

Erasmus University Rotterdam

MSc in Maritime Economics and Logistics

2018/2019

Alternative sources of finance in Greek shipping

by

Tsianakidis Antonios

Contents

List of Figures	ii
List of Tables	iii
List of Abbreviations.....	iii
Acknowledgement.....	v
Abstract	vi
SECTION 1: Introduction	1
1.1: General framework and problem statement	1
1.2: Purpose of the research.....	1
1.3: Research Questions	2
1.4: Relevance of the research	2
1.5: Methodology, nature of results and limitations	2
1.6: Structure of the study	3
SECTION 2: Introduction to the problem statement	3
2.1: Economic cycles and shipping	3
2.2: New regulations (post crisis) and impact on bank finance	5
2.3: New financing landscape for shipping companies :The emergence of alternative sources.....	7
2.4: The situation in Greek shipping.....	12
2.5: Literature Review on sources of shipping finance	15
2.6: Concluding remarks	20
SECTION 3: Methodology	21
3.1: The choice of survey as methodological tool to develop a research	21
3.2: Hypotheses of the study	21
3.3: Interview procedure	23
3.4: Structure of the questionnaire	23
SECTION 4: Results and Analysis	25
4.1: Participants	25
4.2: Traditional bank financing	26
4.2.1: Do you think that banks will fund again Greek shipping at the pre-crisis levels?.....	26
4.2.2: Will Greek banks reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks?.....	26
4.3: Alternative sources of shipping finance	29
4.3.1: Which sources of alternative finance are you aware of in Greek shipping?	29
4.3.2: Which sources of alternative finance do you consider the most important and why?.....	30

4.3.3: Which are the preconditions that alternative financing sources seek in order to invest in Greek shipping?	31
4.3.4: Do you believe that the emergence of the Chinese ship financing is a bubble or the new status quo? In the context of the One Belt One Road Initiative, do you think the rise of China is a threat or an opportunity for the Greek maritime industry?	32
4.3.5: What is the role of Greek shipping families (High-net-worth families) as alternative financiers of Greek and international shipping?	34
4.3.6: In which specific shipping sectors do you expect the largest presence of alternative finance?	35
4.4.: Future relationship between traditional and new sources of finance.....	36
4.4.1: Percentage of total investments in Greek shipping to which alternative financing methods will be a worthy alternative in the future	36
4.4.2: Can the alternative sources of finance effectively cover the bank-lending gap in Greek shipping?	38
4.4.3: Do you believe that bank financing will remain the primary source of ship financing?.....	39
4.5: Implications that the new financing landscape has on the access to capital for Greek shipping	41
4.5.1: How do the requirements that alternative financing sources impose on Greek shipping differ from those demanded by banks?	41
4.5.2: Impact of alternative financing on the financing costs of shipping companies.....	41
4.5.3: The requirements associated with the new financing landscape could potentially restrict access to capital for the Greek shipping.....	42
4.5.4: In the context of the new financing landscape, will Greek shipping retain its global competitiveness?.....	44
4.5.5: Changes in Greek shipping in the context of the new financing landscape	45
4.6: Lessons learned	46
SECTION 5 : Conclusion.....	47
REFERENCES.....	50
APPENDIX.....	57
First Part.....	57
Second Part: SURVEY	59

List of Figures

Figure 1: Shipping cycle	4
Figure 2: Shipping-finance cycle.....	5
Figure 3: Basel III capital requirements	6
Figure 4: Sources of shipping finance.....	8
Figure 5: Shipping Loans and ECAs participation.....	9

Figure 6: Top 5 Chinese Leasing Companies.....	9
Figure 7: Distribution of shipping portfolios based on region.....	10
Figure 8: Comparative chart of Top 10 Shipping portfolios	11
Figure 9: Cost-flexibility relationship	12
Figure 10: Origin of the funds allocated to Greek vessels (in % of total Greek shipping portfolios)	13
Figure 11: The Greek ship-finance market over the last decade.....	14
Figure 12: Year-over-Year Change in the Greek ship-finance market.....	14
Figure 13: Participants per group	25
Figure 14: Will banks fund again Greek shipping at the pre-crisis levels?.....	26
Figure 15: Will Greek banks reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks?.....	28
Figure 16: Alternative sources of finance in Greek shipping	29
Figure 17: Preconditions that alternative financing sources seek in order to invest in Greek shipping	31
Figure 18: Participants' view on Chinese ship financing	34
Figure 19: The role of Greek shipping families as alternative financiers of Greek and international shipping	35
Figure 20: In which shipping sectors do you expect the largest presence of alternative finance?	36
Figure 21: Percentage of total investments in Greek shipping to which alternative financing sources will be a worthy alternative in the future	38
Figure 22: Alternative sources of finance can effectively cover the bank-lending gap in Greek shipping	39
Figure 23: Do you believe that bank financing will remain the primary source of ship financing?.....	40
Figure 24: Alternative financing will lead to an increase in the financing costs of shipping companies.....	42
Figure 25: The requirements associated with the new financing landscape could potentially restrict access to capital for Greek shipping	44
Figure 26: Do you the Greek shipping will retain its global competitiveness?	44
Figure 27: Expected changes in the Greek shipping industry	45
Figure 28: Global Shipping portfolios of top 40 banks (in \$ bn).....	57
Figure 29: Alternative funding sources that are present in Greek shipping	58
Figure 30: Preconditions that alternative financing sources seek in order to invest in Greek shipping	58

List of Tables

Table 1: Relationship between concluding remarks and hypotheses of the study...	22
Table 2: Relationship between sub-research questions and hypotheses of the study	23
Table 3: Relationship between parts of the questionnaire and sub-research questions/ hypotheses of the study	24
Table 4: Outcomes of the hypotheses	47
Table 5: Chinese companies' share in EU ports	57

List of Abbreviations

IPOs	Initial Public Offerings
BRI	Belt and Road Initiative

NPLs	Non-performing loans
BCBS	Basel Committee on Banking Supervision
ECAs	Export Credit Agencies
BBHP	Bareboat hire purchase agreement
M&As	Mergers & Acquisitions
KG	German Kommanditgesellschaft
KS	Norwegian Kommandittselskap
PE	Private equity
SPCs	Special Purpose Companies
CSLs	Chinese sale and leaseback transactions
MLPs	Master Limited Partnerships
HNW	High-net-worth

Acknowledgement

I am grateful to professor Arjen van Klink for his valuable assistance and meaningful comments throughout the thesis process.

Abstract

The study examines the recent trends in shipping finance with specific regard to the Greek shipping industry. Particularly, our research investigates the transition from traditional bank financing to alternative sources of finance in Greek shipping and the implications that the new financial landscape has on the ability of the Greek shipping industry to attract external finance. Conducting a survey among professionals with long working experience in Greek ship-finance, we find that ship leasing from Chinese financial institutions and private equity are the dominant sources of alternative finance that are present in Greek shipping. It is also shown that the quality of the operator, mainly referring to good reputation and positive track record, is considered the most important precondition which the alternative sources seek in order to invest in Greek shipping assets. Moreover, the crucial factors which affect the ability of Greek shipping to attract alternative capital are the levels of transparency, corporate governance standards, innovation, pricing, asset liquidity, sustainability, market conditions and size (in the sense that further consolidation facilitates investments from alternative sources). Furthermore, the transition from traditional bank financing to the alternative capital is not expected to be complete since most participants state that the bank debt will remain the dominant source of shipping finance and the alternative funding sources will present a worthy alternative for less than 50% of the total investments in Greek shipping. It is ultimately noted that although alternative capital entails higher financing costs, access to capital will not be restricted and the competitiveness of Greek shipping will not be affected. This finding contrasts with the well-established theory that the competitiveness of shipping depends on the access to capital with attractive terms and low interest rates (Stopford, 2009). Most participants argue that Greek operators have historically had the flexibility to adapt quickly to new conditions, such as the emergence of alternative funding sources and their associated requirements. In short, though alternative sources of funding will have an impact on Greek shipping companies in terms of transparency, governance, margins, sustainability and scale, they appear to be complementary rather than substitutes for traditional bank financing, leaving the global lead of Greek shipping untouched.

SECTION 1: Introduction

1.1: General framework and problem statement

Shipping, as every capital-intensive industry, requires significant amounts of external financing. Traditionally, the capital needs of the shipping industry were mainly covered by bank (debt) finance. In the aftermath of 2007-2008 financial crisis, international pressure on banking activities led to Basel III (forthcoming Basel IV), an international regulatory framework that sets new standards for banks in terms of minimum capital requirements, risk management, leverage and liquidity thresholds. Particularly in shipping, the new capital standards forced traditional banks to reduce their shipping lending activities, thus attempting to lower the risk of investing in an industry, which is inherently volatile. Moreover, banks had to accept severe losses on their shipping portfolios, making them hesitant for new investments. In addition, the recent IMO 2020 sulphur cap in the context of reducing industry's total CO₂ output by 50% in 2050, poses extra barriers in shipping companies, as regulation compliance will create further financial burdens. Therefore, on the one hand, shipping companies are in a great need of external funds allocated to increased operational costs and necessary investments towards the decarbonisation of the whole industry. On the other hand, banks are obliged to operate under a stricter supervisory mechanism and have less appetite, thus their credit activities are becoming more selective.

This new reality creates a potential gap in ship financing, and alternative ways of financing can play a significant role in filling it.¹ Private equity (PE) and private placements from other institutions, initial public offerings (IPOs), corporate bonds and financial leasing are some of these methods. In addition, the increasing influence of China on infrastructure investments in European ports in the context of the Belt and Road Initiative (BRI)² raises further questions regarding the role of Chinese ship financing as an alternative funding source. The latter is especially important for European banks, which have been historically the global leaders in providing shipping finance services.

1.2: Purpose of the research

The purpose of the research is to elaborate on the implications of the recent trends in shipping finance with specific regard to the Greek shipping industry. Since Greece is one of the largest maritime nations³, it would be fair to argue that what happens in Greek shipping sets at some extent the global agenda of the industry. In this respect, investigating the new trends in Greek ship finance will give us valuable insights regarding the future of the global ship finance.

¹ The shipping portfolios of the top 40 banks have decreased from 463 bn in 2008 to 345 bn in 2017 (Figure 28 in the Appendix). At the same time, the world commercial fleet has grown. Indicatively, the merchant fleet has increased by 3.15% and 3.31% in 2016 and 2017 respectively (UNCTAD, 2018). This situation has created a potential funding gap which has been increasingly supported by alternative funding sources; in 2017, Chinese ship leasing reached approximately \$50 bn (T. Petropoulos, 2018b).

² The One Belt One Road, or the Belt And Road Initiative, is a development strategy introduced by the Chinese government aiming to enhance infrastructure connectivity between several countries in Asia, Africa and Europe (The World Bank, 2018). For a comprehensive view of Chinese investments in EU ports, you may refer to Table 5 in the Appendix.

³ In 2017, the Greek merchant fleet accounted for 17.3% of the world fleet (in terms of deadweight tonnage), placing it stably at the top of the ranking (UNCTAD, 2018).

1.3: Research Questions

Based on the aforementioned problem statement, we develop the following line of thought:

Main Research Question: How is the transition from traditional bank financing to alternative sources of finance progressing in Greek shipping and what does this transition imply about the accessibility to external finance for the Greek shipping companies ?

Sub-Research Questions

- 1) What is the view of the Greek maritime industry regarding the stance of banks towards the financing of Greek ships today and in the future?
- 2) Which sources of alternative finance are prevailing in Greek shipping and why?
- 3) What can change in the future relationship between traditional and new sources of finance?
- 4) How does the new financing landscape affect the ability of the Greek shipping industry to access capital?

Although each of the sub-research questions will be analysed in Section 3, we should clarify from the beginning the relationship between the main research question and the sub-research questions. The first three sub-research questions address the first part of the main research question concerning the transition from traditional bank debt to alternative funding sources in Greek shipping. The fourth sub-research question relates to the second part of the main question regarding the implications that the new financing landscape has on the access to capital for Greek shipping.

1.4: Relevance of the research

We delve into the implications of the new alternative funding sources for the Greek shipping industry, a topic which (according to our literature review) is virtually under-researched. Indicatively, we seek to capture the views of shipping-finance professionals regarding questions such as a) whether bank debt will remain the primary ship-funding method, b) whether alternative funding sources can effectively cover the bank-lending gap, c) whether access to capital for the Greek shipping companies will be restricted, d) whether the global lead of Greek shipping will be affected. Furthermore, most of the shipping-finance literature focuses on statistical measures to provide empirical evidence. In that sense, we seek to differentiate ourselves by conducting a survey. Lastly, the study would like to deliver knowledge that ship owners and financiers can use in their financing decisions.

1.5: Methodology, nature of results and limitations

Our research will be based on a survey of professionals from banks, shipping companies and other ship-finance related businesses, such as consultancies, funds and law firms. According to Graham et al. (2001) and Baker et al. (2011), surveys offer insights regarding people's opinions that the secondary data cannot provide. In addition, a qualitative approach is more appropriate for answering this kind of research questions. Therefore, the results are qualitative in nature arising from closed-ended and open-ended questions; through the answers to the closed-ended questions we will create some statistical figures based on the overall number of participants.

We should also mention the following limitations of our research: a) the size of our sample and b) the time availability to conduct the survey.

1.6: Structure of the study

The research is organised as follows. Section 2 presents an introduction to the problem statement by describing the relevant theoretical background and providing evidence from practice as well as a review of the ship-finance literature. Section 3 analyses the methodology and data employed in this study. Section 4 presents the survey's results and Section 5 summarizes the inferences of the research.

SECTION 2: Introduction to the problem statement

2.1: Economic cycles and shipping

Over the last two centuries, the cyclicity of socio-economic variables has been widely researched.⁴ Cournot (1897) emphasised the importance of differentiating between long-term and short-term cycles. The seminal work of Kondratieff (1926) highlighted the existence of long-term cycles in our economic system. Exploring a sample of various economic variables from the US, France, Germany and England over the period 1780-1920, he reported two and a half cycles each lasting 50 years on average. Furthermore, short-term cycles have a duration of 5-10 years, reflect the usual cycle observed in businesses and match well with the shipping market cycle (Stopford, 2009). Lastly, the seasonal cycles capture the variations during the course of a year.⁵

Shipping market cycle

Based on Stopford (2009) and KPMG (2018), the classic shipping cycle comprises four stages.

Trough: The main features of this period are a) excess supply of ships, 2) freight rates approach the limit of operating expenses, especially for technologically-inferior vessels, 3) lay-ups increase, d) negative cash flows from operations pose further financial risks to shipping companies.

Recovery: In this phase, freight rates start exceeding operating expenses, lay-ups follow a decreasing trend and market confidence emerges.

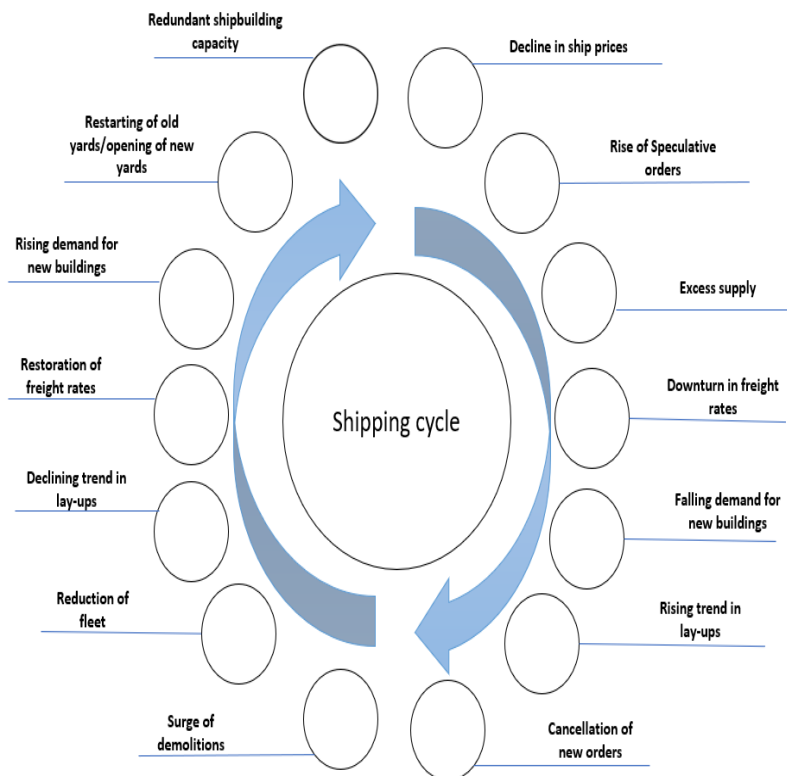
Peak: The main characteristics of this stage are a) freight rates are twice/three times as much as the operating expenses, b) increased activity in the sale & purchase market, with 5-year-old ship prices equalling to newbuilding prices, c) rising demand for newbuildings, d) market overoptimism.

Collapse: During the last phase, oversupply creates imbalance in the market, driving down shipping rates. Scepticism replaces with overconfidence, since the market starts questioning the strength of the shipping industry.

Figure 1 below depicts the mechanism of the shipping market cycle.

⁴ De Groot et al. (2012) provide a comprehensive analysis of the literature related to cycles observed in socio-economic variables.

⁵ Miron (1996) analyses the economic significance of seasonal cycles as a separate stream of scientific research.



*Source: Author's creation based on Stopford (2009) and KPMG (2018)

Figure 1: Shipping cycle

Shipping finance cycle

The shipping cycle is directly relevant to the credit cycle, which refers to alternating periods of growth and reduction in lending/borrowing in the economy (Investopedia, n.d.). According to a popular school of economic thought,⁶ business cycles emanate from variations in the accessibility to capital during credit cycles. In this context, the credit cycle in shipping or shipping finance cycle can be analysed in four stages (K. Ladis, 2012).

Trough: In this stage, the lending activity is anaemic and is mainly conducted by specialised banks. The banks realise high margins (due to low competition) and are selective in terms of which shipping company they fund (because of low freight rates).

Mild period: As the freight rates recover, the profitability of shipping companies starts improving and banks become more eager to finance the industry. Commercial banks (re)enter the shipping-finance market.

Peak: Freight rates are high and access to shipping credit is easy. The presence of many banks fosters competition and drives banks' margins down.

⁶ Indicatively: H.P. Minsky (1992), B. Eichengreen et al. (2003), T. Polleit (2007), A. Macleod (2017).

Mild period: During the last stage, excess supply leads to declining freight rates and the industry's profitability deteriorates. The banks become more reluctant to fund the industry and commercial banks start exiting the market.

Figure 2 presents the operation of the shipping-finance cycle.

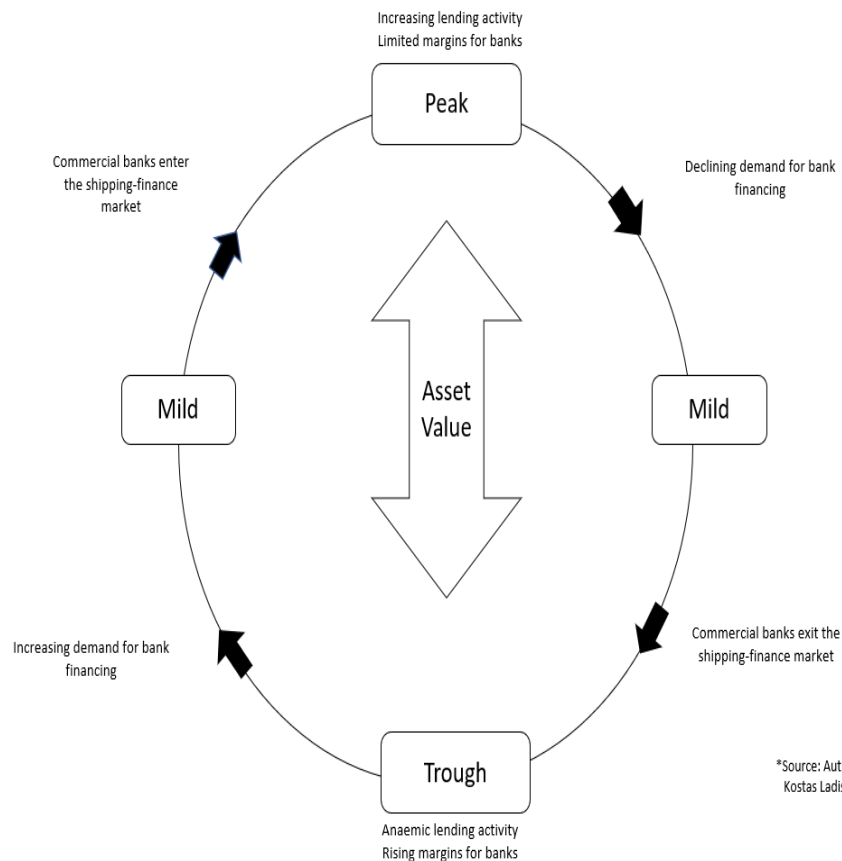


Figure 2: Shipping-finance cycle

2.2: New regulations (post crisis) and impact on bank finance

The 2007-2008 financial crisis had severe repercussions on the world's economy. Assets of financial institutions became impaired losing approximately \$2 trillion of their initial values. This translated to a global GDP lost growth of \$10 trillion (M. Oxenford, 2018). Ten years after the crisis, 85% of the countries that incurred a banking crisis in 2008 still exhibit GDP levels lower than the pre-crisis benchmarks (W. Chen et al., 2018). According to the European Parliament (2018), by the end of 2017, the non-performing loans (NPLs) in EU accounted for 3.6% (on average) of the total loans, while the NPLs in US and Japan were at lower levels both approaching 1% of the overall loans.

In this context, the Basel Committee on Banking Supervision (BCBS) proposed in 2010 a voluntary legal regime for the banking sector. The so-called *Basel III* aims at fostering sector's resilience to external shocks by adapting effective risk-management

tools.⁷ Compared to Basel II, Basel III regulations entail stricter capital measures and new leverage and liquidity requirements.⁸ Restating, the new regulations impose higher equity buffers for banks in order to reduce leverage. Figure 3 depicts the capital requirements during the implementation timeline of the accord.

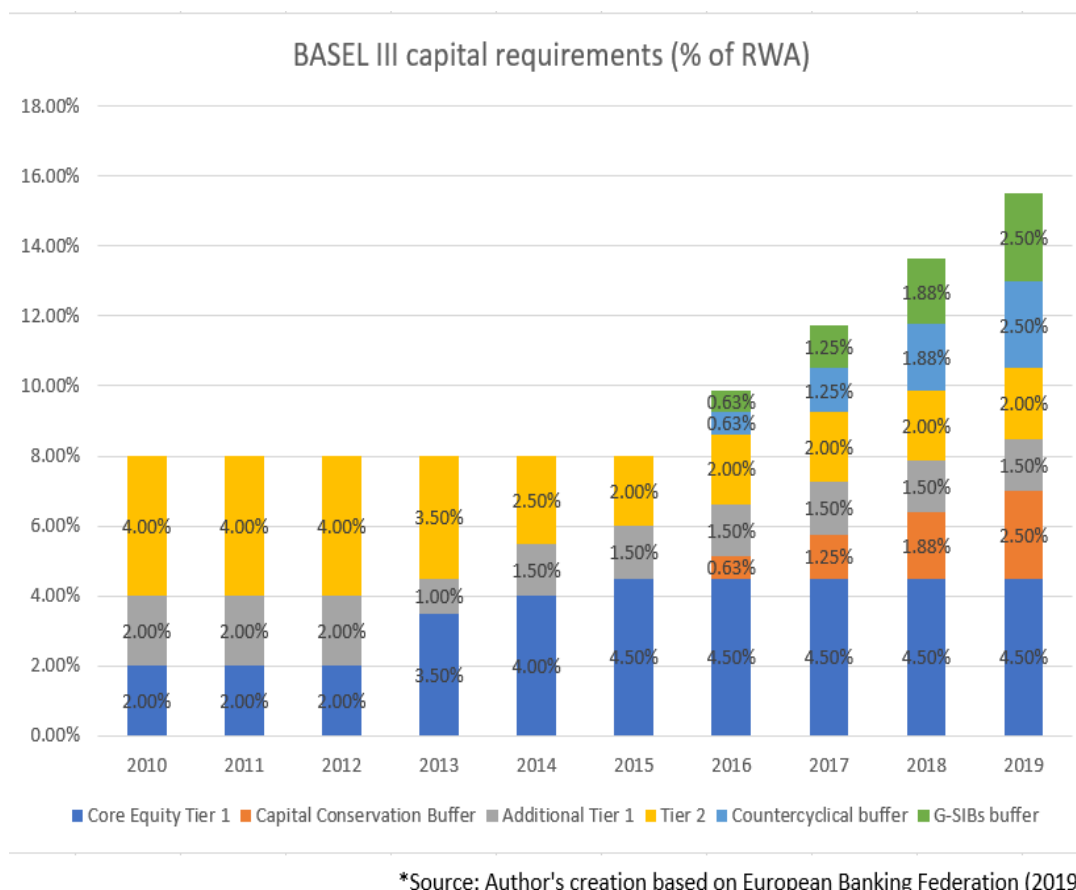


Figure 3: Basel III capital requirements

Since the introduction of Basel III in 2010, a stream of literature has emerged regarding the impact of the new banking regulations on bank finance. E. Sambracos et al. (2013) argue that: a) The lending restrictions introduced by Basel III Accord will force banks to adopt new complicated systems for credit analysis, thus leading to higher costs and higher capital obligations; b) The introduction of Net Stable Funding Ratio will pose extra burden to banks' ability to provide long-term finance. Furthermore, D. Gavalas et al. (2014) report the following: a) In countries that did not experience the financial crisis, a 1.3 percentage point increase in the equity-to-asset ratio (to meet Basel III requirements) leads to a decline in the total loans' volume by 18.67%; b) In countries that experienced the financial crisis, a 1.3 percentage point

⁷ Regarding EU implementation of Basel III regulations, you may refer to the *CRD IV package* (European Banking Authority, n.d.). Regarding US enactment of Basel III, you may refer to *Basel Regulatory Framework* (Federal Reserve System, n.d.).

⁸ a) The minimum Tier 1 Capital was raised from 4% to 6% ; b) The capital conservation buffer, the counter-cyclical buffer and system-risk buffer were introduced; c) a minimum leverage ratio, the liquidity coverage ratio and the net stable funding ratio were created (Bank for International Settlements, n.d.).

increase in the equity-to-asset ratio leads to a decline in the total loans' volume by 4.97%. Moreover, BNP Paribas (2016) conjectures that the implementation of Basel III regulations a) will exercise downward pressure on profitability and ROE of individual banks, b) will deteriorate the lending capacity of the financial system. In 2016/2017, the BCBS proposed amendments in the Basel III accord leading to a new set of regulations, commonly known as *Basel IV*. The new name reflects the wide perception that the changes add further burdens to the banking sector (H. Davies, 2017). Along these lines, S. Schneider et al. (2017) explore a sample of 130 EU banks and find that the implementation of Basel IV regulations implies new capital injections of €120 billion and a decline in banks' ROE by 0.6%.

With specific regard to shipping finance, S. Albertijn et al. (2011) claim that the new banking regulations compel banks to diversify the risk related to their shipping portfolios via loan securitization. In addition, banks pose stricter requirements for new shipping loans.⁹ First, the cost of debt has increased by 150-400 basis points; second, new loans have shorter duration of 4-5 years; third, bank credit procedures have become tighter with more frequent supervision of companies' operations; lastly, stronger collaterals are required in terms of shipyards' guarantees and larger deposits (Van Klink, 2019).

2.3: New financing landscape for shipping companies :The emergence of alternative sources

The tighter regulatory environment in which European Banks have to operate along with severe losses in their shipping portfolios might lead to a funding gap for shipping companies. Alternative sources of finance have stepped into the market to cover this gap: IPOs¹⁰, corporate bonds¹¹ and private equity¹² are examples of alternative

⁹ In essence, the higher the credit risk of an asset, the higher its risk weight, leading to higher capital requirements (as a cushion) in order for banks to be eligible to finance this asset (European Banking Federation, 2019). Asset finance, such as ship finance, is especially hit by Basel regulations; banks have to keep more equity on their balance sheet when they finance assets with a volatile market value such as vessels.

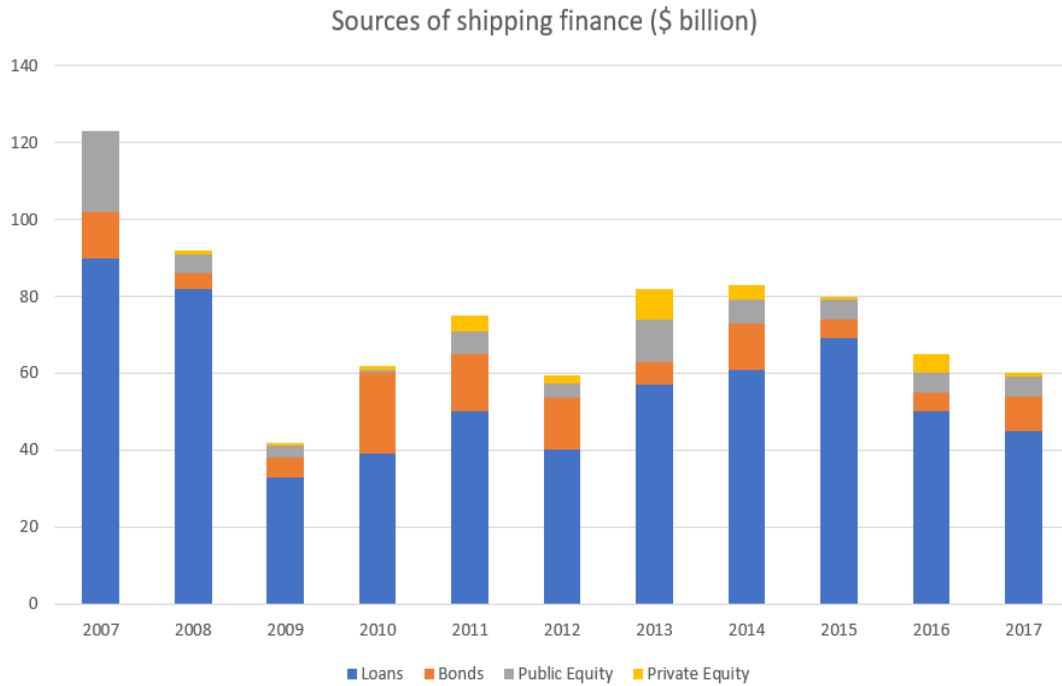
¹⁰ During the last five years, shipping IPOs in the US capital markets have been virtually rare (D. Lunde.,2019). Meanwhile, Norwegian equity markets have demonstrated rising activity in equity offerings: during 2017, shipping companies raised capital of \$224 million, an increase of 10% compared to 2016 figures (Reinikainen, K.,2018) ; furthermore, in November 2017, the shipping index of the Oslo Børs had increased by 25% compared to November 2016 (Oslo Stoch Exchange, 2019). D. Lunde (2019) argues that the investors in Norway have a deep understanding of shipping, a fact that attracts shipping companies to issue capital there. A recent and successful IPO in the Oslo Stock Exchange is that of Okeanis Eco Tankers, a Greek company owned by Alafouzou family, which raised \$100 million (World Maritime News, 2018).

¹¹ 1) Similar to the equity markets, Norwegian bond markets have also experienced increasing activity: in 2017, shipping bond issuances had risen by 600% compared to 2016. Notable examples of companies that issued debt were Teekay LNG and Euronav (Reinikainen, K.,2018).

2) Rokne et al. (2013) show that after the crisis, bondholders have reduced their investment horizons by avoiding long-term commitments.

¹² In general, private asset managers achieved a record raising capital of approximately \$750 billion globally in 2017 (McKinsey, 2018). With regards to shipping, T. Petropoulos (2016) argues that the private equity's flexibility to tailor the needs of ship owners can facilitate external financing in the shipping industry. P. Teklos (2018) conjectures that diversification in external financing for shipping companies can create liquidity during adverse economic conditions; private equity shipping funds can offer a worthy alternative.

methods which already existed before crisis though with increasing presence post-crisis. Figure 4 below depicts the relationship among these sources of shipping finance during 2007-2017. We observe a broadening of the funding base over the decade implying an appetite for further diversification of shipping risk among financiers.

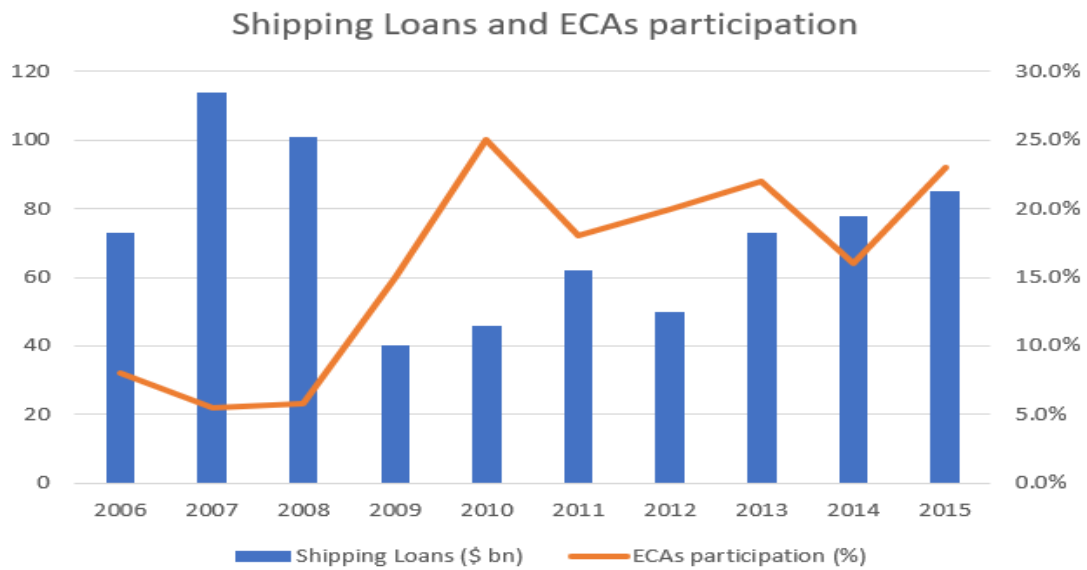


*Source: Author's creation based on a) Marine Money's Online Deals Database; b) Marine Money's Annual Bankers Survey

Figure 4: Sources of shipping finance

Furthermore, other sources of finance that have increased their share in the shipping-finance market post-crisis are the Export Credit Agencies (ECAs), ship leasing companies and institutional funds.

ECAs: They are state-based financial institutions which offer attractive loan terms, financial guarantees or insurance to shipping companies provided that the latter sign newbuilding contracts with national shipyards. These subsidy schemes for the shipbuilding industry are mainly present in China, Japan and Korea (Alexandridis et al., 2018). Figure 5 below demonstrates the rising participation of ECAs in shipping loans during the crisis.



*Source: Author's creation based on T. Petropoulos (2017)

Figure 5: Shipping Loans and ECAs participation

Ship leasing: Leasing companies from China, Japan and South Korea have increased their share in the global ship-finance market. The usual lease operates under a bareboat hire purchase agreement (BBHP), which gives the charterer the right to acquire the vessel at the end of the charter period (T. Petropoulos. 2017) Figure 6 below presents the biggest Chinese leasing companies.

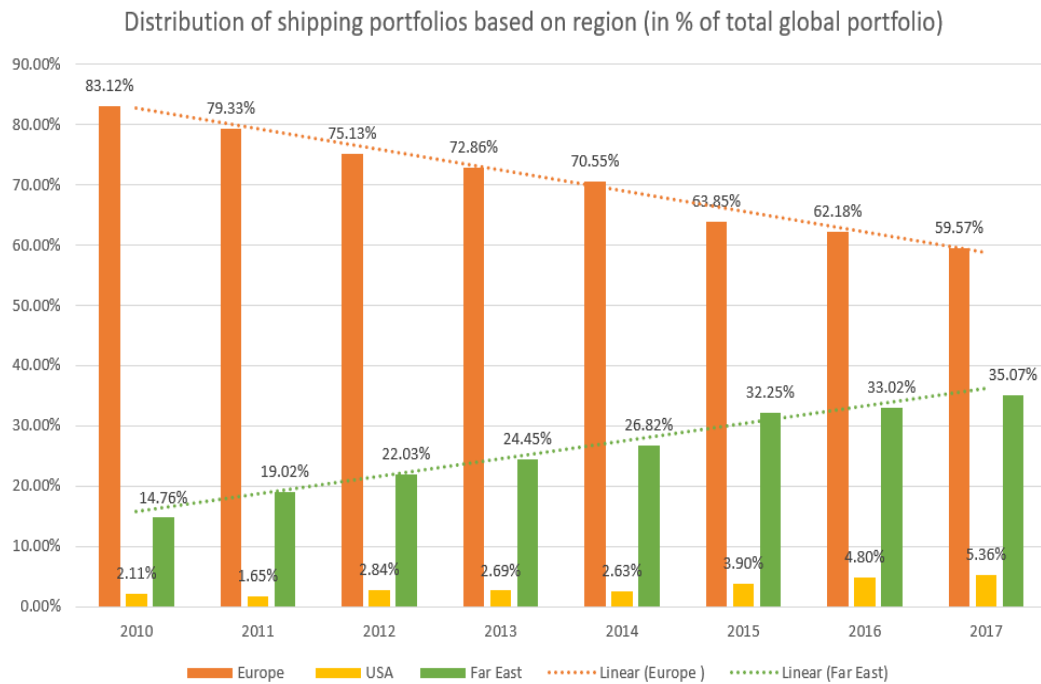


*Author's creation based on T. Petropoulos (2017)

Figure 6: Top 5 Chinese Leasing Companies

It is noteworthy that the leasing companies have close relationships with Asian banks (T. Petropoulos, 2017). The latter have been increasing their share in global shipping portfolios since the outbreak of the crisis. Figure 7 reflects the distribution of shipping portfolios per region; Figure 8 shows the top 10 shipping banks in 2017 compared to 2010. The rising role of Chinese investments in European ports in the context of BRI as well as the higher regulatory standards and incurred losses of European banks

justify the increasing (decreasing) trend of Asian (European) ship financing.¹³ Likewise, the top 2 banks in 2017 (2010) are Chinese (German, Norwegian).



*Source: Author's creation based on T. Petropoulos (2018b)

Figure 7: Distribution of shipping portfolios based on region

¹³ V. Marantidou (2018) argues that Chinese ship leasing enables the extension of Chinese merchant fleet, which in turn enables China to better control global trade.

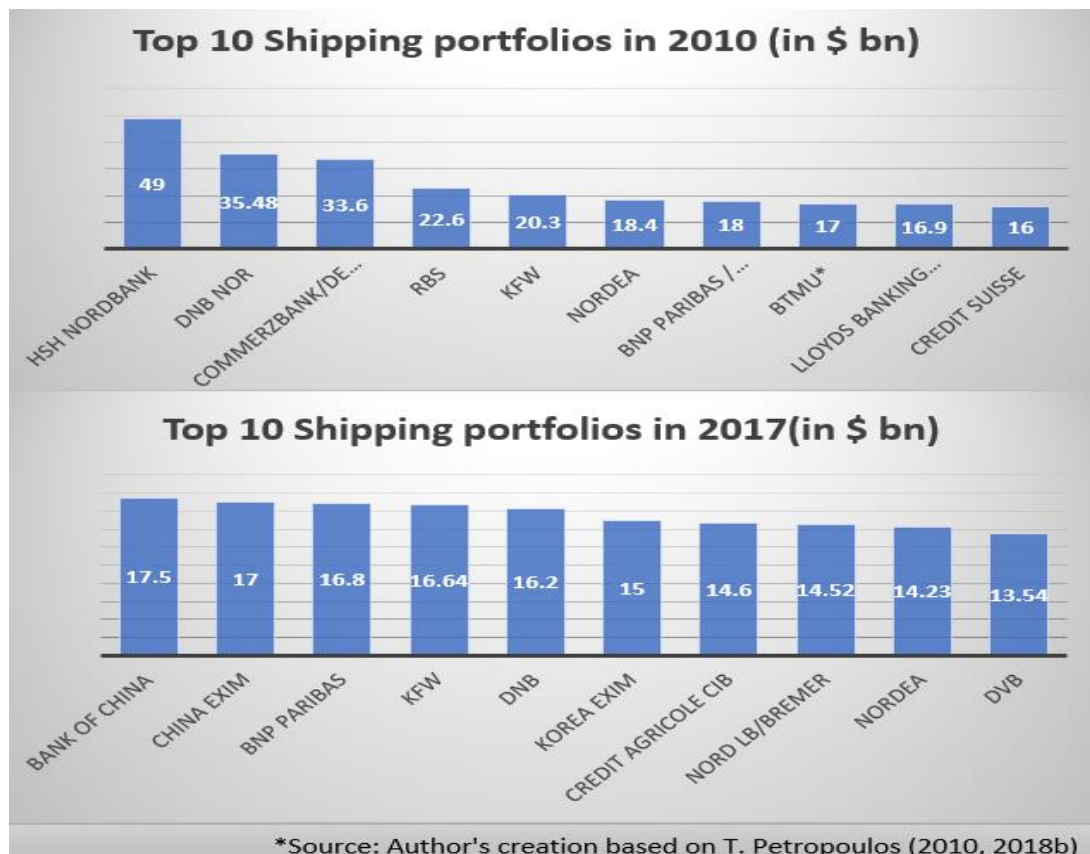


Figure 8: Comparative chart of Top 10 Shipping portfolios

Institutional investors: Institutional investors, having been discouraged by the low interest rates due to quantitative easing on both sides of the Atlantic, have turned their interest to shipping investments attempting to higher yields (J. Saul et al., 2014). A recent example of institutional funds investing in maritime assets is the *Maritime Investment Fund* created by two Danish pension funds and a shipping fund raising a total of \$300 million (World Maritime News, 2017).

Lastly, the alternative funding sources come with specific requirements which may differ from those that the traditional bank financing entails. Figure 9 below provides some support towards this perception. From the cost-flexibility relationship we observe that the higher the financing costs, the higher the flexibility of the funding source. In particular, the funding sources which are more lenient in terms of financial covenants imposed (e.g. minimum working capital requirements or debt and profitability ratios) seem to demand higher returns.

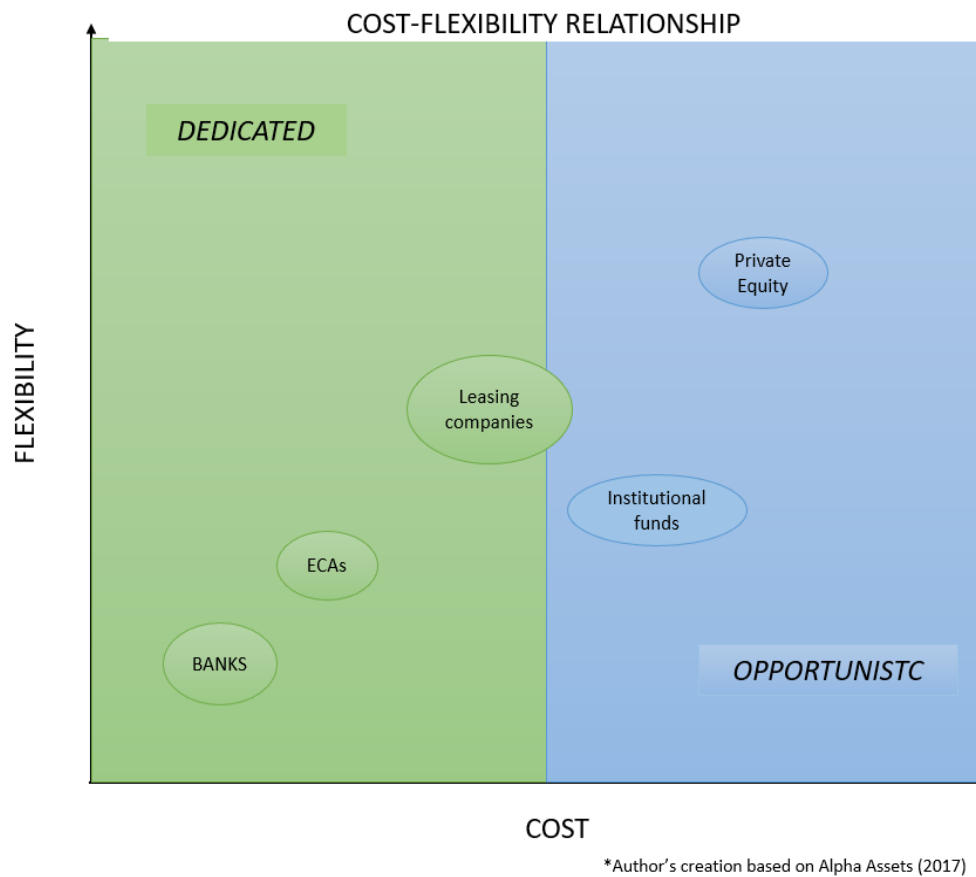


Figure 9: Cost-flexibility relationship

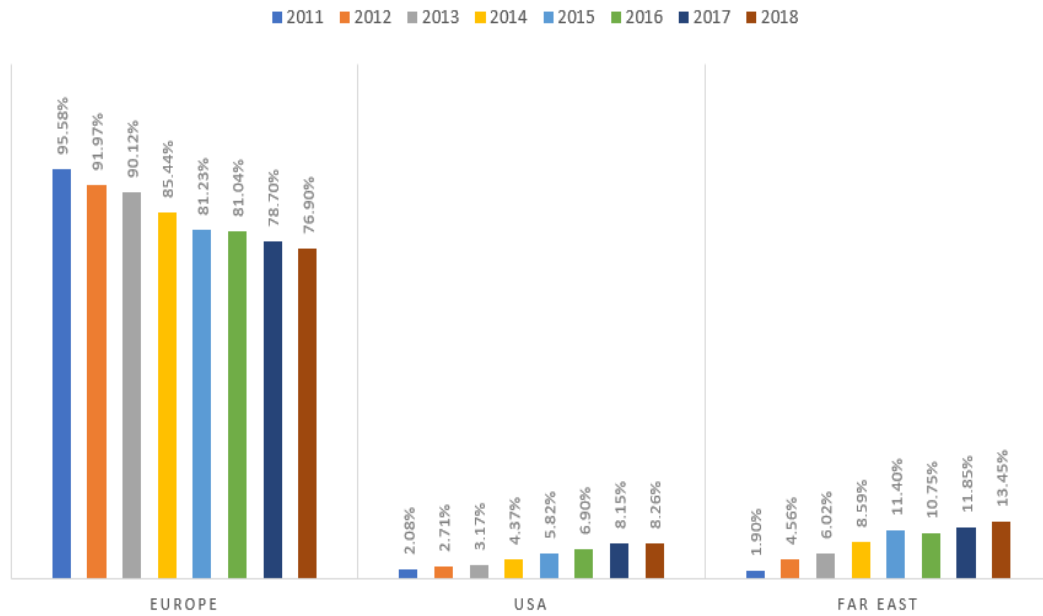
2.4: The situation in Greek shipping

Greek shipping has also been affected by the global trends in shipping finance. The rising influence of Chinese investments in the global maritime industry¹⁴, the lasting effects of the crisis in the Greek banking sector,¹⁵ along with the increased capital requirements imposed on the EU banks explain the current situation in Greek ship finance, as evidenced by Figures 10,11 and 12 below.

¹⁴ The COSCO's investment in Pireaus Port is the only multi-billion-euro port investment in the EU with a total value of €6 billion (Pandya et al., 2018).

¹⁵ In June 2018, the NPL ratio in Greece was still the highest among EU countries, approaching 45% (European Parliament, 2018).

ORIGIN OF THE FUNDS ALLOCATED TO GREEK VESSELS (IN % OF TOTAL GREEK SHIPPING PORTFOLIOS)



*Author's creation based on T. Petropoulos (2019)

Figure 10: Origin of the funds allocated to Greek vessels (in % of total Greek shipping portfolios)

Similar to Figure 7, we can notice that the European banks are reducing their shipping exposure while Asian and American banks are expanding their Greek shipping portfolios.

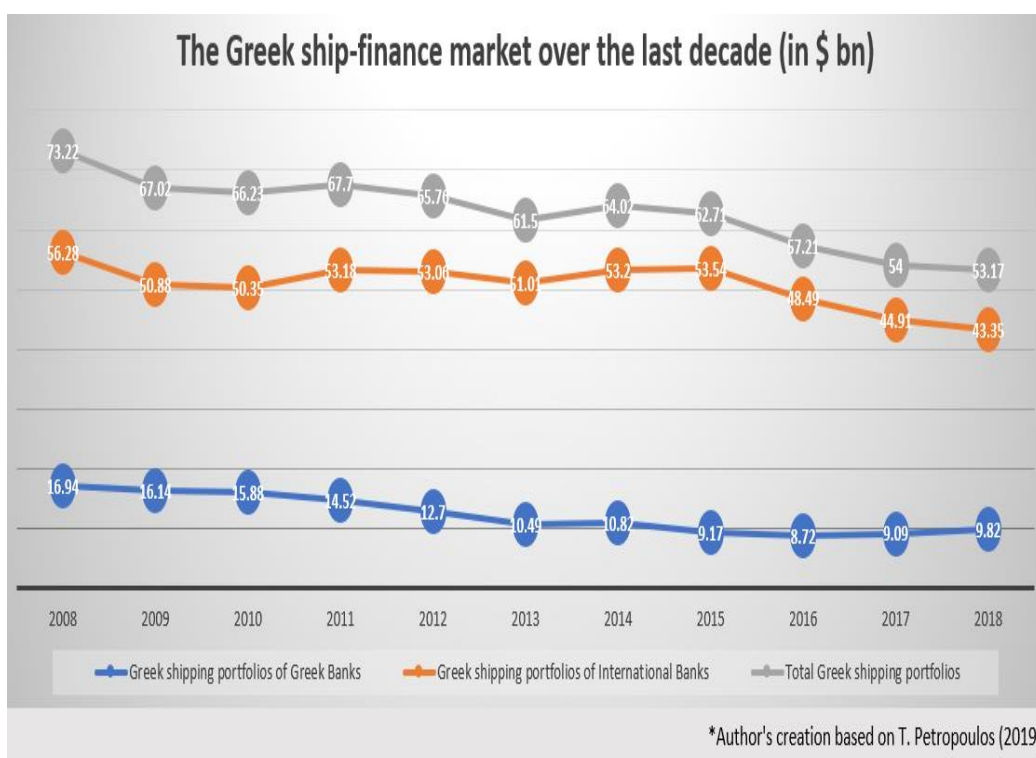
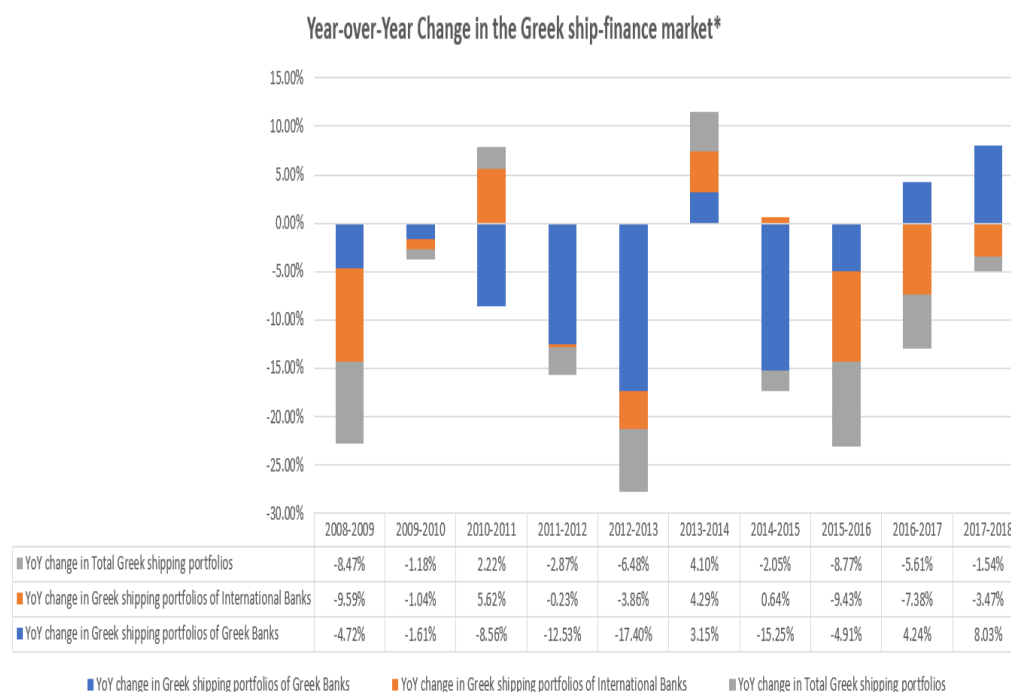


Figure 11: The Greek ship-finance market over the last decade



* Based on the numbers of Figure 11

**Source: Author's creation based on T. Petropoulos (2019)

Figure 12: Year-over-Year Change in the Greek ship-finance market

Based on Figure 11, the total Greek shipping portfolios have been reduced from \$ 73.22 bn in 2008 to \$ 53.17 bn in 2018 (a decrease of -27.38%). According to Figure 12, which is based on the numbers of Figure 11, since 2016, we notice a relative stabilisation in the market. In particular, the rate of decline in the total Greek shipping portfolios is slowing down from a -8.77% in 2016 to a -1.54% in 2018. Likewise, international banks continue to reduce their exposure though to a lower degree (from a -9.43% in 2016 to a -3.47% in 2018). Interestingly, Greek banks are expanding their shipping portfolios during the last two years after a period of contraction (from a -4.91% in 2016 to a +8.03% in 2018).

Three points are noteworthy. First, there is some evidence that Chinese ship leasing and private equity are the main alternative sources that are present in Greek shipping (T. Petropoulos, 2018a). Second, there is a rising trend in shipping Mergers & Acquisitions (M&As) in general and in Greek shipping in particular. In 2018, 30 shipping M&A deals took place with a total value of \$15bn (I. Vovos, 2019). In Greece, the number of Greek shipping companies has declined from 725 in 2007 to 597 in 2017, while the percentage of companies with more than 25 vessels has increased by 58.7% during 2010-2017 representing 67.07% of the total fleet (Petrofin Research, 2018). It is argued that one reason behind the consolidation is the formation of economies of scale which will enable better access to external financing (PwC Greece, 2019).

2.5: Literature Review on sources of shipping finance

As previously discussed, the traditional dominance of bank finance in the 1980s as well as the emergence of alternative sources of finance in the aftermath of the 2007-2008 financial crisis attracted further the interest of the scientific community. Specific issues related to bank financing, corporate bonds, IPOs, KG/KS funds¹⁶, ECAs, leasing and PE are the focal points of the existing literature. An overview of this literature is presented below according to the aforementioned sub-categories. In addition, indicative papers regarding the capital structure of shipping companies are discussed.

a) Bank credit

Research on this subject has mainly focused on the evaluation of the default risk arising from shipping loan portfolios and the qualitative and quantitative criteria that are taken into account during loan-application procedures. Grammenos (2002,2013) was the first to provide a comprehensive methodology for the evaluation of shipping bank loans' probability of repayment. The six "Cs" or criteria for a loan approval are: "Character/Capacity, Capital, Conditions, Collateral and Company".¹⁷

Based on the influential work of Grammenos (2002), Dimitras et al. (2002) examine 17 shipping bank loans that were originated between 1999 and 2001. Using a decision-making optimisation tool (UTADIS method) the authors show that the capacity of the management team, the track-record of the borrower, the fleet quality

¹⁶German Kommanditgesellschaft (KG) and Norwegian Kommandittselskap (KS): A limited partnership of small and medium-sized investors in a closed-ended and not-publicly traded fund investing in a vessel (Van Klink, 2019). Before the crisis, 26% of the world's newbuilding tonnage was financed by KG funding schemes. After the crisis, the share of KG financing reduced to 2% of the new orders (KRAVETS & KRAVETS, 2014).

¹⁷ Kavussanos et al. (2016) argue that Capital, Company and Capacity factors are more important than the rest of the 6 C's of Credit when evaluating the default risk in shipping bank loans.

and the key financial figures contribute the most to a successful evaluation of shipping bank loans' probability of default. In a similar manner, Gavalas et al. (2015) conduct a bank survey in 2012 and provide insights regarding the aspects that relationship managers consider when they assess a shipping-loan proposal. Employing the UTADIS method, the authors find that a) the probability of switching from a high to a low credit rating scale (similar to the credit rating scales of Moody's, S&P and Fitch), b) the leverage ratio and c) the solvency ratio are the decisive criteria during the appraisal of default risk.

As discussed in Section 2.2, the 2007-2008 financial turmoil affected severely the liquidity of the financial sector and raised serious concerns about the stability of the banking sector. This subsequently led important financial institutions and debt-based businesses to file for bankruptcy (Chava et al. 2011). Motivated by the increasing number of non-performing shipping loans (as a result of the crisis), researchers turned their interest to the determinants behind shipping loans' defaults.

In this context, Kavussanos et al. (2016) develop a credit scoring model by employing logistic regression. The authors collect data from the shipping portfolio of a Greek commercial bank, which contains 128 loan agreements between the bank and 63 shipping companies for the years 1997-2011. They show that the shipping loans' defaults can be attributed to a) the present and future environment in the freight market, b) the shipowner's risk tolerance represented by the selected chartering strategy, c) the loan's price as reflected in the administration charge by banks to arrange the funding. Using a similar logit model, Mitroussi et al. (2016) study the credit quality of a shipping portfolio consisting of 30 loans for bulk carriers that took place between 2005-2009. The authors conclude that the shipowner's expertise in the specific market along with shipping market circumstances can justify shipping loans' underperformance.

Two interesting studies based upon bank surveys are also briefly discussed. Gathering information from 12 ship-financing banks in Hong Kong during 2008, Gong et al. (2013) find that loan quality and security are the most significant loan-performance parameters. Interviewing 41 bankers from 11 countries in 2015, Lee et al. (2018) show that recourse, cash flow from vessels and vessels' value are the material considerations of bankers during a loan-approval process.

In sum, we can observe that the main determinants behind shipping loans' defaults are industry-oriented, as they relate to the inherent characteristics of the shipping industry. Thus, we can infer that the pronounced cyclicity, as discussed in Section 2.1, plays an important role during the evaluation of default risk (Alexandridis et al., 2018).

b) Bonds

A key characteristic of public debt is the credit spread, defined as the difference in yield between a risk-free security (usually a U.S. treasury bond) and a corporate bond. This additional return is provided to bondholders as an exchange to the additional risk they undertake. In particular, Kavussanos et al. (2014) find that the spreads of shipping bonds are twice as much as the spreads of bonds in other industries (see for example, Helwege et al., 2014). This observation reinforces the argument that the shipping industry differs from the other industries with regards to its risk profile (Stopford, 2009).

Along these lines, researchers have examined the determinants of the relatively higher spreads that are present in shipping bonds. Examining a sample of 33 shipping bonds that were issued in the European capital markets during 1997-2000, Leggate (2000) finds that bond credit scores are negatively linked with bonds' annual interest payments ("coupons") and positively linked with shipping market environment. Analysing a sample of 30 shipping bonds that took place in the U.S. between 1993-2008, Grammenos et al. (2003) report a positive relationship between bond spreads and issuer's use of leverage; a negative relationship between bond spreads and credit scores/market conditions. An interesting study that uses time-series data is that of Grammenos et al. (2007). Exploring 40 shipping bonds that were originated in the US bond markets between 1998-2002, the authors show that a) the bond credit ratings, b) the variation in shipping earnings, c) the remaining life of the bond until its maturity, d) the benchmark yields of US treasury bonds and US stock market indices, can explain the spreads of shipping bonds. Finally, Kavussanos et al. (2014) study a sample of 54 public debt offerings by listed shipping companies that took place in different capital markets between 2003-2010. The authors find that a) the credit quality of the bond, b) the liquidity risk of the bond, c) the cyclicalities in bond markets and shipping, d) the stock-market volatility, can sufficiently justify shipping bond spreads.

One of the few papers that deals explicitly with the reasons behind shipping bonds' default is that of Grammenos et al. (2008). Analysing 50 bond offerings that took place in the US over the period 2003-2010, the authors show that the default risk is a) positively related to issuer's financial leverage and the ratio of funds raised (through the public debt offering) to total assets, b) negatively related to bond liquidity and shipping market circumstances.

In sum, the aforementioned literature on shipping bond issues further supports the notion of cyclicalities along with the inherent riskiness of shipping investments. This is why shipping bonds are normally placed in the High Yield Bond Markets all over the world (see for example Grammenos et al., 2012a for US high-yield bond market; H. Stolen, 2017 for Nordic high-yield bond market).

c) IPOs

The first key feature of an IPO is the under-pricing, which is the listing of the shares below their market value. When the initial offer price is lower than the ending price of the first trading day, the stock is regarded as under-priced (Investopedia, n.d.). This discount in price is in favour of outside investors, - who are attracted by the lower price, - and against initial owners. The IPO's under-pricing has been extensively investigated in the corporate finance literature. For instance, Ritter (2003, pp.423-425) provides a comprehensive view of IPOs' under-pricing across different countries. IPO under-pricing has also triggered the interest of ship-finance researchers.

In this context, Grammenos et al. (1996) explore shipping IPOs' first day returns in 7 countries and report an initial under-pricing of 5.3% (on average). Analysing 84 shipping IPOs that took place in mainland China and Hong Kong between 1972-1998, Cullinane et al. (2002) find significant first-day returns of 104.95% (China) and 19.17% (Hong Kong). The documented anomaly in Chinese IPOs' under-pricing is not a shipping industry-specific fact, but a general observation. For instance, Chan et al. (2004) report the first-day returns of A-share Chinese IPOs in the vicinity of 180%. Ting et al. (2006) argue that the enormous under-pricing in Chinese IPOs is due to the information asymmetries (followed by the winner's curse) which are present in the Chinese capital markets. Furthermore, Merikas et al. (2009) examine a sample of 143

IPOs that took place in key stock exchanges globally between 1984-2007. They compute first-day returns of 18% on average. Using data from the US capital markets, Merikas et al. (2010) and Grammenos et al. (2012b) explore shipping IPOs that took place over the period 1987-2008. The former find first-day returns of 4.4%, while the latter find first-day returns of 2.7%. Though not directly related to the financing of shipping companies, it is interesting to mention the work of Satta (2017), in which the initial under-pricing of port operators is analysed. The author finds a negative relationship between first-day returns and a) the years the company is in business prior to the listing, b) the number of the underwriters and the track-record of the lead managers, c) country-specific aspects, such as whether the port operators are headquartered in maritime nations or in states with advanced legal framework.

The second important characteristic of IPOs is their long-run poor performance; the fact that in the post-going public period stocks experience negative returns below the market benchmark. For example, Kooli et al. (2004, pp.50) offer a thorough view of IPOs' long-run underperformance all over the world. Likewise, IPOs' long-term underperformance has also been evidenced in the shipping industry.

Grammenos et al. (1999) analyse a sample of 27 shipping IPOs that occurred over the period 1987-1998. Two years after going public, the IPOs exhibit a market-adjusted return of -37%, in line with the general corporate finance literature. The authors also find a positive (negative) relationship between long-term performance and financial leverage (fleet maturity). Moreover, Merikas et al. (2009) show that shipping IPOs experience long-run market-adjusted returns of -16%. From the port operators' perspective, Satta et al. (2017) study 93 IPOs that took place during 2000-2015. Three years after going public, the IPOs incur negative returns of -12.2%. In addition, adverse market circumstances are proven to lead to lower stock valuations and a deterioration of port industry's risk profile (Rodrigue et al., 2011).

Lastly, as previously discussed in section 2.3, access to equity markets for shipping companies has become challenging after the 2007-2008 crisis. In this respect, Pribor et al. (2016) explore a sample of shipping IPOs that occurred in the US between 2013-2015. Since approximately 50% of the listings involved gas carriers, the authors conclude that nowadays the viability of shipping IPO attempts depends on factors related to the specific markets (in this case attractive LNG spot charter rates).

d) KG and KS funds

The absence of publicly available data (and the subsequent lack of external monitoring) has been one of the main reasons behind KG/KS funds' failure. Besides, the lack of information transparency has rendered difficult the scientific research on this topic. One of the few studies on shipping funds' performance is that of Drobetz et al. (2013b). Collecting a sample of 323 Special Purpose Companies (SPCs) established in the German KG market between 1996-2007, the authors find that the KG funds' performance is more contingent upon vessels prices than freight rates, an observation that is attributed to the specific/unsystematic risk related to this asset class. We can thus conjecture that the understanding of the risk-return dynamics of KG funds had been a difficult task, which in turn led to inaccurate analysts' assessments and ultimately collapse of the market. Moreover, examining 341 German KG funds created over the years 2007-2012, Simic et al. (2016) find that the secondary market of KG displays high levels of valuation efficiency. Nevertheless, it is shown that the stocks of shipping funds are sold below their fundamental values,

providing further support to the notion that KG funds market experiences significant information asymmetries.

e) Export Credit Agencies (ECAs)

Since ECAs have recently emerged as a credible shipping-finance alternative, the literature on this topic is restricted. In this respect, Pires et al. (2005) conduct a case study of a Brazilian ECA, the *Merchant Marine Fund*. The authors find that the ECA financing scheme has not materially assisted shipping companies in lowering their cost of capital.

f) Ship leasing

Literature on this topic is also very limited. Li (2006) carries out a case study on ship leasing based on information collected by economists, lawyers and accountants. The respective advantages and disadvantages are reported. On the one hand, tax redemptions and the control of working capital are offered to the lessors¹⁸. In addition, risks are evenly distributed between the lessee and the lessor. On the other hand, ship leasing comes with restricted ship control in the sense that the lessee cannot sell the vessel during favourable market conditions but before the end of the lease contract.¹⁹ Furthermore, ambiguous contractual relationships can give rise to legal disputes.

g) PE funds

Although PE financing in shipping has gained economic importance after the 2007-2008 crisis, relevant literature essentially does not exist. In fact, the sole paper that elaborates explicitly on PE ship financing is that of Abdullah et al. (2016). Focusing on Islamic shipping finance in Malaysia, the authors support that Islamic PE can provide a viable alternative both to shipping companies and investors.

Capital structure

A stream of literature, which is directly linked to the sources of finance, is related to a firm's capital structure or the way in which a firm assigns its capital needs to different funding sources.²⁰ With regards to shipping, Del Gaudio (2018) examines a sample of 500 Italian shipping firms over the years 2007-2015. The author shows that a) the firms are highly leveraged with a mean debt-to-assets ratio of 70%, b) bank financing is dominant (82% of total financing transactions), c) cash reserves play an important role in firms' capital structure decisions. In this context, Ahrends et al. (2018) analyse the cash reserves of 144 shipping companies globally over the period 1983-2014 and find that shipping firms exhibit significantly higher cash reserves than comparable manufacturing firms. The authors attribute the difference in the cash holdings to the *precautionary motive*²¹, which is more pronounced in the shipping industry. The last observation can be further explained by the inherent volatility of shipping earnings,

¹⁸ The control of working capital is achieved because the lessee does not need to incur capital expenses to obtain the ship.

¹⁹ For that matter, you may refer to: Law Explorer. (2015). *Ship Leasing*.

²⁰ The influential study of Modigliani and Miller (1958) is relevant to this case. According to the Modigliani-Miller theorem, the value of a company depends on its ability to generate cash-flows and the underlying risks of its assets, not on the firm's capital structure decisions.

²¹ The Precautionary motive refers to the willingness of a company to create a liquidity cushion to provide for unpredicted demand for cash (Nasdaq, n.d.).

which renders liquidity a critical factor of a shipping company's resilience during adverse market conditions (Stopford, 2009; Drobetz et al., 2013a).

2.6: Concluding remarks

The concluding remarks of the sub-sections 2.1 – 2.5 are presented below. These points will be taken into account during the formulation of the hypotheses of our research.

1) In terms of the stages in the shipping market cycle, freight rates have been normalised (compared to 2007-2008), though shipping companies still face low profit margins (World Maritime News, 2019). Thus, we can infer that the market is going through the stage of recovery. However, the recovery is not taking place uniformly across market segments. For example, the supply-demand balance has been restored in bulkers but not yet in tankers (T. Petropoulos, 2018b).

2) With regards to the stages in the shipping-finance cycle, combining information from the previous sub-sections, we can support the following: Global shipping portfolios continue to follow a decreasing trend, though the rate of decrease is diminishing. At the same time, a few banks, such as ABN AMRO, M&M, Berenberg, Warburg and ATB increase their shipping exposure (N. Roussanoglou, 2018). Therefore, there is evidence that some banks (re)enter the shipping-finance market. The interesting question is to what extent commercial banks will re-enter the game; this is where the role of alternative sources, as previously analysed, become highly relevant.

3) The diversification of funding sources can be viewed as a risk management strategy which resembles the Modern portfolio theory.²² This may serve as a solid economic logic for the sharing of shipping risk among financiers, providing some support towards the viability of alternative funding sources.

4) The cost-flexibility relationship, as previously presented (Figure 9), offers some insights on the requirements that each funding source entails. With regards to Greek shipping, it is interesting to study these requirements and what are their implications in terms of access to capital for shipping companies.

5): Although the NPL ratios of Greek banks are still at prohibitively high levels, their shipping portfolios have expanded during the last two years. It would be interesting to investigate this paradox and how it will work in the future.

6) There is some evidence that Chinese leasing²³ and private equity are the top-2 alternative financiers in Greek shipping. However, further investigation of the topic is highly relevant.

7) One of the main motives behind the recent trend of consolidation in the shipping industry seems to be the accessibility to external financing. To what extent this applies to Greek shipping is open to question.

8) Added value of the study

²² The theory was developed by Harry Markowitz (1952). Given a required level of return, investors can create portfolios of assets with the lowest possible risk through diversification.

²³ Particularly under the auspices of BRI, reasonable questions arise as to what extent Chinese financing is the new status quo in global shipping finance.

Since shipping is inherently volatile, the new regulations will have a relatively higher impact on bank financing of shipping than of other asset-heavy industries. However, the idiosyncratic risk comes with higher returns, a characteristic that seems to attract alternative financiers. Having said that, we are motivated to study the implications of the new alternative sources for the Greek shipping industry, a topic which is virtually under-researched (according to our literature review). Furthermore, since the majority of existing studies focuses on statistical measures to provide empirical evidence, we seek to differentiate ourselves by conducting a survey. Lastly, the global ship finance landscape is changing fundamentally, nobody exactly knows what is becoming the 'new normal' yet. That demands the collection of expert insights and generation of new knowledge. With that new knowledge ship operators in Greece (being an important maritime nation) can anticipate new circumstances and make good investment and financing decisions.

SECTION 3: Methodology

3.1: The choice of survey as methodological tool to develop a research

Our empirical part is based on a dataset collected during a survey. According to Baker et al. (2011), surveys offer information about market participants' perceptions and insights, which secondary data cannot capture. Restating, a survey among key-people in the industry provides subjective information, such as visions, ideas, estimations. Likewise, Graham et al. (2001) conjecture that surveys can cover the gap between theory and reality. Collecting information from banks, shipping companies and other ship-finance professionals, we can answer the sub-research questions (as presented in the 1st Section). That kind of questions cannot be answered using econometric modelling, since there is a lack of available data on this topic. Restating, the changes in the financing landscape of the Greek shipping industry can be better recorded via a survey. Lastly, we include both closed-ended and open-ended questions in our survey. The former enables us to create some statistical figures based on the total number of participants; the latter allows us to delve into the reasons behind participants' answers to the closed-ended questions and identify possible patterns in their responses.

3.2: Hypotheses of the study

In order to design our survey, we construct four hypotheses based on the concluding remarks of the literature review (sub-section 2.6). We then link those hypotheses to the sub-research questions, a process which ultimately leads us to answer our main research question. The hypotheses are the following:

- 1) Greek banks will reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks (in comparison to pre-crisis levels).
- 2) Ship leasing (especially from Chinese financial institutions) and private equity are the main sources of alternative finance that are present in the Greek shipping market.
- 3) Alternative finance will take over bank lending in Greek shipping.
- 4) The new financing landscape will affect shipping companies' accessibility to funding depending mainly on a) the size of the shipping company and b) the specific market in which the shipping company operates.

Table 1 below presents the relationship between the concluding remarks of the literature review and the hypotheses of the research.

Hypothesis	Relevant Concluding Remarks
------------	-----------------------------

Hypothesis 1	5 th Concluding Remark
Hypothesis 2	6 th Concluding Remarks
Hypothesis 3	2 nd & 3 rd Concluding Remarks
Hypothesis 4	1 st , 4 th & 7 th Concluding Remarks

Table 1: Relationship between concluding remarks and hypotheses of the study

*Source: Author

The first hypothesis relates to the fifth concluding remark. As we previously discussed, the NPL levels of the Greek banking sector are still the highest in Europe, however the Greek banks have begun to increase their shipping exposure in the last two years. Based on the numbers of Figure 12, we compute the average decline (on a year-over-year basis) in the Greek shipping portfolios of Greek banks vis-à-vis those of international banks during the last decade: the former have incurred a decrease of 4.96%, while the latter have been reduced by 2.45% (compared to pre-crisis levels).²⁴ We can thus assume that Greek banks will continue to limit their Greek shipping portfolios more intensely than international banks. Therefore, the first hypothesis relates to the first sub-research question.

The second hypothesis is based on the sixth remark. There is some evidence (though not strong enough) that Chinese ship leasing and private equity prevail in Greek shipping as alternative funding sources. The Chinese government's support for global maritime investments in the context of BRI (case of Pireaus Port) provides additional ground to the aforementioned hypothesis. Therefore, the second hypothesis is correlated with the second sub-research question.

The third hypothesis arises from the second and third remarks. The market is going through the mild period of the shipping-finance cycle (from trough to peak according to Figure 2) and banks (re)enter the market reluctantly. In addition, the Markowitz's portfolio theory offers a theoretical basis to the diversification of funding sources, a trend that is currently observed in shipping investments. Therefore, we can assume that alternative funding sources will be viable in the long term, leading to a complete transition in the financing landscape. Thus, the third hypothesis corresponds to the third sub-research question.

The forth hypothesis is relevant to the first, fourth and seventh remarks. The recent trend of consolidation in shipping offers a factor that should be considered when we assess shipping companies' accessibility to capital. Furthermore, the stage of recovery (according to Figure 1) is not occurring uniformly across market segments, implying that more stable cash flows in bulkers (for example) may facilitate access to external financing, while current supply-demand imbalances in tankers may discourage investments. Moreover, based on the cost-flexibility relationship (Figure 9), we infer that there are certain requirements coming with alternative sources and those requirements may affect companies' accessibility to external financing. Thus, we develop our last hypothesis; we deliberately use the phrase "...depending mainly on a)...and b)...", since we want to investigate whether also other factors associated with the requirements imposed by alternative sources have an impact on shipping companies' ability to attract alternative capital. Therefore, the fourth hypothesis is related to the fourth sub-research question.

²⁴ The average decline in the total Greek shipping portfolios (on a year-over year basis over the last decade) is 3.06% (in comparison to pre-crisis levels).

Table 2 below depicts the relevance of each hypothesis to the sub-research questions.

Hypothesis	Relevant Sub-research question
Hypothesis 1	1 st Sub-research question
Hypothesis 2	2 nd Sub-research question
Hypothesis 3	3 rd Sub-research question
Hypothesis 4	4 th Sub-research question

Table 2: Relationship between sub-research questions and hypotheses of the study

*Source: Author

3.3: Interview procedure

We sought to create a well-balanced portfolio of participants by contacting professionals from banks, shipping companies and other ship-finance related entities, such as consultants, investors, lawyers and professors. We contacted 58 professionals in total via their personal email, LinkedIn and phone. The portfolio of potential participants was based on the author's network. The interview process took place from June 2 to July 5. We sent three reminders (at most) to each potential participant during the aforementioned period. Finally, we managed to collect 16 responses; 5 from banks, 6 from shipping companies and 5 from other ship-finance experts. Respondents were interviewed mostly by telephone (and a few via e-mail). They were invited to give their reaction on a set of questions and statements in a semi-structured interview style. All participants have substantial work experience in Greek shipping.²⁵ With regards to banks, we collected responses both from Greek and international banks involved in Greek ship finance. Especially for shipping companies, we gathered information from all market segments in which the Greek shipping has the strongest presence, namely dry bulkers, crude oil tankers and LPG/LNG carriers. With respect to other ship-finance experts, we gained information from shipping consultants and auditors as well as alternative investment fund managers. Lastly, any information regarding the names, positions and companies of the participants will be kept in the strictest confidentiality upon participants' request. Only the supervisor of the study was allowed access to this information.

3.4: Structure of the questionnaire

The questionnaire, which can be found in the Appendix, is structured on the basis of the four hypotheses that we previously developed. The same questionnaire was handed out to all participants, since we wanted to identify whether there are significant differences in the answers depending on the participants' job field. Table 3 below presents the correspondence between the parts of the questionnaire and the hypotheses/sub-research questions.

Part of the questionnaire	Relevant Hypothesis & Sub-research question
2 nd part	Hypothesis 1 & 1 st Sub-research question
3 rd part	Hypothesis 2 & 2 nd Sub-research question
4 th part	Hypothesis 3 & 3 rd Sub-research question

²⁵ The vast majority of participants are Greek professionals with physical presence in the Greek market.

5 th part	Hypothesis 4 & 4 th Sub-research question
----------------------	--

Table 3: Relationship between parts of the questionnaire and sub-research questions/ hypotheses of the study

*Source: Author

The first part of the questionnaire is not included in Table 3 since it relates to personal information of the participants, such as their names, job fields within the shipping industry, companies and positions.

The second part of the questionnaire addresses the issue of traditional bank financing. Through two closed-ended questions we obtain information on a) whether banks will finance again Greek shipping at the pre-crisis levels and b) whether Greek banks will limit their Greek shipping portfolios by a higher percentage compared to that of international banks. In addition, we include an open-type question to understand the reasons behind participants' responses. Thus, we attempt to clearly accept or reject our first hypothesis and answer to the first sub-research question.

The third part of the questionnaire deals with the alternative sources of shipping finance. Through open-type questions we aim to identify the alternative funding sources that are present in Greek shipping and which of these sources are considered the most important. Especially for the Chinese ship financing, we ask our participants their view on Chinese investments in the context of BRI. Furthermore, we attempt to understand the reasons behind participants' answers (regarding the alternative sources that prevail in Greek shipping) by asking them about a) the preconditions that alternative financing sources seek in order to invest in Greek shipping and b) the market segments in which the strongest presence of alternative financing is expected. Moreover, we include a specific question regarding the role of Greek shipping families as alternative financiers; since shipping has been the flagship of the Greek business activity since ancient times²⁶, we are interested to know whether Greek shipping high-net-worth families are involved in alternative financing. In sum, through this part, we aim to accept/reject the second hypothesis and answer the second sub-research question.

The fourth part of the questionnaire elaborates on the future relationship between traditional and new sources of shipping finance. Through closed-type and open-type questions we attempt to gain information a) about the percentage of total investments in Greek shipping to which alternative financing methods will be a viable alternative in the future, b) on whether bank debt will remain the dominant source of ship finance. Through this part, we seek to answer whether a complete transition from traditional bank financing to alternative funding sources will take place in Greek shipping, addressing thus our third hypothesis and the third sub-research question.

It is noteworthy that parts 2,3 and 4 of the questionnaire address the first part of our main research question regarding the emergence of alternative funding sources in Greek shipping.

The fifth part of the questionnaire deals with the implications that the new financing landscape has on the access to capital for Greek shipping. Through closed-type questions we try to collect information about the implications of the new financing landscape in terms of accessibility to capital and financing costs of Greek shipping companies. Through open-type questions concerning the requirements that

²⁶ See for example: S. M. Polemis (1995)

alternative sources impose on Greek shipping, we seek to understand the factors that affect shipping companies' access to external financing. Moreover, through a closed-ended question we aim to take a clear answer on whether Greek shipping will hold its global competitiveness (in the context of the new financing landscape); we include this question since we want to test whether our participants agree with the well-established notion of economic theory that access to external financing (with attractive terms) is crucial to the competitiveness of the shipping industry (Stopford, 2009). In sum, through this part, we attempt to accept/reject the fourth hypothesis and answer the fourth sub-research question.

It is noteworthy that part 5 of the questionnaire addresses the second part of our main research question regarding the impact of the new financing landscape on the accessibility to external finance for the Greek shipping companies.

SECTION 4: Results and Analysis

4.1: Participants

As we described in the methodology, we finally collected 16 responses while we contacted 58 professionals in total. Thus, the participation rate was 28%. In an industry with many banks, shipping companies and other ship-finance related firms we should mention that our outcomes may be insignificant or too optimistic/pessimistic because of the limited participation. Opinions of professionals in shipping companies may differ from those in banks or ship-finance experts, since each of them may possess a different level of information and have different economic interests. Figure 13 divides the sample of our participants into groups. It is observed that the portfolio of participants is well-diversified, enabling us to capture potential variations in responses depending on each category. Further information on names, positions and companies of the participants are treated as confidential.



Figure 13: Participants per group

4.2: Traditional bank financing

4.2.1: Do you think that banks will fund again Greek shipping at the pre-crisis levels?

Based on Figure 14, 88% of the participants responded that banks (both Greek and international) will not finance again Greek shipping at the pre-crisis levels. This result remains unchanged when we split our sample to the three relevant groups. It is noteworthy that the answers of the ship-finance experts are unanimous, while in the groups of banks and shipping companies there are two interesting “outliers”. The first participant, belonging to banks, explained that *“Banks similarly to investors have short memories. Like any other market, ship lending historically presents cyclicity.”* The second participant, being in the group of shipping companies, stated that *“In a strong market we should expect an increased level of irrational behaviour by all participants.”* Those professionals believe that cyclicity is still prevalent in shipping, implying that the market will stabilise and ultimately reach the stage of peak, in which market overconfidence will lead banks to expand again their shipping portfolios at the pre-crisis levels. Thus, we infer that indeed only irrational arguments underline more bank lending for shipping.

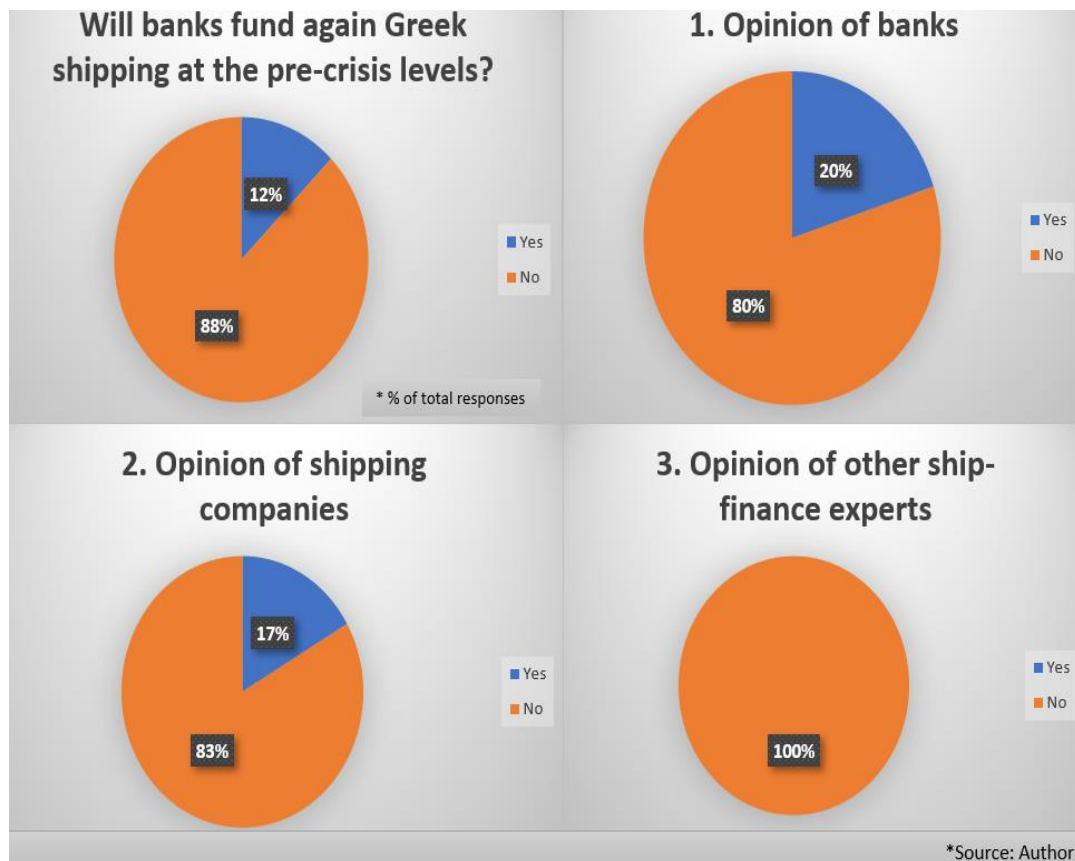


Figure 14: Will banks fund again Greek shipping at the pre-crisis levels?

4.2.2: Will Greek banks reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks?

Since the view that banks will expand their Greek shipping portfolios at the pre-crisis levels belongs to the minority, we further ask the 14 participants who gave negative answers in the previous question about their opinion on the rate of decline of shipping exposure of Greek banks vis-à-vis that of international banks. According to Figure 15,

71% of the participants do not believe that Greek banks will limit their Greek shipping exposure in a higher degree than that of foreign banks. This outcome is in line with the past-two years trend of expansion in Greek banks' shipping portfolios (as shown previously in Figures 11 and 12) but contradicts the current state in the Greek banking sector, which is characterized by the highest NPL ratios in EU.

Delving into the reasons behind the majority's opinion, some of the participants, qualifying as banks, stated the following: a) *"The Greek banks will continue to support the Greek shipping industry albeit at a smaller scale. Foreign banks will continue exiting the shipping finance business as they have lost a lot of money. Only few foreign banks will remain in shipping finance business aiming at a very specific clientele."*, b) *"Greek banks have sophisticated desks and long-standing relationships with Greek Shipping companies. Thus, they can assess and mitigate shipping risks in a manner that will not hinder their risk-return relationship."*, c) *"I think the need of Greek banks to deploy (USD) capital (mostly in the form of loans) in an international business industry (like shipping) is, and likely to remain, greater than the increasing (regulatory, but not only,) challenges that banks in Europe has started to face in financing ships."* Thus, the bankers believe that Greek shipping provides a relatively secure asset-class to deploy banks' capital, because of their in-depth knowledge and established network within the Greek market.

Similarly, the professionals from shipping companies consider Greek shipping a key industry for Greek banks and one of the few profitable ways to allocate their capital. Interestingly, another participant argues that there is no logic in differentiating between Greek and foreign banks, *since "... banks worldwide are reducing their shipping portfolios; it is not an exclusive characteristic of Greek banks."* With regards to ship-finance experts, one participant explains: *"... Greek shipping may be a little more bullish/aggressive in terms of leverage to finance shipping as they are familiar with the industry and ship finance is an easy way for Greek banks to put their money to work."* Another expert argues that *"There is an increasing trend of more international banks exiting or limiting ship financing business substantially. This creates space for mid-market funding players such as Greek banks. Greek banks are currently willing and able to commit to more ship financing transactions, whilst lending in other asset classes (corporate, real estate, etc) may not be as favourable or scalable. The combination of the two leads to the conclusion that ship financing - even in a declining trend - may still possess a higher percentage of the overall portfolio of Greek banks."* Lastly, another ship-finance expert supports that although Greek banks are active again in financing Greek shipping, the new regulations imposed on them, such as *Poseidon rules*²⁷, green recycling/scraping, do not allow them to expand their portfolios at pre-crises levels.

On the other hand, 40% of participants in the groups of shipping companies and ship-finance experts believe that Greek banks will limit their Greek shipping exposure more extensively than international banks. The reported reasons for this opinion are the inherent riskiness of shipping business, the non-viable levels of NPLs in the Greek banking sector and the new stricter regulatory environment in shipping (IMO 2020) and banking (Basel III and IV).

²⁷ The Poseidon rules are an agreement between leading financial institutions in the field of shipping finance. These institutions are jointly committed to integrate environmental criteria into the financing of new ships, thus accelerating the reduction of carbon dioxide emissions in the maritime industry (World Economic Forum, 2019).

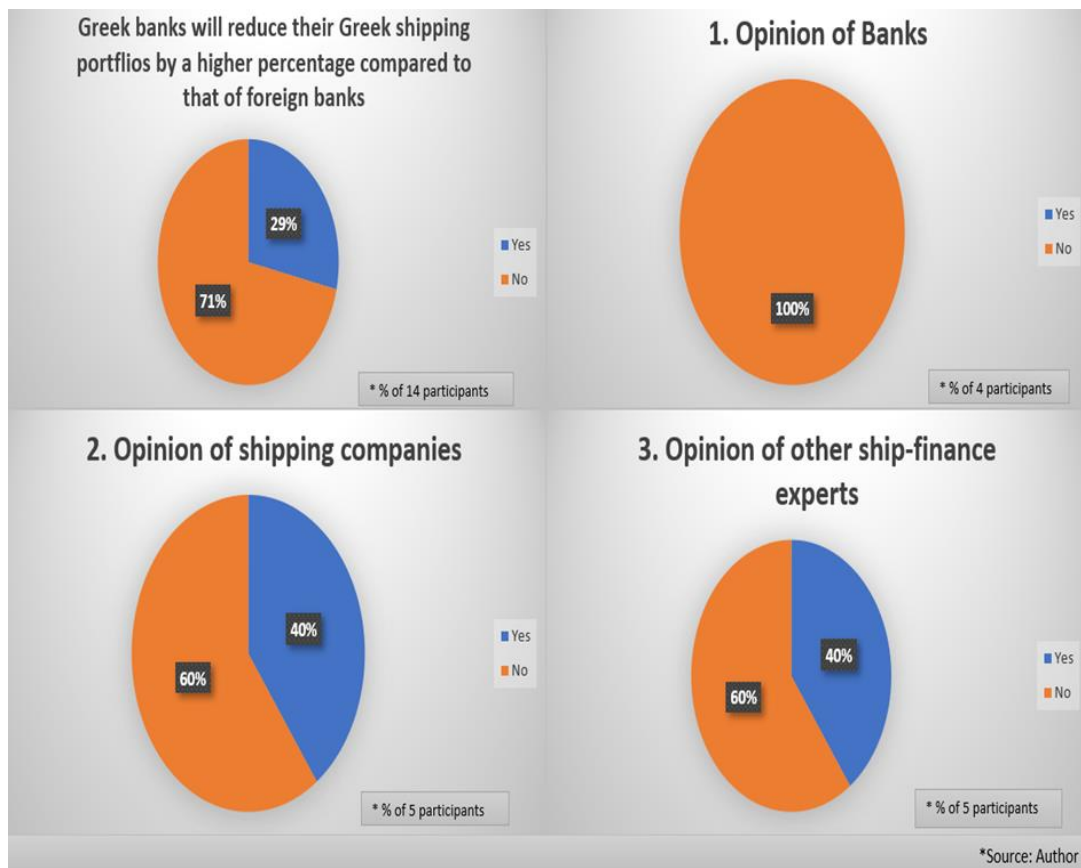


Figure 15: Will Greek banks reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks?

1st Conclusion: In sum, based on the results from the 2nd part of the questionnaire, we can reject our first hypothesis, since most participants believe that Greek banks will continue to finance Greek shipping and the rate of decline in their shipping portfolios will not be higher than that of international banks (in comparison to pre-crisis levels). The most important reason seems to be the crucial role of Greek shipping as an asset class which Greek bankers know well and feel more comfortable about (compared to foreign bankers).

4.3: Alternative sources of shipping finance

4.3.1: Which sources of alternative finance are you aware of in Greek shipping?

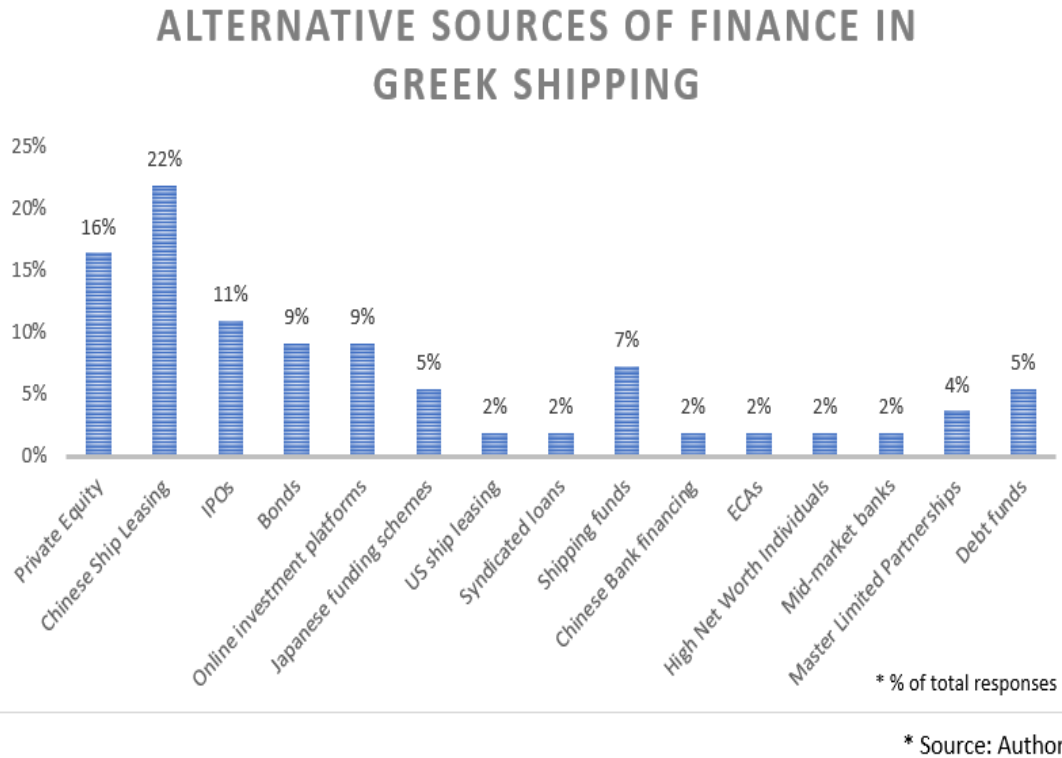


Figure 16: Alternative sources of finance in Greek shipping²⁸

Although this is an open-type question, we can identify the most frequently recorded answers by using keywords.²⁹ Based on Figure 16, our participants ranked Chinese ship leasing and private equity as the top-2 alternative financiers that are present in Greek shipping. With regards to Chinese financing in general, we should mention that Chinese ship leasing along with Chinese bank financing make up 24% of the responses, indicating a clear trend of Chinese investments in Greek shipping. Regarding private equity, one of our participants, qualifying as shipping company,

²⁸ 1) Japanese funding schemes include: a) Japanese Operating Lease (JOL): It is an operating lease financed partly by a Japanese investor, while the remaining acquisition cost of the vessel is covered via bank loan. The Japanese investor is entitled to depreciation tax benefits. It is an off-balance sheet item. C) Japanese Operating Lease with Call Option: It works similarly to the JOL, though it entails the right of the lessee to purchase the vessel. It is an on-balance sheet item (J. Berman, 2016).

2) Mid-market banks are mid-size companies.

3) Master Limited Partnerships (MLPs) have the legal structure of a publicly traded limited partnership. There are no corporate taxes, only income taxes of the MLP's partners; as a listed entity, it benefits from stock's liquidity (Investopedia, n.d.).

4) Debt funds: They differ from PE funds in the sense that their investments mainly focus on fixed-income products (Investopedia, n.d.).

²⁹ Respondents gave multiple answers. We counted the number of the keywords in the open answers. The N (total number of responses) was 55. For a comprehensive view, you may refer to Figure 29 in the Appendix, in which the "long list" of alternative sources is presented.

clarifies that *“Private equity funds are focusing not only on the equity side, but also on the purchase of senior/junior debt.”* Then, IPOs,-including the issuance of both common stocks and preferred stocks,- come in the third place. Next, in the fourth place we find the high yield bonds³⁰ (originated especially in Nordic debt markets) and the online investment platforms. These platforms, using financial technology, can offer two different services, either peer-to-peer lending or crowdfunding or both. In the top five alternative sources we also find the shipping funds which mainly consist of institutional investors and pension funds. Shipping funds are different from private equity in the sense that a) they generally have more knowledge about shipping and are more committed to long-term investment horizons, b) PE funds invest in various industries, while shipping funds are established for the sole purpose of investing in maritime assets.

4.3.2: Which sources of alternative finance do you consider the most important and why?

We further ask our participants about the reasons behind the perceived importance of some alternative funding sources. Regarding Chinese ship leasing, we can identify the following reasons: a) Chinese sale and leaseback transactions (CSLs) are attractive because of the relatively low barriers and competitive terms; restating, they are accessible to a larger number of shipping companies, since they do not require significant initial capital expenditures by the operators and the latter retain the uninterrupted use of the vessel, b) CSLs can be offered up to very significant amounts, *“..especially in respect of the overall cost and leverage.”* An interesting opinion arises from a participant, qualifying as bank: *“Currently sales and lease back transactions offered by Asian Banks are winning more ground as an alternative source of finance for Greek shipping companies. However, sales and lease back can be considered similar to traditional bank financing with many structural similarities. I believe that high yield bond financing could be considered the most important as it includes secured cash flows for the investors and lower issuance cost compared to public offerings without sacrificing the control of the company.”*

Concerning private equity, we can spot the following reasons: a) PE comes with relatively higher flexibility in terms of imposed requirements (in line with Figure 9 in Section 2.3), b) PE financing entered the Greek shipping market in the right momentum. As one of our participants, belonging to the shipping companies, explained: *“I could argue in favour of P/E financing, since it provided capital when traditional owners did not have the required equity and traditional financing wasn't available... However, it worked as a disruptor in the shipping industry since it triggered excessive orderbooks in almost every sector.”* Furthermore, another participant, qualifying as other ship-finance expert, emphasizes the role of online investment platforms: *“ The platform we are developing will be outside bank balance sheet allowing financing of liquid tonnage such as bulk carriers and tankers at conservative levels of up to 50%, thus not having to be regulated as far as the age and size.”* Overall, we can conclude that there is not a one-size-fits-all approach to alternative financing. As two of our participants, qualifying as other ship-finance experts, argued: *“Due to the shortage of finance in the market all alternative financing sources are important to the industry...they are designed to serve different scopes driven by the age profile of the vessels to be financed, the advance rates, tenors, and shipowner profiles.”*

³⁰ Bonds also included convertible bonds (based on the answers).

2nd conclusion: In sum, combining information from questions 4.3.1 and 4.3.2 we infer that although all alternative funding sources are important, Chinese ship leasing and PE funds do prevail in Greek shipping. **Therefore, we accept our second hypothesis.**

4.3.3: Which are the preconditions that alternative financing sources seek in order to invest in Greek shipping?

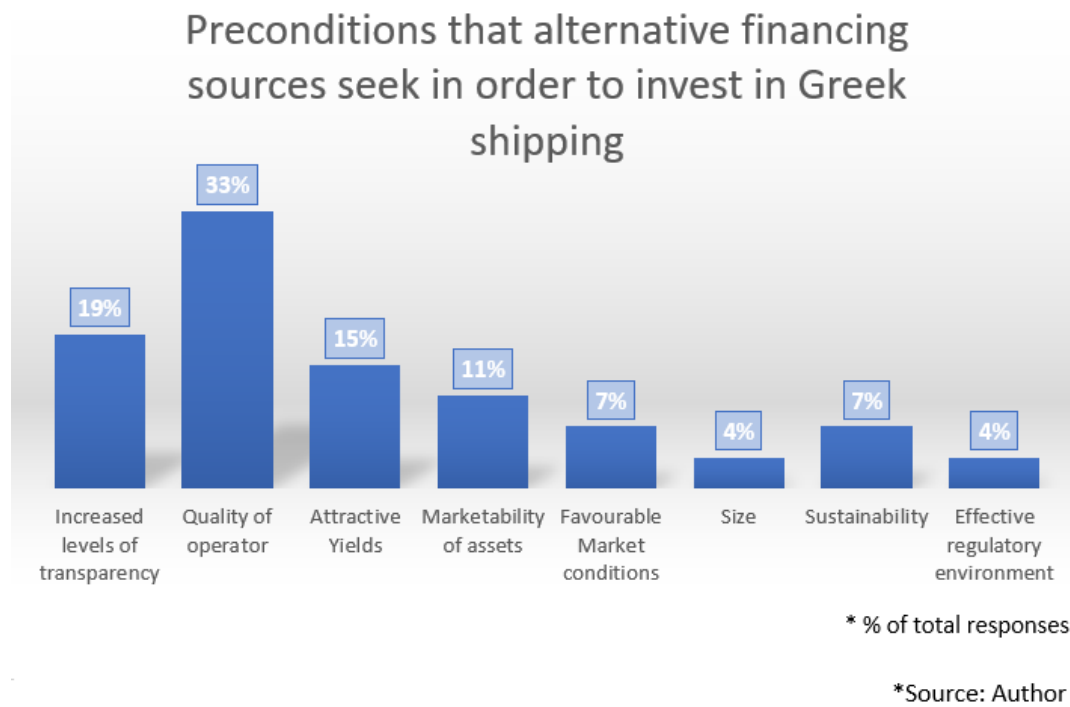


Figure 17: Preconditions that alternative financing sources seek in order to invest in Greek shipping

Since we aim to elaborate further on the emergence of alternative funding sources, we ask our participants about the preconditions that these sources seek to enter the Greek market. Although this is an open-type question, we can identify the most frequently recorded answers by using keywords.³¹ Based on Figure 17, the quality of the operator is the most important precondition. The quality of operator is interpreted as the fact that a shipping company is well-established, in the sense that the owners/managers have solid market experience (top quality technical and commercial management), good reputation and positive track record (strong financial performance over the last 2-3 years). Restating, the shipping companies must show reliability³²; one of our participants, qualifying as bank, explains it in a simple though concise way: *“Shipping companies need to have a story to tell”*. In this context, one of the participants, belonging to the other ship-finance experts, supports: *“In reality there is no such thing as Greek shipping as shipping is an international business and market. However Greek shipowners do not always have the best reputation but are*

³¹ Respondents gave multiple answers. We counted the number of the keywords in the open answers. The N (total number of responses) was 27. For a comprehensive view, you may refer to Figure 30 in the Appendix, in which the “long list” of preconditions is presented.

³² A ship-finance expert clarifies that “...cash commitment in the project...” strengthens the shipowner’s reliability.

generally good operators. So reputation and track record seem to be a precondition for e.g. a U.S. debt fund to finance a Greek shipowner.”

The second most important precondition seems to be the levels of transparency, which mainly refer to the disclosure of audited financial statements. Attractive returns, marketability of assets and market conditions/sustainability are in the third, fourth and fifth place respectively. Regarding the marketability of assets, we should mention the response of a professional from shipping companies: *“ Mostly they (PE funds) seek clear exit structures and assets that can appreciate within the next 4-6 years...they prefer markets/classes with high liquidity.”* Concerning sustainability, one of the professionals, qualifying as bank, highlights the increasing importance of ESG criteria during investment decisions.³³

4.3.4: Do you believe that the emergence of the Chinese ship financing is a bubble or the new status quo? In the context of the One Belt One Road Initiative, do you think the rise of China is a threat or an opportunity for the Greek maritime industry?

Since the BRI is highly relevant to Greece (recent privatisation of Pireaus Port), we are interested to further investigate the stance of our participants concerning Chinese ship financing. Although this is an open-ended question, we were able to identify some patterns in the responses and divide them into four categories (as depicted in Figure 18). *Neutrals* are those participants that think of Chinese financing neither as a threat nor as an opportunity; as one of the participants, qualifying as bank, stated: *“Greek owners rely on traditional ship financing”*, implying that Chinese ship financing is not something we should deal with. *Advocates* are in favour of Chinese investments. Indicatively, one of the participants, belonging to the ship-finance experts, explains: *“Chinese lease finance is not a bubble. It has grown steadily over the past 10 years and it is an opportunity for the Greek maritime industry (as opposed to a threat) because it enables shipping companies to drive growth and expand their fleets.”* Another ship-finance expert points out that: *“Chinese ship financing is not a bubble; however it remains limited in scope and not applicable / useful in many cases (larger / corporate shipowners, larger projects, employment requirement). Therefore, I do not think it is a threat to the Greek maritime industry but rather another option where applicable.”* Similarly, another participant (from the group of shipping companies) argues: *“Chinese are here to stay, however since their approach to date has been quite aggressive it is fair to expect that they will reprice in the next downcycle. There are risks having mainly to do with the industrialization of some sectors of the dry bulk market, but overall china presents a good alternative for the Greeks to fund their business.”*

The next category is that of *Scepticals*, these participants that express doubts about the role of Chinese financing; as one of the participants, qualifying as banks, states: *“Generally, China is one of the most important "Clients" for the Greek maritime industry and it can offer many opportunities at least for the next 5 years. However, I think that sales and lease back transactions is another alternative method of finance that became popular really fast, but it will lose ground due to structural inefficiencies (similar to MLPs and the KGs).”* Similarly, another banker argues that *“The Chinese ship financing will depend on the resilience of the Chinese economy which is directly*

³³ Environmental, social and governance (ESG) factors are benchmarks related to a company's operating activities that investors are increasingly considering when they evaluate an investment proposal (Investopedia, n.d.).

linked to the Chinese Foreign Investments. The BRI is an opportunity on a short and medium term but possibly a threat in the long term." Furthermore, three of the participants belonging to the group of shipping companies claim that it is still too early to draw any conclusions; as one of them explains: *"It is a growing product which may be transformed to a key product for every shipowner; to be seen in the future in a crisis and how Chinese will react."* Another professional from the shipping companies supports: *"I don't see it as a bubble considering that most of the transactions are for undervalued assets. I see it however, as a downward pressure to the overall shipping market, since it supports building constantly new ships without requiring equity injection from the Owners. Hence it supports and attracts speculators."* With regards to other ship-finance experts, one of them expresses concerns that *"BRI may gradually reduce shipping volumes as goods are transported over land; however this will take time and will not be suitable for all situations (for many goods speed and price of transportation are relevant)."* Moreover, another ship-finance expert clarifies that *"Chinese leasing will be always available but there is always the risk of not being there to renegotiate/restructure/refinance terms."*

The last category is that of *Opponents*, who express a minority view. As one of the participants from the group of banks states: *"Shipping is moving east. Yes, China is a threat."* In sum, based on Figure 18 we observe that the *Scepticals* constitute the majority opinion followed by the *Advocates*. When we split the responses into the three groups, we observe that the *Scepticals* are more prevalent in the group of shipping companies; we infer that the shipping companies may be less optimistic about the prospects of Chinese investments, since they have traditionally relied on European bank financing and may appear inflexible to embrace changes. We consider this finding remarkable; one should expect the operators to be enthusiastic, as China is creating new options for them.

All in all, we conclude that most of the participants believe that although the Chinese ship financing does present an alternative funding option for Greek shipping, it comes with potential risks; even in the group of *Advocates* we can identify relative concerns.

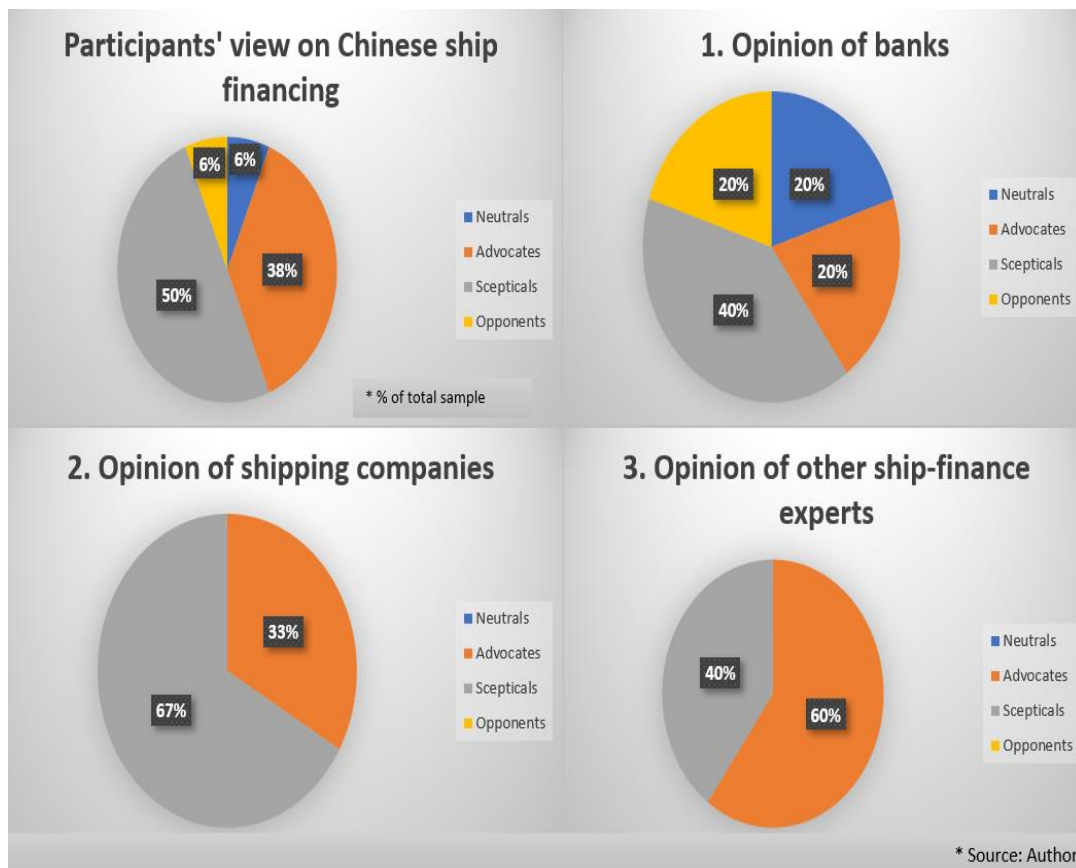


Figure 18: Participants' view on Chinese ship financing

4.3.5: What is the role of Greek shipping families (High-net-worth families) as alternative financiers of Greek and international shipping?

Since Greece is one of the largest maritime nations, we are interested to explore whether Greek High-net-worth (HNW) shipping families act like alternative financiers of shipping. Though this is an open-type question, we captured two patterns: a) Greek shipping families have no role as alternative financiers and they fund their own businesses, b) Greek shipping families do have a role as alternative financiers. The total sample is evenly split into the two categories (Figure 19). With regards to the first category, one of the participants from the group of banks argues that Greek shipping families cannot have a role as alternative financiers “...due to conflict of interests and unfair competition.” Another banker claims that “The HNW shipping families always had a critical role in the support of their shipping investments (and not as alternative financiers of Greek and international shipping in general)” Similarly, a participant from the group of other ship-finance experts argues that “The Greek Shipping families will remain the base of the Greek Shipping. Nevertheless, not as important as in the previous years.”

With respect to the second category, a participant from the group of banks considers Greek shipping (HNW) families a form of private equity, highlighting thus the importance of them as alternative funding sources. Furthermore, participants belonging to shipping companies emphasize that Greek HNW shipping families have the required size to borrow in favourable terms and then offer attractive funding (act like alternative financiers). As one of them explains: “Some of the HNW families borrow with a margin of 1%!” Another participant has a different reasoning: “There

are many ways of money laundering these days one of which is investing in shipping. It definitely fuels the Greek Shipping market although it does it in a way that we cannot assess.” Concerning the other ship-finance experts, one of them argues that the Greek shipping families “...have been always supportive in private deals or projects suggested to them by foreign funds.” Another participant provides specific examples: “There is a role for HNW families as alternative finance providers and some are already doing it (see Kollakis, Pappas etc).”

In sum, based on Figure 19, we cannot identify a majority’s opinion regarding the role of Greek shipping families as alternative financiers. By splitting our responses into the three groups, we observe that most of the professionals in shipping companies are aware of the role of Greek shipping families as alternative funding sources (in contrast to the professionals in the other two groups). We attribute this discrepancy among the groups to the high levels of information asymmetry (partly caused by a high level of informal circuit) that are present in Greek shipping.

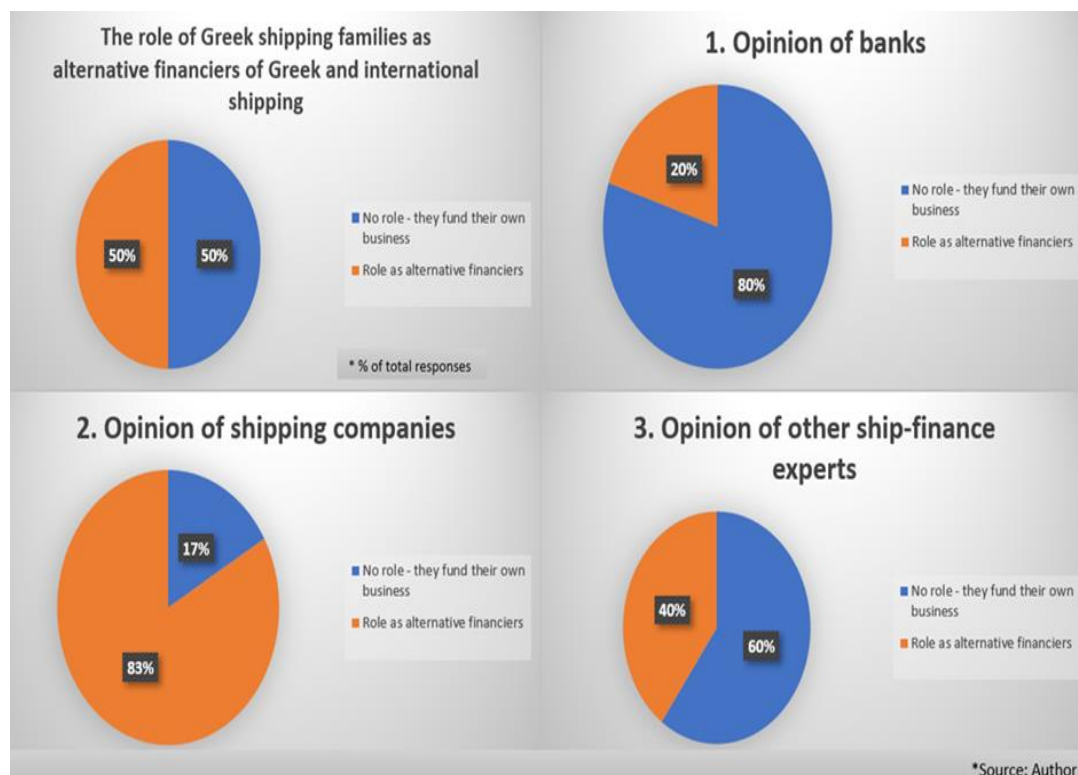


Figure 19: The role of Greek shipping families as alternative financiers of Greek and international shipping

4.3.6: In which specific shipping sectors do you expect the largest presence of alternative finance?

We include this closed-type question (followed by an open-type question regarding the reasons behind participants’ answers) as we want to obtain further insight into the development of alternative funding sources. The results are shown in Figure 20; tankers and bulks are expected to have the largest influx of alternative financing. As one of the participants belonging to other ship-finance experts explains: “The sectors of Tankers and Bulks are the more traditional sectors of the Greek maritime industry.” Regarding tankers, a participant, qualifying as shipping company, argues that “Assets prices are relatively depressed with a potential upside. It (tanker sector) supports high levels of leverage and relatively lower risk S/L transactions.” In the same line of

thought, another professional from a shipping company states that in the tanker sector *“...the returns are better, and sentiment is good for the next 2-3 years.”* Regarding bulkers, a participant from the group of banks supports that the bulk sector is characterized by *“...lower barriers to entry, smaller company size, and greater need for alternative funding as this market has been historically funded mainly by banks some of which are now exiting the market, hence creating a gap.”*

Concerning containers, a banker claims that *“...Containers will stay for the big Lines, the next crisis will clear out all the private container companies.”* In general, most of the participants seem to agree that the conventional sectors (especially tankers and bulkers, but also containers) are more suitable for alternative financing since they have more marketable assets and are more easily understood by investors. As one of the bankers explains, there are prospects mainly for the traditional shipping segments, *“...since there has to be a relatively active secondary market for the underlying ships.”*, while a participant from the group of shipping companies argues that investors need *“...to get comfortable with underlying risks.”* Regarding the gas sector, a banker clarifies that the management of gas vessels need experience (niche market), thus these assets are less liquid and require greater expertise. However, another banker argues that the gas sector offers *“...secured cash flows from long time charter contracts. Furthermore, LNG carriers can boost the current trend for eco-friendly investments. Those two conditions are something that the capital markets like to hear.”*



Figure 20: In which shipping sectors do you expect the largest presence of alternative finance?

4.4.: Future relationship between traditional and new sources of finance

4.4.1: Percentage of total investments in Greek shipping to which alternative financing methods will be a worthy alternative in the future

We include this closed-type question as we explore how the transition from traditional bank financing to alternative funding sources is evolving. Based on Figure 21, 69% of

all participants respond that alternative financing will be attractive for 25-50% of the total investments in Greek shipping. They all agree that alternative sources will be more expensive than traditional bank loans. As a banker explains: *“Alternative financing will be more expensive than traditional bank debt therefore it will take time to gradually increase their share which I think will eventually stand at 25-50%.”* Another banker adds that *“Banks will always be there for the big players. Smaller players will need to seek alternative financing.”* Similarly, a professional from the group of shipping companies argues that *“Investments in shipping are historically low equity return investments which rely heavily on cheap debt. As long as the alternative financing forms are expensive, they will only remain alternative.”* Furthermore, participants qualifying as other ship-finance experts argue in favour of the 25%-50% answer using different reasonings. One of them states that *“The Greek ship financing space is a very large one, so even though alternative financing is growing, it still requires (a) up scaling existing commitments, (b) a mentality change on the part of Greek shipowners to take these more expensive instruments, and (c) building track record in order for the investors behind the alternatives funding schemes to commit more money in Greek shipping.”* Another participant highlights the fact that *“Greek shipping was always in favour of relationship banking. As alternative finance does not always have the relationship as a factor, but rather they are looking into project finance, they are not as attractive as banks.”*

Next, 19% of the participants choose the <25% option; as one of the other ship-finance experts explains: *“Whereas alternative financing methods have a role to play in financing shipping, I believe that traditional shipping banks will continue to have the lion share of the market.”* Likewise, a professional from shipping companies argues that *“When prices and earnings appreciate to average historical levels, the traditional lending will become more attractive.”*³⁴ Lastly, 12% of our participants are more confident about the prospects of alternative funding sources and choose the 50%-75% option; as of them explains, *“...as banks are withdrawing, more players will turn to alternative financiers and compromise with reduced returns on equity.”*

By splitting the responses into the three groups, we observe the following: a) Bankers and other ship-finance experts give a clear answer, since 100% and 80% of their respective responses lie in the 25%-50% range, b) Participants from shipping companies seem to be relatively more optimistic about the percentage of alternative funding sources, since the 50%-75% responses come exclusively from this group.

³⁴ This view is similar to the shipping-finance cycle we analysed in sub-Section 2.1: The availability of traditional bank lending follows a cyclical pattern which will eventually re-emerge.

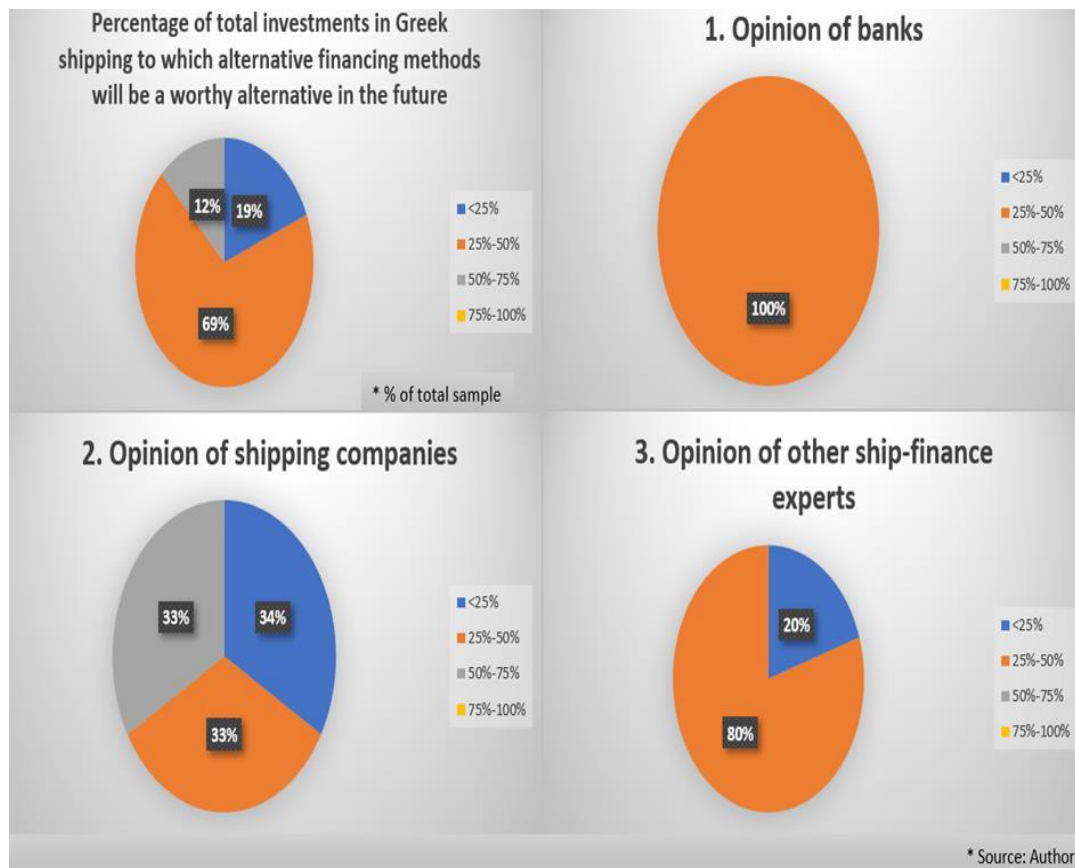


Figure 21: Percentage of total investments in Greek shipping to which alternative financing sources will be a worthy alternative in the future

In order to further strengthen our results, we add the following question.

4.4.2: Can the alternative sources of finance effectively cover the bank-lending gap in Greek shipping?

According to Figure 22, 44% of the participants do not take a clear position on the issue (*Neutral*). As one of them, qualifying as bank, explains: *“The alternative sources need time to convince the industry that they can cover such gap.”* Similarly, another banker states that *“...it remains to be seen as this is a multi- variable factors question, i.e., if the Sale & Purchase market is booming with many transactions available, then there will be a higher need for funding and alternative sources might struggle to cover it.”*

Moreover, another 44% of the participants agree that the alternative sources can effectively cover the lending gap. As a banker specifies: *“The Greek-controlled fleet expanded in the past years since Greek shipowners have managed to unlock the aforementioned sources of alternative finance; other ship-owning nations have not achieved (yet) this.”* In addition, a participant, qualifying as shipping company, clarifies that *“...smaller shipping companies are funding their activities mainly through debt funds following withdrawal of European banks from the sector.”* Similarly, a professional from the group of ship-finance experts argues that alternative sources *“...certainly provide an opportunity to the small/medium shipowner to get the necessary funding for his investments which he could not make because of the regulations European banks specifically are under”*, implying that the borrowing costs

of shipping companies have increased due to the stricter capital requirements European banks need to adhere to.

We should also mention the minority's views. 6% of the sample firmly believes in the effectiveness of alternative sources to fill the lending gap; the professional (from the group of shipping companies) highlights the high interest of Chinese leasing companies for shipping investments. Lastly, 6% of the sample disagrees with the aforementioned statement; the banker claims that *"The period that we can see newcomers in the industry has passed. It will be almost impossible for someone to find financing in shipping to buy his 1st vessel."*

By splitting the answers into the three groups, we observe that the bankers and professionals from shipping companies seem less optimistic than the other ship-finance experts regarding the ability of alternative methods to cover the funding gap. We attribute this difference to the fact that a) bankers are biased towards the strength of bank financing, b) each shipping company has its own features (e.g. size, institutional approach of external financing) and ability to attract alternative financiers.

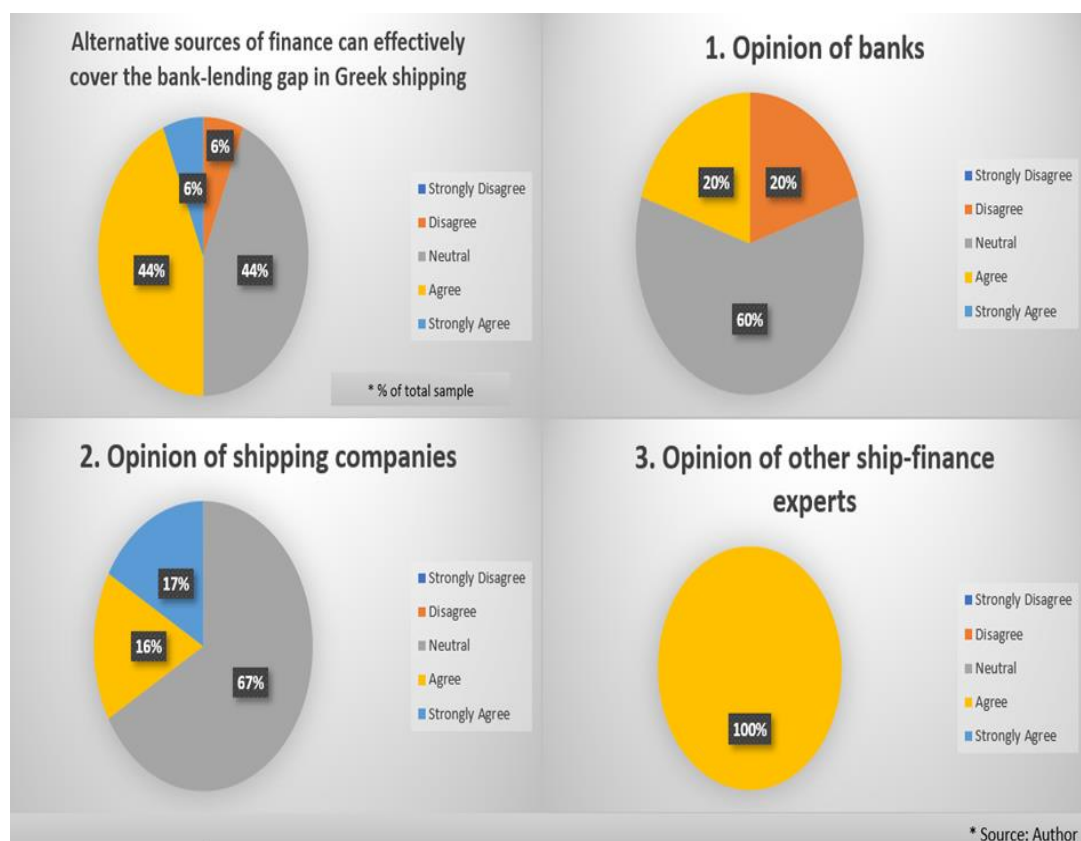


Figure 22: Alternative sources of finance can effectively cover the bank-lending gap in Greek shipping

4.4.3: Do you believe that bank financing will remain the primary source of ship financing?

Based on Figure 23, 69% of all participants believe that bank financing will remain the primary ship financing method. The reasons behind this view, apart from the ones that we previously discussed in 4.4.1, are the following. First, though the bank shipping portfolios are shrinking, alternative sources will not suffice to cover the capital needs of the shipping company, which is capital intensive. Second, as one of the participants

from the group of shipping companies argues, *“Private equity and Sale/Leasebacks are more of opportunistic financing schemes relying on very low interest rates and historical low returns on other available asset classes. They come and go.”* Third, banks possess the required ship-finance expertise to understand risks more efficiently than the new funding sources do.

On the other hand, we should mention that 31% of our participants do not believe that bank financing will retain its dominance. As one of the participants qualifying as ship-finance expert states: *“Increasing regulation does not make bank financing sustainable for the mid / smaller tier shipping companies. This is proven by the increasing number of exiting banks.”*

By dividing the answers into the three groups, we observe that a) Bankers and other ship-finance experts clearly state that bank financing will remain the primary source of ship financing, b) Professionals from shipping companies are evenly split into the Yes/No answers. This outcome is in line with Figure 21; it seems that professionals from shipping companies are relatively more optimistic (pessimistic) than the other participants about the prospects of alternative funding sources (traditional bank financing). We conjecture that the answers from the group of shipping companies depend on specific characteristics of each company; these characteristics may be known to insiders, not to outsiders.

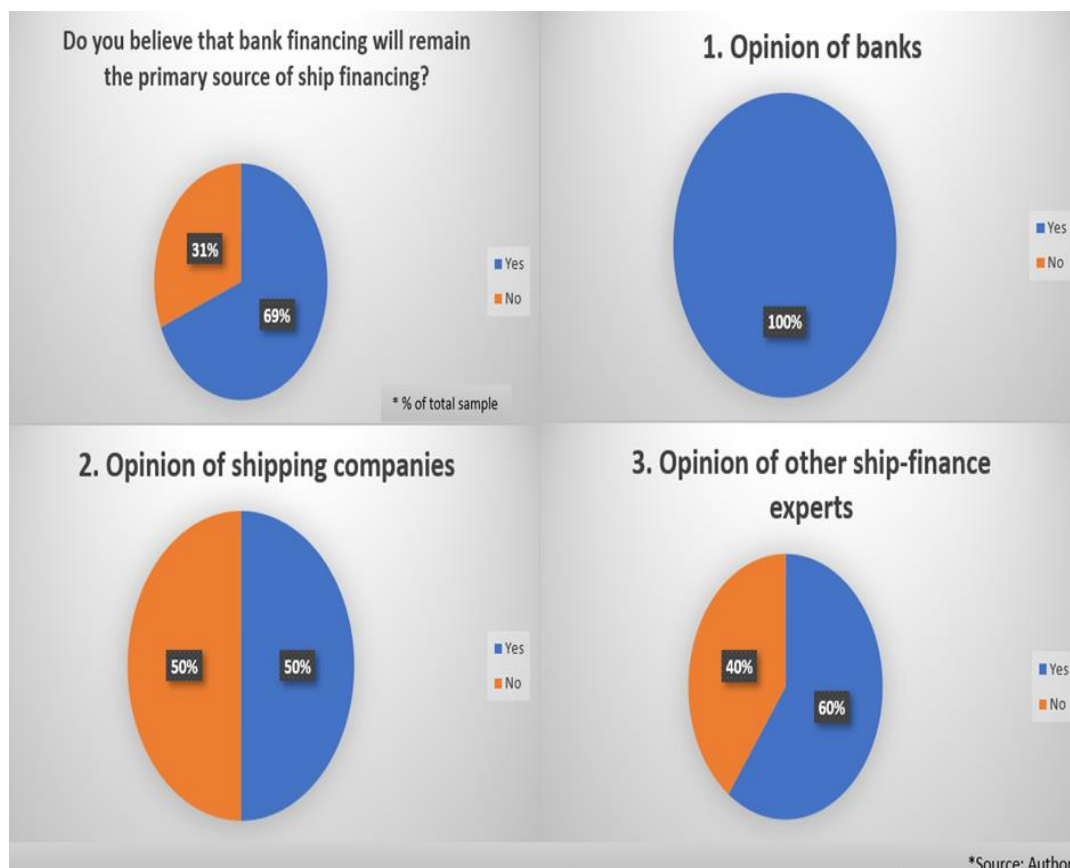


Figure 23: Do you believe that bank financing will remain the primary source of ship financing?

3rd conclusion: Combing information from Figures 21 and 23, we show that: a) 88% of the sample (the aggregate of <25% and 25%-50% responses) states that alternative funding sources will present a worthy alternative for less than 50% of the

total investments in Greek shipping, b) 69% of the sample believes that traditional bank financing will remain the top one funding source for Greek shipping. Furthermore, based on Figure 22, we infer that the market participants seem to have doubts about the ability of alternative funding sources to cover the bank-lending gap. **In sum, the transition from traditional bank financing to alternative funding sources is not expected to be complete, and we can thus reject our third hypothesis.**

4.5: Implications that the new financing landscape has on the access to capital for Greek shipping

4.5.1: How do the requirements that alternative financing sources impose on Greek shipping differ from those demanded by banks?

Since we have already collected sufficient information regarding the preconditions that alternative funding sources seek in order to invest in Greek shipping (Figure 17), we are interested to investigate how these requirements differ from those demanded by banks. Through the responses, we can identify three patterns. First, alternative funding sources impose stricter requirements on Greek shipping (than banks) in terms of financial disclosure, corporate governance standards, sustainability practices, exit structures and size. In particular, alternative sources demand higher levels of transparency (audited accounts) and increased accountability of the board of directors to the shareholders. They also give more qualitative emphasis on the vessel itself, ensuring thus compliance with the highest environmental standards. They also demand better liquidity, that is a mechanism to easily exit the market; therefore, they prefer to invest in young vessels for which an active secondary market exists. Moreover, they prefer bigger companies with more stable cash flows. The second pattern of the responses is that alternative sources come with higher pricing/cost of capital on average. The third pattern is that alternative funding sources are more flexible (than banks) with respect to covenants.³⁵ As a banker explains, *“alternative financing has more flexible requirements, but it has severe consequences in case of default.”* Lastly, we should also mention the minority’s view (12% of the sample) that there are no material differences between alternative sources and banks with respect to imposed requirements.

4.5.2: Impact of alternative financing on the financing costs of shipping companies.

We include this closed-ended question (Figure 24) in order to gain robust evidence about the impact of alternative sources on the financing costs of shipping companies. 75% of our participants (the aggregate of the *Strongly Agree* and *Agree* answers) believe that the alternative sources entail higher financing costs for shipping companies. According to a participant from banks, *“The alternative sources will be more expensive as they will come from “real money” whereas banks have the advantage of lending differently.”* Another banker answers in a simple though concise way: *“All the alternatives are more expensive than the traditional. This is a rule of life.”* Likewise, a professional from the group of other ship-finance experts clarifies that *“Alternative finance providers are definitely more expensive than traditional banks and can go as high as Libor +8%-10%.”*

Interesting responses also come from the minority’s views. A professional, (from the group of shipping companies) who chooses the *Disagree* option, argues: *“The risk-adjusted cost remains practically the same since most of the S/L and P/E structures*

³⁵ Financial covenants are limitations on debt and minimum liquidity levels (Investopedia, n.d.).

require/generate the same WACC. In nominal terms, yes it will increase the cost of debt. Risk-adjusted cost remains practically the same.” A banker, who chooses the *Neutral* option, explains that the answer to whether the financing cost will increase “...depends on the alternative financing method. High yield bonds, public offerings and private equities will increase it. On the other hand, sales and lease back transactions will reduce it but with the cost of removing the asset from your balance sheet and reducing your asset base.”

By dividing the responses into the three groups, we observe that a) 80% of the bankers and of other ship-finance experts choose the *Strongly Agree* and *Agree* options, b) 66% of the professionals from shipping companies choose the *Strongly Agree* and *Agree* options. This difference in answers may indicate that some shipping companies can place themselves in a better position than others in terms of attracting alternative capital with favourable terms.

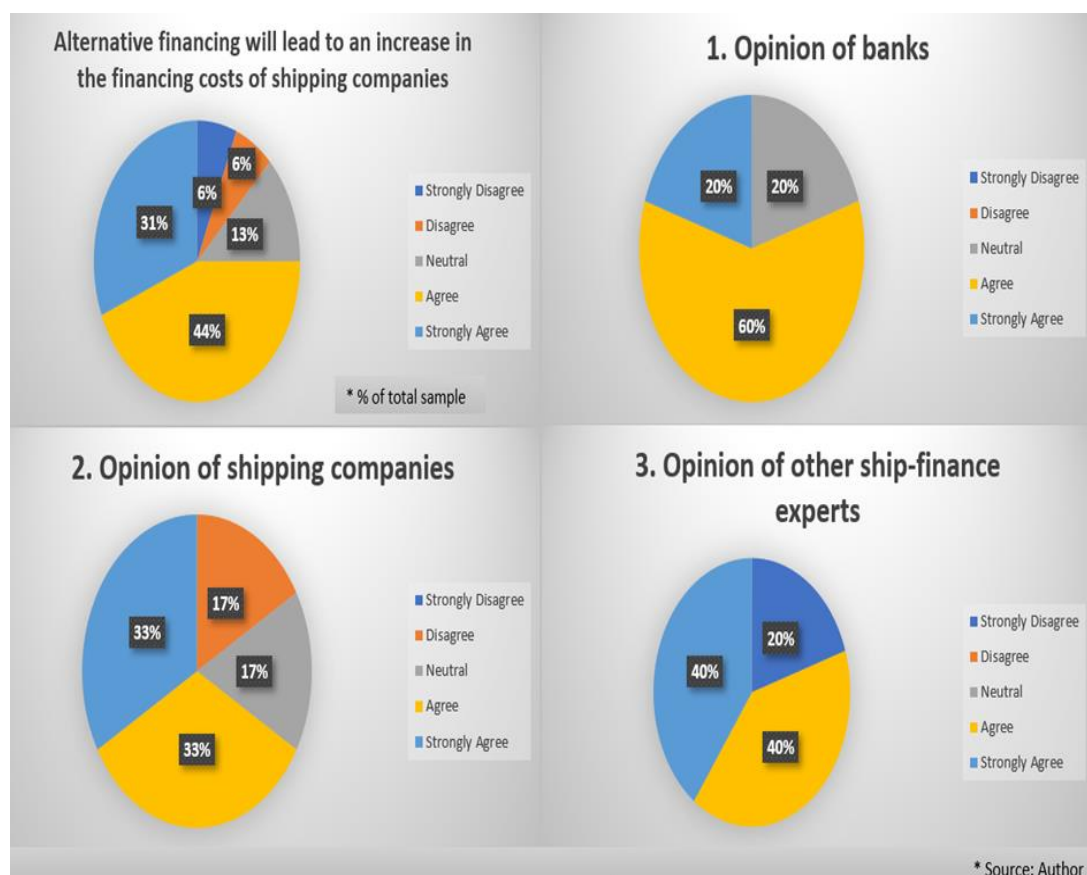


Figure 24: Alternative financing will lead to an increase in the financing costs of shipping companies

4.5.3: The requirements associated with the new financing landscape could potentially restrict access to capital for the Greek shipping.

According to Figure 25, 50% of the sample (the sum of the *Strongly Disagree* and *Disagree* options) believes that the requirements imposed by the alternative funding sources will not deteriorate the ability of Greek shipping to access capital. As one of the participants, qualifying as shipping company, explains: “Greek shipping has always been a shipping lenders favourite and will continue to be so in the era of alternative ship financing due to the deep technical/ operational expertise and financial intelligence of the Greek shipping companies.” Another participant from the

group of other ship-finance experts argues that *“Alternative finance providers have a significant role to play in Greek shipping and are here to stay. Their lending requirements are reasonable and commercially driven.”* In addition, most of the professionals who choose the aforementioned options converge to the view that Greek shipowners have the ability to quickly adopt new international trends, such as the emergence of alternative funding sources and their associated requirements. It is noteworthy that this opinion is also expressed by two professionals who choose the *Neutral* option. The first of them, qualifying as shipping company, claims: *“I tend to believe that the levels of required transparency will may get some hurdles to Greek shipping companies although I am confident that they will find a way to overcome this challenge.”* The second of them, belonging to the other ship-finance experts, supports that *“The shipping companies will certainly overcome any obstacles to reach to new financing sources.”* Thus, it would be fair to say that 63% of the participants (8 participants who choose the *Strongly Disagree* and *Disagree* options, and 2 participants who choose the *Neutral* option) state that the requirements coming with the new financing landscape will not restrict access to capital for the Greek shipping.

On the other hand, 19% of the participants agrees with the statement of Figure 25. As one of them, qualifying as bank, argues: *“The mentality of the traditional shipowners needs time to change (especially regarding auditing/reporting requirements).”* Likewise, a professional from the group of other ship-finance experts clarifies that *“...alternative lenders may be stricter in terms of reputation and professionalism of the organisation/borrower.”* Lastly, a banker, who chooses the *Neutral* option, highlights that the answer depends on the risk profile of the borrower: *“Nowadays, there are more sources of capital available however more accurately match the (financial) profile of the borrowing group; the more “aggressive / opportunistic” the profile of the borrower, the higher cost of capital and less bargaining power.”*

By splitting the responses into the three groups, we observe that the majority’s opinion representing 63% of the sample is expressed by the: a) 40% of the bankers who choose the *Disagree* option, b) 67% of the participants from shipping companies (3 professionals who choose the *Disagree* option, and 1 who chooses the *Neutral* option) and c) 80% of the other ship-finance experts (3 participants who choose the *Strongly Disagree* and *Disagree* options, and 1 who chooses the *Neutral* option). Therefore, we infer that the bankers are relatively less optimistic than the other professionals about the ability of Greek shipping companies to adjust to the requirements demanded by the alternative sources and ensure access to capital. Lastly, we infer that maybe there is not yet a momentum in the market to give a clear indication.

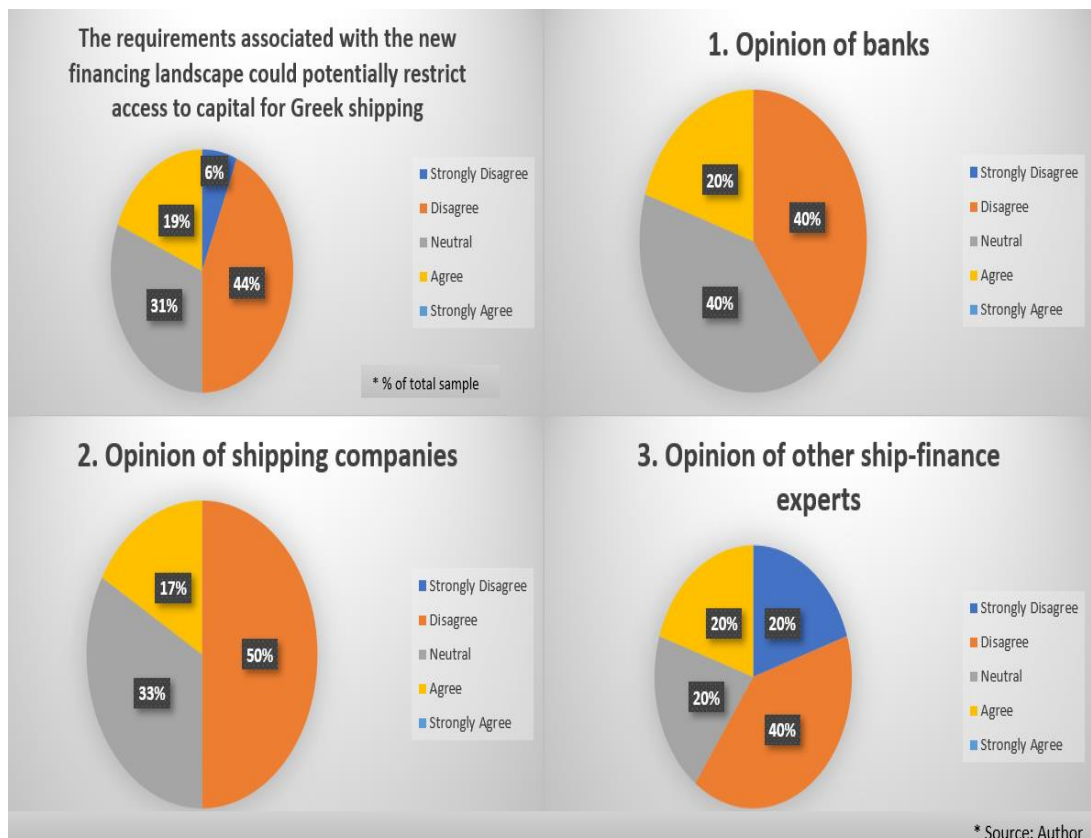


Figure 25: The requirements associated with the new financing landscape could potentially restrict access to capital for Greek shipping

4.5.4: In the context of the new financing landscape, will Greek shipping retain its global competitiveness?

Based on Figure 26, we observe a full match of views, since all participants agree that the Greek shipping will retain its global competitiveness.



Figure 26: Do you the Greek shipping will retain its global competitiveness?

4.5.5: Changes in Greek shipping in the context of the new financing landscape

Finally, we include this closed-type question since we aim to obtain further insights into the factors that may affect Greek shipping companies' accessibility to external financing. Based on Figure 27, 42% of the participants believe that Greek shipping will change in terms of culture.³⁶ Changes with respect to innovation and size come in the second and third place respectively. It is also noteworthy that 8% of the participants expresses doubts about whether Greek shipping will change at all.

By dividing the responses into the three groups, we observe the following: a) *Culture* is the first choice in the groups of banks and other ship-finance experts, while *Innovation* is the first choice in the group of shipping companies, b) *Size* has a relatively low percentage in the shipping companies. Therefore, we infer that a) maybe the shipping companies are not yet ready for a radical change in culture /mentality - that is why they regard innovation as their priority, b) maybe shipping companies are not so willing to give up control of their ownership upon merger, explaining the lower percentage of the *Size* option.

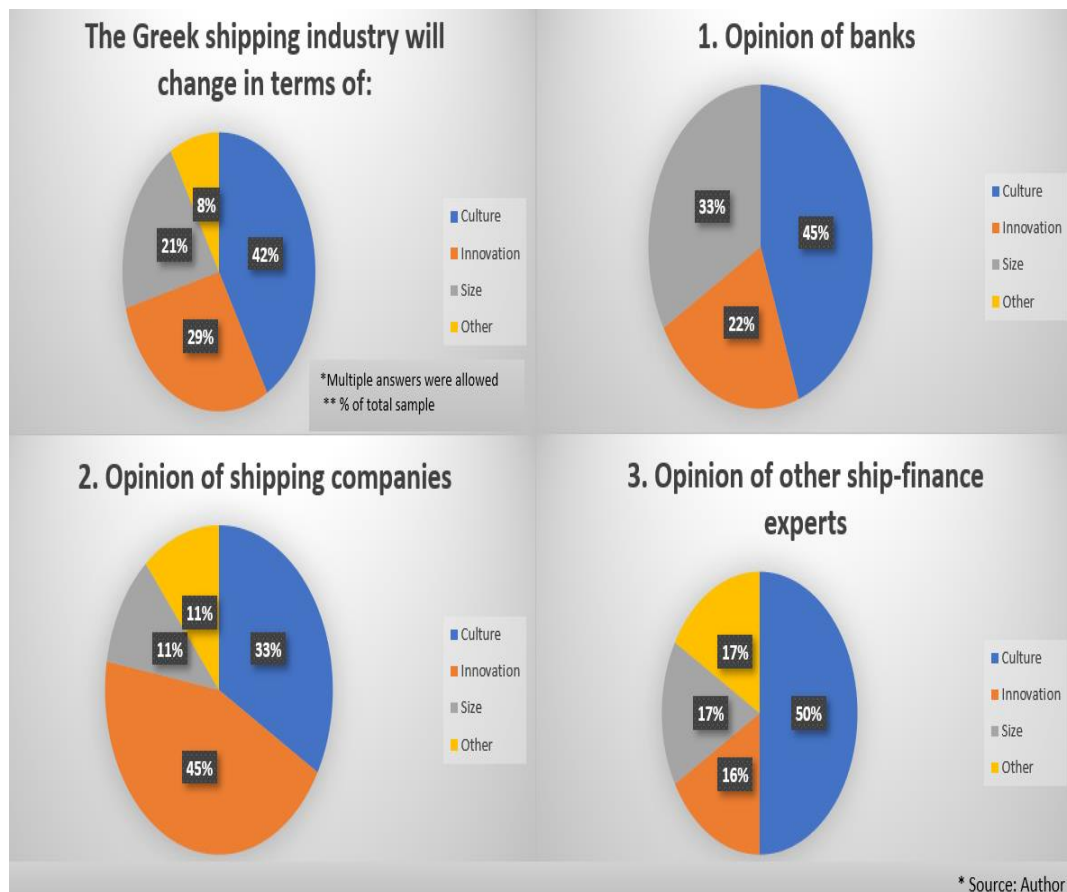


Figure 27: Expected changes in the Greek shipping industry

4th conclusion: Combining information from sub-sections 4.5.1 and 4.5.5, we identify the most important factors that affect the ability of Greek shipping to access alternative

³⁶ Culture mainly refers to a more institutional approach towards the alternative financiers, such as increased levels of transparency and high corporate governance standards.

financing. These factors are associated with the requirements that alternative funding sources impose on Greek shipping and are the following: levels of transparency (mainly audited financial statements), corporate governance standards, innovation, pricing (higher cost of capital), exit structures, sustainability, market conditions and size (bigger companies). Although the size of the shipping company and the market conditions are important, our participants regard them as less important than the rest of the aforementioned factors.³⁷ **Therefore, we reject our fourth hypothesis.**

5th conclusion: Based on the analysis of sub-sections 4.5.2 and 4.5.3 (Figures 24 & 25), we argue that although the alternative sources entail higher financing costs, they will not restrict access to capital for the Greek shipping. The main reason seems to be the ability of Greek shipowners to quickly adjust to new trends, such as the requirements arising from the new financing landscape. Furthermore, based on Figure 26, we show that all participants agree that Greek shipping will retain its global competitiveness in the new era of shipping finance. **In sum, we conclude that though the alternative sources come with increased financing costs, access to capital will still exist and the competitiveness of Greek shipping will remain intact;** this is in contrast to the well-established theory that the competitiveness of shipping depends on the access to capital with attractive terms and low interest rates (Stopford, 2009).

4.6: Lessons learned

Finally, we recap our results. Table 4 presents the outcomes of the hypotheses.

No	Hypothesis	Result
1	Greek banks will reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks (in comparison to pre-crisis levels).	Reject
2	Ship leasing (especially from Chinese financial institutions) and private equity are the main sources of alternative finance that are present in the Greek shipping market.	Accept
3	Alternative finance will take over bank lending in Greek shipping.	Reject
4	The new financing landscape will affect shipping companies' accessibility to funding	Reject

³⁷ This conclusion is further corroborated by the ranking of the preconditions that the alternative funding sources seek in order to invest in Greek shipping (Figure 17): *market conditions* and *size* are ranked in the penultimate and last place respectively.

	depending mainly on a) the size of the shipping company and b) the specific market in which the shipping company operates.	
--	--	--

Table 4: Outcomes of the hypotheses

*Source: Author

SECTION 5 : Conclusion

The financial crisis of 2007-2008 had severe repercussions to the banking sector. With regards to shipping finance, banks were forced to accept significant losses in their shipping portfolios; along with that, financial regulation of banking activities has become stricter (Basel III & IV), rendering expensive the financing of risky assets, such as shipping. This reality has resulted in a potential funding gap in shipping, and as a response alternative financing sources have emerged.

Conducting a survey among professionals with solid work experience in Greek ship-finance, we provide insights about the implications of the new financing landscape for Greek shipping, a topic which is virtually under-researched. Based on the relationship between the hypotheses and the sub-research questions (Table 2 in Section 3), we can summarize the main points of our study:

1) Answer to the first sub-research question: Based on the analysis of Section 4.2 and Figures 14 & 15, most participants believe that Greek banks will not reduce their Greek shipping portfolios by a higher percentage than that of international banks (in comparison to pre-crisis levels). The most important reason seems to be the fact that Greek banks have developed long-standing relationships with Greek shipowners and possess a solid understanding of the Greek market.

2) Answer to the second sub-research question: According to sub-sections 4.3.1 and 4.3.2, we show that Chinese ship leasing and private equity are the dominant sources of alternative finance that are present in Greek shipping. Regarding Chinese ship leasing, it is considered attractive due to its relatively low access barriers (no need for significant initial capital expenses from the operator) and competitive terms (the operator retains the use of the vessel). Concerning private equity, it comes with relatively higher flexibility in terms of imposed covenants.

3) Answer to the third sub-research question: Based on Section 4.4 and Figures 21, 22 & 23, most participants believe that a) alternative funding sources will present a worthy alternative (to traditional bank financing) for less than 50% of the total investments in Greek shipping, b) traditional bank debt will remain the dominant financing method for Greek shipping. Moreover, the participants express concerns about the ability of alternative funding sources to effectively cover the bank-lending gap. Restating, the transition from traditional bank financing to alternative funding sources is not expected to be complete.

We should mention that the first, second and third sub-research questions relate to the first part of the main research question regarding the development of alternative financing sources in Greek shipping. In this context, based on sub-sections 4.3.3, 4.3.4, 4.3.5 and 4.3.6 we obtain interesting insights: a) According to Figure 17, the most important precondition which the alternative sources seek in order to invest in Greek shipping is the quality of the operator, mainly referring to a good reputation and

a positive track record. b) Based on Figure 18, although Chinese ship financing presents a funding option for Greek shipping, most participants express doubts about the long-term viability of this alternative. c) Based on Figure 19, we cannot find clear evidence about the role of Greek shipping families as alternative financiers of Greek and international shipping. We attribute this ambiguity to the information asymmetry that is present in Greek shipping. d) Based on Figure 20, the largest presence of alternative capital is expected in tankers and bulkers, as they are the most traditional sectors of Greek shipping.

4) Answer to the fourth sub-research question: Based on sub-sections 4.5.1 and 4.5.5, we argue that the ability of Greek shipping to access alternative financing depends on the following factors: increased levels of transparency, high corporate governance standards, innovation, high pricing and asset liquidity, sustainability practices, market conditions and size (consolidation). Furthermore, according to sub-sections 4.5.2, 4.5.3 and 4.5.4 we show that although the alternative sources entail higher financing costs, access to capital will not be restricted and the competitiveness of Greek shipping will remain intact. . Most participants agree that Greek operators have historically had the skills to quickly adapt to new trends, such as the rise of alternative funding sources and their associated requirements. This finding is contrast to the well-established notion of economic theory that the competitiveness of shipping depends on access to capital with attractive terms and mainly with low lending rates (Stopford, 2009).

We should mention that the fourth sub-research question relates to the second part of the main research question concerning the implications that the new financing landscape has on the access to external finance for Greek shipping.

In short, although alternative sources of funding will have an impact on Greek shipping companies in terms of transparency, governance, margins, sustainability and scale, they appear to be complementary rather than substitutes for traditional bank financing, leaving the global lead of Greek shipping unaffected.

We trust our results have managerial implications for bankers, managers of shipping companies and investors. Particularly, bankers can better understand what the alternative sources require in order to invest in Greek shipping; leveraging their ship-finance expertise, banks could offer consultancy services to potential alternative investors in Greek shipping assets. In addition, the managers of the shipping companies can understand the way their competitors think. In this way, they could potentially identify their weaknesses and try to improve their strategy for attracting alternative capital. Moreover, investors can see the opinion of the other market participants about the reliability of alternative financing modes; thus, investors could enhance their tactic when approaching shipping companies.

Another goal of our study is to offer recommendations to Greek ship owners in order to remain competitive in the new era of shipping finance. First, Greek ship owners should abandon the family-oriented business culture and adopt a more institutionalised approach to their companies especially in terms of transparency, corporate governance and innovation. Second, ship owners should prefer *greener* investments, if they want to attract external finance with favourable terms. Third, they should become more receptive to Mergers & Acquisitions since inorganic growth seems to play an important role in shipping. Fourth, they should keep doing what they are good at, that is to operate tankers and bulkers; these segments have marketable assets and are more easily understood by potential investors.

Finally, our study could be further expanded by researchers who are interested in the sources of shipping finance. For example, a comparative analysis of the financial performance of shipping companies that used alternative financing before and after the capital injection would provide clear insights concerning the impact of alternative funding sources on companies' bottom line. Moreover, under the so-called *Poseidon Rules*, banks are encouraged to finance *greener* vessels. What would this mean for the financing of less eco-friendly vessels? Would a new funding gap be created and if so, would it be reasonable for alternative financing sources to intervene and fill that gap?

REFERENCES

- Abdullah, A., Hassan, R., & Kassim, S. (2016). *A CONCEPTUAL FRAMEWORK FOR THE APPLICATION OF ISLAMIC PRIVATE EQUITY IN INTERNATIONAL SHIPPING*. Al-Shajarah: Journal of the International Institute of Islamic Thought and Civilization (ISTAC), 21(3).
- Ahrends, M., Drobetz, W., & Nomikos, N. K. (2018). *Corporate cash holdings in the shipping industry*. Transportation Research Part E: Logistics and Transportation Review, 112, 107-124.
- Albertijn, S., Bessler, W., & Drobetz, W. (2011). *Financing Shipping Companies and Shipping Operations: A Risk-Management Perspective*. Journal of Applied Corporate Finance, 23(4), 70-82.
- Alexandridis, G., Kavussanos, M. G., Kim, C. Y., Tsouknidis, D. A., & Visvikis, I. D. (2018). *A survey of shipping finance research: Setting the future research agenda*. Transportation Research Part E: Logistics and Transportation Review, 115, 164-212.
- Alpha Assets. (2017). *What does "Alternative Finance" mean?:Today*. In Petrofin Research 2017. Retrieved from: https://www.petrofin.gr/wp-content/uploads/2018/02/Who_will_replace_European_banks_as_the_primary_ship-April2017.pdf
- Baker, H. K., Singleton, J. C., & Veit, E. T. (2011). *Survey research in corporate finance: bridging the gap between theory and practice*. Oxford University Press.
- Bank for International Settlements. (n.d.). *Basel III: international regulatory framework for banks*. Retrieved from: <https://www.bis.org/bcbs/basel3.htm>
- Berman, J. (2016). *Embracing new ways of thinking in funding shipping projects*. Retrieved from: <https://tms-shipfinanceandtrade.com/wp-content/uploads/Jacob-Berman.pdf>
- BNP PARIBAS. (2016). *INTRODUCTION TO BASEL III IMPLICATIONS AND CONSEQUENCES*. Retrieved from: <https://sg.moorestephens.com/MediaLibsAndFiles/media/sg.moorestephens.com/Documents/Basel-III-Presentation-21Apr16-vfinal.pdf?ext=.pdf>
- Chan, K., Wang, J., & Wei, K. J. (2004). *Underpricing and long-term performance of IPOs in China*. Journal of Corporate Finance, 10(3), 409-430.
- Chava, S., & Purnanandam, A. (2011). *The effect of banking crisis on bank-dependent borrowers*. Journal of Financial Economics, 99(1), 116-135.
- Chen, W., Mrkaic M. & Nabar M. (2018). *Lasting Effects: The Global Economic Recovery 10 Years After the Crisis*. Retrieved from: <https://blogs.imf.org/2018/10/03/lasting-effects-the-global-economic-recovery-10-years-after-the-crisis/>
- Cournot, A. A. (1897). *Researches into the Mathematical Principles of the Theory of Wealth*. Macmillan.
- Cullinane, K., & Gong, X. (2002). *The mispricing of transportation initial public offerings in the Chinese mainland and Hong Kong*. Maritime Policy & Management, 29(2), 107-118.

- Davies H. (2017). *The Last Basel Round?*. Retrieved from: <https://www.project-syndicate.org/commentary/basel-committee-new-capital-adequacy-rules-by-howard-davies-2017-12?barrier=accesspaylog>
- de Groot, B., & Franses, P. H. (2012). *Common socio-economic cycle periods*. Technological Forecasting and Social Change, 79(1), 59-68
- Del Gaudio, B. L. (2018). *The financing of Italian shipping firms*. International Research in Economics and Finance, 2(1), 26.
- Dimitras, A. I., Petropoulos, T., & Constantinidou, I. (2002). *Multi-criteria evaluation of loan applications in shipping*. Journal of Multi-Criteria Decision Analysis, 11(4-5), 237-246.
- Drobetz, W., & Tegtmeier, L. (2013b). *The development of a performance index for KG funds and a comparison with other shipping-related indices*. Maritime Economics & Logistics, 15(1), 32-71.
- Drobetz, W., Gounopoulos, D., Merikas, A., & Schröder, H. (2013a). *Capital structure decisions of globally-listed shipping companies*. Transportation Research Part E: Logistics and Transportation Review, 52, 49-76.
- Eichengreen, B., & Mitchener, K. J. (2003). *The Great Depression as a credit boom gone wrong*.
- European Banking Authority. (n.d.). *Interactive Single Rulebook*. Retrieved from: <https://eba.europa.eu/regulation-and-policy/single-rulebook/interactive-single-rulebook/-/interactive-single-rulebook/toc/2>
- European Banking Federation. (2019). *Basel III*. Retrieved from: <https://www.ebf.eu/priorities/banking-supervision/dealing-with-risk/>
- European Parliament (2018). *Non-performing loans in the Banking Union: Stocktaking and challenges*. Retrieved from: [http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/614491/IPOL_BRI\(2018\)614491_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/614491/IPOL_BRI(2018)614491_EN.pdf)
- Federal Reserve System. (n.d.). *U.S. Implementation of the Basel Accords: Basel III Implementation*. Retrieved from: <https://www.federalreserve.gov/supervisionreg/basel/USImplementation.htm>
- Gavalas, D., & Syriopoulos, T. (2014). *Basel III and its effects on banking performance: investigating lending rates and loan quantity*. Journal of Finance and Bank Management, 2(3), 17-52.
- Gavalas, D., & Syriopoulos, T. (2015). *An integrated credit rating and loan quality model: application to bank shipping finance*. Maritime Policy & Management, 42(6), 533-554.
- Gong, S. X., Ye, H. Q., & Zeng, Y. Y. (2013). *Impacts of the recent financial crisis on ship financing in Hong Kong: a research note*. Maritime Policy & Management, 40(1), 1-9.
- Graham, J. R., & Harvey, C. R. (2001). *The theory and practice of corporate finance: Evidence from the field*. Journal of financial economics, 60(2-3), 187-243.

- Grammenos, C. T. (2002). *Credit risk, analysis and policy in bank shipping finance*. The Handbook of Maritime Economics and Business, London: LLP Publications.
- Grammenos, C. T. (2013). *Revisiting credit risk, analysis and policy in bank shipping finance*. In The Handbook of Maritime Economics and Business (pp. 807-840). Informa Law from Routledge.
- Grammenos, C. T., & Arkoulis, A. (1999). *The long run performance of shipping initial public offerings*. International Journal of Maritime Economics, 1(1), 71-93.
- Grammenos, C. T., & Marcoulis, S. (1996). *Shipping Initial Public Offerings: A Cross Country Analysis*. Empirical issues in raising equity capital, 2, 379.
- Grammenos, C. T., & Papapostolou, N. C. (2012b). *US shipping initial public offerings: Do prospectus and market information matter?*. Transportation Research Part E: Logistics and Transportation Review, 48(1), 276-295.
- Grammenos, C. T., Alizadeh, A. H., & Papapostolou, N. C. (2007). *Factors affecting the dynamics of yield premia on shipping seasoned high yield bonds*. Transportation Research Part E: Logistics and Transportation Review, 43(5), 549-564.
- Grammenos, C. T., Nomikos, N. K., & Papapostolou, N. C. (2008). *Estimating the probability of default for shipping high yield bond issues*. Transportation Research Part E: Logistics and Transportation Review, 44(6), 1123-1138.
- Grammenos, C., & Papapostolou, N. (2012a). *Ship finance: US high-yield bond market*. The Blackwell Companion to Maritime Economics, 417-431.
- Helwege, J., Huang, J. Z., & Wang, Y. (2014). Liquidity effects in corporate bond spreads. Journal of Banking & Finance, 45, 105-116.
- Investopedia (n.d.). *Credit cycle*. Retrieved from: <https://www.investopedia.com/terms/c/credit-cycle.asp>
- Investopedia (n.d.). *Underpricing*. Retrieved from: <https://www.investopedia.com/terms/u/underpricing.asp>
- Investopedia. (n.d.). *Covenant*. Retrieved from: <https://www.investopedia.com/terms/c/covenant.asp>
- Investopedia. (n.d.). *Debt fund*. Retrieved from: <https://www.investopedia.com/terms/d/debtfund.asp>
- Investopedia. (n.d.). *Environmental, Social, and Governance (ESG) Criteria*. Retrieved from: <https://www.investopedia.com/terms/e/environmental-social-and-governance-esg-criteria.asp>
- Investopedia. (n.d.). *Master Limited Partnership -MLP*. Retrieved from: <https://www.investopedia.com/terms/m/mlp.asp>
- Kakissis, Joanna. (2018). *Chinese Firms Now Hold Stakes In Over A Dozen European Ports*. Retrieved from: <https://www.npr.org/2018/10/09/642587456/chinese-firms-now-hold-stakes-in-over-a-dozen-european-ports?t=1551038559588>
- Kavussanos, M. G., & Tsouknidis, D. A. (2014). *The determinants of credit spreads changes in global shipping bonds*. Transportation research part e: Logistics and transportation review, 70, 55-75.

- Kavussanos, M. G., & Tsouknidis, D. A. (2016). *Default risk drivers in shipping bank loans*. *Transportation Research Part E: Logistics and Transportation Review*, 94, 71-94.
- Kondratieff, N. D. (1979). *The long waves in economic life*. Review (Fernand Braudel Center), 519-562.
- Kooli, M., & Suret, J. M. (2004). *The aftermarket performance of initial public offerings in Canada*. *Journal of Multinational Financial Management*, 14(1), 47-66.
- KPMG (2018). *Navigating the future: Changing business models. Shipping insights*. Retrieved from: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/11/navigating-the-future-changing-business-models-shipping-insights.pdf>
- KRAVETS & KRAVETS (2014). *The rise and fall of the German "one ship KG" financing model*. Retrieved from: <https://www.kravets.de/kk-report/2014/10/14/rise-and-fall-of-one-ship-kg-financing-in-germany>
- Kuester Simic, A., Lauenstein, P., & Prigge, S. (2016). *Valuation Efficiency of Secondary Markets for Formerly Illiquid Assets: The Case of German KG Ship Funds*. *Multinational Finance Journal*, 20(2), 127-179.
- Ladis, K. (2012). *Ship Finance after the crisis*. Rotterdam: Netherlands Maritime University.
- Law Explorer (2015). *Ship Leasing*. Retrieved from: <https://lawexplores.com/ship-leasing/>
- Lee, K. R., & Pak, M. S. (2018). *Multi-criteria analysis of decision-making by international commercial banks for providing shipping loans*. *Maritime Policy & Management*, 45(7), 850-862.
- Leggate, H. K. (2000). A European perspective on bond finance for the maritime industry. *Maritime Policy & Management*, 27(4), 353-362.
- Li, Y. (2006). *The pros and cons of leasing in ship financing*. *WMU Journal of Maritime Affairs*, 5(1), 61-74.
- Lunde, D. (2019). *Nor-Shipping ought to celebrate finance achievements*. Retrieved from: <https://splash247.com/nor-shipping-ought-to-celebrate-finance-achievements/>
- Macleod, A. (2017). *Business cycles are credit cycles*. Retrieved from: <https://www.goldmoney.com/research/goldmoney-insights/business-cycles-are-credit-cycles>
- Marantidou, V. (2018). *Shipping Finance: China's New Tool in Becoming a Global Maritime Power*. Retrieved from: <https://jamestown.org/program/shipping-finance-chinas-new-tool-becoming-global-maritime-power/>
- Marine Money. (2018). *9th Annual Marine Money London Forum*. Retrieved from: <https://www.marinemoney.com/system/files/media/2018-01/1%20Mia%20Jensen.pdf>
- Markowitz, H. (1952). *Portfolio selection*. *The journal of finance*, 7(1), 77-91.
- McKinsey&Company. (2018). *The rise and rise of private markets*. Retrieved from: [https://www.mckinsey.com/~media/mckinsey/industries/private%20equity%20and%](https://www.mckinsey.com/~media/mckinsey/industries/private%20equity%20and%20private%20credit%20markets/2018/01/private-markets-the-rise-and-rise-of-private-markets)

20principal%20investors/our%20insights/the%20rise%20and%20rise%20of%20private%20equity/the-rise-and-rise-of-private-markets-mckinsey-global-private-markets-review-2018.ashx

Merikas, A., Gounopoulos, D., & Karli, C. (2010). *Market performance of US-listed Shipping IPOs*. Maritime Economics & Logistics, 12(1), 36-64.

Merikas, A., Gounopoulos, D., & Nounis, C. (2009). *Global shipping IPOs performance*. Maritime Policy & Management, 36(6), 481-505.

Minsky, H. P. (1992). *The financial instability hypothesis*. The Jerome Levy Economics Institute Working Paper, (74).

Miron, J. A. (1996). *The economics of seasonal cycles*. Mlt Press.

Mitroussi, K., Abouarghoub, W., Haider, J. J., Pettit, S. J., & Tigka, N. (2016). *Performance drivers of shipping loans: An empirical investigation*. International Journal of Production Economics, 171, 438-452.

Modigliani, F., & Miller, M. H. (1958). *The cost of capital, corporation finance and the theory of investment*. The American, 1, 3.

Nasdaq (n.d.). *Precautionary motive*. Retrieved from: <https://www.nasdaq.com/investing/glossary/p/precautionary-motive>

Oslo Stock Exchange. (2019). *OSLO Shipping Index*. Retrieved from: https://www.oslobors.no/ob_eng/markedsaktivitet/#/details/OSLSHX.OSE/overview

Oxenford, M. (2018). *The Lasting Effects of the Financial Crisis Have Yet to Be Felt*. Retrieved from: <https://www.chathamhouse.org/expert/comment/lasting-effects-financial-crisis-have-yet-be-felt>

Pandya, S., & Tagliapietra, S. (2018). *China's strategic investments in Europe: The case of maritime ports*. Available at: <http://bruegel.org/2018/06/chinas-strategic-investments-in-europe-the-case-of-maritime-ports/>

Petrofin Research. (2018). *Is further consolidation in Greek shipping a positive development?*. Retrieved from: <https://www.petrofin.gr/wp-content/uploads/2018/06/Is-further-consolidation-a-positive-development.pdf>

Petropoulos, T. (2010). *Prospects for New Bank Finance in 2011*. Retrieved from: <https://www.petrofin.gr/wp-content/uploads/2018/04/23rdShipFinanceInvestmentForum-Informa-London.pdf>

Petropoulos, T. (2016). *The development of Private Equity Funds (PEFS), the impact of the shipping crisis and some predictions as to their future involvement in Shipping*. Retrieved from: https://www.petrofin.gr/wp-content/uploads/2018/03/The_development_of_Private_Equity_Funds-Ted_Petropoulos.pdf

Petropoulos, T. (2017). *Who will replace European banks as the primary ship-lending institutions?* Retrieved from: https://www.petrofin.gr/wp-content/uploads/2018/02/Who_will_replace_European_banks_as_the_primary_ship-April2017.pdf

Petropoulos, T. (2018a). *Trends in Greek ships finance: a different mix of finance*. Retrieved from: <https://www.petrofin.gr/wp-content/uploads/2018/10/Ted->

Petropoulos__-Trends-in-Greek-ships-finance_-a-different-mix-of-finance-Nafs-July-2018.pdf

Petropoulos, T. (2018b). *Key Developments and Growth in Global Ship-Finance*. Retrieved from: <https://www.petrofin.gr/wp-content/uploads/2018/09/Petrofin-Global-Bank-Research-and-Petrofin-Index-of-Global-Ship-Finance-end2017.pdf>

Petropoulos, T. (2019). *Key Developments and Growth in Greek Ship-Finance*. Retrieved from: <https://www.petrofin.gr/wp-content/uploads/2019/06/PetrofinBankResearch-Greek-Shipping-Portfolios-end2018.pdf>

Pires, F. C., Assis, L. F., & Souza, C. M. (2005). *An analysis of the Brazilian ship financing system*. *Maritime Policy & Management*, 32(3), 209-226.

Polemis, S. M. (1995). *The history of Greek shipping*. The Poseidon Voyage, available at: www.iffcbano.org/gallery/shippingHistory/TheHistoryofGreekShipping.pdf.

Polleit, T. (2007). *Manipulating the interest rate: a recipe for disaster*. *Mises Daily*, 13.

Pribor, J., & Lind, C. S. (2016). *Public and Private Equity Markets*. In *The International Handbook of Shipping Finance* (pp. 169-189). Palgrave Macmillan, London.

PwC Greece (2019). *PwC: Maritime Industry Faces Series of Challenges Impacting Shipping Finance*. Retrieved from: <https://www.hellenicshippingnews.com/pwc-maritime-industry-faces-series-of-challenges-impacting-shipping-finance/>

Reinikainen, K. (2018). *Outlook 2018: Oslo capital markets continue growth into 2018*. Retrieved from: <https://safetyatsea.net/news/2018/outlook-2018-oslo-capital-markets-continue-growth-into-2018/>

Ritter, J. R. (2003). *Differences between European and American IPO markets*. *European financial management*, 9(4), 421-434.

Rodrigue, J. P., Notteboom, T., & Pallis, A. A. (2011). *The financialization of the port and terminal industry: revisiting risk and embeddedness*. *Maritime Policy & Management*, 38(2), 191-213.

Rokne, L. G., & Lilland, J. P. (2013). *Development of ship financing: a study of the 2008 financial crisis*. (Master's thesis).

Roussanoglou, N. (2018). *Global Shipping Loan Portfolios' Drop to \$345 billion says Petrofin Bank Research*. Retrieved from: <https://www.hellenicshippingnews.com/global-shipping-loan-portfolios-drop-to-345-billion-says-petrofin-bank-research/>

Sambracos, E., & Maniati, M. (2013). *Shipping Market Financing: Special Features & the Impact of Basel III*. Available at SSRN 2337919.

Satta, G. (2017). *Initial public offerings in the port industry: exploring the determinants of underpricing*. *Maritime Policy & Management*, 44(8), 1012-1033.

Satta, G., Notteboom, T., Parola, F., & Persico, L. (2017). *Determinants of the long-term performance of initial public offerings (IPOs) in the port industry*. *Transportation Research Part A: Policy and Practice*, 103, 135-153.

Saul, J., & Jessop S. (2014). *Pension funds take nautical turn in hunt for higher returns*. Retrieved from: <https://www.reuters.com/article/us-pension-funds-shipping-idUSKCN0JH20I20141203>

Schneider S., Schröck G., Koch S. & Schneider R. (2017). *Basel “IV”: What’s next for banks? Implications of intermediate results of new regulatory rules for European banks*. Retrieved from: <https://www.mckinsey.com/~media/mckinsey/business%20functions/risk/our%20insights/basel%20iv%20whats%20next%20for%20european%20banks/basel-iv-whats-next-for-banks.ashx>

Stolen H. (2017). *UPDATE 1-Nordic high-yield debt at record, driven by shipping, real estate*. Retrieved from: <https://www.reuters.com/article/nordics-highyield/update-1-nordic-high-yield-debt-at-record-driven-by-shipping-real-estate-idUSL8N1O10LZ>

Stopford, M. (2009). *Maritime economics* 3e. Routledge.

Teklos, P. (2018). *Investment Funds - An alternative finance vehicle for shipping*. Retrieved from: <http://forums.capitallink.com/shipping/2018cyprus/pppt/panikos.pdf>

The World Bank. (2018). *Belt and Road Initiative*. Retrieved from: <https://www.worldbank.org/en/topic/regional-integration/brief/belt-and-road-initiative>

Ting, Y. U., & Tse, Y. K. (2006). *An empirical examination of IPO underpricing in the Chinese A-share market*. China economic review, 17(4), 363-382.

UNCTAD. (2018). *Review of Maritime Transport*. Retrieved from: https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf

Van Klink, A. (2019). *Shipfinance*. Rotterdam: MEL.

Vovos, I. (2019). *Shipping M&A: Learning points from recent transactions*. Retrieved from: <https://www.hellenicshippingnews.com/shipping-ma-learning-points-from-recent-transactions/>

World Economic Forum. (2019). *Banks launch green charter to help shipping reduce its carbon footprint*. Retrieved from: <https://www.weforum.org/agenda/2019/06/how-banks-are-leading-shippings-green-transition/>

World Maritime News. (2017). *Danish Trio Sets Up USD 300 Mn Ship Investment Fund*. Retrieved from: <https://worldmaritimenews.com/archives/215673/danish-trio-sets-up-usd-300-mn-ship-investment-fund/>

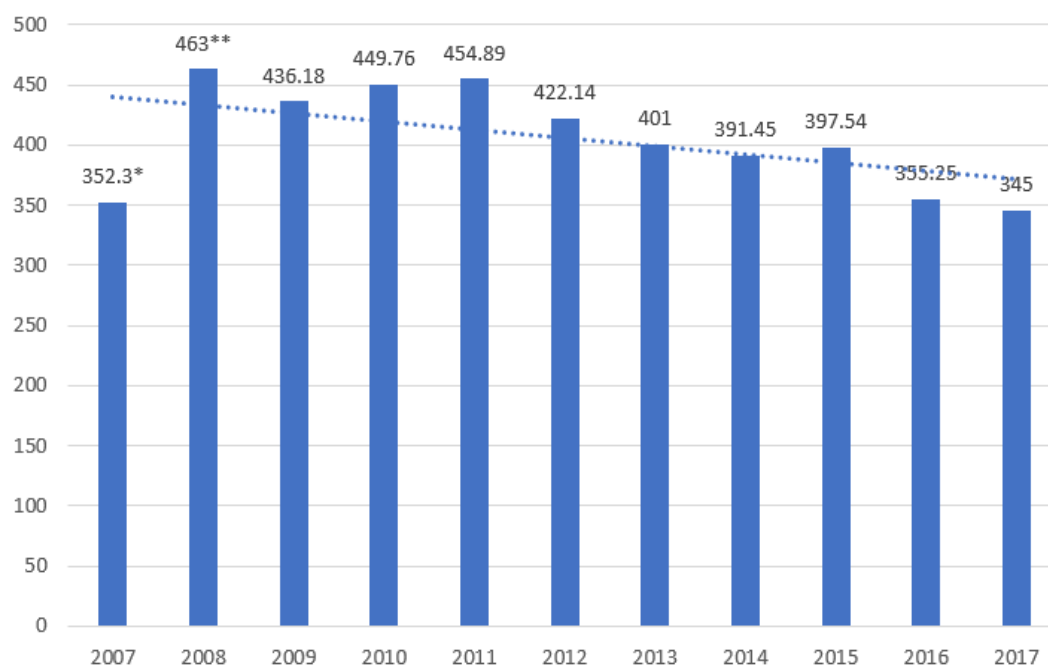
World Maritime News. (2018). *Okeanis Eco Tankers Starts Trading on Oslo Børs*. Retrieved from: <https://worldmaritimenews.com/archives/256301/okeanis-eco-tankers-starts-trading-on-oslo-bors/>

World Maritime News. (2019). *Drewry: 2019 Another Solid Year for Container Market*. Retrieved from: <https://worldmaritimenews.com/archives/268540/drewry-2019-another-solid-year-for-container-market/>

APPENDIX

First Part

Global Shipping portfolios of top 40 banks (in \$ bn)



*Based on 26 banks ** Based on 32 banks

Source: Author's creation based on T. Petropoulos (2018b)

Figure 28: Global Shipping portfolios of top 40 banks (in \$ bn)

PORT	TERMINAL (\$)	SHARE CAPITAL OWNED BY COMPANY
Piraeus (Greece)	Piraeus Container Terminal	COSCO: 100%
Zeebrugge (Bruges, Belgium)	CSP Zeebrugge Terminals NV	COSCO: 85%
Valencia (Spain)	Noatum Container Terminal	COSCO: 51%
Dunkirk (FRANCE)	Terminal des Flandres	CMPort: 45%
Vado Ligure (Genoa, Italy)	Vado Reefer Terminal	COSCO: 40% QPI: 10%
Bilbao (Spain)	Noatum Container Terminal	COSCO: 40%
Rotterdam (Netherlands)	Euromax Terminal	COSCO: 35%
Le Havre (France)	Terminal Nord, Terminal de France	CMPort: 25%
Marsaxlokk (Malta)	Malta Freeport Terminal	CMPort: 25%
Marseille Fos (Marseille, France)	Eurofos	CMPort: 25%
Nantes (France)	Terminal du Grand Ouest	CMPort: 25%
Antwerp (Belgium)	Antwerp Gateway	COSCO: 20% CMPort: 5%

*Source: Author's creation based on J. Kakissis (2018)

Table 5: Chinese companies' share in EU ports

Alternative funding sources that are present in Greek shipping	No of responses	% of total responses
Private Equity	9	16%
Chinese Ship Leasing	12	22%
IPOs	6	11%
Bonds	5	9%
Online investment platforms	5	9%
Japanese funding schemes	3	5%
US ship leasing	1	2%
Syndicated loans	1	2%
Shipping funds	4	7%
Chinese Bank financing	1	2%
ECAs	1	2%
High Net Worth Individuals	1	2%
Mid-market banks	1	2%
Master Limited Partnerships	2	4%
Debt funds	3	5%
Total responses	55	

* Multiple answers were allowed

** Source: Author

Figure 29: Alternative funding sources that are present in Greek shipping

Preconditions that alternative financing sources seek in order to invest in Greek shipping	No of responses	% of total responses
Increased levels of transparency	5	19%
Quality of operator	9	33%
Attractive Yields	4	15%
Marketability of assets	3	11%
Favourable Market conditions	2	7%
Size	1	4%
Sustainability	2	7%
Effective regulatory environment	1	4%
Total responses	27	

* Multiple answers were allowed

** Source: Author

Figure 30: Preconditions that alternative financing sources seek in order to invest in Greek shipping

Second Part: **SURVEY**

ALTERNATIVE SOURCES OF FINANCE IN GREEK SHIPPING

The purpose of this survey is to provide further insights regarding the development of alternative sources of finance in Greek shipping, the relationship between those financing methods and traditional bank financing, as well as the impact of the new financing landscape on the access to capital for the Greek shipping industry.

CONFIDENTIALITY CLAUSE

Please be assured that all the data and information provided during the following questionnaire will be kept in the strictest confidentiality.

Author's signature

Antonios Tsianakidis

Participant's consent

(entering the name is sufficient)

Part 1: Interviewee information

Please indicate your job field within the shipping industry:

- | | | |
|--|--------------------------|--------------------------|
| 1) Bank | <input type="checkbox"/> | Interviewee's name: |
| 2) Shipping company | <input type="checkbox"/> | Company's name: |
| 3) Other ship-finance related business | <input type="checkbox"/> | Position in the company: |

Part 2: Traditional bank financing

1) Do you think that banks will fund again Greek shipping at the pre-crisis levels?

Yes ☐ No ☐

2) If No, then:

Will Greek banks reduce their Greek shipping portfolios by a higher percentage compared to that of foreign banks?

Yes ☐ No ☐

Please explain your answer.

Part 3: Alternative sources of shipping finance

1) Which sources of alternative finance are you aware of in Greek shipping? (you may distinguish between national and international sources of alternative finance)

2) Based on your answer in question 1, which sources of alternative finance do you consider the most important and why?

3) Which are the preconditions that alternative financing sources seek in order to invest in Greek shipping? (for example, focus on a specific market, investment horizon, regulatory environment etc.)

4) If one of your answers in questions 1 and 2 above relates to Chinese financial institutions, please answer the following:

Do you believe that the emergence of the Chinese ship financing is a bubble or the new status quo? In the context of the One Belt One Road Initiative, do you think the rise of China is a threat or an opportunity for the Greek maritime industry?

5) Based on your experience, what is the role of Greek shipping families (High-net-worth families) as alternative financiers of Greek and international shipping?

6) In which specific shipping sectors do you expect the largest presence of alternative finance? (you may choose more than one)

Tanker Bulk Container Gas Other
 (please specify)

Please explain your choice(s).

Part 4: Future relationship between traditional and new sources of finance

1) Percentage of total investments in Greek shipping to which alternative financing methods will be a worthy alternative in the future:

<25% 25% - 50% 50% - 75% 75% -
 100%

Please explain your answer.

2) Alternative sources of finance can effectively cover the bank-lending gap in Greek shipping.

Strongly Disagree Disagree Neutral Agree Strongly
 Agree

Please explain your answer.

3) Do you believe that bank financing will remain the primary source of ship financing?

Yes No

Please explain your answer (for example depending on the specific market in which the shipping company operates, etc.)

Part 5: Implications that the new financing landscape has on the access to capital for Greek shipping

1) Which requirements do alternative financing sources impose on Greek shipping and how do they differ from those demanded by banks?

2) Alternative financing will lead to an increase in the financing costs of shipping companies.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Please explain your answer.

3) The requirements associated with the new financing landscape could potentially restrict access to capital for Greek shipping.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Please explain your answer (for example depending on a: the specific market the vessels of the shipping company operate, b: the size of the shipping company, etc.).

4) Based on your answers in questions 1-3 above, in the context of the new financing landscape:

a) Do you think the Greek shipping will retain its global competitiveness?

Yes

No

b) Will the Greek shipping industry change in terms of (you may choose more than one):

1) culture ?

2) size ?

3) innovation ?

4) other (please specify)?

Thank you

