

The Greek maritime transport industry and its influence on the Greek economy

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1. Introduction

The global maritime industry is of great importance for the global economic activity as 80%* of global merchandise trade by volume is transported by sea. The Greek shipping industry has a prominent position in global maritime transports. The Greek-controlled fleet (i.e. vessels whose owners are Greek citizens, regardless of the flag of the vessel) is ranked first globally regarding international merchant fleet capacities, accounting for 16.16% of the world's total transport capacity. The Greek shipping industry is one of the key pillars of the Greek economy and along with tourism constitutes its two most significant export sectors. This great asset has a significant contribution to the Greek economy. In the period 2000-2013, annual net receipts from maritime transports accounted for 3.7% of Greek GDP on average, covering 16.6% of the annual imports of goods. In comparison, annual net receipts from the tourism industry accounted for 4.2% of Greek GDP on average in the same period, covering 18.9% of imported goods. The total value added of maritime transport to the Greek economy, taking into account both the direct contribution and the indirect impact to other sectors, such as law services, real estate, logistics, insurance and refineries, is estimated at more than 7.0% (direct and indirect) of 2012 GDP, providing employment to 192 thousand employees.

In the following sections, we report the main developments of the Greek-controlled fleet, the evolution of Greek maritime transport receipts and the prospects of the main factors affecting those receipts. Subsequently, we make an estimate of the future path of freight rates. Then, based on those estimates and on growth trends of the size of the Greek fleet, we project future net maritime transport receipts when trickle into the Greek economy.

Our baseline scenario points to an annual growth rate of net receipts equal to 18.8% in 2014 and 18.9% in 2015, accounting for 4.9% of GDP and 5.7% of GDP in 2014 and 2015, respectively.

2. Main trends of the Greek-owned fleet

2.1 Ownership and its evolution

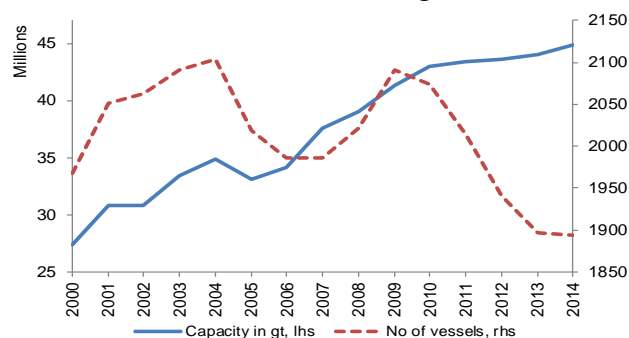
Despite volatile international freights, bank lending restrictions and the fact that the Greek economy in 2013 was running its sixth consecutive year of recession with a 25% cumulative decrease of the gross domestic product, the Greek maritime industry remained particularly competitive, showing an impressive performance in terms of numbers, age and size. Table 1 shows that Greeks control 16.16% of the world fleet in terms of capacity, regardless of the flag of the vessels. In 2013, they maintained 3,669 vessels which correspond to a total capacity of 261.63 million deadweight (dwt) (Table 1).¹ The Greek-controlled fleet, having remained in the second ranking globally since 2008, now precedes Japan. Dry bulk vessels and crude oil tankers aggregate to more than 80% of the total capacity of the Greek owned fleet.

The Greek flag fleet (i.e. ships over 1000 gross tonnage registered in the Greek national registry, see note in Table 1) in 2013 accounted for 802 vessels, ranking seventh internationally and second in the EU. The fleet under the Greek flag represents 28.5% of the total capacity of the Greek owned fleet². Figure 1 illustrates the evolution of the Greek flag fleet. As can be seen, the capacity of vessels increased over time, while the number of vessels declined, as a result of substitution of old vessels with new, larger ships.

One of the main disadvantages of the Greek shipping sector over the past years was the old age of the fleet. Several factors contributed to the renewal of the fleet since 2004. New environmental rules and increased international demand for transports due to the boom of the global trade led Greek

shipowners to take advantage of their dominant position in the sector and invest in new ships. This is evident in the data of purchases and sales of ships in the trade balance (Figure 2). Note that the information presented in Figure 2 is based on transactions made through Greek banks or banks with presence in Greece, pertaining to shipping companies established in Greece or with presence in Greece, which may control vessels under the Greek or any other flag. Therefore, the data may not accurately represent the total purchases and sales activity, given the companies' access to the international financial system. Eventually, the average age of the fleet declined gradually to 9.9 in 2013 from more than 15 in 2000, reflecting not only the investment in new ships, but also the sale and rising scrapping trend of older vessels.³ The average age of the world fleet was 12.4 years in 2013.

Figure 1
Evolution of the Greek flag fleet



Note: the Greek flag fleet refers to vessels registered in the Greek national registry. The difference with the Greek-controlled fleet is that the latter refers to vessels whose owners are Greek citizens, regardless of the flag of the vessel. Also, the capacity of the Greek flag fleet (left hand size axis) is measured in gross tonnage (gt), which is a measurement for the internal volume of a ship.

Source: ELSTAT

Table 1
Greek-controlled shipping
2013

| | Greek (% of Greek total in parenthesis) | World | Greek as % of world |
|--------------------------------|--------------------------------------------|---------|---------------------|
| Capacity in million dwt* | 261.63 | 1,619.0 | 16.16% |
| of which: | | | |
| Ore & Bulk carriers | 132.88 (50.8%) | 717.9 | 18.51% |
| Crude Oil Tankers | 82.28 (31.5%) | 352.8 | 23.32% |
| Chemical & Product Tankers | 46.47 (17.8%) | 336.5 | 13.81% |
| Average Age of the Greek fleet | 9.9 | 12.4 | |

* abbreviation for deadweight, a measure of how much weight a ship can safely carry

Note: Data refer to merchant vessels in excess of 1000 gross tonnage (a measurement for the internal volume of a ship). Also, data refer to vessels owned by Greek companies around the world. The difference with the Greek flag vessels is that the latter refer only to those vessels registered in the Greek national registry.

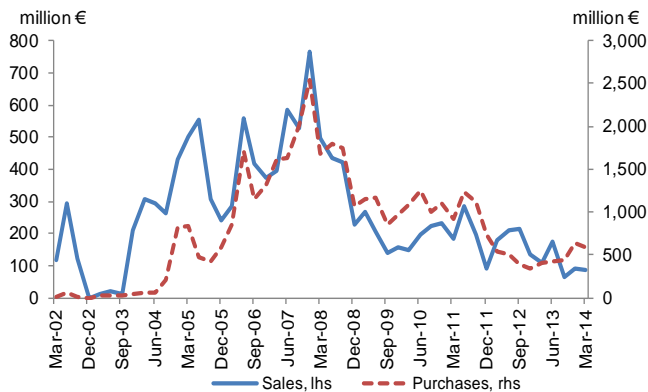
Source: Eurobank Research calculations based on data from the "Annual Report 2013-2014" of the Union of Greek Shipowners

¹ According to data from the Annual Report 2013-14 of the Union of Greek Shipowners. Vessels with capacity less than 1,000 gross tonnage are not included.

² According to data published by UNCTAD in the Review of Maritime Transport, 2013

³ Petrofin Research, "2013-Research and Analysis: Greek shipping companies", October 2013

Figure 2
Sales and purchases of ships in Greece



Note: data are derived from the trade balance data from the Bank of Greece. Thus, data are based on transactions made through Greek banks or banks with presence in Greece and, therefore, may not accurately represent the total purchases and sales activity, given the Greek shipping companies' access to the international financial system.

Source: Bank of Greece

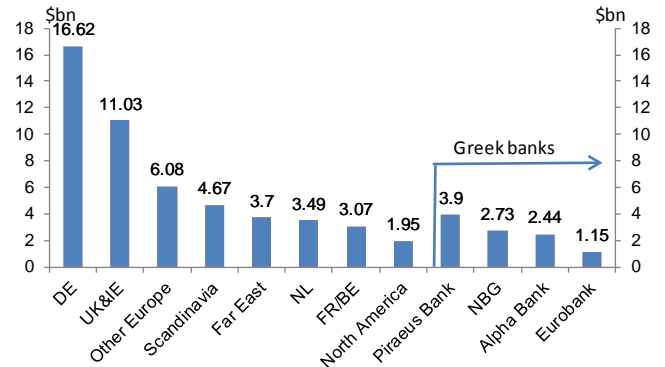
2.2 Financing of the Greek shipping industry

In recent years, financial constraints have been a major hurdle for the shipping industry, as reduced liquidity and the need of restructuring have led European banks to shrink their portfolio in shipping finance. At the same time, US and Chinese banks increased their financing to maritime business. Yet, Chinese banks do not have significant expertise in shipping financing. As a result, the loan appraisal process is time consuming, while financing is limited to big and well-known companies. In addition, ship building in Chinese shipyards is a prerequisite for financing by Chinese banks.

Figure 3 illustrates the access of Greek shipowners to international finance. Greek bank shipping portfolios (including drawn and committed but undrawn loans) amount to \$10.2bn as of end 2013, a decrease of 37.9% relative to their peak value at end 2008. International banks with a Greek presence account for half of total loans to Greek shipping (\$61.5bn), standing at \$30.7bn. These loans show a constant decline in five consecutive years ending in 2013. On the contrary, loans from banks with no presence in Greece exhibit an increase for five years in a row, standing at \$20.3bn at end-2013. The increase of loans from international banks without a Greek presence is to a large part attributed to a surge in financing from Chinese banks.

Looking ahead, dependence of Greek shipping on financing from non-European banks and the private equity sector will likely increase, as several European banks have decided to reduce their shipping portfolio or exit ship finance altogether, such as Commerzbank and Natixis. Commerzbank in particular, has been a traditional lender to Greek shipping, ranking third in terms of market share in the Greek shipping portfolio (6.5%), after RBS (14.4%) and Credit Suisse (9.3%).

Figure 3
Bank lending of Greek shipowners
(outstanding amounts as at end 2013)



Note: DE: Germany, IE: Ireland, NL: Netherlands. FR: France, BE: Belgium, NBG: National Bank of Greece

Source: Petrofin Research

2.3 Newbuilding orders by Greek owners

As of April 2014, outstanding newbuilding orders by Greek owners amount to 495 vessels (about 10.0% of the world orderbook).⁴ Of these vessels, 222 are bulkers corresponding to about 13.5% of bulkers' world tonnage on order (Table 2, Panel a). The data confirms the conclusion of the annual report 2013-2014 of the union of Greek Shipowners⁵ that the orderbook of Greek shipping over the past few years indicates a diversification to specialized ships, such as LNG vessels, containerships as well as offshore platforms and drilling ships.

2.4 Developments in freight rates

Freight rates in shipping are driven by demand and supply. On the demand side, the maritime industry is directly linked to global trade, given that 80%⁶ of the world's goods are transported by sea, more than half of which being dry bulk cargoes. This makes maritime transport a cyclical sector, following closely the economic cycle of world booms and busts. The size and availability of the global fleet affect the supply side. The Baltic Dry Index (BDI) is used as a benchmark for the world freight market and is also seen as an efficient leading economic indicator of future economic growth and production. It tracks the rates charged for vessels that carry commodities which mostly function as raw material inputs to the industrial production.

⁴ Clarkson, "ShipOwner Orderbook Monitor", April 2014

⁵ Union of Greek Shipowners, "Annual Report", 2013-2014

⁶ According to data published by UNCTAD in the Review of Maritime Transport, 2013

Table 2
Panel a) Greek controlled fleet outstanding orderbook as of April 2014

| Category | Greece | | Share of world (in each type) |
|----------------|-------------------|--------------|-------------------------------|
| | Number of vessels | Dwt, million | Dwt, million |
| Bulkers | 222 | 22.0 | 13.5% |
| Tankers | 70 | 7.9 | 11.3% |
| Containerships | 70 | 5.5 | 13.0% |
| L.N.G./L.P.G. | 87 | 4.7 | 29.0% |
| Other | 46 | 3.6 | 33.0% |
| Total | 495 | 43.7 | 14.7% |

Note: dwt: abbreviation for deadweight, a measure of how much weight a ship can safely carry. Greek controlled fleet refers to those vessels whose owners are Greek citizens, regardless of the flag of the vessel.

Source: Clarkson, Eurobank Research calculations

Panel b) Greek-controlled fleet - Delivery Schedule

| | No. of vessels | Dwt, million | Dwt as % of world orderbook |
|-------------|----------------|--------------|-----------------------------|
| 2014 | 153 | 12.7 | 13.9% |
| 2015 | 219 | 17.9 | 17.1% |
| 2016 | 111 | 12.0 | 13.1% |
| 2017 | 12 | 1.2 | |

Note: see note at Table 2, Panel a.

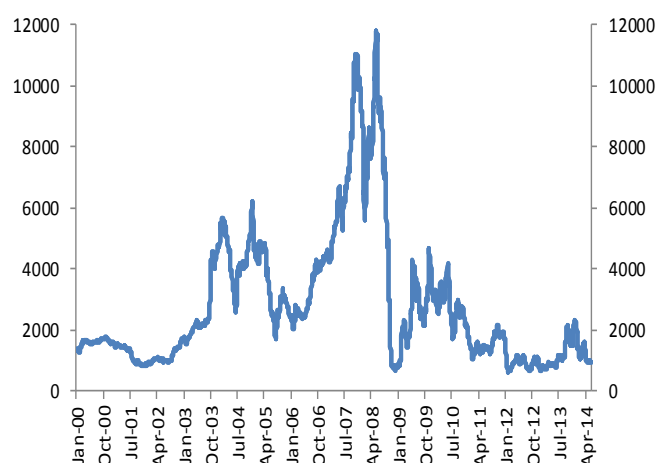
Source: Clarkson, Eurobank Research calculations

During the period 2000-2008, the BDI reached all-time highs (Figure 4), due to fast expansion in world trade volumes. Thereafter, the international financial crisis had a severe impact on global trade. Economic activity of developing economies dropped dramatically, leading to massive cutbacks in industrial production and, thus, to a significant reduction in demand for transportation. The latter, in conjunction with the oversupply of vessels due to the high number of orderings placed during the booming years (especially in the period 2007-2008), led freight rates to their lowest levels in decades, leaving behind a long period of successive records for freight rates.

Looking ahead, freight rates are expected to increase on the backdrop of sustained growth in global demand. However, growth in freights is expected to be moderated by existing overcapacity. In the medium term, however, oversupply is expected to constitute less of a problem, as demand growth is forecasted to outpace supply growth in the coming years (Figure 5). Rising optimism among shipping industry professionals, as is illustrated in Moore Stephens' March 2014 shipping confidence survey, bodes well with expectations of higher freight rates.⁷ In particular, the survey shows that confidence has almost reached the level recorded in May 2008 (Figure 6), while a rising number of respondents expect freight rates to be the same or higher than current levels in twelve months' time. In particular, 93% of respondents expect the same

or higher tanker and dry bulk rates, while 86% of respondents expect the same or higher container ship rates.

Figure 4
Baltic Dry Index



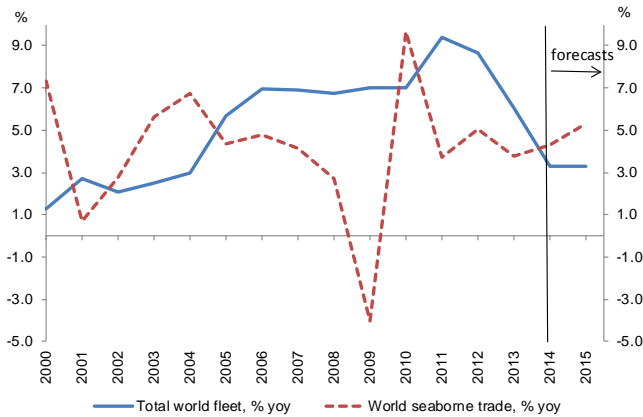
Note: Baltic Dry Index is a shipping and trade index created by the London-based Baltic Exchange that measures changes in the cost to transport raw materials such as metals, grains and fossil fuels by sea.

Source: Bloomberg

⁷ Moore Stephens, "Shipping confidence survey", March 2014

May 2014

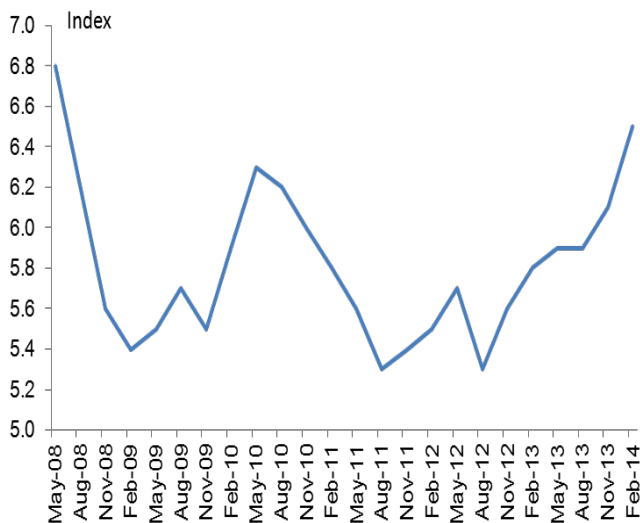
Figure 5
Evolution of the supply (world fleet) and demand (world seaborne trade) in the world maritime industry



Note: The source of data on seaborne trade growth, fleet growth and forecasts for fleet growth is Clarkson. Forecasts for seaborne trade growth are taken from IMF with the assumption that growth in seaborne trade will be equal to growth in world exports of goods, given that 80% of the world's merchandise trade is transported by sea.

Source: Clarkson, IMF World Economic Outlook April 2014

Figure 6
Overall confidence level of shipping industry professionals



Note: Shipping industry professionals respond in a scale of 1(low) to 10(high) to the question about how confident they are about the shipping market in which they operate. Overall confidence is determined by factors including finance costs, freight levels, demand trends, investment plans and competition. The latest survey published in March received 386 responses. The survey is conducted on a quarterly basis.

Source: Moore Stephens, shipping confidence survey

3. The importance of the shipping sector in the Greek economy

As we have already noted, the contribution of oceangoing cargo shipping is particularly important for the Greek economy and along with tourism represent a major source of funding for Greek imports. IOBE has estimated that the total value added of maritime transport to the Greek economy (direct and indirect) was 6.1% of 2009 GDP.⁸ Similar findings are reported in a separate research by Boston Consulting Group.⁹ Table 3 summarizes main figures for the economy as displayed in the balance of payments data from the Bank of Greece from 2000 until recently. Revenues and payments related to maritime transports recorded in the Greek balance of payments are derived from transactions through Greek banks or banks with presence in Greece, pertaining to shipping companies established in Greece or with presence in Greece, which may control vessels under the Greek or any other flag. Given that shipping companies maintain bank accounts in other countries, the figures about maritime transport revenues and expenses presented in Table 3 may not accurately represent their total revenues and expenses.

Net revenues from sea transports contribute positively to the increase of the services balance and thus, to the improvement of the current account balance. Since 2003, the contribution of net revenues from sea transports to GDP increased significantly mainly due to booming trade activity and freight rates. In particular, receipts from sea transports increased with an average annual growth rate of 14.6%, reaching in 2008 the peak level of 17.6 billion. As a result, net revenues from the shipping sector reached 4.8% of GDP in 2008. Indeed, over the period 2006-2008, net sea transports receipts as percent of GDP, services balance and imports of goods overtook the corresponding percentages of tourism balance which was at the first place.

Net revenues from sea transports as percent of GDP increase over time, with 2009 being the only exception, when net revenues declined by 32.4% y-o-y, as a result of the global economic crisis that led to subdued world trade and a collapse in freight rates. However, the Greek shipping industry managed to maintain its leading position in the global ranking of the industry.

⁸ Foundation for Economic & Industrial Research (IOBE), "The Contribution of Ocean-Going Shipping to the Greek Economy: Performance & Outlook", January 2013

⁹ Boston Consulting Group, "Impact Assessment of Greek Shipping on the Economy and Society", October 2013

Table 3

| Receipts from sea transports and main figures of Greek economy | | | | | | | | | | | | | | |
|----------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| billion € | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| GDP (current prices) | 136.7 | 145.1 | 155.2 | 170.9 | 183.6 | 193.1 | 208.6 | 223.2 | 233.2 | 231.1 | 222.2 | 208.5 | 193.4 | 182.1 |
| - Trade balance | -21.9 | -21.6 | -22.7 | -22.6 | -25.4 | -27.6 | -35.3 | -41.5 | -44.1 | -30.8 | -28.3 | -27.2 | -19.6 | -17.2 |
| from which: ships' balance | 0.0 | 0.0 | 0.4 | 0.1 | 0.1 | -0.7 | -3.4 | -5.5 | -4.7 | -3.4 | -3.6 | -3.3 | -1.0 | -1.5 |
| Export of goods | 11.1 | 11.5 | 10.4 | 11.1 | 12.7 | 14.2 | 16.2 | 17.4 | 19.8 | 15.3 | 17.1 | 20.2 | 22.0 | 22.5 |
| Imports of goods | 33.0 | 33.2 | 33.1 | 33.8 | 38.1 | 41.8 | 51.4 | 58.9 | 63.9 | 46.1 | 45.4 | 47.5 | 41.6 | 39.8 |
| - Services balance | 8.7 | 9.2 | 10.8 | 11.5 | 15.5 | 15.4 | 15.3 | 16.6 | 17.1 | 12.6 | 13.2 | 14.6 | 15.1 | 17.0 |
| Tourism receipts | 10.1 | 10.6 | 10.3 | 9.5 | 10.3 | 10.7 | 11.4 | 11.3 | 11.6 | 10.4 | 9.6 | 10.5 | 10.4 | 12.2 |
| Tourism payments | 4.9 | 4.7 | 2.5 | 2.1 | 2.3 | 2.4 | 2.4 | 2.5 | 2.7 | 2.4 | 2.2 | 2.3 | 1.8 | 1.8 |
| Net receipts from Tourism | 5.2 | 5.9 | 7.8 | 7.4 | 8.0 | 8.3 | 9.0 | 8.8 | 8.9 | 8.0 | 7.4 | 8.2 | 8.6 | 10.4 |
| - as % of GDP | 3.8 | 4.1 | 5.0 | 4.3 | 4.4 | 4.3 | 4.3 | 3.9 | 3.8 | 3.5 | 3.3 | 3.9 | 4.4 | 5.7 |
| - as % of services balance | 59.8 | 64.1 | 72.2 | 64.3 | 51.6 | 53.9 | 58.8 | 53.0 | 52.0 | 63.5 | 56.1 | 56.2 | 57.0 | 61.2 |
| - as % of imports of goods | | | | | | | | | | | | | | |
| (coverage ratio of imports) | 15.8 | 17.8 | 23.6 | 21.9 | 21.0 | 19.9 | 17.5 | 14.9 | 13.9 | 17.4 | 16.3 | 17.3 | 20.7 | 26.1 |
| Annual % change of tourism balance | | 13.5 | 32.2 | -5.1 | 8.1 | 3.8 | 8.4 | -2.2 | 1.1 | -10.1 | -7.5 | 10.8 | 4.9 | 20.9 |
| Receipts from sea transports | 8.2 | 8.5 | 8.0 | 9.0 | 12.4 | 13.0 | 13.3 | 15.7 | 17.6 | 12.3 | 14.0 | 12.7 | 11.8 | 10.7 |
| Payments for sea transports | 3.6 | 4.3 | 4.0 | 3.8 | 4.5 | 4.6 | 5.0 | 5.4 | 6.5 | 4.8 | 5.9 | 5.1 | 4.4 | 3.1 |
| Net receipts from sea transports | 4.6 | 4.2 | 4.0 | 5.2 | 7.9 | 8.4 | 8.3 | 10.3 | 11.1 | 7.5 | 8.1 | 7.6 | 7.4 | 7.6 |
| - as % of GDP | 3.4 | 2.9 | 2.6 | 3.0 | 4.3 | 4.4 | 4.0 | 4.6 | 4.8 | 3.2 | 3.6 | 3.6 | 3.8 | 4.2 |
| - as % of services balance | 52.9 | 45.7 | 37.0 | 45.2 | 51.0 | 54.5 | 54.2 | 62.0 | 64.9 | 59.5 | 61.4 | 52.1 | 49.0 | 44.7 |
| - as % of imports of goods | | | | | | | | | | | | | | |
| (coverage ratio of imports) | 13.9 | 12.7 | 12.1 | 15.4 | 20.7 | 20.1 | 16.1 | 17.5 | 17.4 | 16.3 | 17.8 | 16.0 | 17.8 | 19.1 |
| Annual % change of net receipts from sea transports | | -8.7 | -4.8 | 30.0 | 51.9 | 6.3 | -1.2 | 24.1 | 7.8 | -32.4 | 8.0 | -6.2 | -2.6 | 2.7 |

Source: Bank of Greece, European Commission

Net inflows from maritime transport contribute significantly to the reduction of the current account deficit. In the period 2000-2013, net receipts from maritime transports totaled €102.2bn covering, on average, 16.6% of the annual imports of goods. In comparison, the tourism industry generated €111.9bn of net receipts over the same period. On average, the tourism balance coverage ratio of imports of goods was 18.9%. In 2013, net revenues from maritime transport accounted for 4.2% of Greek GDP, posting an annual increase of 2.7% after two years of negative growth rates. Over the period 2000-2013 net revenues represent 3.7% of GDP on average. Looking ahead, the Greek shipping industry as a dynamic export sector could be a key driver of the economic recovery as the country is rebalancing its economy from non-tradable to tradable activities.

4. Factors determining net receipts to Greece from sea transports

In this section, we relate net receipts from maritime transport services to the size of the Greek fleet and the level of international freights. Our approach is similar to earlier research by Bragoudakis and Panagiotou (2010) and Kasimati and Veranos (2011). Data of net receipts from sea transports are taken from the Bank of Greece and refer to transactions made through Greek banks or banks with presence in Greece. Of course, due to the international nature of the shipping activities, these numbers may not match exactly the level of transactions of shipping companies established in Greece. They do, however, provide a good first approximation.

Due to constraints on the availability of data on Greek-controlled fleet, we use quarterly data for the size of the fleet

under the Greek flag (measured in gross register tonnage), compiled by the Hellenic Statistical Authority. As we have already noted, the fleet under the Greek flag represents 28.5% of the total capacity of the Greek-controlled fleet.

For the level of international freights (freight rates), we use the ClarkSea index. The ClarkSea index (measured in \$ per day) is published by Clarkson PLC and is a weighted average of bulker, tanker, gas carrier and containership freight rates. Comprising all major types of ships, the ClarkSea index is more representative of developments in freight rates than the Baltic Dry Index.

To estimate elasticities between net receipts (netrec), the level of international freights (FreightRate) and the size of Greek flag fleet (GreekFleet), we use a log-log specification as described in equation (1). The coefficients b_2 and b_3 are the short run elasticities, which we estimate using the ordinary least squares method. Our sample of data covers the period from Q1-2003 to Q4-2013. The results of the regression are presented in the Table 4.

$$\log[\text{netrec}_t] = c + b_1 * \log[\text{netrec}_{t-1}] + b_2 * \log[\text{GreekFleet}_t] + b_3 * \log[\text{FreightRate}_t] \quad (1)$$

According to the estimation, both explanatory variables are statistically significant at any conventional confidence level and the respective coefficients have the expected signs, i.e. positive relation. Our results are in line with those reported in the literature mentioned above.

Table 4
Dependence of Greek net receipts from maritime transport on the capacity of the fleet and the level of international freights

Dependent Variable: net receipts [netrec]

Sample period: Q1 2003 – Q4 2013, quarterly frequency

| Explanatory variables | coefficient | Standard error | t-statistic |
|-------------------------|-------------|----------------|-------------|
| Constant | -7.16 | 2.81 | -2.55 |
| log[netrec(-1)] | 0.58 | 0.06 | 9.71 |
| log[GreekFleet] | 0.78 | 0.17 | 4.72 |
| log[FreightRate] | 0.26 | 0.04 | 6.67 |
| Adjusted R ² | 0.87 | | |
| S.E. of regression | 0.08 | | |
| Mean dependent var | 21.41 | | |
| S.D. dependent var | 0.21 | | |

Notes: OLS regression estimates, where: (netrec) denotes net receipts from maritime transport (in billion euro), (GreekFleet) denotes the fleet size under Greek flag measure in gross tonnage (a measurement for the internal volume of a ship) and (FreightRate) denotes the level of international freights (measured in \$ per day)

Source: Eurobank Research estimates

The quarterly elasticity of maritime transport receipts to freight rates is 0.26, meaning that, all else equal, if rates increase by 10%, the receipts will increase by 2.6% in the same quarter. The long-run elasticity is 2.4 times bigger, namely 0.62. This means that a 10% increase in freights in a given quarter will raise net receipts by 6.2% in the long term. In a similar manner, if the size of global fleet increases by 10%, net receipts will increase by 7.8% in the same quarter, while the long-term effect will be an increase of 18.6%.

5. Forecasting the net receipts to Greece from sea transports over the next two years

To project net receipts from sea transports over the next two years, we estimate the evolution of the Greek flag fleet (see note in Figure 1 for the difference with the Greek controlled fleet) and we project the future path of the international freights. Then, we apply these estimations on equation (1) and we project annual net receipts from maritime transports over the next two years. Subsequently, we make a sensitivity analysis for the capacity of the Greek fleet and the level of freights, estimating net receipts to Greece from sea transports under a more optimistic and a more pessimistic scenario compared to the baseline case.

5.1 Baseline scenario

5.1.1. Projecting the evolution of the Greek fleet

In order to estimate the evolution of the Greek fleet, in our baseline scenario, we use the current delivery schedule of

vessels presented in Table 2, Panel-b and assume scrapping equal to 3% of the existing fleet, which is the average scrapping rate per year between 2011-2013. Under this scenario the capacity of the Greek-owned fleet will increase by 1.9% yoy in 2014, which corresponds to an average growth rate of 0.5% per quarter. The size of the Greek-owned fleet will increase by another 3.6% yoy in 2015, which corresponds to an average growth rate of 0.9% per quarter. Given that we use data for the capacity of the Greek flag fleet only, we assume that the latter will increase by the same percentages.

5.1.2. Projecting international level of freights

To estimate the future path of the ClarkSea index, we regress annual changes of the index on annual changes of seaborne trade (demand) and on annual growth of the global fleet (supply) as presented in equation (2). The estimation results are presented in Table 5. According to these results and projections for supply and demand presented in Figure 5, which constitute our baseline scenario, we calculate the future path of the ClarkSea index. Our projections suggest an increase of the index of 13.5% yoy in 2014, which corresponds to an average quarterly growth rate of about 3.38%. Additionally, we project an increase of the index of 22.3% yoy in 2015, which corresponds to an average quarterly growth rate of about 5.58%.

$$\Delta[\text{FreightRate}] = -12.8 - 3.6 \cdot \Delta[\text{GlobalFleet}] + 8.8 \cdot \Delta[\text{seaborne trade}] \quad (2)$$

where Δ denotes annual growth rates of the variables.

Table 5**Dependence of international freights on world seaborne trade and capacity of the world fleet**Dependent Variable: annual growth of international freights ($\Delta[\text{FreightRate}]$)

Sample period: 1991—2013, annual frequency

| Explanatory variables | coefficient | Standard error | t-statistic |
|---------------------------------|-------------|----------------|-------------|
| Constant | -12.88 | 10.19 | -1.26 |
| $\Delta[\text{GlobalFleet}]$ | -3.56 | 1.47 | -2.42 |
| $\Delta[\text{seaborne trade}]$ | 8.81 | 1.74 | 5.07 |
| Adjusted R ² | 0.56 | | |
| S.E. of regression | 22.44 | | |
| Mean dependent var | 4.24 | | |
| S.D. dependent var | 33.85 | | |

Notes: OLS regression estimates

where: $\Delta[\text{GlobalFleet}]$ denotes annual growth of the world fleet and $\Delta[\text{seaborne trade}]$ denotes annual growth of seaborne trade

Source: Eurobank Research estimates

5.1.3. Forecasting the net receipts

In order to project the evolution of net receipts to Greece from sea transports, we apply the above estimations for the size of the Greek flag fleet and the level of international freights on equation (1). Our results indicate that annual net receipts from maritime transports will increase by 18.8% yoy in 2014 and 18.9% yoy in 2015. Based on European Commission forecasts for the level of GDP,¹⁰ net revenues from sea transports will account for 4.9% of GDP in 2014 and 5.7% of GDP in 2015 (Table 6).

5.2 Good and adverse scenario

As we noted above, we also perform our calculations for a good and an adverse scenario. In the good scenario, we assume higher world trade growth rates which through equation (2) results in higher growth rates of the level of freights. Upside risks to global trade stem from faster than expected growth in

domestic demand in advanced economies, mainly in the US, the UK and Germany. Reduced fiscal drag and easy monetary conditions in these countries may boost domestic demand, resonating in developing countries and demand for commodities. Moreover, in the good scenario, we assume lower scrapping rates for the Greek fleet.

In the adverse scenario, we assume lower world trade growth rates which through equation (2) results in lower growth rates of the level of freights. We also assume higher scrapping rates for the Greek fleet. Downside risks to global trade are related to lower growth prospects of emerging markets, as the latter need to adjust to an environment of more expensive capital. In China, a hard landing of the economy remains a possibility, as the government is trying to unwind excessive credit growth.

The involvement of private equity funds and hedge funds in the shipping industry is another source of downside risks to future

Table 6**Forecasts of net receipts to Greece from sea transports over the next two years**

| | Greek flag fleet, annual % change | | Freights annual % change | | Net receipts from sea transports annual % change | | Net receipts as % of GDP | |
|-------------------|-----------------------------------|------|--------------------------|-------|--------------------------------------------------|-------|--------------------------|------|
| | 2014 | 2015 | 2014 | 2015 | 2014 | 2015 | 2014 | 2015 |
| Baseline scenario | 1.9% | 3.6% | 13.5% | 22.3% | 18.8% | 18.9% | 4.9% | 5.7% |
| Good scenario | 4.0% | 5.6% | 19.7% | 28.5% | 22.4% | 27.1% | 5.1% | 6.2% |
| Adverse scenario | 0.0% | 1.5% | 2.1% | 10.9% | 13.9% | 8.0% | 4.7% | 4.9% |

Note: *Baseline scenario*: we consider 3.0% scrapping of the Greek flag fleet and an annual growth rate of world seaborne trade of 4.3% and 5.3% in 2014 and 2015, respectively.

Good scenario: we consider 1.0% scrapping and an annual growth rate of world seaborne trade of 5.0% and 6.0% in 2014 and 2015, respectively.

Adverse scenario: we consider 5.0% scrapping and an annual growth rate of world seaborne trade of 3.0% and 4.0% in 2014 and 2015, respectively.

Source: Eurobank Research Estimates

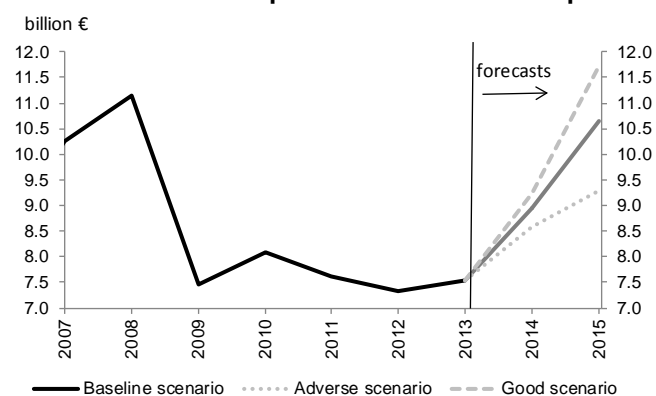
¹⁰ European Commission, European Economic Forecast Spring 2014

freights. Low vessel prices and positive prospects of maritime transports have attracted private funds, which invest in new vessels through shipping companies. However, several members of the shipping community express concerns that liquidity availability from private funds will increase excessively the capacity of world fleet, affecting adversely future freights and earnings prospects of shipping companies.

Table 6 presents our estimation results. Also, Figure 7 illustrates the evolution of net receipts to Greece from sea transports.

Figure 7

Evolution of net receipts to Greece from sea transports



Note: Annual Data. Assumptions and estimation results of the different scenarios are presented in Table 6

Source: Eurobank Research Estimates

6. Conclusions

The shipping sector is a key pillar of the Greek export activity, representing a major source of funding for the Greek imports. Over the period 2000-2013 net receipts to Greece from sea transports accounted for 3.7% of GDP on average, while covered 16.6% of Greek imports of goods. In comparison, the tourism industry accounted for 4.2% of Greek GDP and covered 18.9% of imported goods over the same period. The Greek-controlled fleet (i.e. vessels whose owners are Greek citizens, regardless of the flag of the vessel) is ranked first globally regarding international merchant fleet capacities, accounting for 16.16% of the world's total transport capacity.

In this study, our aim is to assess the evolution of net receipts to Greece from sea transports in the next two years. Our analysis is divided into two stages. In the first step, we quantify the relationship between net receipts from maritime transports and the size of the Greek-flag fleet and the level of international freights. Our results reveal a statistically significant dependence of net receipts on the fleet capacity and freight rates. Specifically, a 10% increase in the level of freights in a given quarter will result in 2.6% higher net receipts in the same quarter and 6.2% higher net receipts in the long-run. Similarly, a 10% increase in the capacity of Greek-flag fleet will bring a 7.8%

increase in net receipts in the same quarter and 18.6% increase in the long-run.

In the second stage, we estimate the evolution of the Greek fleet capacity and the level of freights in 2014 and 2015 in order to estimate the future path of net receipts based on the elasticities mentioned above. To calculate the future capacity of the Greek fleet we use data for the delivery schedule of new vessels and own estimates for the Greek fleet scrapping. Concerning the projection of the future path of international freights, we use a model that relates annual growth of freights to annual growth of the world fleet capacity and annual change of the world seaborne trade.

In our baseline scenario, we estimate that net receipts to Greece from sea transports as percent of GDP will rise to 4.9% and 5.7% of GDP in 2014 and 2015, respectively, from 4.2% of GDP in 2013.

Subsequently, we make a sensitivity analysis for the capacity of the Greek fleet and the level of freights and we estimate net receipts to Greece from sea transports under a more optimistic and a more pessimistic scenario compared to the baseline scenario. In the good scenario, where freights and the Greek fleet increase more than in the baseline scenario, net receipts to Greece from sea transports as a percentage of GDP are 0.2 and 0.5 percentage points higher than in the baseline scenario for 2014 and 2015, respectively. In the adverse scenario, where the freights and the Greek fleet increase less than in the baseline scenario, net receipts are 0.2 and 0.8 percentage points lower than those of the baseline scenario for 2014 and 2015, respectively.

Overall, our results confirm the key contribution of the Greek maritime industry to the recovery of the Greek economy. The role of the shipping sector is all the more important in the current juncture, when the country's growth model is rebalancing towards tradable sectors. Future opportunities of the maritime transport sector look positive on the backdrop of ever greater globalization and the involvement of an increasing number of developing countries in the world production process. Greek ship owners are well placed to take profit of these opportunities, supported by a young and cost efficient fleet, high expertise and close business links around the globe. In turn, the Greek economy may be supported by the direct and indirect effect of higher maritime transport revenues

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