

**ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΙΡΑΙΩΣ**



**ΤΜΗΜΑ ΝΑΥΤΙΛΙΑΚΩΝ ΣΠΟΥΔΩΝ**

**ΠΡΟΓΡΑΜΜΑ ΜΕΤΑΠΤΥΧΙΑΚΩΝ  
ΣΠΟΥΔΩΝ**

**στην ΝΑΥΤΙΛΙΑΚΗ ΔΙΟΙΚΗΤΙΚΗ**

**THE RELATIONSHIP BETWEEN THE NATIONAL  
ECONOMY AND THE INTERNATIONAL MARITIME  
SECTOR: THE GREEK FINANCIAL UNCERTAINTY  
INDEXES.**

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*Διπλωματική Εργασία*

που υποβλήθηκε στο Τμήμα Ναυτιλιακών Σπουδών του Πανεπιστημίου Πειραιώς ως  
μέρος των απαιτήσεων για την απόκτηση του Μεταπτυχιακού Διπλώματος  
Ειδίκευσης στην Ναυτιλιακή Διοικητική

ΟΚΤΩΒΡΙΟΣ 2021, Πειραιάς

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Three-member examination committee

The subject dissertation was approved unanimously from the Three-Membered Examination Committee that was set from the GSES of the Department of Maritime Studies of the University of Piraeus according to the regulation of operation of the program of the postgraduate program in Shipping Management.

The members of the committee are :

- Dimitris Tsouknidis (Supervisor)
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- Vasileios Naoum

The approval of this Dissertation from the Department of Maritime Studies of the University of Piraeus doesn't declare the acceptance of the opinions expressed from the author.

## **PROLOGUE:**

This research is part of a Master's thesis for the University of Piraeus' Master of Science's Shipping Management program. The study took place during a four-month period, beginning in June 2021 and ending in October 2021. The purpose of this dissertation is to show not only the current ship-financing instruments, but also a review of the Uncertainty Indexes, particularly for Greece, and how the latter affects the sector of finance through banks.

Several variables pertinent to this research within the international marine business have been collected from current scientific literature and are synthesized to reach the results. The first section of this thesis will present the most popular, readily available financing solutions for either supporting the firm's operations or financing expansion projects. Moreover, it will examine the Uncertainty Indexes based on the frequency of media coverage. The Indexes reflect the regularity of specific terms for each country separately; the Greek perspective will be analysed in this dissertation.

The methodology adopted within this phase is primarily a literature review, which showed that there was room for further research on the degree to which finance affected the maritime industry compared to the Greek Economic Policy Uncertainty (EPU) Index.

The second phase consists of a field research, in which data from Greek Shipping Companies financed via the banking sector are included and their total annual portfolios are presented. Petrofin provides various annual reports, containing information on how the Greek Shipping companies have been financed. In this part there are constructed figures (or in some instances the figures of the studies themselves have been used the figures) in order to compare the data.

The third phase consists of analysis of the acquired data, produced from the aforementioned sources which helps increase the research's validity. The assertions can be validated by examining the outcomes and undertaking pattern matching. The analysis displays the cycles that have been noticed compared with the possible effect of the global and local economic events.

The fourth and final phase entails the completion and response to the research topic and sub-questions. When discussing the final results in this chapter, they must be debated in order to question the conclusions, and they must be contrasted to the most recent

findings from additional study. In addition, future research recommendations will be made, with this research serving as the starting point.

I would like to assign my truthful kind regards to my supervisor Professor mr Dimitrios Tsouknidis for his continuous guidance and support during my dissertation. Not only has his assistance been critical to the accomplishment of this thesis but it also helped me create principles which I will follow throughout my lifetime. Furthermore, I would like to thank the members of my supervising committee mr Dionisios Polemis and mr Vasileios Naoum for their valuable contribution.

## **ABSTRACT**

The financial methodologies used by shipping corporations and the economic policy uncertainty index in Greece are discussed in this paper. The research is carried out by comparing 2 different factors. From the one hand, the published data from previous studies and articles of Greek Shipping Companies that have been financed during a certain period and from the other hand, the economic policy uncertainty index in Greece. To begin with, an explanation of the financing in the shipping sector, as well as an explanation of how policy uncertainty and local and/or global events affect the field of ship-lending, particularly via banking will be provided. Shipping finance has evolved significantly over the last few decades, and the traditional capital structure of bank lending combined with shareholder equity has given way to more sophisticated and innovative financing methods, resulting in a new capital structure that is more complicated but better serves today's financial needs. As the analysis reveals, there is a discussion in this thesis regarding how uncertainty plays an essential part in shipping finance. Finance in shipping industry was chosen because of its high volume, market fundamentals, and abundance of information. Bank lending, bond issuance, equity offering, and private equity funds are all analyzed to see what benefits and costs they may induce.

## **ΠΕΡΙΛΗΨΗ**

Στην παρούσα εργασία παρουσιάζονται οι τρόποι χρηματοδότησης στις ναυτιλιακές εταιρείες και οι δείκτες αβεβαιότητας στην Ελλάδα σχετικά με την πιθανή επιρροή που μπορεί να έχουν ασκήσει στον τομέα της χρηματοδότησης των εταιρειών. Η έρευνα διεξάγεται με τη μορφή σύγκρισης των δημοσιευμένων δεδομένων άλλων ερευνών και άρθρων στην πάροδο των ετών μεταξύ των δεδομένων για την χρηματοδότηση των Ελληνικών εταιρειών και του δείκτη αβεβαιότητας που προκύπτει από την πολιτική στην Ελλάδα. Σε πρώτο στάδιο υπάρχει αναλυτική προσέγγιση της χρηματοδότηση στον τομέα της ναυτιλίας και στην συνέχεια παραθέτοντας δεδομένα της Ελληνικής αβεβαιότητας αναλύοντας την πιθανή επιρροή τόσο από τοπικά ή/και άλλα παγκόσμια γεγονότα στην χρηματοδότηση, ιδιαίτερα μέσω τραπεζών. Η

χρηματοδότηση της ναυτιλίας μεταβάλλεται συνεχώς σε σχέση με εκείνη των περασμένων δεκαετιών και η παραδοσιακή κεφαλαιακή διάρθρωση των ναυτιλιακών εταιρειών στον τραπεζικό δανεισμό μαζί με τα ίδια κεφάλαια δίνουν τη θέση τους σε εξελιγμένες και καινοτόμες μεθόδους χρηματοδότησης σχηματίζοντας μια νέα δομή κεφαλαίου που είναι πιο περίπλοκη αλλά εξυπηρετεί καλύτερα τη σημερινή οικονομική ανάγκες. Όπως δείχνει η ανάλυση, σε αυτήν την εργασία γίνεται συζήτηση για το πώς η αβεβαιότητα έπαιξε σημαντικό ρόλο στη χρηματοδότηση της ναυτιλίας. Ο λόγος για τον οποίο επιλέχθηκε αυτό το τμήμα αποστολής έγκειται στον μεγάλο όγκο, τα βασικά στοιχεία της αγοράς και την πληθώρα πληροφοριών. Ο τραπεζικός δανεισμός, η έκδοση ομολόγων, η προσφορά ιδίων κεφαλαίων και τα ιδιωτικά κεφάλαια τοποθετούνται στο μικροσκόπιο για την αποκάλυψη των οφελών και του κόστους τους που μπορεί να προκαλέσει.

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## **ABBREVIATIONS**

new building (NB)

master limited partnerships (MLPs)

speculative limited partnerships (SPVs)

public offering (IPO)

SEC( Securities and Exchange Committee)

net asset value (NAV)

Special Purpose Companies (SPC)

Fair Market Value (FMV)

asset backed securities (ABS)

Earnings Before Interest and Tax (EBIT)

Economic Policy Uncertainty (EPU)

Economic Policy Uncertainty Currency-or Grexit possibility- (EPUC)

Economic Policy Uncertainty Pension policy (EPUP)

Economic Policy Uncertainty Fiscal (EPUF)

Economic Policy Uncertainty Monetary (EPUM)

Economic Policy Uncertainty Banking (EPUB)

Economic Policy Uncertainty Tax (EPUT)

Economic Policy Uncertainty Debt (EPUD)

'rest of the world' (RoW)

Compensated Gross Tons (CGT)

Basel Committee on Banking Supervision (BCBS)

International Convergence of Capital Measurement and Capital Standards: a Revised Framework' (RF)

internal ratings-based approach (IRB)

# 1. INTRODUCTION

## 1.1 MOTIVATION

The shipping business is an important part of global trade. The global economy is reliant on the commercial marine fleet and the goods it transports. Many of the items we consume have been brought by ship in some form or another. The shipping industry is booming these days. This maritime boom has resulted in a large number of new vessel investments and there is a need of finance in order vessels to be constructed. The robust growth in shipbuilding orders seen in the first half of 2021 is expected to continue for the rest of the year, according to Chinese officials(<https://www.maritime-executive.com/article/china-forecasts-beginning-of-shipbuilding-boom>). In this thesis the finance sources in shipping field are analyzed.

Apart from the theoretical approach describing the shipping finance, there is a comparison between data and how economic recessions influence the shipping finance field. For the first time since 1982, global GDP decreased by 2.2 percent, while the international trade rate fell by 14.4 percent. Both trade volumes and economic activity have decreased because of the reduced economic activity and consumption. This affects the demand for maritime transportation that has been decreased. The shipping industry experienced a notable rise in the mid-2000s when the world economy was doing well, and its fortunes were intricately linked to the current global economic downturn. As a result, predictably the shipping industry has suffered a lot, because of the global financial and economic crisis.

Shipping trade estimated 90% of global trade volume (ICS- international chamber of shipping), plays an important role at economic progress. It has never been more reliant on the rest of the globe. As a result, economic, commerce, production, consumption, politics, financing, and technology all have an impact on the demand and supply of manufactured goods, raw materials, and transportation services. Intercontinental trade, bulk transportation of raw materials, and the import/export of affordable food and manufactured commodities would all be impossible without shipping(ICS - <https://www.ics-shipping.org/shipping-fact/shipping-and-world-trade-world-seaborne-trade/>).

The worldwide financial and economic crisis of 2008 had a significant influence on the shipping business. The demand (subsequently and the freight rates) for vessels declined to near all-time lows and the ports were full of vessels in ballast condition and laid up. The need (or the decline of need) for seaborne transportation is influenced by global commodity demand as well as energy prices, resulting in high volatility in freight rates. When the freight market is bullish or bearish, this volatility affects both the new building (NB) and second-hand markets, leading asset prices to bounce back and forth between highs and lows. As a result, cyclical and volatility are common characteristics used to describe shipping, making the possible investors to consider the shipping as a dangerous sector. As a result, if prudent and risk-averse investors are involved, shipping as a potential business is highly undesirable. Ship-finance becomes particularly effective when all these features are applied to a capital-intensive company like shipping.

## 1.2 RESEARCH QUESTION

A company is almost exclusively financed by both equity and debt. This thesis describes the possible sources of ship finance. The problem is if, when and in what degree the financial crisis or economic recessions have an impact on ship-lending.

## Part I

### 2. LITERATURE REVIEW

This section will include a brief explanation of finance in the Shipping Sector. Shipping companies are closely related to the need of vessels' acquisition, (secondhand or newbuilding). Contracting a single new-building vessel typically requires capital expenditure of more than \$40million (depending on size, type and market conditions), aggregating to total investment of around \$130 billion per annum. Meanwhile, there is also an active second-hand S&P market, adding further to the heightened demand for capital (Alexandridis et al. 2018). On contrary, to the common companies '*shipping has distinctive characteristics which make financing different from other asset-based industries*' (Martin Stopford - 2009, ch 7 p.294). Each vessel's construction demands an important amount of capital, due to their important cost. There are two options for companies to invest in vessels. The first is to use their gains from previous operating years and the second, to borrow money from commercial banks, investment banks, finance houses, leasing companies or ship credit schemes. Most companies prefer obtaining loans to purchase vessels. The savings can be allocated between Insurance firms, pension funds, savings banks, finance houses, trust funds, mutual funds, and commercial banks that take money on deposit, also known as "institutional investors," to manage the money.(Martin Stopford, ch 7 p.302).

#### 2.1. FINANCE IN THE SHIPPING FIELD

The shipping industry is one *of the most capital-intensive industries* (Alexandridis et al. 2018) as it utilizes high-value assets *and accounts for the majority of a shipping company's capital structure*(Alexandridis et al. 2018). Furthermore, it needs to spend a significant amount of capital to replace an old vessel with a new one so as to be more efficient. Alexandridis et al, in their article in 2018, refer to the importance of decisions about corporate financial management being especially important for shipping companies because they affect almost every aspect of their operations. From cash-flow generation capacity (Drobetz et al., 2016b) to corporate ownership/governance structures (Andreou et al., 2014), and ultimately their value creation potential (Kang et al., 2016). Indeed, shipping companies' long-term viability has always been dependent

on their ability to obtain financing with favorable terms and, particularly, low interest rates (Stopford, 2009).

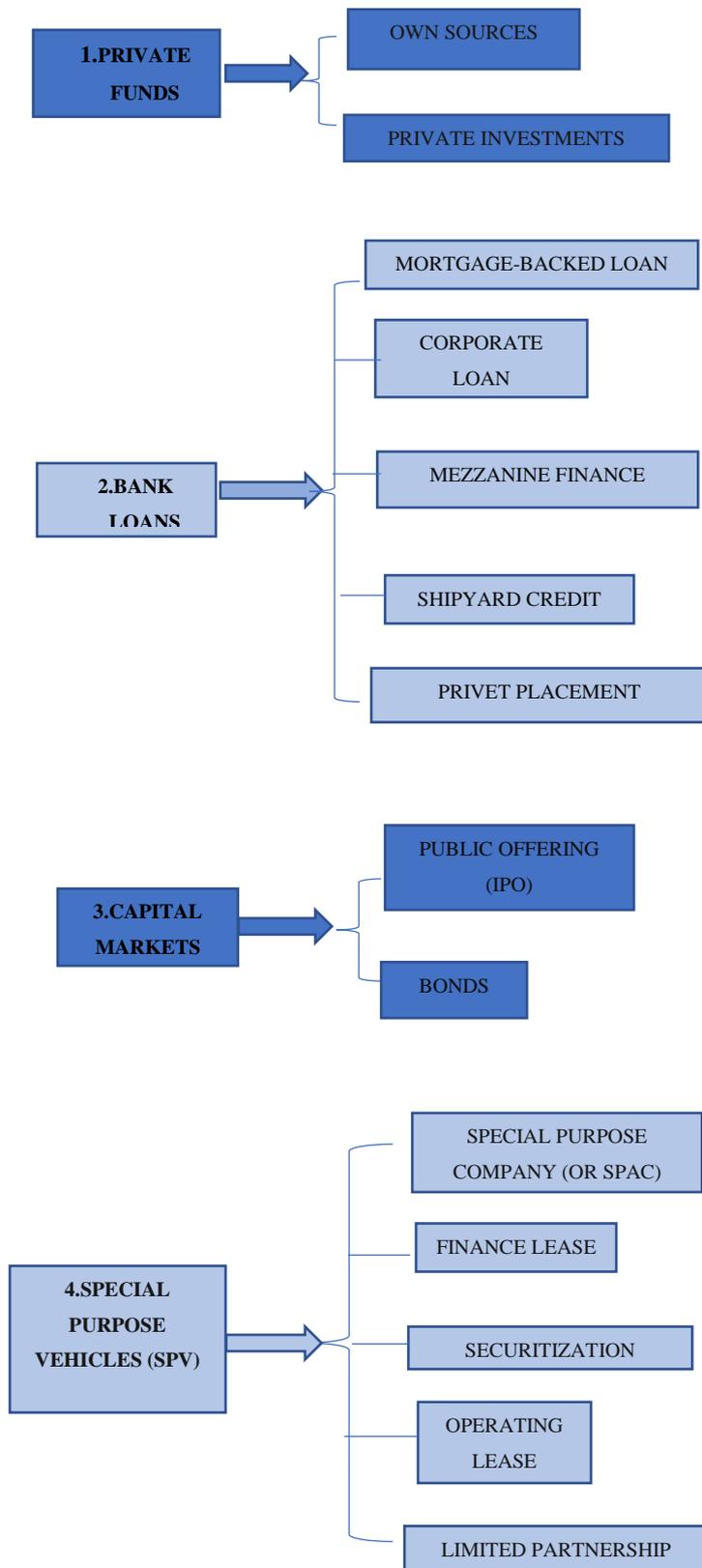
As discussed in Alexandridis et al. article in 2018 initially, own equity was used to fund maritime ventures, followed by smaller sums of capital provided by banks. In the early 90's, an increasing number of shipping businesses have used global capital markets to diversify their funding sources and tap into a larger spectrum of institutional and retail investors, breaking away from traditional forms of financing like as bank loans. Shipping companies had to be altered from typically family-oriented businesses to corporate entities, in order to obtain access to global capital markets. This, necessitated a structural restructuring and accelerated substantial improvements in corporate governance.

Shipping companies have a variety of financing options, ranging from traditional mortgage-backed loans to more complex structures such as high yield debt, sale and leasebacks, mezzanine financing and other forms of equity-linked debt, private equity, or funding through the formation of publicly traded spin-offs, such as master limited partnerships (MLPs) and speculative limited partnerships (SPVs)( Kavussanos et al - 2016, p 73)

The most common financing methods in the shipping sector have been divided into four categories:

- 1) Private funds,
- 2) Banks Loans,
- 3) Capital Markets
- and 4) Special Purpose Vehicles (SPV).

Figure 1 depicts the ways of finance in Shipping , where the bank finance could be analyzed as Mortgage-backed loans ,Newbuilding financing and Mezzanine, whilst the Capital Markets could include high yield bonds ,Convertible notes , Public Equity Offerings - IPOs, Follow-on offerings ,At-the-market offerings , master limited partnerships (MLPs) and special purpose acquisition companies (SPACs).The following figure shows the sources of finance as:



*Figure 1 sources of finance*

**Source of figure :** Stopford, 2009.

## 2.2 THE ROLE OF LENDER AND INVESTORS

*Companies, financial institutions and private investors could be considered a source of investment funds.* In exchange for a share of the profits, **the investor** puts money into a company enterprise. The only method to recover this money is to sell the company's "equity" portion to someone else. A public corporation is an entity, whose equity is traded on an exchange and whose shares can be purchased or sold on the stock market where they were issued. **The lender**, on the other hand, lends money for a decided beforehand period in exchange for regular interest payments and a predetermined payback plan for the principal. The prearranged 'debt' should be fully returned by the end of the agreed period. Another way of fund is **the private placement**, which is a direct method of placing finances with companies in need of funding. The lender (a pension fund or an insurance company) commonly is trying to reach into an agreement that both parties (borrower and lender) would agree. The only drawback in private placement is that it *presents practical difficulties* (stopford, 2009).

As stated in Maritime Economics, by Stopford in 2009 an alternative is to use the financial markets. This could be achieved via the three markets that have been developed where funds are traded :

1. **money markets,**
2. **bond markets**
3. **and equity markets .**

The **money markets**, as referring at the Stopford (2003) are trading short – terms debt (less than a year).

**Bond markets** are commonly trading long-terms bonds (often 10 or 15 years) that could be issued by companies or governments. Companies issue bonds or debentures (bonds without collateral) through a dealer, and a bond must have a credit rating (from AAA to C) to be tradeable. The Bonds rated Baa3 by Moody's<sup>1</sup> are referred to as "high-yield" bonds. The rate of interest is determined by redeeming coupons connected to the bonds.

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<sup>1</sup> The importance of "relationship" based bank financing, in which the "name" of the ship-owner requesting the loan is given significant weight in the decision-making process, is an important aspect in which assist to generate Moody's framework.

It represents the credit rating. To be more specific, in order for an issuer to place a bond, the financial institutions that acquire it must be able to determine if the yield accurately reflects the risk and whether the principal will be returned on time. To meet this requirement, a shipping firm issuing bonds must get a credit rating from one or more credit rating organizations for the transaction (the credit rating agencies are Standard & Poor's, Moody's, Fitch, and Duff & Phelps). The 'eurobond' market refers to off-shore bond transactions. Both money markets and bond markets could be separated into Domestic (local investors and currency) and Europaper (money stored in a country other than the issuing country).

**Equity markets** (known as securities or stocks) allows credit worthy enterprises to raise funds through a stock market known as 'public offering'. Securities are exchanged on capital markets, which are heavily regulated to guarantee that the regulations are obeyed. Almost half of the world's capital is invested in the equity market (stopford, 2009).

### 2.3 SOURCES OF FINANCE

Stopford in 2009 in his book *Maritime Economics* refers to the maritime industry's primary source of debt financing as commercial banks. They provide 2- to 8-year term loans, which they primarily fund by borrowing capital and money markets. Commercial banks' willingness to take on longer-term loans is limited by this short-term funding, and most are wary of anything longer than 5–6 years. On modern ships, a balloon payment is frequently employed to reduce debt servicing costs, but borrowers seeking longer-term financing must look elsewhere, such as the capital markets or leasing businesses. Syndicated loans of more than \$100 million are usually made between numerous institutions. Banks currently provide a variety of services in addition to loans, such as risk management products, mergers and acquisitions and financial advice services. Investment banks often arrange and underwrite financing but do not provide capital. They organize loan syndications, public equity offers, capital market bond issuance, and debt or equity private placements with financial institutions or private investors. Furthermore, in some countries, credit is given by specialized shipping banks (Ship credit banks), which may raise funds on the open market or issue bonds with tax advantages for local investors. Brokers and finance houses are some financial

organizations that manage large sums of money have dedicated shipping sections that lend directly to the industry. Leasing firms specialize in leasing assets, and some will arrange for long-term ship leasing. Furthermore, leasing businesses are important lenders in countries like Japan. In these countries, they are governed by distinct rules, and can provide long-term financing that conventional banks would not be able to take on their balance sheets. Finally, some governments provide shipbuilding loans to both domestic and international shipowners.

### 2.3.1 PRIVATE LOANS

Figure 1 shows the sources of financing for shipping companies. The **Private funds (1)** could be achieved either by company using **its own fund** (sometimes from the owner's private resources, or from the earnings of other ships) **or via private investment** (an investment or loan from friends or family). Every commercial company has operating expenses and subsequently, needs capital. It is possible for a company not to be liable to cover these expenses, so the solution in order to find the capital, is to sale the shares of the company. Additionally, when a company wants to raise its capital, it could create shares to put on the stock market. The aforementioned are ways to employ the company's funds for financing. It is common for a shipping company to use often its own resources; either the funds come from the company or personal resources. (ICS, S&P, 2020 edition).

### 2.3.2 BANK LOANS

**Banks loans (2)** are the primary source of ship financing. Bank loans to finance shipbuilding or second-hand ship acquisitions are historically the most popular source of capital in the shipping industry (Albertijn et al., 2011). Bank loans do not require the shipping company to disclose its business information to the general public as with IPO's and bond issues – (Kavussanos and Tsouknidis (2014)). As observed in financial markets on a massive scale, starting from 2007, default risk can lead banks and bank dependent firms to bankruptcy - see for instance Chava and Purnanandam (2011). Identifying the factors which drive default risk in bank loans is extremely important for

the survival of banks and other financial market participants, the stability of the financial system and ultimately the global economy (Kavussanos et al 2016).

Mortgage-backed loans, corporate loans, and loans granted under shipyard credit schemes are the primary types of loans accessible to shipowners. A bank will occasionally provide mezzanine financing (stopford, 2009). On the other hand, bank loans have three restrictions. To begin with, in case of ship companies asking for huge amounts of loans, these loans must be syndicated among several banks. When the shipping market is bad, managing huge syndications can be tough. Secondly, loans are often limited to 5–7 years and a 70–80% advance rate, both of which are restrictive. In other cases, banks will only lend a certain amount of money. Finally, the bank requires a ship mortgage as well as restrictive covenants, which is '*complex and inconvenient*'(stopford 2009) for large companies with huge fleet. **Mortgage loans , corporate loans ,shipyard credit; and mezzanine finance** are analyzed in detail below:

#### 2.3.2.1 MORTGAGE-BACKED LOANS :

In mortgage-backed loans the ship is used as collateral to secure the lender's exposure. The borrower is a single-purpose company, which owns the collateral vessel and is registered in a legally acceptable jurisdiction, most likely in countries like Liberia, the Marshall Islands, or Panama. This provides immediate access to the collateral for the lender and separates unrelated financed assets. In many circumstances, the holding company that holds the single-purpose company's shares functions as a guarantor of the borrower's obligations. The debt conditions must be designed in such a way that, first, the earnings of the vessel can cover the debt, and second, the vessel provides sufficient collateral against the outstanding loan. Also , the main term of a mortgage – backed loan could categorized as following : the financing amount usually is between 50 and 80% of the collateral vessel's value and depends on the age of vessel, freight outlook of subsector.The available securities, namely the Time-charter contracts and other corporate guarantees depend on the creditworthiness of the other contracting party. Usually, lenders require the equity from the owner to be paid first before the loan is available to be drawn.

In the form of a letter, the loan proposal is written and includes the *term sheet*, usually addresses the seven essential concerns stated below, with a disclaimer stating that the offer is subject to different circumstances, such as credit committee approval.

1. *The amount, or maximum size of the loan*
2. The *tenor* , that it the duration of the loan(5-10 years usually),which depends on the bank's ability to secure funding and age of the vessel
3. The *repayment structure*. Usually repaid in semi-annual or quarterly installments, usually of equal amount, with a balloon at the maturity of the loan. Furthermore , the repayment profile of the loan depends mainly on the age of the vessel.
4. The *interest rate*
5. The *fees* , to be more specific this is the amount that are added to the loan to compensate the bank's costs of arranging and administering the loan.
6. The *securities* in case of borrower defaults, so as the loan could be amortized by the forfeiture of company's asset.
7. The *financial covenants*, the borrower promises to perform certain things while he have the responsibility to refrain from other things. Affirmative covenants commit to following the law(maintaining the vessel in a good condition and its class ). Restrictive covenants *limit third-party debt, cash dividends and the pledging of assets to third parties (stopford 2009)*.

#### 2.3.2.2 CORPORATE BANK LOANS

Borrowing against individual ships is inconvenient for major maritime corporations since any change in the fleet necessitates a time-consuming loan procedure. As a result, major corporations with well-established financial systems frequently prefer to borrow as a corporation and use their corporate balance sheet as collateral. The loan process consists of two parts , the first is the credit facility of arranged amount (usually the 2/3 of the loan) as an short-term loan and the rest of the amount that is the 'revolving credit' and is available to be drawn up by the borrower at any moment to the limit. During the agreed period the term loan should be repaid in equal quarterly instalments, while the 'revolving credit' should be repaid at maturity.

This form of agreement has the benefit of providing the organization with a flexible source of capital. The term loan must be repaid immediately, resulting in a significant negative cash flow, while the revolving credit gave an overdraft facility, allowing the business to make unforeseen expenditures or cover cashflow swings. The lender's primary concern is the borrower's balance sheet, therefore standard criteria include the corporate leverage ratio, interest coverage ratio, and asset cover.

Larger loans are commonly shared across numerous banks in a syndication to share the risk. As a result, asset 'distribution' is used to break down large loans into smaller packages that can be distributed across other banks. It also permits banks that do not have the ability to assess shipping loans to participate in the sector under the supervision of a lead bank that does. Syndicated loans could be enough complex and sometimes difficult to manage, so shipowners may have to wait for months. Because some loans are commonly accepted in the market, they can be placed fast.

Apart from the aforementioned, banks also sale assets. Usually, the loan is recorded on the bank's balance sheet. Thus, lending activity exposes financial institutions to substantial default risk, as potential default events in individual bank loans lead to losses in the value of the loan portfolio (tsouknidis et al , Default risk drivers in shipping bank loans, 2016). If the risk is high and the bank decides to reduce it , she could sell the loan to another bank that have the appropriate margin in its balance sheet. When the agreement between the two banks is made, the transfer a certain percentage of the loan, under the original bank management.

The ability of ships to generate cash flow is unclear, owing to the high volatility of freight rates, which translates into significant change in asset (ship) prices. cash-flows adequate to meet both vessel operating costs and debt repayments due, while maintaining a sufficiently high collateral value of the asset to guarantee the loan

**Finance in new-building vessels** has some differences compared with the second-hand vessels. The capital cost of a new ship is frequently too high in comparison to its likely

spot market income to be funded through cashflow, especially if the loan is amortized over the short terms that commercial banks prefer. Because the funds are needed before the ship is finished, there is a period of time before delivery when a portion of the loan is drawn, that the hull is not accessible as collateral. As detailed below there may be a *pre-delivery* finance or a *post-delivery*. The former is normally set up individually. Customers are typically obliged to make 'stage payments' to shipyards in order to pay for the materials and labor required to build the ship. This entails paying a deposit to the builder for materials at the time of contract signing, with the balance due in about equal installments at the time of keel laying, engine delivery, launching, and delivery. According the agreement in case of pre-delivery, the initial payment is made by the buyer, and the bank is responsible to pay the remaining amount of agreed payments. The only drawback in this instance is the risk of bankrupt (or located in politically unstable areas) of shipyard before the vessel delivery. The need of further security could be offered by the shipyard's bank, known as "refund guarantee", or when the shipyard located in high risk areas the government guarantee. Furthermore, post-delivery, which means that the drawn is on the vessel's delivery, can be acquired: through a shipyard credit scheme, commercial bank credit, or leasing. Government guarantee, Interest rates subsidy and Moratorium are approaches for the government to make the latter shipbuilding finance more appealing to shipowners than commercial bank credit. The government guarantee may have little of more value for the shipowner, that's depending on the degree of help and influence that want to put on. The interest rate subsidy by government could be very helpful for some cases, that, based on the agreed-upon current rate (if it is high, the government will cover the difference between the agreed-upon loan rate and the prevailing market rate, which might be a large difference.) and the last way in which a government can make its shipbuilding credit more appealing to potential shipbuilders is the Moratorium where the government may agree to a one- or two-year deferral on interest or principal repayments in tough circumstances.

### 2.3.3 MEZZANINE FINANCE

Mezzanine financing is not frequently used in shipping and is difficult to get. It could be described as a term refers to high-yielding financing that is typically priced several

percentage points over LIBOR<sup>2</sup> and sometimes includes some type of equity "kicker" such as equity warrants (stopford , 2009). Mezzanine is the suitable middle-ground solution, when a corporation wants to maximize its profits without contributing more equity and has exhausted its options for typical secured financing. The cost of the mezzanine is greater than standard secured loans but lower than the cost of equity because of the claim that the vessel is senior only to the common equity and can be structured as debt or equity. Mezzanine financing is provided by traditional shipping banks, private equity firms, or hedge funds. If the vessel has a second or third mortgage, the interest rate is high, and the repayments are lower than a standard mortgage-backed loan, a subordinated debt could be obtained.

#### 2.3.4 CAPITAL MARKET

**Capital market (3)** plays an important role for those companies which want to raise finance either by **Public offering of shares or by issuing bonds**.

##### 2.3.4.1 PUBLIC - OFFERING (IPO)

In order a company to raise equity in the public markets must launch an initial public offering (IPO) to be listed on a specified stock exchange where they will be traded (stopford 2009) after the prospectus (a financial document that provides the potential investors with information about the company's business, financial information and risk factors) (kavussanos et al ,2016) has been approved by the SEC( Securities and Exchange Committee) after which the business and its underwriters present the offering to investors. The company's market-adjusted net asset value (NAV); the enterprise value based on the company's EBITDA compared to similar listed companies; and, in the case of offerings aimed at income funds and retail investors, the yields of comparable public companies will all be taken into account in pricing a shipping offering(stopford , 2009). One of the stylized facts in firms' public debuts is initial

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<sup>2</sup> The London Interbank Offered Rate (LIBOR) is the average interbank interest rate at which a group of banks on the London money market are willing to lend to one another.( <https://www.global-rates.com/en/interest-rates/libor/libor.aspx>)

under-pricing, which is reflected by a substantially higher closing price on the first day of trading than the initial offer price.

#### 2.3.4.2 BONDS

A bond is a debt security (also referred to bonds as a "note") that is due to be redeemed on a certain date and for which the issuer pays interest. The shipping firm (the 'issuer') sells bonds to financial institutions (the bondholders), who then receive interest (known as the coupon). The capital is refunded to the bondholder at the conclusion of the period (stopford, 2009). Many shipping companies choose the public debt, because of the following benefits: (Alexandridis et al. 2018):

- ✓ better access to debt capital markets
- ✓ shipping bonds have more flexible terms
- ✓ less difficult and time-consuming processes
- ✓ bond issues leave ownership do not change the structure of the shipping company whereas providing equity capital results in dilution of ownership
- ✓ borrowers have the opportunity to realize tax benefits
- ✓ provide an alternative to traditional bank finance during periods of credit crunches
- ✓ cash flow is flexible during the repayment schedule because repayment of a bond issue becomes due at its maturity

Apart from the benefits not only bonds put shipping investors at a larger risk of financial, given the added complication and cost of renegotiating conditions with bondholders in comparison to shipping bank loans, but also '*issuing public debt is its relatively higher cost of capital relative to shipping bank loans*'. (Alexandridis et al. 2018).

Bonds can be utilized in two ways in the shipping sector. The first is to make capital market finance available to creditworthy private enterprises who do not want to follow the public equity route. The second is by established public shipping companies with a big market capitalization, which can leverage their credit status and relationships with

financial banks to obtain relatively large amounts of capital swiftly and easily. Bonds provide them with quick and flexible financing.

### 2.3.5 SPECIAL PURPOSE VEHICLES (SPV)

#### 2.3.5.1 FINANCING SHIPS WITH SPECIAL PURPOSE COMPANIES

In a normal ship leasing structure, a leasing institution forms a Special Purpose Company (SPC) to own the vessel. The vessel is then purchased through a combination of equity from the leasing institution and debt from a debt financier (shipping bank), all of which is backed by the vessel's first priority mortgage (Kassanos et al., the handbook).

The Special Purpose Companies (SPC) could be achieved by the two (2) ways after purchases, the ships the vessels are available to lease or to time-charter them to other parties. The ships are managed by a manager, and finances are raised through equity investors, sometimes augmented by a bank loan (Stopford, 2009). There has been no new financing activity in the primary KG market since the post-Lehman era (Simic et al., 2016). A Special Purpose Company (SPC) is often founded for the purpose of owning and chartering a single vessel in KG and KS funds<sup>3</sup>, which are tax-driven leasing schemes. Many maritime corporations were aggressively growing their fleets prior to 2008, either by acquiring newbuilding vessels or purchasing used ones. The German KG scheme, in particular, was responsible for about 26% of all containership newbuilding orders from 2006 to 2008, and a third of the global fleet as of March 2013 (Alexandridis et al. (2018).

#### 2.3.5.2 LEASING SHIPS (FINANCE & OPERATING LEASE)

Leasing as a source of finance is connected with some risks that should be taken into consideration: the revenue risk (the risk is related with full repayment of the purchased-vessel); the operating risk (the risk of vessel's-asset's break down); and the residual value risk (the risk of who benefits if the property is worth more than anticipated at the end of the lease)(Stopford 2009). A finance lease provides 100 percent financing without the need for extra security such as mortgages on other ships in a company's

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<sup>3</sup> A KG fund represents a long-term investment in a vessel with a contract duration of 15–25 years. A very similar and equally successful financing vehicle is the Norwegian KS structures (kommandittselskap). Stopford (2009) presents a thorough examination of the various ship finance instruments. (Wolfgang Drobnitz et al., 2013)

fleet. If a shipowner needed to obtain 100 percent financing for a ship mortgage loan, he would have to achieve the maximum feasible vessel employment in order to satisfy required cash flows for debt servicing, and he would also be burdened by significant cross-collateralization on other debt-free ships. Since ship prices have grown, leasing has become a more enticing financing option (Syriopoulos, 2007). Moreover, the leasing company contributes equity and senior debt is sourced from banks in lease financing models. As a result, lease payments must amortize and compensate (a) the lease structure's underlying debt component and (b) the leasing institution's equity component. As a result, leasing structures have larger cash-flow servicing requirements than simple loan financings (Kavussanos et al., *The International Handbook of Shipping Finance\_ Theory and Practice* 2016 ,p201, ).

Generally, financially strapped shipowners have relied heavily on leasing in the form of Sale & Leaseback arrangements. The vessel is sold to an SPC owned by a new owner (the lessor) and simultaneously chartered-back by the shipowner who initially sold it — on a long-term bareboat or time-charter agreement (the lessee). The original shipowner receives roughly 80–90% of the vessel's Fair Market Value (FMV) while continuing to operate the vessel under the lease agreement.

According to Li (2006) and his research about the advantages and disadvantages of ship leasing, shipping industry risk is distributed evenly among all parties involved. Lessors can also benefit from tax redemptions, the retention of operating capital, and longer repayment schedules compared to alternative finance options. Furthermore, because the lessee shipping firm is not needed to make a capital outlay for the acquisition of a vessel, the working capital can be retained (Alexandridis et al. 2018).

Operating leases and finance leases are the two types of leasing structures. According to current accounting rules, the distinction between on and off-balance sheet, and thus operating versus finance lease, is determined by whether substantially all of the risks and rewards of ownership of the leased asset have been transferred from the lessor (the company leasing out the asset) to the lessee (the company leasing in equipment). In an operational lease, the leased asset is exclusively recorded on the lessor's balance sheet, and both the lessee and the lessor realize rentals in their income statements for the lease period. In the case of a finance lease, the lessee must additionally book the leased asset on its balance sheet at the lower of the asset's

fair value or the present value of the minimum lease payments (kavussanos et al , The International Handbook of Shipping Finance\_ Theory and Practice 2016).

#### 2.3.5.3 SECURITIZATION IN SHIPPING

The aggregation of future cash flows, their transfer to a separate legal entity (a special purpose vehicle—SPV), and that entity's issuance of marketable bonds to investors is known as securitization (kavussanos et al , The International Handbook of Shipping Finance\_ Theory and Practice 2016). Finance mortgage loans, auto loans, credit card receivables commonly use asset-backed securitization<sup>4</sup>. The method entails selling a portfolio of cash-generating assets, such as mortgage loans, aircraft, and ships, to a bankruptcy remote trust, which then issues bonds backed by the assets' cashflow (stopford, 2009). Securitization also refers to the use of income streams and/or asset portfolios to support the issuance of securities, namely debt, and in some cases equity. The packaging of cash flow streams and asset portfolios, as well as the structuring of the multiple tranches of securities to be issued in a sale, are not only the most tempting but also the most challenging aspects of this instrument (Syriopoulos, 2007). The cash flows must meet three financial (rather than legal) requirements in order to be qualified for securitization. They must first be stable and predictable. Second, they must be homogeneous in the sense that they come from the same source or group of sources; charter-party receipts would meet this requirement. Third, they must be legally assignable: Schedule 1 of the Merchant Shipping Act 1995, paragraphs 11–12, states that a registered mortgage may be transferred by an instrument made in the form prescribed by or approved under registration regulations, and that when such an instrument is presented to the registrar, the latter registers the transferee in the prescribed manner (kavussanos et al , The International Handbook of Shipping Finance\_ Theory and Practice 2016). Asset securitization entails pooling and re-packaging assets and receivables in such a way that the entire relatively homogeneous asset package can support multi-tranche offerings of liquid securities, including a significant top slice of investment grade paper (Stokes, 1997). The mortgages on the ships would be transferred to the SPV because they are the assets that are used to back the bonds. Since legal ownership of the loans initially accruing to the originator (the

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<sup>4</sup> it has also been utilized extensively in the aircraft industry, which has a comparable asset base to shipping

bank) has now been transferred to the SPV, re-registration would be required. Investors' payments for the SPV's bonds are used to acquire the cash flows, resulting in an advance payment to the originator against those cash flows. In the case of default on the original loans securitized, the originator as collecting agent will still be responsible for taking legal action (kavussanos et al , 2016).

## 2.4 THE GREEK INDEXES MEASURING UNCERTAINTY

### 2.4.1 THE ECONOMIC POLICY UNCERTAINTY INDEX (EPU)

#### 2.4.1.1 HISTORY OF THE INDEX

The Index initially interested many researchers from the past until now. These included, among others, Bernanke in 1983, McDonald and Siegel in 1986, Dixit and Pindyck in 1994; Bloom, Bond and Van Reenen in 2007, Pastor and Veronesi in 2012 and 2013 and Baker, Bloom and Davis at 2016. Baker, Bloom and Davis (et al 2013) construct the index, analyze the gathered information and published an article in 2016 for the United States and 11 other major economies as a way of measuring the economic policy uncertainty based on newspapers written words-topics , which findings were categorized firstly and analyzed afterward by some terms. Moore and Arbati separately at 2017 , followed the same path and continued the construction of indexes relates with other many economies. In 2018 Hardouvelis, Karalas, Karanastasis. Samartzis published two versions of their research about the index in Greece. Apart from the newspapers source of research Bontempi et al. (2016) present an additional way of search based on Internet searches by introducing a new indicator of uncertainty. Castelnovo and Tran (2017) create uncertainty indexes based on Google Trends data for the United States and Australia.

#### 2.4.2 THE INDICES AND THE DATA

Baker, Bloom, and Davis in 2016 published article reported their conclusions about the relativeness between the higher stock price volatility and lower investment and employment in policy-sensitive industries such as military, healthcare, finance, and infrastructure building, using firm-level data, taking into consideration more specific parameters about the companies data , not focusing only on the averages of the same,

in order to minimize the heterogeneity at the micro level findings. From the macro scope, investments, outputs, and employment in the United States noticed decline when the policy uncertainty changed.

#### 2.4.3 CLOSELY RELATIVE INDICES

To the Economic Uncertainty (EU) index, a wider index that take into account term of uncertainty and economy, was added more parameters in order to converted one more specific index , the EPU. Fiscal Policy Uncertainty (EPUF), Monetary Policy Uncertainty (EPUM), Currency Policy Uncertainty (EPUC), Banking Policy Uncertainty (EPUB) and Pension Policy uncertainty (EPUP) are more specific – oriented indexes. Additionally, there is a further separation of EPUT terms EPUF into subsets for tax policy uncertainty (EPUT) and debt policy uncertainty (EPUD).

Tables 1 to 8 represent one or more terms about uncertainty, economy , policy and other terms that reflects the category and newspapers should contain in order to calculate the indexes.

Table 1 Groups of words for the construction of the Greek EPU Index Group

Table 2 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUF & EPUD

Table 3 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUT

<b>table 1<sup>1</sup> :</b>	
english word	Greek translation
uncertainty or "uncertain"	"αβεβαιότητα" or "αβέβαιος"
"concern"	"ανησυχία"
"vagueness"	"ασάφεια"
"doubt"	"αμφιβολία"
"economy" or "economic"	"οικονομία" or "οικονομικός"
"reform"	"μεταρρύθμιση"
"structural changes"	"διαρθρωτικές αλλαγές"
"legislation" or "legislative"	"νομοθεσία" or "νομοθετικό"
"Bank of Greece"	"Τράπεζα της Ελλάδος"

“central bank”	"κεντρική τράπεζα"
“law”	"νόμος"
“minister”	“υπουργείο” or “υπουργός”
“prime minister”	"πρωθυπουργός"
“Maximos Mansion”	“Μαξίμου”
“deficit”	"έλλειμμα" or “ελλειματικό”
“deregulation”	"απορύθμιση"
“regulatory framework”	ρυθμιστικό πλαίσιο" or “κανονιστικό πλαίσιο”
“Capital Market Commission”	"Επιτροπή Κεφαλαιαγοράς"
“Competition Commission”	“Επιτροπή Ανταγωνισμού"
"government"	"κυβέρνηση"
“Council of State”	Συμβούλιο της Επικρατείας
"parliament"	"βουλή"
<b>Term Groups for the Greek specific Policy Uncertainty Sub-Indices</b>	
<b>table 2<sup>1</sup>: Greek term Fiscal Policy Uncertainty (EPUF)</b>	
"government spending"	"δημόσιες δαπάνες" or “δαπάνες δημοσίου” or "κρατικές δαπάνες" or “ δαπάνη γενικής κυβέρνησης"
“primary spending”	"πρωτογενής δαπάνη"
“defense spending”	"εξοπλιστική δαπάνη"
“public investment”	"δημόσια επένδυση"
"budget"	"προϋπολογισμός"
"sovereign debt"	"κρατικό χρέος"
“public debt”	"δημόσιο χρέος" or “οφειλές δημοσίου”
“transfer payments”	“μεταβιβαστικές πληρωμές”
“public consumption”	"δημόσια κατανάλωση"
"benefit" or “allowance”	"επιχορήγηση" or "επίδομα"

"default of the country"	"πτώχευση της χώρας" or "πτώχευση της Ελλάδας"
	or "χρεοκοπίας της χώρας or "χρεοκοπία της Ελλάδας"
"tax"	"φορολογία" or φόρος"
"tax office or authority"	"εφορία"
"public revenue"	"τακτικά έσοδα" or "δημόσια έσοδα" or "έσοδα
	προϋπολογισμού"
"privatization revenues"	"έσοδα αποκρατικοποιήσεων"
"value added tax"	"φ.π.α."
"special consumption tax"	"ειδικός φόρος κατανάλωσης"

**table 3<sup>1</sup>: Debt Policy Uncertainty (EPUD)**

"government spending"	"δημόσιες δαπάνες" or "δαπάνες δημοσίου"
	or "κρατικές δαπάνες" or "δαπάνη γενικής κυβέρνησης"
"primary spending"	"πρωτογενής δαπάνη"
"defense spending"	"εξοπλιστική δαπάνη"
"public investment"	"δημόσια επένδυση"
"budget"	"προϋπολογισμός"
"sovereign debt"	"κρατικό χρέος"
"public debt"	"δημόσιο χρέος" or "οφειλές δημοσίου"
"transfer payments"	"μεταβιβαστικές πληρωμές"
"public consumption"	"δημόσια κατανάλωση"
"benefit" or "allowance"	"επιχορήγηση" or "επίδομα"
"default of the country"	"πτώχευση της χώρας" or "πτώχευση της Ελλάδας"
	or "χρεοκοπίας της χώρας or "χρεοκοπία της Ελλάδας"
	Ελλάδας"

**table 4<sup>1</sup>: Tax Policy Uncertainty (EPUT)**

"tax"	"φορολογία" or φόρος"
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"tax office or authority"	"εφορία"
"public revenue"	"τακτικά έσοδα" or "δημόσια έσοδα" or "έσοδα"
	προϋπολογισμού"
"privatization revenues"	"έσοδα αποκρατικοποιήσεων"
"value added tax"	"φ.π.α."
"special consumption tax"	"ειδικός φόρος κατανάλωσης"
<b>table 5 <sup>1</sup>: Monetary Policy Uncertainty (EPUM)</b>	
"cost of money"	"κόστος χρήματος"
"monetary policy"	"νομισματική πολιτική"
"quantitative easing"	"ποσοτική χαλάρωση"
"interest rate"	"επιτόκιο" or "euribor"
<b>table 6 <sup>1</sup>: Currency Uncertainty (EPUC)</b>	
"exchange rate"	"συναλλαγματική ισοτιμία" or "ισοτιμία του ευρώ"
"drachma"	"δραχμή"
"Eurozone"	"Ευρωζώνη or "ζώνη του ευρώ"
"national currency"	"εθνικό νόμισμα"
"economic and monetary union"	"ονε" or "οικονομική νομισματική ένωση"
"gexit"	"gexit" or "έξοδος από το ευρώ"
"currency appreciation"	"ανατίμηση"
"currency depreciation"	"υποτίμηση"
<b>table 7<sup>1</sup>: Banking Uncertainty (EPUB)</b>	
"bank"	"τράπεζα"
"banking sector "	"τραπεζικός κλάδος" or "τραπεζικός τομέας"
"banking system"	"τραπεζικό σύστημα"
"interbank market"	"διατραπεζική αγορά"
"lending rate"	"επιτόκιο χορηγήσεων"
"deposit rate"	"επιτόκιο καταθέσεων"
"deposits"	"καταθέσεις"

"loans"	"δάνεια"
<b>table 8<sup>5</sup> : Pension Uncertainty (EPUP)</b>	
"pension"	"σύνταξη"
"pension insurance system"	"ασφαλιστικό σύστημα or "το ασφαλιστικό""
"insurance fund"	"ασφαλιστικό ταμείο"
"social insurance institute"	"ίδρυμα κοινωνικών ασφαλίσεων"
"pension reform"	"ασφαλιστική μεταρρύθμιση"
"social insurance"	"κοινωνική ασφάλιση"
"zero deficit clause"	"ρήτρα μηδενικού ελλείμματος"
"insurance contribution"	"ασφαλιστική εισφορά"
"funded pension scheme"	"κεφαλαιοποιητικό σύστημα"
"pay as you go pension scheme"	"διανεμητικό σύστημα"
"lump sum pension"	"εφάπαξ"

Table 4 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUM

Table 5 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUB

Table 6 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUC

Table 7 Term Groups for the Greek specific Policy Uncertainty Sub-Indices EPUP

#### 2.4.4 *THE GREEK INDEX DATA*

Greek the index that was utilized to inquire into the policy uncertainty role was the Economic Policy Uncertainty (EPU). It was used on 4 leading Greek newspapers and was based on phrases and expressions that were close related with the tough and difficult economic crisis in Greece. A factor that was in the spotlight for many years. The writers followed the same path and used the same key words of the Baker's (et al 2016) research, for US and 11 other economies, so that the indices could be used in parallel with their international EPU indices in research work. Some of these terms that

<sup>5</sup> All the tables are according the Hardouvelis et al ,2018 , Economic Policy Uncertainty, Political Uncertainty and the Greek Economic Crisis article.

counted for the EPU index were *uncertainty, vagueness, doubt, concern, economy, Policy - Parliament, legislation, government, Bank of Greece, central bank, reform, structural changes, law, minister, prime minister, Maximos Mansion, deficit, deregulation, regulatory framework, Capital Market Commission, Competition Commission, or Council of State*(Hardouvelis et al ,2018 , *Economic Policy Uncertainty, Political Uncertainty and the Greek Economic Crisis*). According to the research needs, different group of terms were considered for the research each of the indices to be analyzed.

The major global events of the past, that affect the global economy are :

- Russian Crisis
- the 9/11 attacks
- the second Gulf War,
- the Post Lehman financial crisis.

The Greek economy not only affected by global events but influenced by the following local events:

- New property tax imposed
- Plans for referendum by Papandreou
- Inconclusive elections of May 2012
- Elections 2015 (syriza)
- Failure to elect new president – announcement of Snap elections
- Rating agencies downgrade Greece
- Referendum
- Parliament approve the 2017 budget

Before the euro entry in Greece , the value of the index (EPU) was high in the first part of the sample. From 2003 to 2007 it is noticed a reduction, but upon the appearance of the international and the Greek crisis the index rose.

The Greek index is particularly correlated with the corresponding European, US and worldwide indices generated via way of means of Baker, Bloom and Davis (2016), which shows that uncertainty in Greece is stimulated now no longer most effective via way of means of local, however via way of means of worldwide activities as well. In fact, before the outburst of the Greek disaster the excessive values of EPU befell

specially throughout global activities. Later, throughout the Greek disaster, the superb correlations of the Greek EPU index with overseas EPU indices reduced in size in length and steadily collapsed, especially the correlations with indices outdoor Europe, suggesting the Greek disaster has a selected Euro Area taste to it.

## Part II

### 3 GREECE : DATA OF BANKS UNINVOLVED IN SHIPPING FINANCE

#### 3.1 MEASURING THE HIGH-LEVEL EPISODES OF UNCERTAINTY

In our case (which is to measure the uncertainty level in Greece) there are available data on a monthly basis for the economic policy uncertainty (EPU) index. For the data comparison will be used the method of the figures' average.

From 1998 until 2020 the lowest price of EPU average was 86,56 , whilst the higher was 130,19. The analyzation of possible reasons affect the uncertainty in Greece will be presenting below. Figure 2 represent the EPU between 1998 until now.

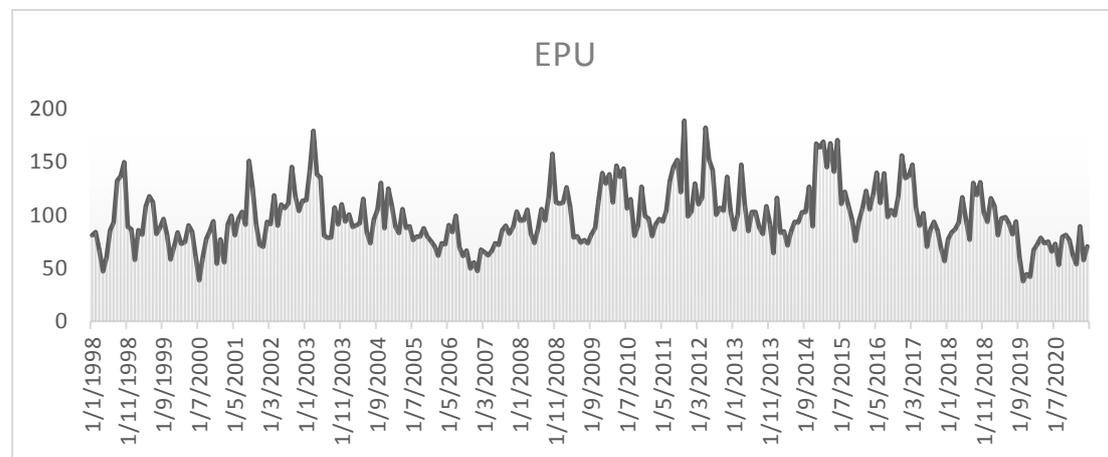


Figure 2 EPU FOR 1998-2021

Source : constructed from published data in Economic Policy Uncertainty website - <https://www.policyuncertainty.com/greece.html>

#### 3.2 GREEK SHIPPING COMPANIES LOANS OVER TIME

I will separate the time period as followed:

1<sup>st</sup> period :1992-2002

- ❖ 1992-1999
- ❖ 1999-2002

2<sup>nd</sup> period:

- ❖ 2003-2021

### 3.2.1 1992-2002 : THE GREEK PARADIGM

For the period 1992-1999 the finance ship-lending related with Banks evolve in International Shipping Field , divided to finance categories the major and the minor role of Shipping Finance and into three (3) categories:

1. International Banks WITH a Greek presence
2. International Banks WITHOUT a Greek presence
3. Greek banks

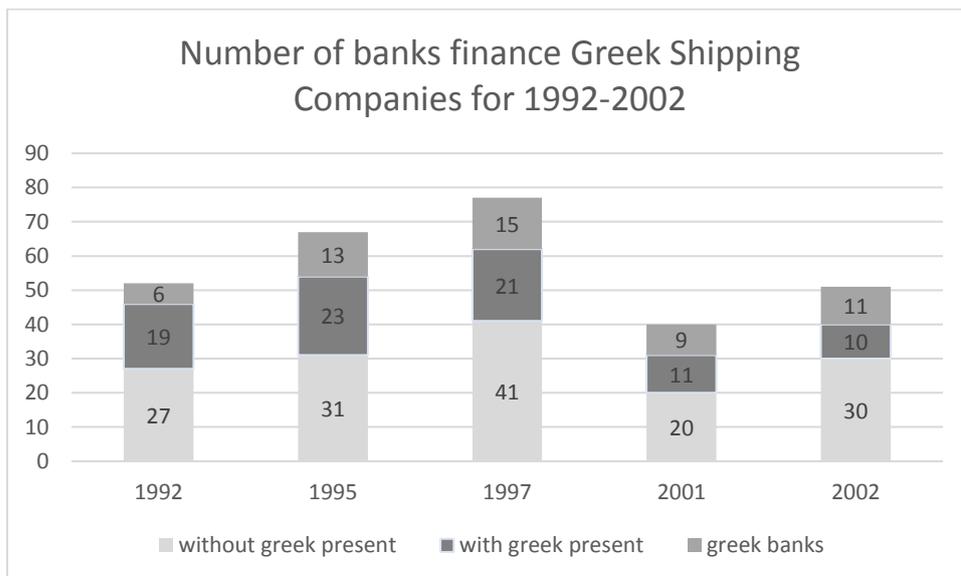
In 1992, there were 39 banks with major roles in Greek shipping companies financing and 28 with minor roles. During the course of time, the number of banks has been increased in total. The peak of the most banks , both with minor and major roles, was in 1996 , where 201 banks (62 major roles compared with 139 minor roles). Until 1996 there was an annual increase of banks that financed Greek Shipping companies , whilst after this year noticed an annual reduction (in 1999 there were 39 banks with major role , whereas 93 had minor role). More specifically according Petrofin researches , the major Banks financing Greek Shipping Companies showed a cyclicity and that they peaked at 1996. The minor role of Banks that financed Greek Shipping companies from the other hand shows wider intensity between the years 1992-1999. Unfortunately, there are not enough data for the amount of bank loans for the specific period. The Economic Policy Uncertainty (EPU) was above its average between the periods of 1998-1999 as the figure 5 shows. This could be an explanation for the reduction that noticed at the same period for the Banks that financed the Greek Shipping Companies. The market considers banks with a higher ship-lending engagement as a percentage of their lending assets to be "higher risk." As a result, the focus has been on lowering each large ship-lending bank reliance on ship-lending. Surprisingly, the consequences of the Far East crisis appear to have subsided. It's worth noting that ship-lending capacity has not reduced as much as the number of shipping-related institutions would suggest. A stronger emphasis on quality and size, as well as asset age, has resulted in a significant change in interest towards new-buildings and larger lending limits for a smaller number of clients. While mergers and acquisitions may have streamlined shipping departments, ship-lending capacity has not necessarily been lost (petrofin 1999).

The following table (9 ) refers to the number of Banks that Finance Greek Shipping Companies and the total amounts, respectively. As we can see from the table 9 there is an 28,65% accretion of Greek Portfolios , in 2002.

The representing amounts are in million USA \$ (dollars).

<b>No of Banks fiance Greek Shipping Companies &amp; the amounts(\$mil)</b>			
<b>2001</b>			
<b>without greek present</b>	<b>with greek present</b>	<b>greek banks</b>	<b>total amount of finance</b>
20 banks	11 banks	9 banks	16525
6165	7050	3310	
<b>2002</b>			
30 banks	10 banks	11 banks	21261
8604	8185	4472	

Figure 3 number of banks that finance Greek Shipping Companies for 1992-2002



source: Petrofin 2003

According to the EPU (Policy Uncertainty Index-figure 2) we can observe the fluctuations during the years. At 31/10/1998 the amount is approximately 150, followed by a reduction at 31/01/1999 to 57.9. In 2000 the price range was between 38.4 and 94.1. The period of high EPU, namely, is related with the low demand of bank loans.

In 2001 there was (a reduction in relation with other years in demand of shipping loans) an increase of uncertainty. In 2001 there was less demand for borrowing than in 2003 where uncertainty falls and borrowing rises. It has already started in 2002 where there is an increase in corporate lending. The end of 2001 shows a high level of uncertainty. The first period of 2002 has firstly a sudden rise at EPU index and then a reduction of uncertainty. On the other hand, the ship lending at 2001 is lower and as the EPU index falls, the loans increased.

### 3.2.2 2003-2021 : THE GREEK PARADIGM

The international crisis makes its first appearance in August 2007. The Greek crisis seems to have two phases as Hardouvelis et al. analyze in their paper in 2018. The first phase is the restoration of balance, during which, the policymakers take steps to correct the imbalance. After a long period, of six years, at the end of 2013, Greece and Greek residents have coped with very strict supervision of European banks and the International Monetary Fund. To a large extent the main fiscal imbalance, and the current account imbalance has ended following by series of structural reforms especially in the labor market. Many important international and local events, as referred above, affect the EPU index for instance the 9/11 terrorist attack, the Gulf war in 2003, in 2010 the first Greek financial rescue, the public discussion on the November 2011 referendum and the Greek double elections of 2012. The main peak of the EPU index was mainly driven by international events before the economic crisis in Greece. The index regime changes after the 2008 could be ascribed to the global financial crisis.

The years 2002-2008 we observe a positive correlation of Greek Shipping Companies portfolios. In 2009, when the crisis showed, the growth of loans has negative correlation, while the Greek Economic Policy uncertainty is high.

In 2003, the banking industry noticed deals with an accretion of consolidation in the last 5-10. Contrastingly, many banks that focused on finance in Shipping Field present a growth, especially the Greek ship-lending banks. To be more specific the Greek ship finance has grown during a period when the shipping market has been in decline, which has resulted in lower returns. The BASEL II agreement played an important role at this period, because of the necessity of Banks and shipowners to evaluate the positive effects of this agreement so to reposition themselves. Although the BASEL II criteria did not immediately effect banks until 2006, the process of adjustment has already begun in earnest, with credit assessment ratings and spread/fee modifications already reflecting the BASEL II standards.

While Greek shipowners were more willing to accept the increase in spreads in order to be prepared for the BASEL II, the predominant interest rates were low. Higher loan yields, as well as a rebound in the global economy, international commerce, and the shipping industry, will function as a tremendous incentive for Greek ship finance to expand its loan volume.

The GDP decreased by more than 25% between 2008 and 2013, while the general government debt-to-GDP ratio skyrocketed from approximately 100 percent in 2007 to around 180 percent in 2016 (Hardouvelis et al 2018).

The annual total amounts of Greek Shipping portfolios noticed growth and depression during the years 2003-2007. Greek portfolios had continuously increased from 2003 where the total amount of loans reached \$25.554 million to \$63.941 million in 2007, an increase of 37,84% (in 2004 loans amounted at \$32.352mil and the growth compared the previous year was 26,60%, in 2005 companies financed \$36.112mil raised 11,62% and in 2006 total loans were \$46.387 and the growth was 28,45%). EPU fell and remained at low levels from 2003 to 2007, but then surged again after the international and Greek crisis (Hardouvelis et al 2018). The key conclusions are that overall funding allocated to Greek shipping increased by 44.3 percent to \$66.94 billion in 2007. This indicates the appeal of Greek shipping, as well as the growing confidence of international and Greek banks in the Greek fleet. The demand for loans has increased as a result of record-breaking purchases of used tonnage as well as record-breaking newbuilding orders (Petrofin 2008). The Greek maritime finance market accounts for

roughly 19 percent of global totals, according to the same year's Petrofin Bank Research.

The success of Greek shipping is reflected in the increased interest shown in Greek shipping by both Greek and international banks, as well as the expansion of Greek ship finance totals. In 2007 the subprime and international banking crisis had an impact on the rate of expansion of Greek ship finance. As a result, banks' desire has slowed, not because of shipping prospects per se, but because of the international banking crisis(Petrofin 2008).

At the end of 2008, total loans amounted to \$73.228bn, up by only 9.39% from 2007. From September 2008, indicators of the crisis growing struck shipping, as well as all other industries. In the following years, the decline in the demand for financing in the field of shipping becomes apparent. New loans are being offered on significantly more favorable conditions than they were a year ago, and this trend will continue. Loan margins have more than doubled, and in some cases trebled. Fees for making arrangements have gone up. Finance ratios have dropped to around 50%, and there are a slew of new terms and regulations, including financial covenants (petrofin , 2009). In 2009 (loans were \$67020 million) consequently there is a reduction of -8,48%. There's no denying that 2009 was a watershed moment for Greek ship financing. The repercussions on Greek ship finance have been minor when compared to the severity of the worldwide banking crisis, international illiquidity, consumer and business confidence loss, the collapse of international trade, and the plunging of vessel values and freights (petrofin 2010). In 2010 the decrease was -1,1% , while the 2011 there seem to be a small raise of demand because of the small rise of shipping loans( from \$67020 to \$67694) of 2,20%. The inability of banks to raise their exposures is more to blame for the overall decline in Greek ship finance totals.

In recent years, the Greek banking sector has been affected the most, by the aforesaid issues of capital insufficiency, illiquidity, and overexpansion, combined with the country's economic woes and the problems that Greek banks face across the entire spectrum of their activities in Greece (petrofin 2011).The latter year(2011) we can observe an extremely high EPU in 11/2011 was 188,70(average 116.59). Some political and fiscal events happened the same period such as, a call for vote of confidence of Prime Minister Papandreou, who won this confidence, and a referendum on the EU

summit deal in regards to the Greek debt haircut. After that in November the Prime Minister there is a sworn of the new Greek Prime Minister. High price of EPU is likely to happen again in May of 2012 which was 182,1. Simultaneously the 2012 in Greece were the two local events of the Greek double elections. The EPU average were about 123. four of the twelve months measuring above this average. These months were the February , May , June and November. If we want to delve into this year November was the month of the Greek government submits the 2013 Budget to Parliament, which forecasts a general government deficit of 5.16 percent of GDP, May and June Greece had the national elections with a change of government and February was the Second bailout package that finalized (hardouvelis et al 2018).All these factors played an important role of the economic policy uncertainty, so the percentage of growth in 2012 were again negative of -2,83%(loans amounted \$65780million). There is again a decline in Greek ship finance in 2013 was 6.51 percent.

As of December 31, 2013, the total amount of Greek loans booked in Greece and around the world was \$61.498 billion, down from \$65.78 billion the previous year. Additionally, in 2013 noted the growing presence of US equity funds in Greek ship finance, attracted by low-cost prospects and the absence of favorable terms offered by traditional ship finance(petrofin 2014).

In 2014, GDP had stabilized and started to rebound again. The new second phase started in 2015 and is not related to the macroeconomic imbalances; but given the huge policy and political errors during the years resulting from poor administration, Greece's economic and political uncertainty grew. The second phase includes the elections of 2015 and the referendum of June 2015 that could be considered to be decisive for the EPU. With the fear of Grexit looming after a new government strategy, in turn followed by 'bank deposit withdrawals, new funding pressures on the government and on domestic banks, capital controls, stock market volatility, and an unbalanced fiscal mix, with taxation rising to new unprecedented levels'' ( Hardouvelis et al.2018 paper). The crisis lasted longer than predicted. Subsequently EPU seems to have increased in the second phase of the Greek crisis, which may be due to the intensified political polarization that Greece had to deal with during this period. But the importance of sea transportation plays an important role of Greek economy, especially in 2015, according to Eurobank research, *the earnings from the Shipping Industry accounted on 5.7% of annual GPD.*

The decline in Greek ship finance bank loans reflects the difficult regulatory and operational environment for banks (mainly in Europe). On the contrary, the operating conditions of Far East Bank and the leasing companies are more favorable. Greek banks are an exception because they have benefited greatly from the significantly upgraded ratings of Standard & Poor's and Moody's of Greece, lower financing costs, attractive loans and subordinate to business returns, and a strong loan portfolio.

‘As the year progressed, loans to asset finance levels approached 50-55% for bank lending and 60-65% for leasing. Furthermore, in the course of the year, confidence returned both for banks and clients alike and ship finance volumes rose.’ Petrofin Research© - [www.petrofin.gr](http://www.petrofin.gr)

During 2014 the percentage of growth is 4.51 , compared to the previous years (2012 was - 2,20% negative growth and 2013 the percentage was at -6,51%) depicting an improving trend for shipping and finance. The EPU index average for the same year is 101.2, and as we can see from figure 2 this year fluctuated enough low prices. The months with the highest uncertainty were January (31/1/2014) where the EPU was 116,14, October(31/10/2014) with a 126,63 EPU value and December(31/12/2014) of the same year with 167,20 EPU value. In order to define the possible reasons the most important fiscal and political events will be analyzed. Greece's primary budget surplus is 1.5% of GDP for the year 2013. In December of 2013, there was a failed attempt to elect a new government to the Hellenic; last-minute parliamentary elections were held scheduled on January 25, 2015. Once more, in 2015 and the local events affected the field of finance, as a result the growth can be seen as negative. Syriza won the Greek Policy elections for the first time in 2015, and along with the Independent Greeks (ANEL) created a new coalition government whereby Alexis Tsipras was sworn in as the new Prime Minister. From 1998 to 2021, EPU experienced a higher value of 130.19. This means that the whole year the Uncertainty in Greece was high. Not only that, but 6 out of 12 months were above the average (the highest was 168.83 and the lowest 75.47). To be more specific 2015 Greece had to deal with the following issues<sup>6</sup> :

- Greece's credit rating is gradually downgraded at the first half of the year and then upgraded from B to CC and to CCC by Fitch(In 12/2014 Standard and Poor's upgrades Greece's credit rating from B- to B).
- Moody's (from Caa1 gradually to Caa3) and Standard and Poor's (from B- gradually to CCC-) have both reduced Greece's credit rating.
- The government transferred the cash reserves of government institutions and municipal authorities to the Bank of Greece through a legislative act.
- The Eurogroup has agreed to extend Greece's borrowing for another four months.
- Greece requested that the IMF postpone the payment due on June 5 until the end of the month.
- Prime Minister Alexis Tsipras called for a vote on the bailout accord on July 5, 2015.
- Tsipras stated that Greek banks will remain closed for the time being, as well as capital controls (a €60 daily withdrawal limit and the prohibition of most foreign transfers).
- Greece defaulted on a loan from the International Monetary Fund (IMF)
- Prime Minister Alexis Tsipras resigns and announces that elections will be held on September 20.

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<sup>6</sup> Harduvelis et al , 2018

- Again, national elections are held, and Syriza won with a large majority.
- A fresh austerity package is passed by the government. Two members of the coalition government's deputies voted against the measures and were expelled.

Greek ship finance is decreased by 2.04% year by year, whilst the total amount of Greek loans booked in Greece and around the world has dropped to \$62,711.5 million from \$64.019 billion. All the banks are on a downhill trajectory. The more temperate ups and downs of last year have given way to a significant drop in Greek bank engagement in Greek ship finance<sup>7</sup>.

During 2016, bank ship-finance into Greek shipping fell by 8.77 percent. This is the most significant drop since 2009. This should be viewed in the context of Greek shipping's DWT growth of about 3% in 2016. The bank ship finance industry is struggling, as evidenced by the shrinking loan portfolios for Greek ship finance. The year 2016 was exceptionally difficult for Western banks, and it began to hit Far Eastern banks as well. Both vessel values, which represent banks' collateral, and cash flows, which represent clients' ability to service shipping loans, were severely impacted by historic drops in the dry bulk, offshore, and container segments, along with a poor performance in the wet sector. As owners were compelled to consider scrapping, layup, or trading at below breakeven rates, the number of non-performing shipping loans increased. All of the shipping banks reported record bank losses as a result of bad loan losses and provisions, and many of them had to increase the pressure on non-performing clients. The willingness of banks for fresh loans has dwindled. As a result, it is a significant achievement that certain banks were able to implement a countercyclical<sup>8</sup> lending policy. Other banks, leasing firms, or individual clients purchase back their loans at a discount, with the backing of new banks. These were examples of growth, which is swiftly abandoning ship financing. The majority of bank loan sales activity focused on sales to equity, vulture, or special situations funds after some intense talks and multiple transfers taking during the 2016. Additionally, depending on the credit and performance status of the underlying loans, loan discounts ranged from 10% to 20% of their value. The market was taken aback by some bank's

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<sup>7</sup>Petrofin research 2016

<sup>8</sup> The volatility of economies is one of their distinguishing characteristics, owing to their reliance on commodities. This volatility is documented in the report's empirical study, which alludes to a link between it and debt crises. If a country has experienced an exports shock in the previous three years, the chances of it facing a debt crisis are greatly raised. Therefore, donors create a new lending instrument based on this analysis: the countercyclical loan (CCL). The objective is to cut the grace term of a normal concessional loan from ten to five years, while keeping the remaining grace periods as an asset that the country can use in the event of a terrible shock. Such an instrument should enable development agencies to restart funding to the world's poorest countries while publicly identifying the dangers that have led to debt cancellation measures in the past(OECD DEVELOPMENT CENTRE , Lending to the Poorest Countries: A New Counter-cyclical Debt Instrument , Daniel Cohen, H el ene Djoufelkit-Cottenet, Pierre Jacquet and C ecile Valadier, 2008 Research area: Financing Development).

decision to foreclose on significant companies that had an asset-to-loan ratio breach but were purportedly servicing their debt. In most other cases, new money was required in some manner before restructures could be implemented. For leasing firms, the leasing model with the Lessor's title is an appealing and secure concept since it allows them to explore greater highlighted "loan to asset" value amounts and more flexible leasing repayments. Furthermore, leasing businesses are more commercial in their attitude and are willing to accommodate lesser-known clients and non-Chinese-built vessels.

EPU 31/12/2016 was 118,26. at this time Greek economy has to face some of important local and international events<sup>9</sup> such as the Brexit, the Donald Trump is elected President of the United States of America, Greek government submits the 2017 Budget to Parliament, forecasting a general government deficit of 0.8 percent of GDP, Greek parliament has approved a new austerity package (the thirteenth) at €5.4 billion, and Greece's talks between the Minister of Economy, Development and Tourism and the so-called Institutions (European Commission, ECB, IMF) on the management of non-performing loans have come to a halt. Bank ship-finance into Greek shipping fell by 5.62 percent in 2017 (amounted 53.995 million dollars). In other words, this is a raise in Greek fleet. Furthermore, the global economic growth and international trade continued to accelerate, surpassing 4% per annum. Despite a slowdown in new vessel deliveries across several sectors, the improved sentiment let a margin optimism among banks. Small number of banks maintained and expand their market share, while others were capable to reduce or sell large portions of their loan portfolios. At the same time, loan provisions began to fall year over year. It is becoming clear that the total number of banks that are downsizing or leaving shipping is beginning to fade. Loan portfolios with problems have started to shrink, as have loan provisions. It observed that bank loan margins are attractive and bank loan demand is high, in addition to the fact that several banks have either begun lending to Greek shipping or have begun to raise their commitments.

Bank loan terms are stringent, and lending has high standards but still is the traditional source of finance. The Greek fleet is continuously expanding and sometimes the demand for loans excess the supply as a result the raise in popularity among owners of other forms of financing (petrofin, 2018). EPU in 2017 fluctuated from 56,45 to 147,39. The highest EPU was in March because of the delayed talks on the second review of the third bailout program between the Greek government and creditors, heightening fears about mounting fiscal expenses, while the economic policy uncertainty index (EPU) average for the same year is 98,17 (Hardouvelis et al, 2018). In 2018 Greek Bank portfolios were amounted to be \$ 53.176 million dollars, therefore there is -1,52 % the percentage of growth compared with the previous year.

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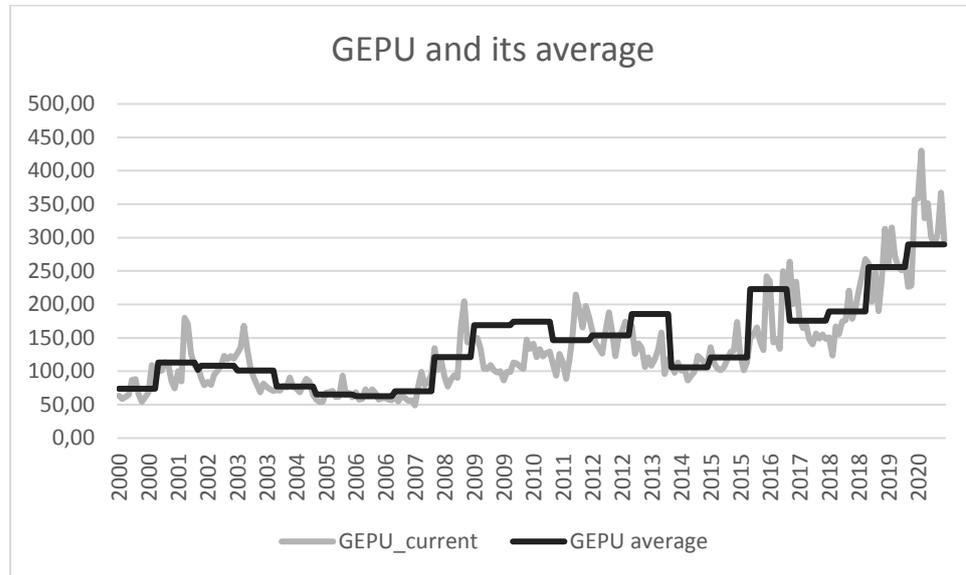
<sup>9</sup> Hardouvelis et al 2018

The same year (2018), the shipping markets were not particularly inspirational, but they did provide some help to banks. As the year progressed, fears about the impact of trade conflicts and restrictions, the impacts of Brexit, rising geopolitical tensions, and the repercussions of the Vale dam accident, which significantly limited Brazilian iron ore production and exports, grew. Banks are growing increasingly concerned about the slowing of international trade growth as a result of greater tariffs imposed by the United States and China, and how this would affect international commerce. Although a decrease in newbuilding orders and delivery has helped to offset the slowing growth of international trade, scrapping is still at low levels (petrofin , 2019).EPU average for the 2018 was 100.32 and was fluctuate from 76,72 to 130,86. The highest months of EPU were the August (130.15) and the October (130.86).

Greek shipping bank ship-finance fell to -0.13 percent in 2019 from -1.52 percent in 2018, with Greek Shipping portfolios totaling 53.108 million dollars. The appearance of the Covid-19 pandemic this year has undoubtedly been the most significant event of the year, not only in Greece but throughout the world. As countries have gone into lockdown, this has had a rising detrimental influence on the global economy, culminating in a global economic fall of roughly 6%. By the time the Western world and other Pacific countries were attacked by pandemic, China, which had taken the brunt of the epidemic and the lockdown, had begun to stabilize and recover. The international trade slowed down , ships were subjected to more stringent quarantine and other limitations that bring many changes in their crewing, supplies, maintenance, spare parts, dry dockings, ballast water treatment fittings, scrubber retrofits, and movements. Charter rates and utilization fell precipitously, with rates falling below operational expenses. Banks and non-bank lenders were hit hard by the changes that we had (and still have) to deal with due to pandemic. Suddenly banks, owners and generally the global economy and international trade had to deal with many changes and many difficulties that had no idea what to expect. The majority of bank employees 'worked from home,' and marketing and meetings were conducted remotely. Banks' loan requests and throughput declined as credit and risk departments struggled to support new lending in the midst of the crisis and uncertainty, and sought out only the strongest clients and credits, generally on the most severe terms. As perceived shipping risk increased and banks began to receive loan restructure requests from distressed clients, loan margins began to rise. It's worth noting that Chinese lending and leasing to non-Chinese companies has come to a halt. This was due to China's strong exposure to other hard-hit industries, such as the shipping sector. Another cause was the unavailability of US Dollar finance for Chinese leasing companies, which meant higher funding expenses that they couldn't pass on to their customers (petrofin 2020). EPU average was 79.32 , during the 2019 the Geek EPU vary from 37,69 to 115,79 .Only because of the pandemic was a global event, I

will compare and the Global Economic Policy Uncertainty (GEPU) Index<sup>10</sup>, hence the average GEPU in 2019 was 256.09 compared with the GEPU in 2018 that was 189.44, which increased by 35.18%. Figure 4 shows GEPU and its the average from 2000-2020.

Figure 4 GEPU and its average



In 2020 bank ship-finance for Greek shipping has fallen by 6.24 percent year on year. Greek loans totaled \$49,794.51, down from \$53,107.8 million in 2019. The reasons for the fall could be linked to the effects of the pandemic on global and international trade, as well as market volatility and general uncertainty. In order to minimize the spread of the virus globally, countries subject restrictions such as physical limitations on travel, meetings. The development of new client and additional client business have all played a part. However, some barriers hampered banks' lending ability and appetite, such as unfavorable regulatory constraints and operational difficulties. European banks re-evaluated their lending criteria across the board, with shipping being an easy target with few ramifications. Being involved in the Greek finance in particular, made little sense as banks all over the world began to sell buildings and reduce personnel numbers. Greek EPU average is 79,39, when the Global EPU is the highest of the last two decades 289,77.

<sup>10</sup> First, the constructors re-normalize each national EPU index to a mean of 100 from 1997 (or first year) to 2015. Second, they impute missing values for certain countries using a regression-based method

### 3.2.4 AN OUTLOOK OF TOTAL INDICES BETWEEN THE 1998-2021

Generally, Public market activity has slowed down due to the lower price per share of almost all public shipping companies compared to the net asset value per asset. However, IPOs have risen by 60%, and shipping bonds have fallen by 25%. As shipping performance and good prospects are realized by the wider investment community, interest in public market activity, is expected to grow in both the United States and Scandinavia, London, and the Middle East. The size of Greek shipping has attracted a large number of private equity funds seeking higher return on investment. Some of these are based on loan agreements or selective investments in specific projects with short horizons. However, more and more funds such as Entrust and others looking to invest in private or public shipping pools appreciate short- to medium-term investments. In addition, several investment / charter / financing schemes have been developed that allow the owner's participation to be limited to 20%, but with relatively low break-even point and some parity between the owners and the profiteers. with. These investment / financial plans and other tailor-made financial products have helped many Greek owners expand their fleet ahead of recent market improvements.

Figure 5EPU and its Average

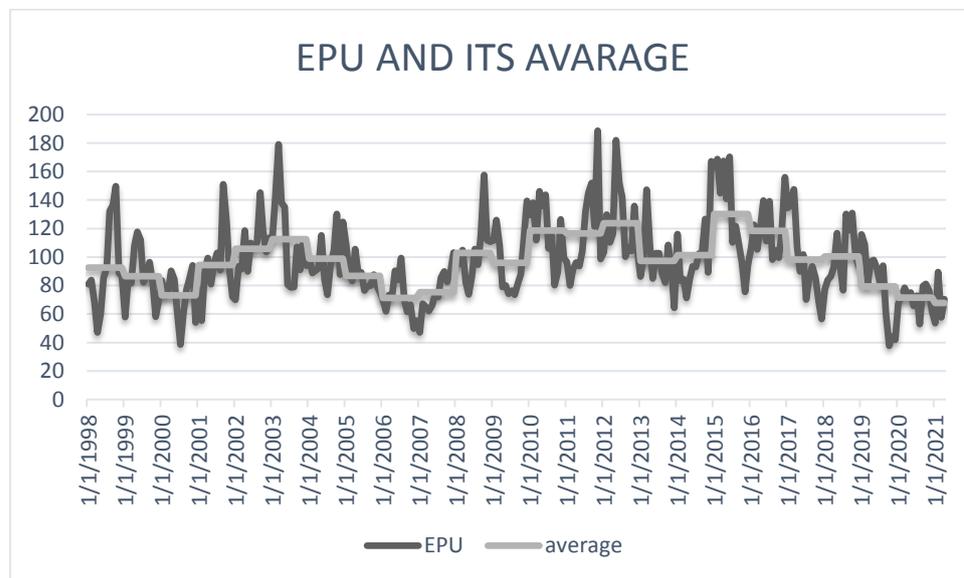
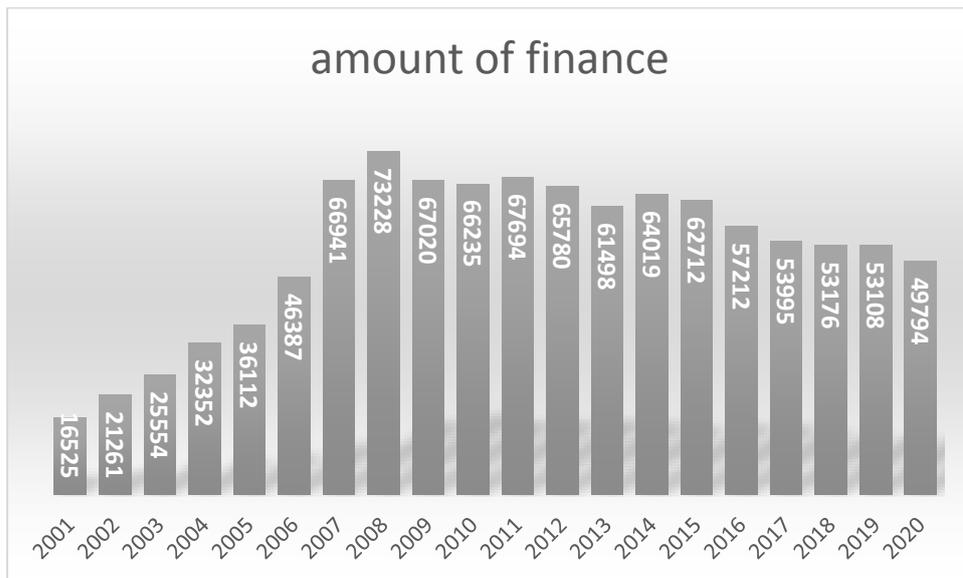


Figure 6 amount of financed Greek Shipping Companies



### 3.2.5 SYNDICATED LOANS

Petrofin research of 2003 describing syndicated loans as ‘ loans contributed by banks *other than the lead managers*. In cases where there is more than one lead manager, the syndicate / club amounts involved are split accordingly.’

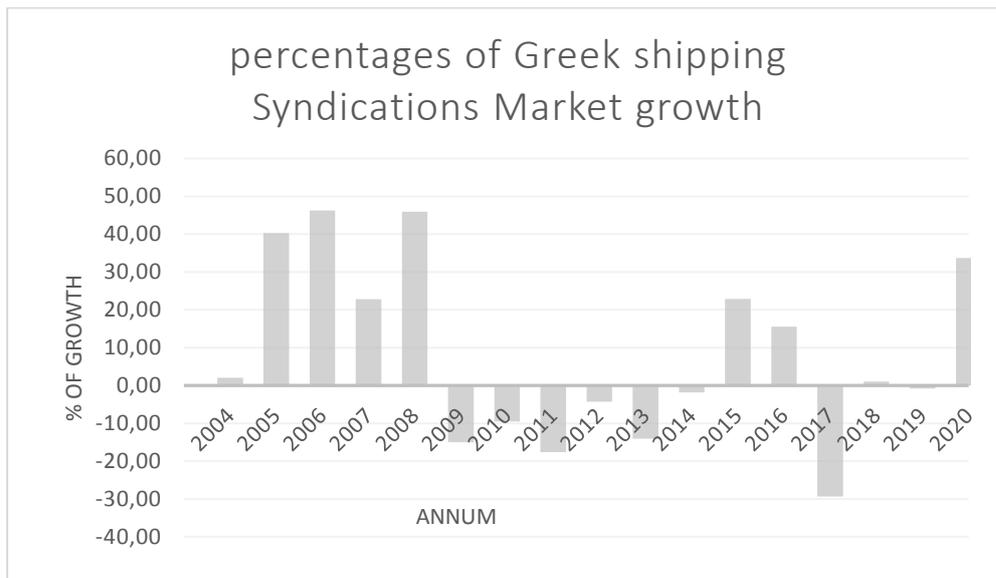
#### 3.2.5.1 THE GREEK SHIPPING SYNDICATIONS MARKET OVER TIME

The following table 12 anticipates the amounts of syndicated loans to Greek shipping companies for the years 2003 until 2020. the fourth column shows the growth or the regression of the annual data. For this aim each year is compared with the previous in order to calculate the difference between the years. Additionally, the figure 7 shows the annual growth (or the recession) of the Greek shipping Syndications Market.

Table 8 Greek Syndicated Loans

<b>Table 8 syndicated loans</b>			
<b>year</b>	<b>month</b>	<b>amount \$ m</b>	<b>percentage of growth</b>
2003	1	4721,00	
	6	5257,00	
	12	5056,00	
2004	12	5160,00	2,06
2005		7240,00	40,31
2006		10588,00	46,24
2007		13004,00	22,82
2008		18977,00	45,93
2009		16134,85	-14,98
2010		14596,30	-9,54
2011		12022,84	-17,63
2012		11512,48	-4,24
2013		9897,21	-14,03
2014		9713,29	-1,86
2015		11935,06	22,87
2016		13790,65	15,55
2017		9747,04	-29,32
2018		9846,23	1,02
2019		9767,45	-0,80
2020		13061,54	33,73

Figure 7 percentages of Greek shipping Syndication Market Growth



The total loans controlled by lead managing amounted to \$202.049,94m for the years 2003 -2020. For the month of January 2003, the total loans held by lead managing banks were \$4,721m , while the same year noticed an increase at June 2003 to \$5,257m and finally in December 2003 the total loans was accounted for \$5,056m. more details for the following yeas presenting at the table. There seems to be a growth for the years 2005 , 2006, 2007 and 2008 as the percentages of growths are 2.06% , 40.31% , 46.24% , 22.82% and 45.93%, respectively. Via syndicated market, banks' desire to share risk, given that the amount of money engaged in shipping is growing at an exponential rate, especially since the IPO wave in 2004, which included the purchase of whole fleets. Coming years (2005,2006,2007 etc) because of the IPO wave of had as a result the raise of vessel's demand, so did the amounts involved in shipping(petrofin,2008).In 2007 the annual percentage of growth is less. To be more specific , the amount of syndicated loans increased by 22.82 percent to \$13.004 billion in 2007. Due to the onset of the current credit crunch, syndications are projected to continue to rise as banks seek to limit their own risks. Total loans supervised by lead managing banks increased from \$13.004 billion in 2007 to \$18.977 billion in December 2008. The increase of syndicated loans is remarkable , indicating that lead banks are increasingly dependent on the cooperation of other banks in arranging deals, and that banks are more willing to share risk(petrofin 2009).From 2009 onwards the uncertainty of the financial crisis seemed to affect the Greek Shipping Syndication Market , as we can observe the recession of the annual loans. The managed portfolios of syndicated loan Lead

Managers have declined by 7,08 percent, from \$18.977(2008) to \$17.635(2009) billion. Lead managers in syndication loans have reduced their managed portfolios in 2010 from \$16 billion to \$14.6 billion, a fall of -9.54 percent over the previous year's -7.07 percent.

The managed portfolios of syndicated loan Lead Managers have fallen to \$12.023(2011) billion from \$14.6 billion (2010). According petrofin 2012 annual report it is attributable to some banks' re-definition of third-party participations and leader/manager positions. Whether due to actual or intangible factors, the reduction demonstrates a stumbling syndication market, as well as re-definition and re-alignment of roles within it, particularly for client credits undergoing restructures. In 2013 Syndicated loan Lead Managers have reversed last year's gain in their managed portfolios, reducing such exposure by 14% to \$9.89 billion. 2014 noticed a decrease of The Lead Managers in syndicated loans by 1.86%. The percentages fluctuate between -17,63%(2011) to -1,86%(2014) , until 2015 and 2016 that there is a positive correlation, but in 2017 the Greek Syndication faces the recession once again. To be more specific in 2015 Lead Managers in syndicated loans has increased by 22.87 percent, whilst in 2016 where these are up by 15,55%. The Lead Managers in 2017 were down by 29.32% compared to previous year's increase of 15,55%. The total portfolio the same year (2017) was 9.74 billion dollars, the next year (2018) was amounted \$ 9.84 billion accompanied with a small raise of 1.02%. According to the Petrofin 2018 report over the years, both market volatility and the very high-quality criteria for such funding have harmed the bank syndication and Club transaction industry. Owners are increasingly having more options when it comes to bond issuance or tapping the Norwegian market, which has had an impact on the syndications market. The decrease in new construction orders and deliveries has also had an effect. The year of 2019, the portfolio of Lead Managers syndications was 9767,45 million dollars, whilst there is a reduction of 0.8%. The 2020 amounted an increase of 33.73% because of the Lead Managers total portfolios of \$ 13,061 billion. Bank leadership in syndications declined in the first half of 2020, and due to an overall uneven between new lending and retiring loan debts, overall Greek ship finance lending is expected to fall during this time from end-2019 levels.

AMONG OTHERS, LIST OF BANKS INVOLVED IN SYNDICATED LOANS

Citibank	Alpha Bank	National Bank of Greece	Fortis Bank Belgium	Deutsche Schiffsbank	Bank of Scotland
DVB	BNP Paribas	KFW	Nord LB	DB/SHL	Royal Bank of Scotland
Aegean Baltic	First Business Bank	Commerzbank	ABN (subsidiary undertaking of Royal Bank of Scotland)	EFG-Eurobank	Bremer Landesbank
Nordea	HSBC	DNB*	Aspis Bank	Emporiki Bank	
HSH Nordbank	Dresdner Bank	HVB	First Business Bank	Fortis Bank NL	

## 4. A GLOBAL REVIEW OF THE GLOBAL SHIPPING INDUSTRY AND SHIPBUILDING MARKET: THE GREEK CASE

### 4.1 GLOBAL OUTLOOK

The Union of Greek Shipowners presents in its annual Greek Shipping and Economy article an outlook of both global and Greek data. According to their 2020 published article the global economic activity slowed in 2019, the production dropped while the trade and the geopolitical tensions escalating, particularly between the United States of America (US) and China. The global trading system and international business is uncertain, as a result has impacted corporate confidence, investment decisions, and global trade volumes, which increased by 0.3 percent in 2019. Coronavirus (COVID-19) epidemic appeared all at once, before that the projections for trade volume increase in 2020 was around 2.7 percent, indicating an unstable recovery.

The coronavirus pandemic caused an unpredicted worldwide crisis, making the global economy and international seaborne trade more vulnerable and bleak. Noticeable is the fact that according to the World Trade Organization (WTO) forecasts that the world trade is expected to fall by between 13% and 32% in 2020, actually trade in goods declined by 5.3 percent in 2020 and Global merchandise trade volumes dropped the second quarter of 2020 by 14.3 percent. COVID-19 containment measures that globally governments coerce companies and citizens into following affected economies around the world. This decline is more pronounced than the 10.2% dip experienced during the financial crisis between the third and first quarters of 2008.

The shipping sector has experienced a sharp and rapid decline in demand, which has had a significant impact on freight rates and profitability. As Union of Greek Shipowners report refers in the dry bulk segment, average daily profits of capesizes were more than 85 percent lower between January and April 2020 compared to 2019, 40 percent lower for Panamax, and 35 percent lower for Supramax. Though these prices may recover once Chinese factories appeared again online, the coming global recession, as well as the subsequent decline in worldwide demand as a result of the lockdowns in Europe and North America, has had a significant influence on shipping demand. The economic freeze in Europe and North America will have a significant impact on employment rates. The International Monetary Fund (IMF) has predicted that

the COVID-19 pandemic will plunge the world economy into its deepest slump since the Great Depression, warning that global recovery prospects are bleak. The shipping slump is forecast to endure for more than a year, and maritime activity is unlikely to recover in the coming months. This is partly because, as a worldwide sector, much of shipping's activities takes place in the southern hemisphere, where key raw material exporting countries are particularly heavily struck by COVID-19.

#### 4.2 GLOBAL SHIPBUILDING MARKET

According to the published 2019 Annual report of BRS Group, the three Asian shipbuilding giants, who together account for about 95% of the global orderbook by deadweight, continued to battle for market share. With a market share of 43.1 percent in 2018, China maintained its leadership position. Korea, in second position, boosted its market share to 27.5 percent, while Japan, in third place, fell to 24.0 percent. The 'rest of the world' (RoW) and Europe, respectively, accounted for 3.8 percent and 1.6 percent of the worldwide market. The representing figure 8 shows the fluctuations during the years of the orders of vessels, whilst the figure 9 represent the deliveries vs the demolitions of vessels. During the 2003-2005 the decrease of the orders in shipbuilding field can be observed, whilst 2006 and 2007 seems a raise. Noticeable is the fact that 2007 is the year with the most orders among 2003-2018. From 2007 onward, due to the global financial crisis there are many fluctuations with intense differences especially in 2009 , 2012 and 2016. The year of 2009 began on the worst possible note, with no freight market (except in the tanker sector), no vessel sales, falling economic consumption affecting the containership sector, and, finally, a paralyzed financial market completely reliant on the goodwill of international regulatory bodies and government policies(BRS- annual report of 2010).

In 2012 the shipyards supplied more than 2,000 ships in a market that was affected by the global economic crisis and a slowdown in Chinese GDP. Over the last four years, the global fleet has grown by 35%. Despite a historic high of approximately 55 million dwt demolished, this growth, the last flourish of the economic exuberance preceding 2008, has not been matched for by the tonnage of ships sent for scrapping. With only 840 ships purchased, new orders were at an all-time low, slightly higher than 2009 but still 11 years behind 2001 levels. The interaction of these elements suggests a gradual

restoration to market equilibrium within two years, but only if demand exists (BRS – annual report 2013).

As a result of the owners' retrenchment, vessel ordering activity in 2016 was at its lowest level since 2009. The fall in global shipbuilding capacity, from an estimated 1,150 active yards in 2000 to roughly 630 yards in 2016, was likely the most significant and critical move toward a healthier market. This is a reduction of 35% to an anticipated 45 million Compensated Gross Tons (CGT). The trend is expected to continue in 2017, with an estimated 3 million CGTs due to be phased out (BRS-annual report 2017). In 2018, newbuilding deliveries fell to 78.7 million dwt, down from 96.1 million dwt the previous year, reflecting a drop in newbuilding orders in 2016. In 2020, amid trade conflicts and other political and economic uncertainty, the Covid-19 epidemic cast a shadow over the global economy. As a result, newbuilding orders fell from 1,120 ships in 2019 to 859 ships in 2020. After peaking in 2018, demand dropped for the second year in a row. Nonetheless, in comparison to recent years such as 2009 and 2016, when newbuilding orders barely exceeded 30 million tons deadweight, the shipbuilding sector remained remarkably resilient in 2020. Despite the fact that demand for bulkers and special ships fell in line with the global downturn, demand for tankers was nearly unchanged from the previous year. Additionally, container carrier orders have surpassed the previous year's total.

figure's 8 & 9 source: 2021 Annual report of BRS

Figure 8 deliveries vs demolitions

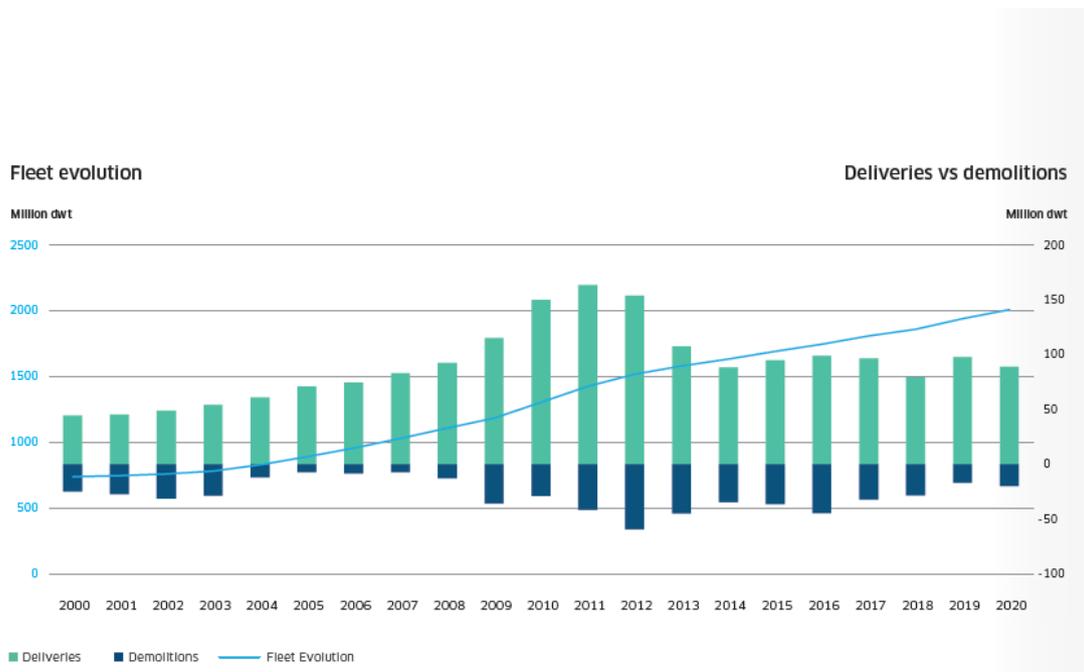


Figure 9 Global vessel's orders outlook



### 4.3 AN OVERVIEW OF THE GREEK ORDERBOOK CASE OVER TIME: SHIPPING COMPANIES AND THE SHIPBUILDING RELATIVENESS

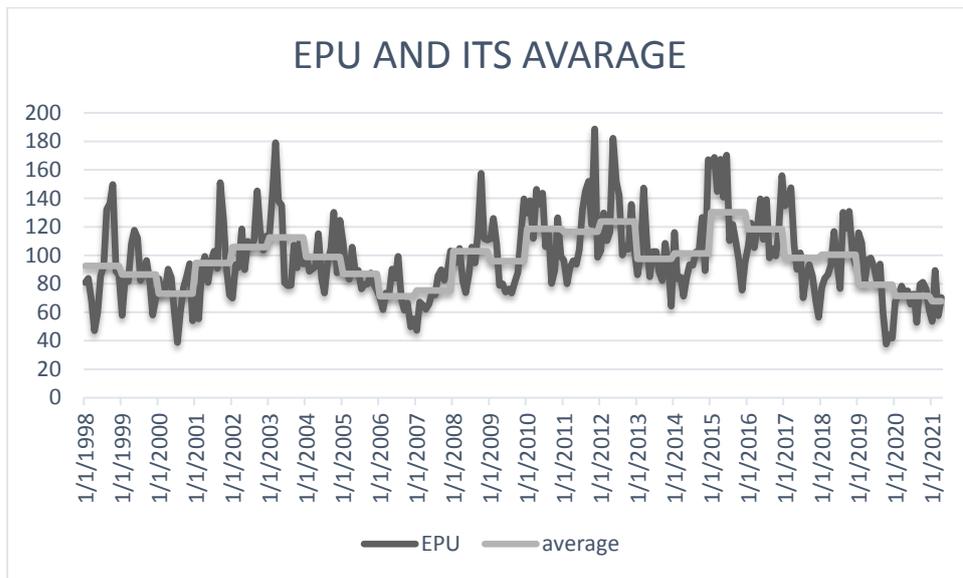
#### 4.3.1 DATA FOR GREEK FLEET & SHIPBUILDING OF VESSELS

The 2020 Review of Maritime has detailed that in 2019 Greece, Japan, and China are the top three shipowner countries in terms of cargo-carrying capacity, accounting for 40.3 percent of global tonnage and 30% of global fleet value. Namely, data for the 2015-2019 period Germany, Japan and the Republic of Korea have been notice a reduction, while Greece, Singapore, China and Hong Kong, China seems to be increasing.

From 588 in 2018 to 589 in 2019, the number of Greek shipping companies in operation increased as the Union of Greek Shipowners refers at their annual report for 2020. Furthermore, in 2019, Greek property owners found newbuilding prices to be too exorbitant in comparison to market prospects, therefore they focused on second-hand acquisitions. Even still, such purchases were down from 2018, as markets across the board showed volatility and a lack of direction. Except for the biggest names, capital market activity was limited, and bank financing was restricted and relatively expensive. Chinese leasing remained the top source of credit for these buyers ready to buy in 2019, however with strict client conditions. What we saw in 2019 was not a lessening of Greek resolve to grow, but rather a 'wait and see' mentality, with an eye to future chances. Greek owners were unsure what the new standards would be and how older vessels would be treated, as a result of the increased regulatory and bank emphasis on fuel pollution. Furthermore, it is thought that existing main engine technology has achieved its peak efficiency and lowered emissions, necessitating the development of new, more expensive technologies over the next decade. As a result, Greek property owners have shown a reluctance to invest in outdated technologies for new construction, and we expect this tendency to continue. In 2021 Greece is the world's largest shipowner, with a fleet of 4,901 ships accounting for 19.42 percent of global deadweight tonnage (dwt). By 2020, the Greek-owned fleet will have grown by about 4% to almost 364 million dwt.

According a published article in New York Times website the in some yards for a normal commercial ship to be constructed, including 12 to 16 months of comprehensive design and planning, exceed the two-year period of construction, sometimes reaching three years ,depending on the grade of orders and theirs complexity. Figure 10 shows the Greek orderbook and deliveries from 2005 to 2018. It seem to have a bullish until the peak in 2009 from onward began the downtrend. The crisis of 2009 , the uncertainty Index (EPU)was hooked up as the

Figure 5 EPU and its Average



However, it should be emphasized that, as shipbuilding costs have risen, banks are growing more careful when it comes to funding such new-buildings and have cut their lending percentages proportionally as costs have increased and delivery have been pushed to 2007/8 or beyond(petrofin 2009). The years following until 2013 notice orders to have continuous cathode. The interim period 2013-2014 EPU was not exceeding much its average, so the orders again seems to be increasing. In 2016 the EPU again is significant raised, i.e uncertainty of Greece was high again, consequently the orders began to reduce.

Figure 10 Greek orderbook and deliveries



## 5. CONCLUSION

In a broad sense, ship finance changes in tandem with global economic conditions, available cash, and the current state of the shipping sector, influencing each section separately. The fundamental characteristics of shipping, such as revenue volatility, intense capital requirements, the inherent demand nature of transportation, and higher rules in operations, combine to create a sector in desperate need of money but also one that is riskier to participate in. Furthermore, because of the coexistence of variable revenues and high fixed expenses, lowering a company's finance costs is critical for attaining survival, profitability, and sustainability throughout the shipping cycle. Many various strategies for funding a shipping firm and supplying the necessary funds to acquire vessels, sustain day-to-day operations, and repay indebtedness have been used during the last decade.

The most considerable financing sources for Greek shipping companies are bank lending, leasing and syndication, IPOs in international equity markets, private equity funding, high-yield bond issues, and securitization. All these ways of finance have been analyzed in the part I.

The 2008 bank crisis influenced significantly not only the shipping sector but also the global economy. From 2008 onwards, the Greek economy starts its deterioration. Although the shipping field were influenced, Greek shipping companies managed to remain in the top three of worldwide shipping list and control 19.42% of global deadweight tonnage (dwt.) and stand out in the international trading market (<https://www.hellenicshippingnews.com/greece-still-leading-global-shipping/>).

This thesis is presenting firstly the possible sources of finance in Shipping Field and secondly is oriented in the analysis of the shipping funding via banks and specifically via loans. Throughout time, shipping companies lend from banks sometimes more than other periods. These variations of ship-lending through banks have been explained through the degree of uncertainty indices for the local economy. According the above analysis, it is noticed that when the uncertainty is high, the demand for loans are low. This applies the opposite way also. Moreover, when the bank loans are high, ship companies' goal is to acquire vessels either by constructing one or by buying from the second – hand market. In other words, EPU index raised during the Greek economic crisis, so it could be a good paradigm to examine the crisis and explain it. As referenced in the Hardouvelis et al analysis of the EPU: ‘’ Throughout time, it showed substantial positive correlation with other international EPU indices. This correlation increased during the international financial crisis but declined during the Greek crisis, pointing to the idiosyncratic nature of the Greek crisis.’’(page 31, Economic Policy Uncertainty, Political Uncertainty and the Greek Economic Crisis).

### 5.1 LIMITATIONS OF THIS RESEARCH

At this point, it is crucially important to underline the difficulties that had to be faced or get handled, so that this research could be conducted. Countries like BRICS or other worldwide players, not present detailed results of their economies at the end of each financial year, so as to compare theirs results . Highly valued characteristics of each market and economy render them so unique that sometimes it is impossible for them to be juxtaposed. Sociological and technological factors lead to the conclusion that many

varieties need to be taken in consideration. Unfortunately, it goes without saying that a paper written under the financial and academical limits of a master's degree, is not in a position of being foreseen. In continuation to the aforementioned statement, and taking in account the financial limitations, the research itself, had to be restrained to the comparison of only specific elements of the economic cycle.

## 5.2 SUGGESTIONS FOR FURTHER RESEARCH

A valuable suggestion for future research, could be the analysis of more financial and economic factors. Of course, another key issue would be the examination of all these important data of whole continents. A more aggregated picture of the economies that are examined (like the Greek one) would ultimately be proven beneficial for the conduction of pivotal results.

## **6. DEFINITIONS**

Tax (fiscal) policy - tax, value added tax, special consumption tax, public revenues, privatization revenues, tax office or authority

Debt (fiscal) policy - government spending, primary spending, defense spending, public investment, budget, sovereign debt, public debt, transfer payments, public consumption, public benefit or allowance, country default

Fiscal policy - the union of words in the previous two groups (Tax and Debt).

Monetary policy - interest rate, cost of money, monetary policy, quantitative easing

Currency policy - exchange rate, drachma, Eurozone, currency appreciation, currency depreciation, national currency, economic and monetary union, Grexit

Banking policy - bank, banking system, banking sector, loan, deposits, interbank market, lending rate, deposit rate

Pension policy - pension, lump sum pension, pension insurance system, insurance fund, Social Insurance Institute, social insurance, zero deficit clause, pension reform, insurance contribution, funded pension scheme, pay as you go pension scheme

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## ANNEX

In this additional part of document, I am going to add the table of Greek Shipping Companies loans ,the number of banks financed the specific field and the percentage of growth.

number of banks finance Greek Shipping companies				ammount of finance mil \$ (bn)				
	without greek present	with greek present	greek banks	without greek present	with greek present	greek banks	total amount of finance	percentage of growth
2001	20	11	9	6.165	7.050	3.310	16.525	
2002	30	10	11	8.604	8.185	4.472	21.261	28,65961
2003	29	10	15	9.788	10.124	5.642	25.554	20,1919
2004	27	9	14	12.070	13.938	6.344	32.352	26,60249
2005	15	11	14	10.049	19.540	6.523	36.112	11,62216
2006	16	11	12	14.788	24.252	7.347	46.387	28,45315
2007	16	13	12	14.061	34.040	15.840	63.941	44,30983
2008	16	12	12	17.300	38.984	16.944	73.228	9,391853
2009	18	11	12	14.102	36.777	16.141	67.020	-8,47763
2010	16	11	12	14.469	35.882	15.884	66.235	-1,17129
2011	32	11	12	17.887	35.290	14.517	67.694	2,202763
2012	31	11	9	19.161	33.914	12.705	65.780	-2,82743
2013	30	11	5	20.231	30.537	10.487	61.255	-6,50958
2014	33	11	5	23.759	29.441	10.819	64.019	4,09932
2015	35	11	5	26.435	27.104	9.173	62.712	-2,04158
2016	36	10	5	24.501	23.990	8.721	57.212	-8,77025
2017	36	10	5	23.437	21.467	9.091	53.995	-5,62295
2018	36	9	7	24.992	18.433	9.821	53.246	-1,38717
2019	38	9	8	25.707	17.477	9.924	53.108	-0,25917
2020	40	8	8	23.747	14.162	11.885	49.794	-6,24011

Furthermore , alongside is presenting Moody’s rating scale :

Source : Moody’s website

Finally , below are information about Basel Committee that are important for the bank contracts .

### BASEL COMMITTEE (BASEL I ,II & III)

The Basel Committee, established in 1974, is an international organization that develops regulations for the world's banks. The original rules, which required banks to hold a fixed amount of capital against loans and other assets, were updated in 2004 with

the introduction of Basel II, which aimed to bring the laws up to date with the products available and the risks faced by banks at the time. The implementation of foundation, standardized, and advanced techniques was an important component of these reforms, with the latter allowing banks to keep significantly lower levels of capital against specific risks. These reforms were unable to avoid the global financial crisis, which began with the sub-prime lending catastrophe in 2007 and worsened with Lehman Brothers' bankruptcy in 2008, only a few years after the improved laws were implemented. Basel III was introduced in 2010-2011, with implementation expected to take two to three years around the world. As a result, bank capital and liquidity requirements will be greatly increased, and lender pricing is expected to rise. This is especially likely for large, long-term loans, which are frequent in the shipping industry)ICS -SHIPPING FINANCE 2015.

### BASEL I

#### Long-term Debt Ratings (maturities of one year or greater)

##### INVESTMENT GRADE

- » Aaa – highest rating, representing minimum credit risk
- » Aa1, Aa2, Aa3 – high-grade
- » A1, A2, A3 – upper-medium grade
- » Baa1, Baa2, Baa3 – medium grade

##### SPECULATIVE GRADE

- » Ba1, Ba2, Ba3 – speculative elements
- » B1, B2, B3 – subject to high credit risk
- » Caa1, Caa2, Caa3 – bonds of poor standing
- » Ca – highly speculative, or near default
- » C – lowest rating, bonds typically in default, little prospect for recovery of principal or interest

#### Short-Term Debt Ratings (maturities of less than one year)

- » Prime-1 (highest quality)
- » Prime-2
- » Prime-3
- » Not Prime

The basic capital adequacy ratio was developed as the foundation for banking risk regulation in Basel I. Initially, it was merely a credit risk ratio of bank capital to risk-weighted assets. Market risk was included in the revision, as well as inadequacies, such as the countries with zero risk weighting, in the Basel I framework were addressed . Due to the period of Basel I Chairman of the Basel Committee, the work to incorporate later issues needed another ten years to agree on the core Basel I paradigm. It's worth noting that, whereas Basel I was a fixed risk-weighting strategy for credit risk, market risk legislation already permitted variable risk-weighting. Despite the fact that operational risk management principles were announced, they were not given the same quantitative assessment as credit and market risks when Basel I was amended. During the second regulatory wave, active work on polishing Basel I occurred in a very positive economic situation. The Basel Committee had already produced eight consulting documents during the second regulation wave, but no feedback had been made public. The stage is distinguished by the publication of 57 documents, totaling 20 times the volume of the previous regulatory wave.<sup>11</sup>

## BASEL II

The main goal of Basel II was to amend the provisions of the 1988 Basel Capital Accord in order to better match banks' regulatory capital with their risks, taking into consideration advances in risk measurement and management, as well as the opportunity for increased supervision that these bring. This approach entails aligning regulatory capital with economic capital, whose levels reflect banks' own judgments in light of their revenue and loss predictions in the absence of regulatory constraints, as well as broadening the scope of capital needs to include operational and credit risk. The Basel Committee on Banking Supervision (BCBS) wants the revised recommendations to maintain the overall level of minimum capital requirements while also encouraging banks to use the riskier Basel II methods. In light of the foregoing, the BCBS has established a new framework for calculating risk weights in 'International Convergence of Capital Measurement and Capital Standards: a Revised Framework' (RF) that includes a fuller recognition of provisions prior to capital estimation under the BCBS's internal ratings-based approach (known as the IRB approach)<sup>12</sup>.

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<sup>11</sup> History of banking regulation as developed by the Basel Committee on Banking Supervision 1974-2014 , Penikas 2015

<sup>12</sup> BASEL II: THE REVISED FRAMEWORK OF JUNE 2004, Andrew Cornford ,2005

Basel II also established a three-pillar framework, with Pillar I representing minimum capital requirements, Pillar II representing a supervisory review of Pillar I results, and Pillar III summarizing the approach to information disclosure. Pillar II charges frequently exceed Pillar I charges due to the incorporation of extra risks, but to a lesser extent than when banks were allowed to account for diversification benefits; the 2007-09 crisis was a reason used by regulators to cancel the possibility of accounting for diversification benefits; however, Pillar II is a completely necessary piece since the power of capital requirements determination shifted from regulators to banks when internal ratings-based approach (IRB) models were authorized. The regulatory wave continued until the bottom of the world's 2007-2009 recession, thanks to the consultation process and modifications. As a result, it enclose the need to alter market risk models, including the addition of a stressed component to a simple (non-crisis) market risk measure.<sup>13</sup>

### BASEL III

Basel III is a comprehensive set of rules designed by the Basel Committee on Banking Supervision to improve the banking sector's regulation, supervision, and risk management. The goal of this comment is to improve the banking sector's ability to absorb shocks resulting from financial and economic stress, regardless of source, as well as risk management and governance. Finally, banks' transparency and disclosures will be improved. Basel III attempts to improve the quality and quantity of capital required by banks. The BCBS's broad revision of risk coverage assumptions and criteria goes hand in hand with this trend. The development of a set of system-wide macroprudential measures, however, may prove to be the most innovative and contentious aspect of Basel III. While Basel I and II focused almost entirely on microprudential or bank-specific reforms, Basel III incorporates a set of macroprudential tools and norms, such as a countercyclical buffer and a universal leverage ratio, to manage systemic risk in the global financial system.<sup>14</sup>

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<sup>13</sup> History of banking regulation as developed by the Basel Committee on Banking Supervision 1974-2014 , Penikas 2015

<sup>14</sup> Basel III: An Overview By Peter King and Heath Tarbert , 2011

