investment Company	No
27.	**Jaguar Tankvaart**	Rensen Beheer B.V.	The Netherlands	Real Estate Investor	No
28.	**Philos Shipping B.V.**	Dekatria Holding B.V.	The Netherlands	Pension Fund	No
29.	**Rederij Westland B.V.**	Hasbo Holding B.V.	The Netherlands	Financial Holdings Company	No
30.	**Procyon Shipping B.V.**	Shipping Trade Sirius B.V.	The Netherlands	Financial Holdings Company	No

31.	**Zwaansdelta Barging B.V.**	Flowmax B.V.	The Netherlands	Financial Holdings Company	No
32.	**Salvinia B.V.**	Koudenburg B.V.	The Netherlands	Insurance Company	No
33.	**Oost Atlantic Lijn B.V.**	Sea-Oil Holding B.V.	The Netherlands	Financial Holdings Company	No
34.	**Chemgas Shipping B.V.**	Jaegers Holding GMBH & Co. Kg	Germany	Management Consulting Company	No
35.	**Misc Agencies**	Malaysia	Malaysia	Government	No
36.	**Condor Ship B.V.**	C.J.M. de Vetter Holding B.V.	The Netherlands	Financial Investment Company	No
37.	**Admiral Ship Management B.V.**	M.A.E. Holding B.V.	The Netherlands	Financial Investment Company	No
38.	**Scheepvaartmaatschappij Coral Meandra B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
39.	**Scheepvaartmaatschappij Coral Millepora B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
40.	**Scheepvaartmaatschappij Obelia B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
41.	**Scheepvaart Maatschappij Coral Rubrum B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
42.	**Coral Leaf Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
43.	**Coral Acropora Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
44.	**Coral Actinia Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
45.	**Coral Alicia Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
46.	**Coral Energy Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
47.	**Coral Lacera Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
48.	**Coral Medua Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes

49.	**Coral Monactis Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
50.	**Coral Pearl Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
51.	**Coral Patula Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
52.	**Coral Ivory Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
53.	**Coral Methane Shipping B.V.**	Hal Trust Committee Limited	Curacao	Management Consulting Service Company	Yes
54.	**Holland America Line N.V.**	Carnival Corporation	Panama	Financial Investment Company	Yes
55.	**Spido B.V.**	4KB Investments B.V.	The Netherlands	Consultancy and Pension Fund	No
56.	**CWT Commodities B.V.**	Hainan Province Cihang Foundation	China	Financial Company	No
57.	**FPS Famous Shipping B.V.**	Singapore Post LTD.	Singapore	Telecommunication Company	Yes
58.	**Inchcape Shipping Services Logistics**	Government of Dubai	United Emirates	Government	No
59.	**P&O Ferries Pride of Rottterdam**	Government of Dubai	United Emirates	Government	No
60.	**Legero Launch & Offshore Services**	Simbolo Investments B.V.	The Netherlands	Financial Holdings Company	No
61.	**Fesco North West Group Europe B.V.**	Far-Eastern Shipping Company	Moscow	Part of Private Equity Group	No
62.	**Mission Freight Rotterdam B.V.**	Meta International Holding B.V.	The Netherlands	Financial Holding Company	No
63.	**Jolandia II B.V.**	International Maritime Investment SA	Switzerland	Investment Intermediation Company	No
64.	**Maiden B.V.**	International Maritime Investment SA	Switzerland	Investment Intermediation Company	No
65.	**Glenthorne Shipping Limited**	Sedanley Unilimted	United Kingdom	Financial Holding Company	No
66.	**Eaglestar Marine B.V.**	Malaysia	Malaysia	Government	No

Table 2

Oil and Gas Extraction Industry

Another industry within the port economy in Rotterdam is the *Oil and Gas Extraction Industry*. The NUTS-II Level at Zuid-Holland will stay the same with the same NUTS-III regions: Zuidoost-Zuid-Holland and Groot-Rijnmond. In the regions of Zuidoost-Zuid-Holland and Groot-Rijnmond, there are a total of 99 companies active in this industry. Of those companies active in these sectors and in these regions, the following 19 companies that are presented in table 3 have owners with non-industry related backgrounds.

Name	Global Ultimate Ownership	Land of Origin	Type Of Company	Stock Listed
1. **Salym Petroleum Development N.V.**	Public Joint Stock Company Gazprom Neft	Russia	Oil Corporation	Yes
2. **Dana Petroleum Netherlands B.V.**	Korea National Oil Corporation	Korea	Oil Corporation	No
3. **Kirthar Pakistan**	Kuwait Petroleum Corporation	Kuwait	State Owned Oil Corporation	No
4. **TAQA Energy B.V.**	Abu Dhabi National Energy Company	Abu Dhabi	International Energy and Oil Company	Yes
5. **KAHN Offshore B.V.**	Javelin Capital B.V.	Israel	Financial Services And Investments Provider	Yes
6. **Gas Plus Netherlands B.V.**	US. Fin S.R.L.	Italy	Financial Services And Investments Provider	No
7. **Swift Drilling**	Engie Services Nederland	The Netherlands	Management and Financial Services	No
8. **RTE B.V.**	RTE Groep B.V.	The Netherlands	Holding and Financial Company	NO
9. **Tulip Oil Handling B.V.**	1. Barclays Bank 2. Northwarth Nominees Limited	England	1. Bank 2. Mutual and pension fund	1. Yes 2. No
10. **SMD Beheer B.V.**	Calchin Finance B.V.	The Netherlands	Financial Company	No
11. **Hollandia Fuel B.V.**	M.A. Consultancy	Belgium	Financial Consulting Company	No
12. **JEC Fuel and Marine Services**	Floyd & Fletcher B.V.	The Netherlands	Investment Company	No
13. **Eternamente B.V.**	Sombrilla B.V.	The Netherlands	Financial Holding Company	No
14. **Count Energy Trading B.V.**	PGFO B.V.	The Netherlands	Financial Services Companies	No

15.	**Kolmet B.V.**	A.T.S. Nominees Limited	Cyprus	Pension Fund	No
16.	**BTC Industrial Solutions B.V.**	Ortep Holding B.V.	The Netherlands	Financial and Insurance Company	No
17.	**Maumo International B.V.**	Kelroy Holding B.V.	The Netherlands	Investment Company	No
18.	**Zettex Nederland B.V.**	Wisto Holding B.V.	The Netherlands	Finance and Insurance Company	No
19.	**Vogelaar Rhoon B.V.**	Hoefnagel Beheer B.V.	The Netherlands	Pension Fund	No

Table 3

Petroleum Bulk Stations and Terminals

The third industry within the port economy in Rotterdam is the terminal operating industry and in specific the petroleum terminal operating industry. The industry chosen in Orbis is classified as *Petroleum and Petroleum Product Merchant Wholesalers.* This classification covers the *Petroleum Bulk Stations and Terminals* within the port economy. The same NUTS-II Level filter and NUTS-III regions filters are again applied for this industry to reveal owners with no industry related background.

This presents a list of 169 companies within the Port of Rotterdam. Of these 169 companies, the following 24 companies are presented in table 4 with owners that do not have industry related backgrounds.

Name		Global Ultimate Ownership	Land of Origin	Type of Shareholder(s)	Stock Listed
1.	**Hollandia Fuel B.V.**	M.A. Consultancy	Belgium	Management and Public Relations Services	No
2.	**G.C.T. Holding**	Bank Hapoalim BM	Israel	Commercial Bank	Yes
3.	**Transasian Oil B.V.**	Xena Investments S.A.R.L.	Luxembourg	Financial Investment Company	No
4.	**Chimbusco Europe B.V.**	Chinas Peoples Republic	China	Government	No
5.	**Tamoil B.V.**	Government of Libya	Libya	Government	No
6.	**PLI B.V.**	Malaysia	Malaysia	Government	No
7.	**Chemoil Europe B.V.**	Glencore PLC	United Kingdom	Natural Resource Company	Yes
8.	**Tamoil Energy B.V.**	Government of Libya	Libya	Government	No

9.	**Bunkerstation "Delta" Stolk & Berends B.V.**	Participant B.V.	The Netherlands	Financial Holdings Company	No
10.	**Bunkerstation Papendrecht B.V.**	Holding van der Hoff B.V.	The Netherlands	Financial Holdings Company	No
11.	**Atlantic Aardolieproducten Maatschappij B.V.**	Sea-Oil Holidng B.V.	The Netherlands	Financial Holdings Company	No
12.	**ALM Oil B.V.**	J.M. Uittenbogaard Beheer B.V.	The Netherlands	Investment Compant	No
13.	**N. Van Gelderen B.V.**	Moerman Beheer B.V.	The Netherlands	Financial and Insurance Company	No
14.	**Maumo International B.V.**	Kelroy Holding B.V.	The Netherlands	Financial and Insurance Company	No
15.	**Natuna 1 B.V.**	Malaysia	Malaysia	Government	No
16.	**He Blends Nederland B.V.**	Berkman Beheer B.V.	The Netherlands	Financial Holding Company	No
17.	**Zettex Nederland B.V.**	Wisto Holding B.V.	The Netherlands	Financial Holding Company	No
18.	**PDB Netherlands**	Malaysia	Malaysia	Government	No
19.	**Finco Bunkering B.V.**	Coloured Finches B.V.	The Netherlands	Financial Holdings Company	No
20.	**JEC Fuel and Marine Services B.V.**	Floyd & Fletcher B.V.	The Netherlands	Real Estate Company	No
21.	**Gulf Bunkering B.V.**	Coloured Finches B.V.	The Netherlands	Financial Holdings Company	No
22.	**Eternamente B.V.**	Sombrilla B.V.	The Netherlands	Financial Holdings Company	No
23.	**Falk Oline B.V.**	Carmanoil B.V.	The Netherlands	Financial Company	No
24.	**Count Energy Trading B.V.**	PGFO B.V.	The Netherlands	Financial and Insurance Company	No

Table 4

Marine Cargo Handling

To complete the overview of the industries within the port economy of Rotterdam, ownership data shall be extracted from the filter *Marine Cargo Handling*. This industrial sector covers the range of companies operating within the activities of port operations and other activities contributing to the port economy. The research shall again remain at the same NUTS-II Level and within the same NUTS-III regions.

After applying these filters, a list of 210 companies is presented. Of the 210 companies, the 31 following companies are listed in table 5 below. The listed companies have owners who do not have port-related industrial backgrounds.

Name	Global Ultimate Ownership	Land of Origin	Type of Company	Stock Listed
1. **Euromax Terminal Rotterdam B.V.**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
2. **Europees Massagoed-Overslag Bedrijf (EMO) BV**	Riverstone/GOWER MGMT Holdings LLC	United States	Mutual and Pension Fund	No
3. **ManuFrance B.V.**	Riverstone/GOWER MGMT Holdings LLC	United States	Mutual and Pension Fund	No
4. **ECT Home Terminal**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
5. **ECT Delta Terminal B.V.**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
6. **ECT Eemshaven I B.V.**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
7. **AGV International B.V**	Broeder Management B.V.	The Netherlands	Financial Management	No
8. **JLA Loading Technology B.V.**	J. De Jonge Beheer B.V.	The Netherlands	Financial Holdings Company	No

9.	**Oil Movement Services**	Acta Non Verba	The Netherlands	Financial and Insurance Company	No
10.	**CWT Commodities Metals B.V.**	Hainan Province Cihang Foundation	China	Financial Company	No
11.	**European Bulk Services (ESB) B.V.**	Riverstone/GOWER MGMT Holdings LLC	United States	Mutual and Pension Fund	No
12.	**Ninamoire B.V.**	Swets Invest Company B.V.	The Netherlands	Financial Company	No
13.	**Rotra Air & Ocean B.V.**	Rotrexma Holding B.V.	The Netherlands	Financial and Insurance Company	No
14.	**Haan Oil Storage B.V.**	Hametha B.V.	The Netherlands	Real Estate Company	No
15.	**Cromstrijen Warehousing B.V.**	Pemaro Holding B.V.	The Netherlands	Financial and Pension Fund	No
16.	**Agro Delta op- en overslag B.V.**	SZ New Enterprises Investments B.V.	The Netherlands	Real Estate Company	No
17.	**Hanno Rotterdam B.V.**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
18.	**Rotterdam Bulk Terminal B.V.**	Riverstone/GOWER MGMT Holdings LLC	United States	Mutual and Pension Fund	No
19.	**Europe Container Terminus B.V.**	CK Hutchinson Holdings Limited	Hong Kong	International Investor	Yes
20.	**Mariflex Transfer Services B.V.**	Cohold B.V.	The Netherlands	Financial Holdings Company	No
21.	**Horizon Shipping and Agencies B.V.**	Tial Holding B.V.	The Netherlands	Financial Holdings Company	No
22.	**Expeditie – en Handelsonderneming M. Van der Heiden, Groot Ammers B.V.**	Huijbregts Groot Ammers B.V.	The Netherlands	Mutual and Pension Fund	No

23.	**Chemical Sailor Limited**	Bank Hapoalim BM	Israel	Commercial Bank	Yes
24.	**Chemical Noy Shipping Company LTD**	Bank Hapoalim BM	Israel	Commercial Bank	Yes
25.	**Rotterdam Fruit Wharf B.V.**	Sea-Invest Corporation SA	Luxembourg	Financial Company	No
26.	**Mariflex Equipment B.V.**	Cohold B.V.	The Netherlands	Financial Holdings Company	No
27.	**CTT Rotterdam BV**	C.T.H. Vastgoed B.V.	The Netherlands	Mutual and Pension Fund	No
28.	**Cargo Lashing Technical B.V.**	Yound-Euro-China Trading B.V.	The Netherlands	Financial Holdings Company	No
29.	**Chemical Master LTD**	Bank Hapoalim BM	Israel	Commercial Bank	Yes
30.	**AGV International B.V.**	Broeder Management B.V.	The Netherlands	Financial Holdings Company	No
31.	**Kramer Cargo Services B.V.**	DCCS Holding B.V.	The Netherlands	Financial Holdings Company	No

Table 5

Results of the data

After applying the NUTS-II Level filter at the Zuid-Holland province and selecting the regions of Zuidoost-Zuid-Holland and Groot-Rijnmond at NUTS-III Levels the following table is presented. The table provides information that within the port economy of the Port of Rotterdam, there are multiple actors who own port-industry companies but have no port-industry related backgrounds.

The collection of data is presented in table 6. The information is divided into the four types of industries that have been researched, the total amount of companies operating within the Zuid-Holland region (NUTS-II Level) and in particular within the regions of Zuidoost-Zuid-Holland and Groot-Rijnmond (NUTS-III Levels). A percentage is shown of the number of companies that have owners with non-industry related backgrounds. The last column provides information concerning the number of owners who are situated in foreign countries.

The information in table 6 provides the following. For the Water Transportation Industry within the regions of Zuidoost-Zuid Holland and Groot-Rijnmond, there are 2051 companies active. Of these active companies, there are a total of 66 companies with owners that have non-industry related backgrounds, forming a total of 3.22%. Of these companies, 18 of the owners are situated in foreign countries. For the Oil and Gas Extraction Industry within the regions of Zuidoost-Zuid-Holland and Groot-Rijnmond, a total of 99 are active. Of these companies, 19 companies have non-industry related owners, forming a total of 14.20%. Of these owners, 9 are situated in foreign countries.

For the Petroleum Bulk Station and Terminal industry, a total of 169 companies are active. Of those companies, 24 have non-industry related owners, forming a total of 14.20%. Of these 24 companies, 8 are situated in foreign countries. For the Marine Cargo Handling Industry, there are 210 companies active within the selected regions. Of those 210 companies, 31 have non-industry related shareholders, forming a total of 14.76%. 7 of these companies are situated in foreign countries.

Of the financial institutions owning the companies within these four industries within the port economy of Rotterdam, the results show that financial investment and financial holding companies have the strongest presence. Of the 140 companies presented in the tables, financial investors and financial holdings own 58 of these companies. Governments own only 5 companies, indicating that private companies own the most companies within the port economy of Rotterdam. (Note: actors owning multiple companies within an industry have been counted once)

	Companies at Nuts II level (Zuidoost-Zuid Holland & Groot-Rijnmond)	Companies with industry foreign shareholders	Percentage	Amount of foreign owners
Water Transportation Industry	2051	66	3.22%	18
Oil and Gas Extraction Industry	99	19	19.19%	9
Petroleum Bulk Stations and Terminals	169	24	14.20%	8
Marine Cargo Handling	210	31	14.76%	7

Table 6

Part 2.2 Analysis of the data

The data above provides evidence of financialization within the port economy of Rotterdam. As discussed earlier, according to Manuel Aalbers (Aalbers, 2018), financialization is not a concept alone but forms a larger concept in combination with other concepts such as neo-liberalization, internationalization, and globalization. The findings above have supported this view such as in the case of neo-liberalization. The Port Authority in Rotterdam has created an environment in which it is feasible for financial institutions to enter and invest in either infrastructure projects of the port or in ports assets. David Bassens (2018) supports this view of neo-liberalization in the port economy. He states that due to the decrease of involvement by the government, ports such as the Port of Rotterdam have become more interesting for financial institutions.

The data also provides that of the 140 companies researched, 74 of them are owned by foreign from foreign countries. This supports the view of Aalbers that financialization is not a stand-alone concept but also consists of globalization. Companies in the port economy of Rotterdam are not only becoming assets of Dutch financial institutions but also of foreign financial institutions. The case is presented above that foreign financial institutions are investing in the port economy of Rotterdam. Capital is finding its way across borders and industries, a fundamental concept of financialization labeled by Marx (1848) as the spatial expansion of accumulation. This fundamental concept can still be seen today in the port economy of Rotterdam.

2529 companies have been researched and a total of 140 companies have non-industrial related owners. This may have possible strategic concerns for these port actors and the complete port economy of Rotterdam. Rodrigue, Pallis, and Notteboom (2011) have discussed such a possible strategic concern.

These financial institutions that are entering the port economy of Rotterdam often have different primary goals than those of the assets they have invested in. Port assets within a port economy are extremely capital intensive. Financial institutions have large sums of capital and are willing to invest in these port assets, but this has a consequence. Primary goals may become the increasing of profit instead of the enlarging of production and trade. Of the researched companies, governments own only 5 companies. Financial institutions own the other 135 companies. This may indicate that there has been a shift within the port economy of Rotterdam towards a more rent-seeking mindset.

A rent-seeking mindset is not negative but as explained by Aalbers (2018) could have negative outcomes for the Port of Rotterdam in the future. Companies acquired by financial institutions become financial assets. As long as these financial assets are profitable, they remain in the investment portfolio. When they do not become profitable anymore they may likely be sold off. Thus port companies operating the Port of Rotterdam will suddenly receive less funding and with that the possibility of bankruptcy increases. The government may eventually step in and acquire a majority share in these companies to bail them out. At this point such transactions become the interest of the public, as such companies will have to be acquired with Dutch taxpayer money according to Aalbers (2018).

Financialization has negative and positive sides for actors in a port economy. Through financialization, port actors have come into contact with financial institutions that are capable of providing large amounts of capital. Through this capital, these port actors can invest and expand their production operations, contributing to national and international economies. To elaborate the negative sides of financialization an example will be provided of a financial institution entering the port economy of Rotterdam.

British Petroleum has a refinery in the Port of Rotterdam. This refinery processes 400.000 barrels of oil each day, a total of 17.9 million tons each year. As stated before, the Port of Rotterdam has a certain last man standing position when it comes to oil, creating high continuity and stability for the many following years. The oil refinery is extremely capital intensive and will generate high returns. This forms an attractive investment for an Arabian or Chinese private equity fund. These foreign equity funds buy shares of the British Petroleum refinery in the Port of Rotterdam.

For many years this deems to be a profitable investment and each year there is a steady return on investment. But with new upcoming regulations, refineries are forced to invest in newer fuels and cleaner ways of refining. This may lead to a situation that Aalbers (2018) explained. These port assets are no longer as financially attractive as before due to the increasing amount of investment needed to stay competitive and profitable. In this case, the Arabian and Chinese private equity funds could sell off their shares of the British Petroleum refinery and cease to invest, leaving a large capital gap.

The refinery may not operate optimally anymore due to the lack of finance and in the worst case, the Dutch government will have to intervene and provide that finance. Financialization has positive effects for companies within the Port of Rotterdam, as it provides capital for companies, but in the long run, may lead to the failure of the 140 companies presented above if they do not deem profitable anymore.

Part 2.3 Conclusions

This part of the thesis will answer the sub-questions and provide information concerning the main research question.

The first sub-question is aimed at discussing the concept of financialization. Numerous academics have discussed the concept of financialization and multiple definitions have emerged over the years. Sweezy and Magdoff discuss three major economic trends, the slowing down of the global economy, the global rise of monopolistic –and oligopolistic corporations and the financialization and accumulation of external capital. The outcome of these major economical trends is the creation of financial derivatives. Parameswaran continues with the subject of financialization and explains that a derivative is a financial security with the value derived from other assets. Derivatives originate from the exchange market but have made their way to other industries such as the commodity industry.

These derivatives formed gateways for finance to expand into other economic geographies as explained by Pike and Pollard. Through the up rise of financial derivatives, financial institutions gained more power in reshaping the socio-economic spheres of corporations. This resulted in an increase of financialization across the economic geographies. Blackburn explains that financialization could be experienced within all economical scales and labeled it as the financialization of the daily life. Pollard, Oldwell, and Thornes provide examples of such financial derivatives crossing economic geographies in their research about weather derivatives. Weather derivatives form contracts between financial institutions and companies whose profits are dependent on the weather. These derivatives acted as financial insurances for a company if profits were lower than expected after a too dry –or wet period.

It is a common concept that non-financial companies use derivatives as forms of insurance. In an interview with Manuel Aalbers (2018), an example was provided of the housing corporation Vestia. Vestia had acquired capital through financial derivatives, a common manner of acquiring finance among housing corporations. Aalbers states that financialization is not the result of neo-liberalization, globalization or internationalization but forms a global concept with the other concepts. These concepts are needed to explain the bigger images in the economy.

Different aspects have been discussed by academics to form a uniform concept of financialization. Although opinions differ on the emergence of financialization and its true effects, all researchers and academics agree that financialization is the increasing role of financial institutions and financial actors in non-financial industries.

The second sub-question is aimed at explaining the influence of financialization in non-financial industries. Blackburn describes in his article that financialization has an effect on all levels of the economy. Financialization forms every actor, corporation or an individual into a financial object. Sokol supports this and states that these actors get absorbed into global financial circuits and become financial objects of the system. In an article written by Rodrigue, Notteboom, and Pallis, information is provided about the connection between financialization and embeddedness. With the increase of financial actors in an industry, the decrease of embeddedness becomes more likely. This will lead to financial actors making investments in non-financial industries that are possibly reckless.

The regulation theory states that an increase of financial institutions into non-financial industries causes the shareholder power to increase. As capital originates from these shareholders their influence increases towards future strategies and decisions. Shareholders may become more interested in short-term interest growth than long-term production growth. This theory is supported in the article written by Rodrigue, Notteboom, and Pallis.

The third sub-question is aimed at exploring the concept of the port economy. The port economy is not a stand-alone concept but consists of multiple actors that operate in a global supply chain. Ports can be divided into three functions. These functions are the port as a transport mode, the port as a location for industrial activities and the port as a location for logistics activities. A port with a transport function handles, stores and trades cargo. A port with an industrial function operates as a location for chemical –and industrial activities.

Ports have location advantages for these industries as they are connected with global waterways and hinterland transport. A port with a logistics function operates as a complex for global logistic activities. Containerization contributed to the creation of the logistics function. Within a port economy, there are multiple industries. Such industries are the shipping industry, the terminal operating industry, and the industrial industry. These industries are part of the larger maritime industry. Ports are attractive locations for these clusters as they already consist of the infrastructure, knowledge, and labour needed for this industry.

A small sub-question has been added to establish a connection between financialization and the port economy. Finance for the maritime industry can be divided into two groups. The first groups exist of traditional banks that found the maritime industry financially attractive as certain port actors such as terminal operating companies were extremely capital intensive and it was possible to form long-term agreements. From the 1990s onwards the growth of such terminal operating companies experienced a peak, while in continents such as Asia the growth was still increasing. This led to the rise in mergers and acquisitions among such companies to secure larger market share. This formed a gateway for the second type of finance for the maritime industry: pension funds, insurance companies, and other financial institutions. The importance of these financial institutions increased due to the financial crisis as banks became more selective with their investments. A decline in finance from traditional banks led to an increase in finance from other financial institutions such as private equity funds.

The fourth sub-question provides existing cases of financialization and additional cases of financialization collected from online databases. Assets within the Port of Rotterdam are highly attractive for financial institutions as Rotterdam makes a part out of the ARA region and forms the largest oil port in Europe. Rotterdam is accessible for the largest oil tankers and has large pipeline networks into the hinterland. Rotterdam's last man standing position creates long-term investment opportunities for financial institutions, as oil storage facilities will likely remain in use up till 2050. As explained by David Bassens the jurisdiction of ports such as the Port of Rotterdam is correlated with the investment attractiveness. The lower the degree of government involvement the more attractive a port becomes for investments.

As financialization can be measured through ownership, research from online databases such as Orbis has shown that there are multiple cases within the Port of Rotterdam. After applying filters at NUTS-III levels and narrowing the research scope to the regions of Zuidoost-Zuid-Holland and Groot-Rijnmond and in the industries of Water Transportation Industry, the oil and gas extraction industry, the petroleum bulk stations and terminal industry and the marine cargo handling industry a total of 2529 companies came forward. Evidence collected from the Global Ultimate Ownership information revealed that of these 2529 companies, 140 companies are owned by non-industrial related companies, such as financial holdings, insurance companies, family funds, and governments. Of these 140 companies owned, 42 owners are situated in foreign countries. Although these 140 port assets are highly attractive for financial institutions, there shall always be a possibility that the financial institutions will retreat is they deem unprofitable, causing port actors within the Port of Rotterdam to cease operations if there are no other forms of finance.

Through these four sub-questions, an understanding has been gained concerning the concept of financialization within the Port of Rotterdam. The concepts of financialization and the port economy have been explained and have been connected. The scope has been narrowed to the Port of Rotterdam and existing cases of financialization have been presented. In addition to these cases, other cases of financialization have been presented through the collection of data. Although a current understanding has been created, future effects of financialization may be destructive for the port.

Limitations and future recommendations

A limitation in this thesis is that it is the simplification of the actual situation in the Port of Rotterdam. As stated in the introduction financialization can be measured in multiple manners, such as the number of securitizations, the number of stock buy-backs, the total market of financial derivatives and by ownership. This thesis only makes use of the data regarding the ownership of assets within the port economy of Rotterdam and not data concerning the number of financial derivatives within certain port assets or if stock buy-backs have occurred. Ownership provides information concerning the evidence of financialization, but not of the depth or scale of it. The choice was made to research ownership, as it is the most measurable factor of the possibilities and the most available information. Another limitation concerning the research data in this thesis is that it is not clear in some cases whether the financial holding functioning as the owner of a company, owns the company as an investment or whether the financial holding functions as an ownership structure to limit liabilities. This was the case with some companies in the water transport industry. In most cases, it was possible to discover the objectives of such a financial holding by only selecting those who owned multiple corporations, but it has nonetheless proved in some cases to be difficult and therefore those cases have been left out of the analysis.

A recommendation for future research is that in order to provide a more in-depth analysis of the case of financialization within the port economy of Rotterdam, it will be essential to also research the other factors that contribute to financialization. Such factors are the amount of financial derivatives companies within the port economy hold and the number of stock buy-backs.

Another recommendation for future research is when building up a database concerning the ownership of port assets; it will be essential in discovering whether or not financial holdings act as ownership structures. For creating a more complete image of financialization within the port economy in Rotterdam this will need to be researched. This can be done through researching a level beyond the global ultimate ownership.

The last recommendation is to increase the scope of the research across all industries within the port economy of Rotterdam. These four industries haven been chosen as they are the largest in the port, but in order to research the complete case of financialization, all industries within the port must be included in the research.

Bibliography

Aalbers, M. (2018, 11 30). Factors contributing to financialization. (M. Groenewegen, Interviewer)
Aali-Bujari, Venegas, & Perez. (2016). Impact of derivatives markets on economic growth in some of the major world economies: A difference-GMM panel data estimation (2002-2014). *The IEB International Journal of Finance* , 110-127.
Bassens, D. (2018, 11 21). Financialization. (M. Groenewegen, Interviewer)
Blackburn, R. (2003). Banking on death, or, investing in life: The history and future of pensions. In R. Blackburn, *Banking on death, or, investing in life: The history and future of pensions* (pp. 1-3). London: Verso.
Boyer, R. (2000). Is a finance-led growth regime a viable alternative to Fordism? A preliminary analysis. *Economy and Society* , 29:111–45.
Chakraborty, S. (2017, 09 30). *Understanding Design Of Oil Tanker Ships*. Retrieved on 11 08, 2018, from Marine Insight: https://www.marineinsight.com/naval-architecture/oil-tanker-ships/
Company, G. (2009). *GRIMES COMPANIES: LOGISTICS WAREHOUSE TRANSPORT & SUPPLY CHAIN BLOGS.* Retreived on 2018, from The Grimes Companies: http://www.grimescompanies.com/logistics-blog/106-landlord-port-model-cost-effective
Drewry. (2016). *The Top Terminal Operators by 2020.* Drewry.
Epstein, G. (2001, December 1). Financialization, Rentier Interests, and Central Bank Policy. *manuscript, Department of Economics,* , p. n.a.
Erturk, I., Froud, J., Johal, S., Leaver, A., & Williams, K. (2011, 03). Financialization at Work: Key Texts and Commentary. *Journal of Economic Issues* , 247-249.
Foster, J. (2007). The Financialization of Capital. *Monthly Review* , 1-6.
French, S., Leyshon, A., & Wainwright, T. (2011). Financializing space, spacing financialization . *Progress in Human Geography* , 798-819.
Geerling, H., Kuipers, B., & Zuidwijk, R. (2017). Port and Networks. In H. G. Zuidwijk, *Port and Networks* (pp. 2-6). Rotterdam: Routledge.
Harst, F. v. (2016). *Rotterdam Port Fund onderstreept de ondernemingsgeest van NIBC.* Rotterdam: NIBC Bank.
Karan. (2016, 07 16). *What are Gas Carrier Ships?* Retrieved on 11 14, 2018, from Marine Insight: https://www.marineinsight.com/types-of-ships/what-are-gas-carrier-ships/
KPMG. (2018). *Infrastructue- The Real Deal.* KPMG.
Kuipers, B. (2017). The Industrial Seaport. In H. Geerlings, B. Kuipers, & R. Zuidwijk, *Ports and Networkd.* New York: Taylor & Francis Group.
Lalkens, P. (2018, 07 02). Private equity is dol op Rotterdamse olieterminals. *Financieel Dagblad* .
Langmack, J. (2017, 03 10). Establishment of new maritime investment fund.
Li, M. (2018, 07 02). BoComm Leasing orders another Suezmax at HHI. *Fairplay* .
Limited, A. I. (2018, 05 04). Aviva Investors participation in Rotterdam World Gateway financing.
Lugt, L. v. (2018, 11 30). Port Economy. (M. Groenewegen, Interviewer)
Miliotis, L. (2017, 12). *Trends in ship finance*. Retrieved on 11 20, 2018, from Norton Rose Fulbright: http://www.nortonrosefulbright.com/knowledge/publications/158513/trends-in-ship-finance
Nijdam, M., & Van der Horst, M. (2018). The Primary function of a port and iets main actors. In H. Geerlings, B. Kuipers, & R. Zuidwijk, *Ports and Networks* (pp. 16-20). New York: Taylor and Francis Group.
Palley, T. L. (2008). *Financialization: What is it and Why it Matters.* Leibniz: Marcoeconomic Policy Institute.
Parameswaran, S. (2011). An introduction to Financial Institutions, Instruments and Markets. In S. Parameswaran, *Fundamentals of Financial Instruments* (pp. 1-7). Asia: John Wiley & Sons.
Pike, A., & Pollard, J. (2010). Economic Geographies of Financialization. *Economics Geography* , 29-51.
Pollard, J. S., OldWeld, J., Randalls, S., & Thornes, J. E. (2008). Firm finnances, weather derivatives and geography. *Elsevier* , 616-624.
R, L., GL, C., J, P., & A, L. (2009). The remit of financial geography: Before and after the crisis . *Journal of Economic Geography* , 723-747.
Research, T. M. (2016, 10 10). *Chemical Tanker Shipping Market - Global Industry Analysis, Size, Share, Growth, Trends, and Forecast 2016 - 2024*. Retrieved on 11 15, 2018, from Transparency Market Research: https://www.transparencymarketresearch.com/chemical-tanker-shipping-market.html
Reuters. (2009, 12 02). Barclays Capital launches LNG services division. *Reuters* .
Rodrigue, J.-P., Notteboom, T., Pallis, & A., A. (2011). The financialization of the port and terminal industry: revisiting risk and embeddedness. *Maritime Policy & Management* , 191-213.
Rotterdam, P. o. (2017). *Facts and figures.* Rotterdam: Port of Rotterdam.
Rotterdam, P. o. (2018). Map of Rotterdam. *Map of Rotterdam* . Rotterdam, Netherlands: Port of Rotterdam.
Satta, G., Parola, F., & Persico, L. (2016). *Initial public offering in ports: The determinants of the long-term aftermarket performance.* Hamburg: IAME 2016 Conference.
Sea, O. (2017, 10 1). *Shipping Finance: Recent Developments, Top Bank Portfolios and Alternative Schemes*. Retrieved on Open Sea: https://opensea.pro/blog/shipping-finance
Sokol, M. (2015, 09 15). Financialisation, financial chains and uneven geographical development: Towards a research agenda. *Research in International Business and Finance* , 678-685.
Steenderen, V. (2018). *Ports & Terminals.* Rotterdam: Van Steenderen Mainport Lawyers.
Stopford, M. (2009). Maritime Economics . In M. Stopford, *Maritime Economics* (p. 81). Rotterdam: Taylor & FrancisLtd.
Van Klink, A., & Van den Berg, C. (1998). Gateways and Intermodalism . *Journal of Geography Transport* , 1-9.