



International Economics

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**GREEK SHIPPING INDUSTRY
AND ITS DEVELOPMENT**

Abstract

The purpose of this article is to present and discuss empirical results for the shipping sector focusing on the shipping industry in Greece and the position of Greek shipping in the international market. The methodology of the study will be based on the collection of secondary data from articles in journals, books and official websites. Conducting such a research consists of locating, studying, analyzing, criticizing and presenting views and data from published texts.

Greek-owned shipping holds 16% of world commercial capacity while the percentage of Greek Gross National Product (GDP) to the world is 0.4%, which is 40 times less than the percentage of Greek-owned shipping worldwide. Greece faced the biggest economic crisis since World War II twelve years ago and continues to face it today. At the same time, today Greece is facing a new economic crisis due to the Covid-19 pandemic. At this critical moment, the Greek shipping industry, already having a significant contribution to the Greek GDP, could be a key driver of growth by supporting the Greek economy in liquidity, employment, contribution to GDP and investment. This study was prepared in order to evaluate the economic and social benefits of the Greek shipping industry (cluster).

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shipping industry; Gross Domestic Product (GDP); economic crisis; Greek-owned fleet; shipowners; flags; charterers; brokers; bulk cargo shipping; regular line shipping; passenger shipping; shipping cycles; Greek Merchant Navy; Liquefied Natural Gas.

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Introduction

The shipping industry is not immune to the economic downturn. This has had a strong impact on the shipping market. Shipping is the faithful servant of world trade and the lever of economic growth, facilitating an estimated 90% of world trade volume. The 2008 crisis was the largest and most severe recession for the modern merchant in the history of the shipping industry. Fares in key transactions have fallen to almost all-time lows. The crisis has also fueled devastating competition, and not all shipping companies are able to survive. The economic crisis, as well as other factors cause fluctuations in the shipping market, which in the literature are presented in terms of shipping cycles. The shipping cycle is an economic concept that explains how shipping companies respond to supply and demand, as an important feature of shipping activity is the separation between types of shipping cycles – the underlying fluctuations, which can be long or short. In general, market cycles are the driving force behind shipping and chartering investment. It is the heart of the shipping market, of cashing in and out of the shipping business. By forcing companies to compete with each other for a share of this wealth, the market is dragging them in the direction required for more and more efficient use of resources. In fact, «circles» are part of the culture of the shipping industry, to which much time has been devoted by scholars and researchers in the shipping industry seeking to define it.

This article aims to examine the Greek shipping sector in order to obtain data that will contribute to the formation of proposals for its improvement and greater development. The Greek shipping sector is growing but at this stage has to face significant challenges due to developments in the global economy.

Literature Review

According to Mantalis et al. (2016), shipping, by its very nature, is international and is governed by regulations, conventions, decisions taken internationally; it draws resources and funds from the international money market, and is affected by events (military or financial) that take place in various parts of the world and even in the more distant countries. There is also intense competition in shipping and the terms of domestic and international competition are taken into account in the pursuit of maritime policy. Merika et al. (2015) mention the factors that influence the development of shipping distinguishing them into three categories (a) economic, such as national trade, financing, shipbuilding, insurance coverage and competitiveness; (b) geographic, such as islandic nature and natural resources; and (c) historical, such as naval tradition and threats.

According to Pantouvakis et al. (2017), the purpose of shipping, through its usefulness and development, is to create an industry in which many states will be brought together. This is achieved through work and activities so that it can evolve further and increase the division of labor by combating any crisis in the future.

Shipping as a human occupation at sea has a long history, practically since the man turned to it as a food source. However, the sea is very important for Greece because it had a significant influence on the intellectual culture created by the Greeks and thanks to their merchant fleet the Greek civilization was spread all over the world (Goodwin, 2016).

As for the impact of the crisis on the shipping industry, as early as 2018, two of the world's largest banks in maritime financing, Nordea Bank AB (NDA) and DNB ASA estimated that the first signs were beginning that the crisis that has plagued and significantly restructured the shipping industry in recent years was finally coming to an end (Tzamouzakis & Spathi, 2017). Nordea Bank AB (NDA) claimed that the losses from the loans of the shipping companies were reduced by 15% and the operating profits had reached the highest point. Accordingly, DNB announced that the losses caused by the crisis in the wider industry (Shipping, Offshore and Logistics) had decreased significantly by 43%. Both banks concluded that shipping was gradually recovering, as the spread of loans in the wider shipping industry played an important role in helping it, as opposed to banks that abandoned shipping or sold their shipping paper with discount (Papanasiou et al., 2020).

Observing the general state of international shipping since the onset of the crisis, the low prices prevailing in both the value of ships and charters may no longer signal the global economic hardship of previous years, but emphasize the fact that there is a surplus large ships. However, both the recovery of the global

economy and the recovery of world trade are not expected to improve rapidly in the coming years (Goodwin, 2016).

The emergence of the global economy and shipping from the crisis does not necessarily mean the resumption of their period of rapid growth (Bissias & Kapetanakis, 2018). Nevertheless, the development and the course of the shipping sector in the world (but also in the Greek case) will depend, on the one hand, on the course of recovery of the international economy and international trade, on which it is directly dependent and, on the other hand, on the course of implementation of major orders for shipbuilding assigned to major shipyards worldwide. While the future forecast for shipping is positive, as there is a significant increase in revenue, it will still take several years for it to fully recover and return to pre-crisis data.

The shipping industry contributes significantly to the improvement of the balance of services, the trade balance and the balance of payments of the country as well as to the fiscal sector, through taxation and tax revenues from shipping (Fafaliou & Aroni, 2016). Regarding the balance sheet, exports and capital inflows from the shipping activity of Greece exceed the outflows, contributing positively to the balance of payments (Goulielmos, 2007). In the financial sector, on the other hand, it is important to contribute to the national economy through taxes imposed on shipping companies and employees in the shipping industry, as well as other tax revenues derived from them (Bissias & Kapetanakis, 2018).

Development of the Greek Shipping Industry

The uniqueness of the Greek shipping example lies in the fact that in the difficult and demanding conditions of both the 19th and, above all, 20th century a small island nation of a few million inhabitants in the eastern corner of the Mediterranean managed to build and operate one of the largest merchant fleets globally, competing with economic giants of the time such as Japan, USA, Britain and Norway (Kampalampidis, 2018).

The astonishing growth of the Greek shipping industry during the post-war period can easily be demonstrated by the available quantitative data. In 1938, just before the outbreak of World War II, the Greek-owned fleet reached a total capacity of 1.8 million GRTs. In 1949, a few years after the end of the war, the fleet's capacity increased to 2.4 million cubic meters, reaching an astonishing 50.6 million cubic meters in 1976, with Greek shipowners emerging as the strongest players in the field of the global shipping industry (Bissias Kapetanakis, 2018).

It is worth noting that even today, at the end of the second decade of the 21st century, the Greek-owned fleet remains the largest in the world both in terms of total capacity and displacement tonnage, although in absolute numbers

it has fewer ships compared with, for example China or Japan. Indicatively, Greek shipowners at the end of 2018 remained first in tankers, second in bulk dry cargo ships and second in liquefied natural gas transport ships (Papathanasiou et al., 2020).

According to official data from December 2018, the Greek-owned fleet numbered a total of 4,995 ships, while the international valuation company *Vesselsvalue.com* estimated that the value of the Greek-owned merchant fleet in August 2018 reached \$111 billion. Thus, today Greek shipowners have the largest seafaring merchant fleet in the world, which is essentially the backbone of global merchant shipping (Papathanasiou et al., 2020).

Thus, the question is this: how did the Greek shipowners manage to occupy this dominant position in the hierarchy of the global shipping industry? The answer to the question should not be sought only in the «maritime nature» of the Greeks or in what we have learned to call «their marine DNA». On the contrary, as historical research has shown in the archives of the great and historical Greek naval sites, Spetses, Kefalonia, Hydra, Chios, Syros, Kos, etc., Greek maritime sovereignty should be sought in the basic business strategies and values on which Greek shipowners have chosen to build their maritime wonder since the 19th century and culminating, of course, in the 20th century (Harlaftis & Tsakas, 2019).

What were these strategic choices and values of the Greeks? The creation of a global network of offices and agencies, the staffing of their businesses based on kinship and common place of origin, the use of Greek crews on their ships, access to international shipping and financial centers, specialization in the transport of bulk goods, use of various flags, direct access to charterers, the choice of the traditional business model of the market and the operation of second hand ships, and of course the timeless business principle of Greek shipowners, which stipulated to «buy cheaply and sell expensively» (Papathanasiou et al., 2020).

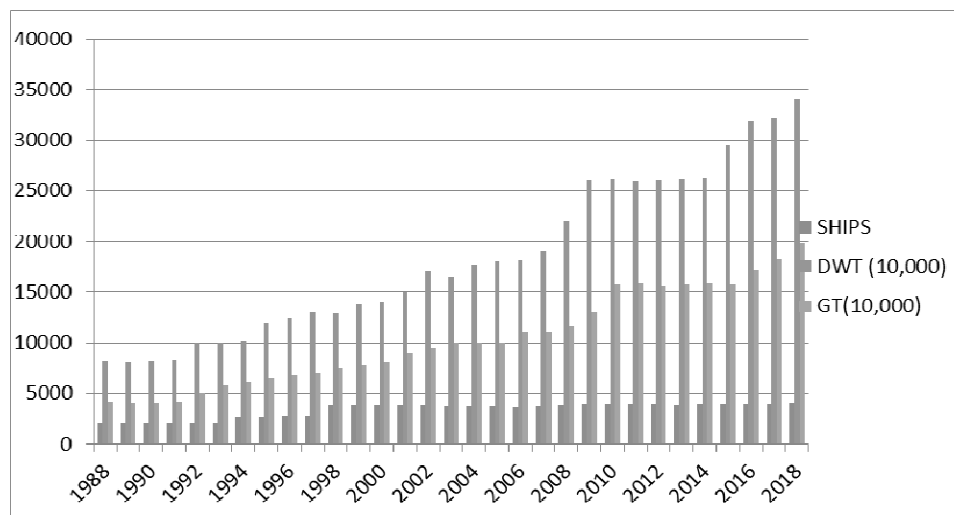
It is a great challenge for the shipping miracle of Greek shipowners and sailors of the 20th century to become better known to the general public to get to know or reread the unique history of Greek shipping of the 20th century and to feel proud of the past and the present of Greek shipping (Lagoudis & Theotokas, 2007).

According to the annual statistics of the Greek Shipping Co-operation Committee, which comes from the IHS Markit analysis company and concerns Greek-owned ships with a capacity of more than 1,000 GT, regardless of flag, the Greek-owned fleet continues to grow in DWT and GT terms (Bissias & Kapetanakis, 2018).

Specifically, on March 19, 2018, the fleet consisted of 4,148 ships of various classes, with a gross tonnage of 199,286,013 GT and a carrying capacity of 341,925,357 DWT. Compared to March 2017, the number of Greek-owned ships increased by 63 ships. The gross tonnage and carrying capacity of ships increased significantly, by 6,855,494 GT and 13,161,590 DWT, respectively (Papathanasiou et al., 2020).

Figure 1

Greek controlled fleet 1988-2018



Source: Papandreou, K. (2019).

In terms of registration, Greek-owned ships carry 41 different flags. Two open registrations appear to be tied for first place, as 19% of Greek-owned ships (824 ships) carry the flag of Liberia, and 19% also carry the flag of the Marshall Islands. The flag of Greece follows with 723 ships with a total capacity of 74,537,350 tons, the flag of Malta with 694 ships, Panama with 355 ships and Cyprus and the Bahamas with 274 and 247 ships, respectively. Compared to last year's data, there has been an increase in ships that chose the flag of the Marshall Islands, Liberia, Cyprus and Malta, while a decrease was recorded in the Greek flag by 24 ships, with a carrying capacity of 672,557 DWT and a gross tonnage of 317,788 GT. The share of the Greek-owned fleet in the world fleet is 7.6% in the number of ships, 13.8% in gross tonnage and 16.4% in terms of carrying capacity. Greek-flagged ships in terms of number of ships, GT and DWT represent 1.3%, 3% and 3.6%, respectively, of the global fleet (Pantouvakis et al., 2017).

The Aim of the Article

The purpose of the article is the analysis of the competitiveness of Greek shipping sector in the international services market and development of the proposals for maintaining (strengthening) its world leadership.

Methodology

The methodology of the study will be based on the collection of secondary data from articles in journals, books and official websites. Conducting a secondary research consists of locating, studying, analyzing, criticizing and presenting views and data from published texts.

Empirical results and discussion: Shipping Sector

The shipping market (shipping industry) is essentially made up of four sub-markets that have undertaken the difficult task of maritime transport. The first is the freight market, the second is the sale and purchase market, the third is the newbuilding market, and the fourth is the one that trades in framework of the demolition market.

More specifically, the shipping market is dominated by shipowners, charterers and brokers, who are also the providers of tax revenues, i.e. the source of the capital required by the shipping company (Thanopoulou, 1994). In addition to the above, the freight market extends to the derivatives market, through which shipowners have the ability to offset the business and the risk arising from tax fluctuations (Slack, Comtois & McCalla, 2002).

In the used ship market, shipowners either as buyers or as sellers complete their transactions with the cooperation of shipbrokers. The prices are dynamically formed, since they are determined by the respective supply and demand, bringing significant revenues to the shipowner. Important factors in this market are the specifications desired by the potential shipowner, the agreed delivery time, the terms of payment and the amount of funding. The prices of the newly built ships are proportional to the size, while in the long run they seem to follow a certain range.

Finally, the Scrap market deals with old ships, which their owners can no longer use, so they sell them for sale (Fayle, 2006). A solicitor buys the obsolete ship in order to benefit from the exploitation of the steel and other equipment of the ships. The prices of the materials are formed by their age, their general condition and by the level of demand that appears for the scrap (used – useless material, often available for reuse).

The above markets coexist and operate within the required funds. They offer significant facilities to their members, opportunities for profit, flexibility in their strategies and consequently allow the shipping company to develop its competitiveness (Sys, 2009).

The structure of the shipping industry is determined by all the sectors that shape it, by the different types of ships and by the type of cargo they carry. According to Vlachos (1999), the main categories in shipping are bulk cargo shipping, regular line shipping and passenger shipping. The first category includes companies that transport dry cargo, liquid cargo or cargo with dangerous or special specifications. In the category of regular lines, ships are able to transport cargo differently from each other, with strict conditions regarding delivery time, itinerary and required fares. Loads carried along these lines are sometimes 'loose' and sometimes 'boxed', liquid, refrigerated or heavy (Fafaliou et al., 2006).

In passenger shipping, the characteristic of companies is the fluctuation of demand and the appearance of demand production. The latter comes from the demand for other services primarily, which lead to the need for shipping services or benefits.

In the shipping industry, the basic categorization refers to the following types of operations (Vlachos, 2011).

- Shipowners: companies based in the global or domestic market that own ships, which are exploited exclusively.
- Management companies: which, in exchange for a pre-agreed fee, undertake the smooth economic and operational course of the ships, by implementing the required strategies and tools.
- Brokerage firms: in this category there are charter brokers, freight brokers, insurance, sales, procurement, spare parts and generally companies that mediate for various shipping services at sea.
- Exploitation and distribution companies: their object is the resale of fuel and lubricants for ships.
- Supplier companies: deal mainly with the supply of spare parts, materials and consumables for ships.

- Ship manning and staffing companies: undertake the selection, evaluation and wider manning of the ship, as well as any kind of negotiation on the contracts and agreements with the crew.
- Shipping Agents: their object is the transport of cargo and all that it entails, such as cargo, invoices, agreements, charters, payments, etc.

According to research by Haralambides (2007), the main features of the Naplio market include, among other things, the periodicity and cyclicity of the fluctuations of all the economic variables associated with it. At the study level, economists internationally analyzing this industry argue that both in the long run and in the medium and short term, special phenomena and cyclically occurring conditions are formed, which concern sizes such as the total product, the price level, unemployment, the pre labor demand and more.

In particular, in the long run and with a duration of about fifty years, the time required for the transition from maximum to minimum values is between thirty and fifty years. At the medium term, the investments and the cycle that they write off over a period of ten years in the industry are examined. In the short term, circularity is linked to the trade cycle of the industry and lasts from three to four years.

The above three cases are also referred to as shipping cycles, favoring the systematic ways in which the balance between supply and demand occurs. The formation of such a cycle depends on variables in both the internal and external environment of the shipping company.

After all, in the industry in general, the influence of such factors is observed, which is due either to political, technical, economic, global changes and conditions and is not easy to analyze. Such factors are observed in the long-term cycle. On the contrary, it is easy to examine and evaluate the factors associated with short-term crises.

In addition to the above two types of marine cycles, there is also the seasonal one, which is analyzed on an annual basis and concerns the seasonal demand for maritime transport. Based on the above, a typical shipping cycle is completed in four phases: malnutrition, rejuvenation, bliss and recession (Benacchio et al., 2007).

Shipping circles are particularly interested in the analysis of the industry, but also in the understanding of the overall market mechanism. However, the irregularity of circularity prevents the prediction of cycles.

A shipping company operates within a dynamically changing environment with global influences. This globalized character of the shipping market creates the complexity and particular dynamics of the industry.

Other special features are the shipping demand derivative, the difficulty of forecasting, the great distance between the production unit and the management

center, the intense competition, the difference in the size of the companies, the choice of immediate performance strategies and the flexibility in shaping variable costs. In addition, peculiarities for the industry and the general environment in which the shipping company operates include the high working capital required, the diversity and the different nationality of the human resources, the geographical dispersion of the enterprises, the ship's insurance premiums and the risks associated with charter fluctuations.

In particular, a shipping company derives its production rates from the global market, while providing their services in the same market (Grammenos & Choi, 1999).

With regard to derivative demand, this means that the demand for shipping services is directly dependent on the wider economic conditions in the industry. This is because it is observed that in recessionary periods the demand is limited, resulting in strong fluctuations in the freight markets.

Furthermore, it becomes difficult to predict the above demand, as the volatile external environment of the shipping industry creates conditions that make it difficult to make decisions and draw up strategies.

Regarding the existence of a distance between a production unit and an administrative center, i.e. a ship and an office, it causes an even greater restriction on the application of administrative models, human resource management and the organization and operation of the shipping company (Goulielmos, 2004).

Another special feature of the maritime environment is the coexistence and competition that develops between companies of different sizes, management methods, strategic and operational models. This means that all companies, from the smallest to the largest, have to deal with the flexibility, potential, prospects and portability of the same global shipping market (Fayle, 2006).

The characteristics of the shipping industry are also affected by the formulation of strategies that aim at immediate performance, a fact that also marks the relative pricing of the services provided. Especially when fares are low, a shipping company often makes the decision to buy a new ship at this time. The opposite is true in the case of fare increases, when shipowners prefer to sell part of their fleet (Goulielmos, 2004).

The last feature of the shipping company is the flexibility in dealing with market changes. This refers to its ability to change its strategy every time it sees an opportunity or notices a negative development in the market. Flexibility is mainly based on the ability to reduce operating costs, by changing the flag, by staffing with more economical staff, by reducing the ship's speed, and by implementing business and administrative models based on predetermined goals (Lun et al., 2010).

Research Results: Development of the Shipping Industry in Greece

Today, shipping is very important for Greece. It is responsible for 6.5% of GDP, employs about 290,000 people (7% of the workforce), and represents 1.6 / 3 of the country's trade deficit.

The table below shows the number of ships and their capacity for the years 2016-2018.

Table 1

Number of ships and their capacity for the years 2016-2018

Ship Classes	2016		2017		2018	
	Number of ships	GRT	Number of ships	GRT	Number of ships	GRT
Cargo ships	473	15.458.267	441	13.934.876	427	13.320.602
Tankers	522	27.800.582	529	29.667.703	518	29.168.180
Passenger	613	1.363.379	626	1.345.752	648	1.377.622
Other	238	70.344	246	86.131	262	92.411
Total	1.846	44.692.842	1.842	45.034.462	1.855	43.958

Source: Papandreou, K. (2019).

The table above shows a gradual decrease in ships carrying goods such as cargo and tankers while on the contrary those carrying passengers show an increase. This shows an upward trend in ships serving touristic purposes over commercial ones.

The dynamics of the Greek Merchant Navy, from ships 100 KOX and above, in May 2015 compared to the dynamics of May 2014, showed a decrease of 2.2% compared to a decrease of 2.6% that occurred during the corresponding comparison of the year 2014 to 2013

The Total Capacity of the Greek Merchant Navy, from ships 100 KOX and above, in May 2015 in its comparative analysis with the capacity of May 2014, increased by 0.2%, while an increase of 0.9% was presented in the corresponding comparison of the year 2014 to 2013 (Fafaliou et al., 2006).

The following table shows Greece's foreign exchange earnings from shipping (in € million).

Table 2

Greece's foreign exchange earnings from shipping (in € million)

Year	Inflows	Outflows	Net Receipts
2017	13.130	6.258	6.872
2018	9.968	5.430	4.538
2019	7.814	4.453	3.361

Source: Papandreou, K. (2019).

The above table shows that Greece's net income from shipping shows a significant decrease from 2017 to 2019. Shipping, despite all the above negative developments, is still one of the two pillars of the Greek economy, because for decades offers steadily to the Greek economy in various ways, promoting the country's profile internationally. In addition, inflows from shipping to the balance of payments amount to approximately 136 billion euros for the years 2007-2016. That is 16% more than the other important economic sector, tourism, which contributed around €117 billion over the same decade. The shipping industry employs about 200,000 people (Hellenic Shipowners Association, 2017).

The contribution of the Greek shipping industry to the Greek GDP

There is no doubt about the power of Greek-owned shipping, which is characterized as an overdeveloped force for the Greek domestic data. For a decade (2009-2019) Greek-owned shipping is the main service sector which contributes more to the Current Transaction Balance of the Greek economy through the Services Balance. The annual course curve of shipping receipts is the one that affects the fluctuations in the receipts of the Balance of Services. The parallel course of the two figures proves that the receipts of shipping are the main factor of dependence of the total receipts of the Balance.

The activity of Greek-owned shipping, as an export of service is part of the Gross Domestic Product. The presentation of its receipts over a decade and their comparison with the amounts of Gross Domestic Product of those years will give us the importance of its activity. The methodology followed for the compilation of the table was the receipt of the annual amounts in millions of euros of the Gross Domestic Product by the Hellenic Statistical Authority (ELSTAT) and the research of the annual receipts of the Greek-owned shipping through the ELSTAT service accounts.

Table 3

Shipping Receipts as a percentage of GDP

YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018
GDP according to ESA	199.013	217.831	232.831	233.198	231.081	222.151	208.532	193.347	182.054
Shipping Receipts	12.953	13.280	15.679	17.624	12.262	14.013	12.711	11.761	10.672
Rate	7%	6%	7%	8%	5%	6%	6%	6%	6%

Note: source of statistics is ELSTAT, data in millions of euros.

The last eight years are a reasonable period of time to obtain a substantiated view of the percentage of GDP represented by Shipping receipts. It is a time period with several fluctuations, with the two years 2012-2013 GDP growing, in 2014 falling and from 2015 to 2018 it remained stable at 6%. However, in contrast to GDP data, in 2015 and 2016 Shipping revenues stabilized and although they had been declining marginally in the previous years, their decrease had nothing to do with Gross Domestic Product.

The activity of shipping and its revenues, certainly play a decisive role in the Greek economy and could be the springboard towards the economic recovery of the country. Shipping seems to be an industry that can contribute to the development of Greece's production capacity and boost economic growth. In recent years, the industry's contribution to the domestic economy has often been highlighted in political and economic debates. Certainly, the percentages of the Shipping receipts are particularly high, ranking it in the two most important sectors of the Greek economy together with tourism.

The position of Greek shipping in the international market

The Greek leadership is reaffirmed by this year's ranking of the most reliable and famous list compiled by Lloyd's. The only country that appears to have the largest shipping power from China is, according to the Lloyd's List, Greece: 12% of the list of the most powerful people in shipping comes from the country of the Dragon, while 14% (15 representatives) from Greece. Ranked in the third place are Britain (10%), followed by Norway (8%), the United States (7%), Korea (6%) and Germany (5%). It is worth noting that China's influence is slightly lower

than in the 2017 list, due to the turmoil caused by the Sino-US trade war. In contrast, Greeks appear to be expanding their influence and leading the industry, which is going through a critical transition period, both because of new environmental regulations (marine ballast management, new desulfurized fuel IMO 2020, targets for a drastic reduction in CO2 emissions until 2050), as well as because of the Greek business spirit, which manages to be ahead of developments and even turn a crisis into an opportunity.

According to the Lloyd's List that is an international reference point for industry, Greek shipowners remain the largest force in the global shipping industry and continue to «teach» how one can win even in the downward market cycle. Regarding the Greek presence, special mention is made of the dominance movements in the new market of LNG made by the shipowners Giannis Angelikousis, George Prokopiou and Panagiotis Livanos, in the rapidly growing Star Bulk, led by Petros Pappas, but also in Capital Group with the strong dividend yields of Ev. Marinakis. In addition, the list notes the know-how that Angeliki Frangou and George Oikonomou continue to display as the leaders of some of the largest listed shipping companies. According to data compiled by Vessels-Value, the 16 Greeks on the list have a fleet of 1,058 ships of all types (dry cargo ships, tankers, liquefied petroleum gas tankers, drilling ships, and containers) with a total value of \$38.187 billion.

In general, there are 839 Greek ships recorded in the Greek register with a capacity of 80.4 million tons, covering a percentage of 20.6% of the total capacity of the Greek-owned fleet, while. According to Lloyd's Register and the Greek Commission London Maritime Cooperation, this is followed by Liberia with 739 ships of 54 million tons and 18%, the Marshall Islands with 697 ships with a capacity of 54.8 million tons and 17%, Malta with 606 ships with a capacity of 48.5 million tons and 15%, Panama with 398, capacity of 25,200,000 tons and 10%, Cyprus with 253 ships of 17,600,000 tons and 6%, and the Bahamas with 243 ships, 17.5 million tonnes and 6% (Fayle, 2006).

Liquefied natural gas (LNG) in Greek shipping

Liquefied natural gas (LNG) gives new possibilities to Greek shipping. In particular, seafaring is able to take advantage of new trends in the global market, as half of the LNG ships built recently are Greek. Statistics show that Greek shipping controls 9.1% of global LNG capacity this year, up from 7.4% last year. In terms of the number of ships, Greek companies operate 140 LNG ships out of a total of 1,512 ships worldwide. In addition, the Greeks had the first place in terms of the Northern Passage, as a few months ago a Greek-owned ship LNG made the voyage from Europe to Asia, passing through the Arctic Circle (Zouroudi, 2018).

As for natural gas, its use as a fuel for ships will significantly reduce emissions, but at the same time it will need a new generation of engines and ships that can use it. For this reason, Greece gives priority to marine fuels, in the framework of the European Directives. In addition, recently the EU presented its guidelines for the development of alternative fuel networks, which include the LNG. Specifically for Greece, the use of LNG in shipping would reduce dependence on oil, with beneficial effects on the national economy, as long as gas prices remain competitive. However, in order for Greece to exploit LNG, investments will be needed in the ports, in order to make gas available as fuel for those ships that will choose it in the future (Strantzali et al., 2018).

Conclusions

According to what was recorded, one of the strongest and most important naval states in the world is Greece, where merchant shipping and tourism are the pillars of the national economy, as the Greek-owned fleet for many years holds the first place in the world. Shipping, today, is the most important industry in Greece (worth 251.1 billion euros in 2018). It accounts for about 6% of GDP, employs about 300,000 people (7.5% of the workforce) and shipping tickets account for about 1/3 of the nation's trade deficit. The Greek Merchant Navy in 2018 handled, in terms of capacity, the largest merchant fleet in the world, with a total DWT of 334,649,089 tons and a fleet of 5,226 ships, according to Lloyd's List. Greece also ranks at the top for all types of ships, including first for tankers and bulk carriers. In the first months of 2017, Greek shipping successfully faced the crisis and, of course, the Greek-owned fleet of 5,272 ships, valued at about \$86 billion, is still the largest in the world, based on Gross Tonnage. One of the most extroverted sectors of the Greek economy is shipping.

Based on the favorable results of Greek shipping in 2018, the Ministry of Shipping and Island Policy will continue to seek to create competitive conditions at national and international level for the long-term maintenance of Greek shipping in the first place in the world, focusing on the development of competitiveness, digitization, security and protection of the gas and marine environment, in full harmony with the strategic objectives of the EU and IMO maritime policy but also the requirements of the National Economy.

A basic condition for maintaining and improving the share of Greek shipping internationally is the maintenance and improvement of its competitiveness, which has been tested by the crisis. The reduction of the competitiveness of the Greek shipping will result in the reduction of the inputs in the Greek economy. The factors that determine competitiveness depending on the shipping industry are various, but a common factor of all industries is the ship and the services it offers, combined with its quality and staffing costs. Greek-owned shipping, due to

its size, requires extensive experience and knowledge at the international level, therefore, there are some suggestions for this. Greece can become an International Shipping Center with development policies to produce new wealth. A single Ministry of Shipping can be created, which will have a clear structure and responsibilities, like the Coast Guard (today it is fragmented). The tax regime of shipping must be reviewed in its entirety. Government must support Greek shipping and encourage registration or re-registration in the Greek register ships of Greek and other interests. Development measures include the modernization of the institutional framework, the elimination of bureaucracy, the upgrading of public sector services.

In the context of the reorganization of the Greek banking system, the banks should not avoid their important role in financing the Greek shipping. As part of a national development policy, the role of Greek banks in financing shipping should not be reduced, covering any gaps left by foreign banks.

The upgrading of the public maritime education system should provide for the retraining of existing teaching staff, especially on newly built ships. In the context of the activation of the NSRF, maritime education and training should not be ignored.

The development of Greece as a starting point of the cruise in the Mediterranean with simultaneous development of all land infrastructure should be one of the priorities. Drawing up a national development strategy of the Greek-owned fleet in the Aegean, as an area of special national importance, in order to preserve national interests should be another.

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