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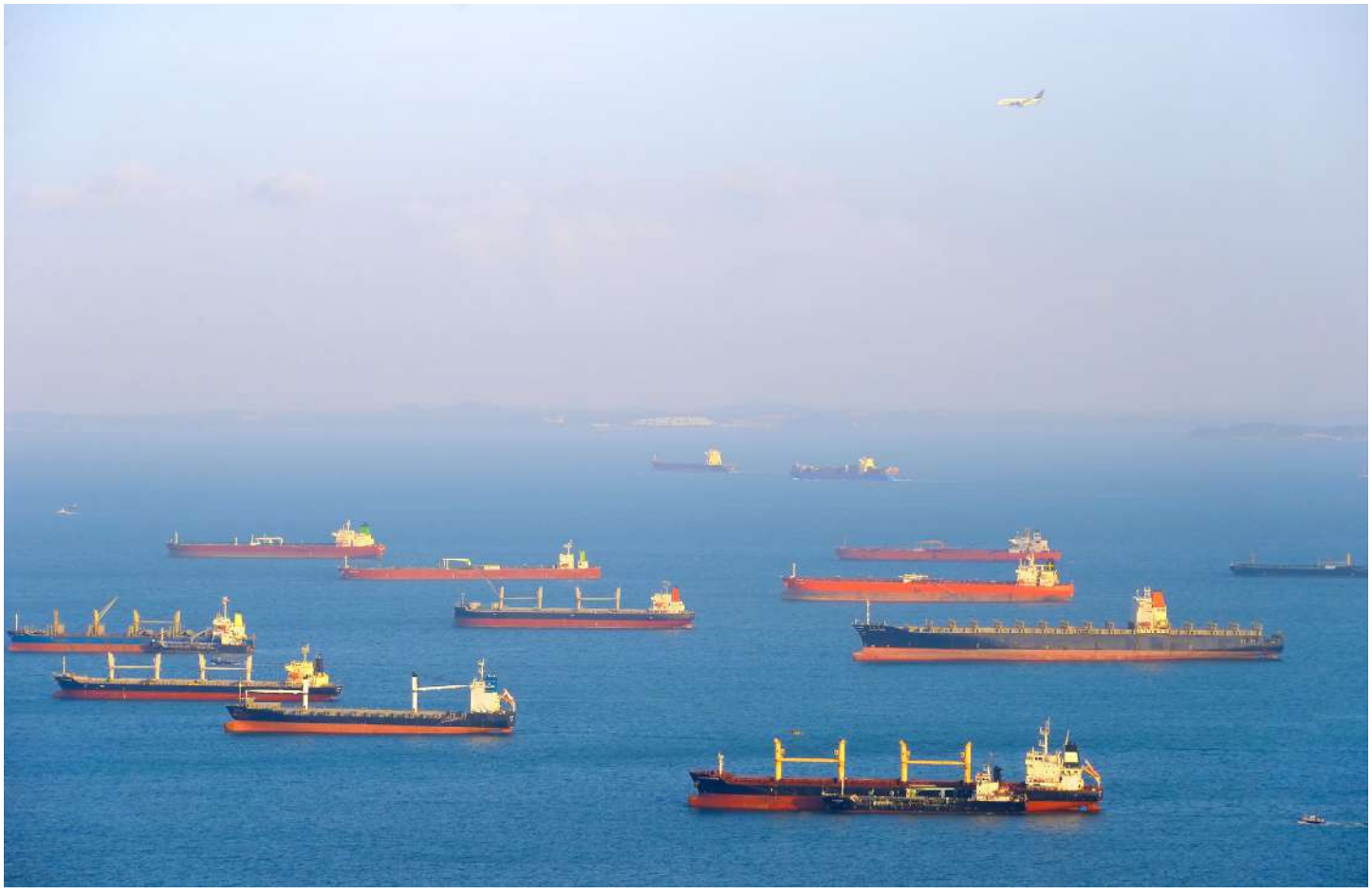

Maritime Subsidies

Do They Provide Value for Money?

Case-Specific Policy Analysis

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The International Transport Forum

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International Transport Forum
2 rue André Pascal
F-75775 Paris Cedex 16
contact@itf-oecd.org
www.itf-oecd.org

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Cite this work as: ITF (2019), "Maritime Subsidies: Do They Provide Value for Money?", International Transport Forum Policy Papers, No. 70, OECD Publishing, Paris.

Acknowledgements

This project was directed and written by Olaf Merk with co-authorship by Lucie Kirstein and Vatsalya Sohu at the International Transport Forum. The report was made possible through a voluntary contribution by the International Transport Workers Federation. Data collection for the report benefited from answers to a questionnaire sent to country representatives of both the International Transport Workers Federation and the International Transport Forum.

Valuable comments on a draft version of the report were provided by Stephen Perkins, Rex Deighton-Smith, Michael Kloth and Edwina Collins (all ITF/OECD), Jonas Teusch (OECD), officials from the International Transport Workers Federation, officials from DG Competition at the European Commission. The report also benefits from valuable contributions from Karin Gourdon (OECD), Bill Hemmings and Faig Abbasov (Transport and Environment).

A draft version of the report was discussed in the Transport Research Committee of the International Transport Forum in April 2019. In addition, the report benefits from a panel discussion on "Maximising regional value through maritime connectivity investment" at the 2019 Summit of the International Transport Forum, held 22-24 May 2019 in Leipzig. This panel, moderated by Pat Cox, consisted of Philippe Alfonso (European Transport Workers Federation), Martin Dorsman (ECSA), Christophe Tytgat (SeaEurope) and Katherine Bamford (Port of Vancouver).

Valuable information and perspectives for the study were collected via interviews with: Sveinung Fjose (Menon Economics), Henryk Piatkowski (Polish Seafarers' Union), Margarida Martins (European Maritime Safety Agency), Catarina Ramos (European Maritime Safety Agency), Jaime Veiga (European Maritime Safety Agency), Jacob Clasen (Danish Shipping), Marcel van den Broek (Nautilus International), Anders Hansson (Norwegian Maritime Officers Association), Kasper van der Gugten (Netherlands Ministry of Infrastructure and Water Management), Anne Legregeois (Lawyer), Francesca Baiocchi (Uiltrasporti), Jean-Philippe Chateil (FOMM UGICT CGT), David Dearsley (DM Consulting), Michael Thöne (FiFo Institute for Public Economics at the University of Cologne) and various experts that prefer to remain anonymous. The improvements to the report made as a result of consultations with all of these groups and individuals is gratefully acknowledged but the interpretations and conclusions drawn remain the responsibility of the authors.

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Executive summary

What we did

This report gives an overview of direct and indirect subsidies available to maritime transport in OECD countries. It assesses whether they provide value for taxpayers' money and offers recommendations how policy makers can increase the effectiveness of maritime subsidies. The analysis is based on desk research, questionnaires and interviews with relevant stakeholders and experts. ITF member country representatives were consulted on the accuracy of the data collected.

What we found

Maritime subsidies relate to support for national flags, seafarer employment, the competitiveness of maritime clusters, promoting high quality standards and maintaining maritime connectivity. They can take the form of budgetary expenditures, tax expenditures and transfers of financial risk to governments.

At least EUR 3 billion per year is spent on just three maritime subsidies in OECD countries: tonnage taxes, tax exemptions for fuels for domestic shipping, and fiscal measures to reduce wage costs of seafarers. Systemic gaps in the data mean the picture on the monetary value of maritime subsidies is incomplete. Subsidies granted by European Union (EU) Member States are subject to control by the European Commission when they fall under the legal definition of State aid.

Some measures are notified and subject to the European Commission decisions and subject to its decisions. Others are exempt from notification, but still subject to some reporting and transparency obligations. Some maritime subsidies may not constitute State aid, however, and are not brought to the attention of the European Commission.

Tonnage tax is one of the main maritime subsidies. This is considered to be an implicit subsidy, since the shipping-specific tax, based on the tonnage of a ship, replaces regular corporate income tax. The result is a more favourable tax treatment. The average spending on tonnage taxes in OECD countries has been an estimated EUR 1 billion per year since 2000. The scope of these maritime subsidies has been extended in recent decades. Subsidy conditions have become more generous and the range of activities covered has been enlarged. Exemption from taxation of ship fuels is a second important maritime subsidy. It represented around EUR 1 billion in 2016 for domestic shipping alone in OECD countries.

The nature of the maritime subsidies currently in place is defensive, rather than strategic. They have grown in reaction to two developments: open shipping registries in developing countries ("flags of convenience") and subsidies in other developed countries. Thus, maritime subsidy schemes often include the notion of tonnage taxes as a way to level the playing field for the shipping industry of developed countries in competition with flags of convenience. The European Commission has formulated EU Maritime State aid Guidelines that aim to avoid fiscal competition between Member States. These guidelines have clarified which state aid could be introduced by Member States to promote the maritime transport interests of the European Union in their competition with non-EU shipping registries, but would require updating.

Impact studies do not find much evidence of the effectiveness of maritime subsidies in achieving their stated aims. Local flags and seafarer employment within the EU have in fact declined. Short sea shipping connections in the EU are still fairly limited. However, maritime subsidies might have increased the

liquidity of shipping companies, allowing some of them to renew or expand their fleets. This has contributed to increased overcapacity, and ships have been pre-dominantly ordered in Asian shipyards. The resulting cargo peaks, increased ship sizes and subsequent consolidation of container shipping lines have had mixed impacts on ports and shore-based employment.

OECD countries are spending large and increasing amounts of money on retaining national shipping industries, a highly globalised and mobile sector. The evidence suggests that there are limited benefits for the broader national economy in retaining nationally flagged vessels, however. There is room therefore for redesigning subsidies to make them contribute more efficiently to broader public policy goals.

This could include the decarbonisation of transport, and reducing congestion and urban pollution. More focus is required on reaching wider international agreement on common rules to wind back harmful tax and subsidy competition. It also requires shifting the focus to subsidies that are explicitly tied to the achievement of more tangible policy goals and subjected to rigorous verification.

What we recommend

Re-orient and harmonise maritime subsidy policies

Countries with substantial maritime subsidies could benefit from a systematic review of their subsidies. Within the EU, an evaluation of the Maritime State aid Guidelines is warranted, to assess which instruments are best adapted to supporting specific strategic orientations. The 2004 EU Maritime State aid Guidelines aim to harmonise State aid to the shipping sector. Despite this, the evolution of approved maritime State aid – in particular tonnage taxes – does not seem to have stopped a "race to the bottom". The approved tonnage tax schemes, for Poland (2009), Croatia (2015) and Malta (2017) are considerably more generous – in terms of rates and tax load - than those approved previously. A global discussion on tonnage taxes could be linked to the OECD/G20 initiative on Base Erosion and Profit Shifting (BEPS).

Clarify objectives of maritime subsidies

Maritime subsidies often have multiple objectives. The most effective subsidies, however, target clear and precise goals. Objectives should be formulated to allow for quantified evaluation of their effectiveness. Certain strategic goals could be achieved more efficiently with more targeted instruments, rather than generic instruments such as a tonnage tax. In some cases, the basis for subsidies is not altogether clear. The EU Energy Tax Directive states that maritime fuels shall be exempted from taxation, although Member States may limit the scope of this exemption. This does not align well with EU policy on decarbonising transport and should be reconsidered.

Make maritime subsidies more conditional on positive impacts

Most maritime subsidies are granted with only few conditions attached. An exception is the United Kingdom's tonnage tax scheme, which contains a training requirement. The Norwegian and Portuguese tonnage taxes are more beneficial to cleaner ships. If they are retained, general maritime subsidies like tonnage taxes should be linked clearly to the achievement of identified policy goals, as in these United Kingdom, Norwegian and Portuguese examples. This could take the form of a stricter link between the subsidies and flying a European Union/European Economic Area (EU/EEA) flag and using seafarers, in particular when the ship is operating mainly in European waters.

Design maritime subsidies in ways that avoid market distortions

Some subsidy schemes have evolved in ways that distort markets. Many tonnage tax schemes now also encompass profits from terminal operations. This benefits vertically integrated shipping companies that compete with independent terminal operators, ship operators and freight forwarders that do not have similar tax benefits. Relevant regulations, such as the EU Maritime State aid Guidelines, should be amended to avoid such market distortions and unbundle the activities eligible for favourable tax treatment under tonnage tax schemes.

Improve transparency around maritime subsidies

More transparency could help to increase the effectiveness of maritime subsidies. EU countries are subject to reporting requirements on maritime subsidies, but these seem to be loosely respected by Member States. The European Commission should make clear that future maritime State aid will only be granted under the condition of receiving impact reports that will be made public. An obligation to report on the usage and quantified impact of maritime subsidies could help find ways to make subsidies more effective. Governments should release reliable, harmonised maritime employment data along the lines of data published by the European Maritime Safety Agency. Transparency around maritime subsidies in non-EU countries could be improved along similar lines.

Typology of maritime subsidies

Maritime subsidies have existed for centuries, with applications as diverse as overseas maritime expeditions and the development of steamship companies. Studies on maritime subsidies of the past can fill a medium-sized library, but recent studies on the subject are scarcer, if not non-existent. This report aims to fill that gap by providing an overview of existing maritime subsidies and their effectiveness. This is relevant for policy makers who have to be able to justify public support to this specific sector, and be able to improve the effectiveness of its policies.

This section classifies and identifies the different sorts of maritime subsidies that exist today. The main maritime subsidy categories that will be described here include *direct subsidies, tax expenditures*, and *transfer of financial risk to governments*.

Classification of maritime subsidies

A subsidy is a monetary transfer from a government to a private or public company active on the market, with or without conditions for services to render. Subsidies can take different forms and will in this report be classified along two indicators: the transfer mechanism - how a transfer takes place - and the statutory incidence - to whom and for what a transfer is first given.

We distinguish five different transfer mechanisms:

- Direct subsidies: these direct transfers of funds are budgetary expenditures by governments.
- Tax expenditure (also referred to as tax revenue foregone). This refers to favourable fiscal treatment of the shipping sector that results in revenue foregone, namely revenue that would have been collected were shipping treated as other economic sectors.
- Other government revenue foregone; this is a similar category as tax expenditure, except that it applies to other government revenue, such as tariffs, fees and charges.
- Transfer of risk to government; such as favourable loans and loan guarantees.
- Induced transfers; transfers from consumers to producers that result from constraints on competition contained in shipping regulation.

This report mainly focuses on the first three categories. Information on the transfer of risk to governments will also be included when this can be quantified. Induced transfers will not be covered in this study.

The classification of subsidies applied here has been influenced by other OECD inventories of support measures[1]. These OECD support inventories have generally used the producer and consumer support estimates (PSE and CSE) framework that distinguish between support measures that benefit producers and consumers. The framework also covers a third category of support, namely the support that benefits producers and consumers collectively, or that do not support current production, such as industry-specific research and development. In the context of this report, ship-owners and operators receiving

subsidies are the "producers" of maritime services. We do not cover subsidies for "consumers" of maritime services, such as shippers or passengers –these seem to be quite rare.

Production is relevant for the second indicator used to classify maritime subsidies, namely statutory incidence, that is: to whom and for what reason a transfer is first given. Production factors considered are labour, capital (ships), energy (fuel), infrastructure and knowledge. The income of the shipping enterprise and the different factors of production for shipping services are considered when defining the statutory incidence. Combining the indicators of transfer mechanisms and statutory incidence makes it possible to classify shipping subsidies, as illustrated in Table 1.

Table 1. Classification of maritime subsidies

	Production					
	Enterprise income	Costs of production factors				
		Labour	Capital	Energy	Infrastructure	Knowledge
Direct subsidies	Operation subsidy Subsidy for war-time availability of ships State as owner or shareholder	Training subsidy Crew travel and relief costs	Grants to acquire ships Scrap-and-build grants Interest rate subsidies	Grants for: - Green shipping - Conversion to LNG - LNG bunkering - Shore power Bunkering infrastructure	Port infrastructure	Pilot project grants Technology grants Maritime cluster grants
Tax expenditures	Corporate tax exemption (tonnage tax) Business tax exemption Dividend tax reduction	Personal income tax exemption Foreign earnings deduction	Capital gains tax exemptions VAT zero rate Accelerated depreciation Reduced tax for ship lease	Exemption of: - Fuel tax - Electricity tax Electricity below cost-price		
Other government revenue foregone	Debt write-off state-owned shipping firms Recapitalisation shipping banks	Social security exemptions Social costs of automation	Customs duties exemptions for ship construction inputs Favourable buy and lease back		Port fee reductions Canal fees	
Transfer of risk to government	Favourable loans and credit		Favourable non-market-based loans and guarantees for ship acquisition Export credits for shipbuilders		Loans for port infrastructure	Loans for maritime innovation
Induced transfers	Cargo reservation schemes Cabotage restrictions FDI restrictions Price fixing via shipping conferences	Domestic seafarer requirements	Domestic ship-built requirements			

Reserving certain types of shipping, such as domestic shipping, to domestic companies could be considered a shadow subsidy. This policy confers a benefit upon the national firm, which results in higher prices for domestic consumers, but also aims to achieve that the state's own nationals can compete for jobs in their own country, via local content requirements. In other words, it has an opposite effect of what maritime subsidies usually do: it effectively increases the price of a shipping service. E.g. in the case of local content requirements, firms cannot source inputs from outside and therefore often cannot choose the input with the lowest cost. In many cases foreign investment restrictions and local content requirements keep the price of a shipping service higher than what the market price would have been: the price difference between the market price and the actual price can be considered the hidden subsidy. This is the cost that consumers pay via higher prices of imported goods, in exchange for the value of the local content requirement that can be realised. An actual subsidy is a cost that taxpayers pay. Some markets remain protected because incumbents lobby for their continuation as they rightly suspect that actual subsidies are more visible than hidden subsidies, and – hence – more likely to be cancelled over time.

Whilst subsidies from central governments are reviewed the most in this report, subsidies from sub-national and supra-national governments – such as the European Union - are taken into account where relevant. Subsidies from public port authorities are also taken into account, insofar as public authorities form part of or are owned by national or sub-national governments. Direct subsidies go directly to shipowners or operators. Indirect subsidies go to another party (e.g. ports), but provide benefits to shipowners and operators. This overview does not cover subsidies to ship yards, so generally excludes shipbuilding subsidies; the OECD Inventory for Government Subsidies and Other Support Measures for Shipbuilding covers these. Shipbuilding subsidies are only included if these are in fact subsidies to shipowners that they need to spend in domestic shipyards, as ship-owners can then be considered direct beneficiaries – and shipyard indirect beneficiaries. Out of the scope of this report are subsidies for fisheries.

Data availability and comparability

This report leans heavily on government information on maritime subsidies: what is reported on in government publications, what is included in government budgets and what is notified to competition authorities (e.g. to the European Commission). This information is complemented with other sources. There is a rich but highly-dated academic literature that can only be of limited help for a comprehensive overview of current maritime subsidies. There are also consultancy reports, which can be helpful sources of information, but some of them are commissioned by interested parties and therefore biased.

There are obvious data gaps to be dealt with. Data on merchant vessels, ship registries and ship ownership have been available for many years collected by private stakeholders. In contrast, reliable data on maritime employment are not readily available.

There is often a significant difference between budgeted subsidies and actual use of the subsidies. Expenditure can vary significantly where the number of beneficiaries fluctuates, mainly as a result of the flag choice made by ship-owners, the decision to opt into a specific scheme, and the number of nationals employed. This is especially the case for tax expenditures, where the actual subsidy is dependent on what a company would have paid without the tax exemption. Estimates are made in comparison with the usually applicable corporate tax rate.

Direct subsidies

Subsidising shipping companies

Some countries subsidise ship operations, in particular to compensate for higher costs of operating a ship under the domestic flag compared to a foreign flag. For example, the Maritime Security Program (MSP) in the United States offsets the costs of operating under the US flag. This programme finds its basis in the Maritime Security Act of 1996, but is based on a much longer history of subsidising the operational cost differences of US-flagged ships, going back to the 1936 US Merchant Marine Act. Under the Maritime Security Program direct annual stipends are provided to active, commercially viable, militarily useful, privately-owned US-flag vessels and crews operating in US international trades, in return for the owner/operators' agreement to make the vessels available to the US government in times of war or national emergency. Most ships in the MSP also take part in the Voluntary Inter-modal Sea-lift Agreement (VISA) program that provide the Department of Defense (DOD) with "assured access" to commercial sealift and intermodal capacity to support the emergency deployment and sustainment of

US military forces; in exchange the shipowners get priority for cargo transported by the government. All the companies that received subsidies in the program that preceded it, the Operating Differential Subsidy (ODS), continued to receive subsidies under the new program. Under the Maritime Security Program foreign-built vessels are also eligible for subsidies (in contrast to the ODS).

Some subsidies are even more explicitly targeted at strategic sealift capacity in times of war and emergency. In the United States, the National Defense Reserve Fleet (NDRF) consists of a reserve of inactive ships – mostly merchant vessels - that can be activated within 20 to 120 days to provide shipping for the United States during national emergencies, either military or non-military. Part of the NDRF is the Ready Reserve Force (RRF) that must be ready for operation within five days for transportation of military cargo to critical areas of operation.

A readily available strategic fleet could also be one of the motivations of state-owned shipping companies. These state-owned companies are supported by their governments, often via subsidies. These can take the form of a government financing operational losses and debts. Two countries with considerable shares of state-owned shipping companies are the People's Republic of China and South Korea. For example, COSCO received USD 230 million in subsidies from the Chinese government in 2018, of which USD 122 million for vessel demolition and USD 107 million for other unspecified government subsidies. Since 2010, COSCO Shipping Holdings have recorded total subsidies of USD 1.3 billion from the Chinese government (Alphaliner, 2019). In the case of China, certain state-owned shipping companies are supposed to actively implement China's geopolitical strategies, such as the Belt and Road Initiative.

Direct grants are provided by a range of European countries in order to encourage water transport as a means to reduce congestion and greenhouse gas emissions from land and air based transport. The objective of such schemes is to encourage a modal shift of freight from road to coastal and short-distance sea-shipping transport. These exist in Italy, the United Kingdom, Sweden and Norway. Shipping companies are the direct beneficiaries of some of these subsidies, e.g. the Italian Mare-Bonus scheme approved in 2017. Whereas other schemes benefit the users of maritime transport, for example trucking companies that use short sea shipping services in the 2007-2009 Italian Eco-Bonus scheme.

One of the oldest categories of maritime subsidies is to provide cargo transport on certain routes. For example mail subsidies that made the earliest Atlantic steamship lines possible, but that were also associated with inefficiencies and corruption (Dunmore, 1907).

In the European Union, subsidies may be granted to provide certain freight and passenger services. These are often provided under so-called Public Service Obligations (PSO) which impose on one or several companies (by legislation or contract) the obligation to provide a service of general interest within the European Union territories, usually in exchange for compensation. PSOs can be imposed when there is a market failure to provide such service. Under EU cabotage rules[2], any tender for ferry services must be available to all EU shipowners or operators. All community operators are entitled to apply for compensation in exchange for accepting PSOs. Whereas in many countries these subsidies are provided to ferry operators in order to ensure territorial continuity. Spain also extends them to freight transport, particularly to the Canary and Balearic Islands, with the objective to lower prices of imported goods. Compensation for PSOs is not always regarded as state aid under article 107 TFEU and is therefore not always subject to prior notification and approval by the Commission. In order to establish whether the undertaking constitutes EU state aid, the four "Altmark" criteria (established by the Court in the Altmark judgement) are applied:

- the recipient undertaking must have public service obligations and the obligations must be clearly defined

- objective and transparent parameters for calculating the compensation payments
- compensation that does not exceed the cost of delivering the service minus the revenues earned with providing the service plus a reasonable profit
- the existence of a public tender or alternatively a thorough cost analysis (benchmarking exercise).

If all criteria are fulfilled, the compensation does not constitute state aid as it does not provide any advantage to the undertaking in question – it merely sets out the costs of providing the required service.

Shipping companies can also benefit from European Union grants. E.g. the Motorways of the Sea (MoS) project promotes modal shift on four corridors:

- Motorway of the Baltic Sea: linking the Baltic Sea Member States with Member States in Central and Western Europe, (including the route through the North Sea/Baltic Sea canal)
- Motorway of the Sea of western Europe: leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea
- Motorway of the Sea of south-east Europe: connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean
- Motorway of the Sea of south-west Europe: western Mediterranean, connecting Spain, France, Italy and including Malta and linking with the Motorway of the Sea of south-east Europe and including links to the Black Sea.

This may include start-up aid to new or improved short-sea shipping services and financial contributions for establishing and operating a maritime transport service. Member States' authorities complement EU funds by allocating their own financial resources to selected projects.

Governments have granted direct support in the context of bail-outs and support of shipping firms that are considered to be of national strategic importance. This has been most frequent in times of economic crisis, e.g. the capital injections of governments for shipping companies like CMA CGM, Hapag Lloyd and Yang Ming. Hapag Lloyd is partly owned by the HGV Hamburger Gesellschaft für Vermögens- und Beteiligungsmanagement mbH (13.9%), which is a wholly-owned subsidiary of the City of Hamburg. In 2012, the French carrier CMA CGM signed a Memorandum of Agreement with the public Fonds Stratégique d'Investissement (FSI).[3] The FSI subscribed to bonds redeemable in shares for an amount of USD 150 million giving right to a 6% stake in CMA CGM upon conversion. In 2017, the National Development Fund of the Taiwan Government (NDF) increased its share ownership in Yang Ming. The total government-owned Yang Ming stock, including the holdings of the ministry of transport and communications is reported to be 36.62%. Although government ownership does not necessarily result in subsidies, it may translate in losses for the taxpayer if the companies have sustained losses, for example due to the economic crisis, overcapacity and low freight rates. Subsidies on interest rates may also occur as a means to support firms in financial difficulty. In countries such as Japan, Italy and Spain, interest rate grants are available to SMEs in the maritime sector in order to stimulate growth and development of these companies.

Subsidies for labour

Various government subsidies help shipping companies to lower their staff costs. These are described in the sub-section on foregone government revenue. Direct labour subsidies are often linked to training provision. In the United Kingdom, the Support for Maritime Training (SMarT) scheme has been in place

since 1998. It covers up to 50% of training costs and is directly paid to the shipping companies who sponsor the trainees. In Ireland, a shipboard training subsidy is paid by the Department of Transport, Tourism and Sport (DTTAS) through the Irish Maritime Development Office, to companies providing training for cadets studying in Ireland.

Maritime academies for commercial shipping can also benefit from government support. The National Maritime College of Ireland was set up in the form of a public-private partnership in 2004. Other EU Member States with dedicated *public* maritime colleges separated from universities are Bulgaria, Estonia, Germany, Croatia, Greece, Sweden, Latvia, Portugal and the United Kingdom. Outside Europe, governmental maritime colleges exist in Canada (federal and provincial institutions), Japan (six major maritime technology universities), Korea (Korea Maritime University), the United States (US Merchant Marine Academy and other provincial academies), China, India, Taiwan and others.

As part of the European Maritime and Fisheries Fund, the EU funds innovative approaches to strengthen the cooperation between industry and education in order to bridge the gap between skills' offer and demand in the maritime industry.

Beside training aid, some countries also provide assistance with the travel costs of seafarers. In the United Kingdom, the Crew Relief Costs Scheme (CRCS) subsidises 20% of the cost of flying British seafarers to and from ports outside Europe. Denmark covers 50% of returning costs for seafarers who have worked for at least six months on a ship that has not called on home ports for the last three months.

Subsidies for capital investments

Some countries provide grants to shipping companies to acquire ships. In many cases these are countries that want to support their shipbuilding and shipping industries at the same time. Various South Korean subsidies have this double aim and channel support to their domestic shipyards via their domestic shipping companies. Similarly, the Operating Differential Subsidies in place in the United States until 1996 were only granted for ships that were US built. Such subsidies are different in nature from direct subsidies to shipyards that indirectly benefit all ship-owners, also those from other countries.

Scrap-and-build grants encourage ship-owners to acquire new ships but also to break up old ships. For example, China combines multiple goals in its scrap-and-build scheme by stimulating Chinese shipping companies to scrap their ships at Chinese demolition yards and build new ships at Chinese shipyards.

Subsidies have been limited to scrapping ships in some cases, for example Italy's scheme to speed up the phasing out of single-hull tankers more than 20–years' old which accelerated the transition to double-hull tankers. The maximum subsidy per ship to be scrapped was EUR 3.8 million.

Interest rate subsidies are frequently provided as a direct grant to subsidise a firm's interest payments on a loan. These subsidies can range from partial to the full coverage of interest. Several countries subsidise the interest payments on ship loans. Levels of discount against market rates can vary between and within countries. An example is Spain where the Spanish Ministry for Industry, Energy and Tourism concedes interest compensation on loans to shipowners for the acquisition of new built vessels.

In the light of upcoming sulphur-content limitations of marine fuels, some countries support the conversion of the shipping industry towards less-polluting fuels. For example, Germany grants allowances for the equipping and conversion of seagoing vessels to use liquefied natural gas (LNG) as marine fuel. Shipowners may apply for grant funding of up to EUR 15 million per vessel to convert German vessels to LNG or dual-fuel bunkering, including the adjustment of tanks, fuel systems and

auxiliary systems. Under the Connecting Europe Facility (CEF), the European Commission has supported LNG conversion investments, for example funding 20% of the conversion of Balearia Eurolineas Maritimas S.A.'s ferries operating in Spanish ports (EC, 2018a).

Subsidies for energy products

Environmentally-friendly technologies and the reduction of environmental footprint are increasingly relevant for the shipping industry. Finland has installed an investment aid scheme for purchasing more sustainable ships and environmental retrofits on existing ships to encourage shipping companies to better meet these requirements. Some countries provide grants for LNG bunkering infrastructure. The Japanese government supports the development of an LNG bunkering infrastructure in Japanese ports (ITF, 2018a). Under the Motorways of the Sea project and the Connecting Europe Facility, the EU has funded 30% of the development of LNG and CNG bunkering and refuelling facilities in Mediterranean ports (EC, 2018a).[4] The Spanish State Ports (Puertos del Estado) and the energy company ENAGAS are coordinating a project to develop LNG supply facilities. This project benefits from 50% co-financing by the European Union under the Connecting Europe Facility.

The EU Horizon 2020 framework supports the research and development of next generation non-food or feed drop-in biofuel and alternative renewable fuel technologies for shipping with EUR 3 to 5 million per awarded project (EC, 2018b).

Virtually all shore power-facilities in ports are financed with subsidies. These facilities make it possible for ships to switch off their engines at berth and be plugged in to the local electricity grid to power the ship. Around twenty ports have installed such facilities, all financed by public port authorities or public subsidies. In some cases, ports provide free electricity as the facilities would not be used otherwise, considering that ship fuel is cheap in comparison with electricity from the grid. This also represents a hidden subsidy. Germany, for example, has an electricity tax-reduction in place for the onshore supply of electricity to vessels.

Subsidies for maritime infrastructure

Many ports receive public subsidies for investments and projects to maintain and expand their general infrastructure. These are granted in particular for port adjustments that are needed to adapt to changes induced by shipping companies, such as increased ship size. Related adaptations to infrastructure include dredging, raising bridges and deepening and widening canals. Since the latest update of EU State Aid Rules in 2017, Member States can make public investments of up to EUR 150 million in sea ports and up to EUR 50 million in inland ports without prior checks by the Commission. The Regulation also allows public authorities to cover the costs of dredging in ports and access waterways. Also relevant here are subsidies for loss-making ports, as these are often related to port fees that do not recover investment or maintenance costs. In most cases it is difficult to detect this, as many countries have national port systems where loss-making ports cross-subsidise profit-making ports. Government financing of fossil fuel infrastructure, such as LNG bunkering infrastructure, could also be considered subsidies.

Some port infrastructure projects in Europe may be co-funded by the European Regional Development Fund (ERDF). The public funding of port infrastructure projects often consists of a 50% contribution from EDRF and 50% from national bodies. Co-funding of TEN-T projects in EU Member States is possible under the Connecting Europe Facility (CEF). Port infrastructure in some Member States may also benefit from the EU Cohesion Fund which is aimed at countries whose Gross National Income (GNI) per inhabitant is

less than 90% of the EU average. The Fund aims to reduce economic and social disparities and to promote sustainable development and is often made available by regional governments.

Subsidies for maritime knowledge and innovation

The United Kingdom contributes to funding of research and pilot projects at the Energy Technologies Institute (ETI). These include work on maritime energy efficiency devices (such as state of the art propellers, on-board waste heat recovery, and rotor sails) and the use of fuel cells to propel ships. The German Maritime Research Programme funds research projects on high-performance alternative-propulsion systems and new-energy sources as well as networked components, assistance systems and autonomous technologies. France's "*Programme d'investissements d'avenir*" supports industrial research or experimental development related to environmental performance of ships, security and automation. While industrial research is supported by grants, projects in experimental development are assisted in the form of repayable advances. Singapore's Maritime Innovation and Technology Programme (MINT) funds universities, research institutes and companies for R&D and test-bedding of maritime technologies. The Programme provides up to 50% of total project costs.

At the EU level, the programme Horizon 2020 awards funds for maritime research and innovation with the objective to encourage efficiency and environmental performance. The EU supports research on retrofit solutions and alternative propulsion to reduce greenhouse gas (GHG) emissions, the collection and use of maritime satellite data (Copernicus), the development of digital and other maritime innovations such as physical sensors, satellite technologies, advanced materials, ICT, big data analytics, autonomous systems, etc..[5]

Shipping companies benefit – but in a more indirect manner – from subsidies that target the establishment of a maritime cluster in a country. An example is the Maritime Cluster Fund (MCF) of the Maritime and Port Administration (MPA) in Singapore. This fund has three main axes; targeting manpower development in the maritime sector, business development and productivity increases in the maritime cluster via enhancing business processes and technological solutions. The Business Development programme supports eligible expenses incurred by maritime companies and organisations in the setting up of new maritime-related businesses or expansion; into new lines of maritime functions in Singapore, and internationalisation efforts by maritime companies. Another means of indirect support is the establishment of free zones that target maritime businesses. An EU free zone that has targeted the maritime sector is the Portuguese Madeira FTZ ("Zona Franca da Madeira"), approved by the EU as a regional aid scheme to promote local economic activity and employment.

Tax expenditures

This section covers the shipping-specific exemptions from taxation and related government revenue. A distinction is made here in taxation on the income of shipping companies and the main production factors: labour capital (ships), fuel, infrastructure and knowledge.

Tax exemptions of shipping companies

These exemptions mainly cover the corporate income tax, either via a shipping-specific alternative tax (the tonnage tax), or via other exemptions from regular corporate and business taxes.

A tonnage tax is a specific tax for the shipping sector that replaces a regular corporate income tax. The tax base is the net tonnage that a shipping company operates (hence the name of the tax), rather than

corporate income or profit. In essence there are two different tonnage tax systems. The most common system consists of tonnage tax schemes with formulas for calculating a fictional profit, the "tonnage tax profit", on which regular corporate tax rates are applied. A different model is applied in Greece, Cyprus[6], Malta, Norway and Croatia where special tax rates are applied to ships according to their tonnage: so both tax base and tax rate are different than what the regular corporate income tax would have been. Tonnage tax is levied independently of the actual accounting profits or losses from the exploitation of a vessel. As such, the tonnage tax to be paid by the shipping firm is more predictable than a regular corporate tax. The tonnage tax can be considered tax treatment that is favourable to the shipping sector, as the corporate tax that a shipping firm pays is much lower than other businesses, to the extent that some have referred to the situation as "zero taxation" for world shipping (Knudsen, 1997). As such, the tonnage tax generates tax expenditures for a country; the tax receipts from a tonnage tax are lower than the receipts from applying a regular corporate tax would have been (the tax expenditure is the difference between the two). The tonnage tax holds an advantage over direct subsidies for shipping companies in that it does not facilitate loss-making firms, so allows for the "creative destruction" of unsound businesses.

The tonnage tax has become one of the main maritime subsidy mechanisms in recent decades. While Greece has had a tonnage tax since 1957, many European countries started to introduce a tonnage tax after the Netherlands put one in place in 1996. Currently, 22 EU countries have introduced a tonnage tax, but other countries have done so as well, e.g. Japan, South Korea and India (Table 2). Most of these schemes were motivated by the declining competitiveness of the domestic shipping sector and the associated with the decline in the number of vessels carrying the national flag. The uptake of tonnage tax schemes could be considered a reaction to the emergence of open shipping registries, like those of Panama, the Marshall Islands and Liberia. Many tonnage tax schemes aim to encourage the repatriation of parts of the shipping fleets that re-flagged to these open registries, also called flags of convenience.

Most tonnage tax schemes are optional, so shipping firms can choose whether they want the regular corporate tax to be applied or the tonnage tax regime. Companies are locked in to this choice for a certain time period, ten years in most schemes, in order to avoid the shipping companies opting out of the tonnage tax scheme when appropriate to them, i.e. when they are making losses, so would not need to pay corporate taxes. The exception to this optionality is the scheme of Greece and the schemes that are inspired by it. These schemes are mandatory, so shipping firms cannot opt out the tonnage tax.

Tonnage taxes mostly apply to the international transport of goods and persons by sea and are generally applied to the firms that operate ships. This can be ships owned by the firm, but also ships that are chartered. Tonnage tax schemes are different with regards to ship categories that are covered. Some schemes include ships related to offshore, dredging, towage and pilotage. Domestic and inland shipping is generally excluded from tonnage taxes. Some schemes, such as the Danish ones, have expanded coverage to also include laying, inspection and repair of pipelines or cables on the seabed, housing of staff, spare parts and workshop facilities with connection to offshore work and are covered by the Maritime Guidelines by analogy.

Various tonnage tax schemes require firms to fly the national flag, but there are many exemptions. For example, under the EU Maritime Guidelines, shipping companies benefiting from a tonnage tax scheme must generally maintain or increase the share of the EEA flag vessel in their fleet. If they do not fulfil that condition, they can no longer include non-EEA flag vessels. This "share requirement" does not apply if the shipping firm operates at least 60% of its tonnage under the flag of an EU member state. Some countries impose additional conditions, e.g. the training of seafarers. In the United Kingdom, firms are only eligible for tonnage tax benefits if they meet a minimum training obligation, that is: to train or

facilitate the training of cadets. Some tonnage tax schemes differentiate according to environmental performance (Norway, Portugal), age of the ship (Cyprus)[7] or ship type (Greece).

Table 2. Implementation of national tonnage tax regimes

Year of introduction	Country	Year of revision
1957	Greece	1975
1973	Malta	2018
1996	Netherlands	2010
1996	Norway	2017
1999	Germany	
2000	United Kingdom	2018
2002	Belgium	2017
2002	Denmark	2018
2002	Spain	
2002	Latvia	
2003	France	2015
2003	Ireland	
2003	Finland	2012
2005	Bulgaria	
2005	South Korea	
2005	Italy	2016
2006	Poland	
2007	Lithuania	2017
2009	Japan	2013
2009	Slovenia	2019
2010	Cyprus	
2017	Sweden	
2018	Portugal	

Note: Only includes most recent amendments. The year of revision corresponds to the year in which the amended regime (after approval of the European Commission) entered into force. Many recently amended regimes include extensions of the regime towards a broader range of beneficiaries, such as offshore and service vessels.

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Various countries without tonnage tax have *other corporate tax exemptions* for shipping companies. Australia has a Shipping Exempt Income tax incentive for Australian ship operators (registered on the national as well as the international register) for coastal shipping to and from the country. This delivers an effective income tax rate of zero for income from core and incidental shipping activities. In order to qualify for this exemption, ship operators need a "shipping exempt income certificate" from the Australian Department of Infrastructure, Regional Development and Cities. Some countries have other business taxes, from which shipping companies can be exempted. In South Africa, international shipping companies are exempt from corporate income tax, usually calculated at 28% of a company's taxable income. In China, international shipping is exempt from paying a business tax of 3% on corporate revenues. Legislation covering the Turkish International Shipping Registry (TISR) provides for tax exemptions on revenues from the operation of vessels. Similarly, profits received from international cargo and passenger transportation and other related shipping services are exempt from taxation in Russia, provided the ships are registered in the Russian International Register of Vessels (RIRV).

Tax exemptions for labour

Several countries establish *wage-cost deductions*, that is, the amount of payroll tax to be paid by shipping companies. Such mechanisms are in place in many European countries, but also in Australia, Japan, South Korea and India. In these countries, a differential tax rate applies to eligible seafarers under certain conditions. This should make it more attractive for shipping companies to hire domestic seafarers. The wage cost deduction is supposed to correct for the cheaper wage costs of foreign seafarers. These deductions could go up to 100% of the payroll tax, e.g. in Germany and Denmark. In Greece, seafarers' income tax is reduced to 15% and officers and lower crew pay a rate of 10%. In the Netherlands, there is a special deduction of 40% (Table 3). In general, such deductions are only provided for domestic seafarers on vessels flying the national flag, but there are exceptions. In the EU, these deductions must apply for all EU/EEA residents.

In some countries, seafarers can deduct foreign earnings from their taxable income. In the United Kingdom, the seafarer's general earnings related to the period of work done outside the United Kingdom are excluded from income tax. Swedish seafarers are entitled to special deductions in their personal income tax returns, slightly higher for seafarers on vessels in foreign traffic. Although this does not count as a direct subsidy to shipping firms, it lowers the effective personal income tax rate for domestic seafarers, which benefits the domestic shipping firms, as it lowers their gross wage costs.

Similar deduction schemes exist for non-wage costs of seafarers such as *exemptions from social security contributions and other ancillary labour costs*. This includes employers' contributions to social security (including pension, family allowances and public health insurances), that shipping companies can keep. Seafarers continue to be covered by the social security arrangements of their countries, even if their employers do not pay their contributions. These schemes are being justified with reference to the high non-wage labour costs of seafarers in developed countries that would make them less attractive to hire. For example, Germany provides grants to shipping companies that cover the costs for the employers' contributions to the social security for their seafarers on German-flagged ships. Since the amendment of the scheme on the reduction of non-wage labour costs in shipping in 2016, EU and EEA seafarers on flagged-out ships can be included into this scheme under specific conditions. Other countries such as Estonia, Finland, France and Ireland also refund social security contributions of seafarers. For example, in Estonia, reimbursed social tax is comprised of pension insurance contributions and health insurance contributions. Family allowance and employment insurance scheme contributions are eligible for refund in France.

Table 3. Fiscal exemptions for seafarers in selected countries

Country	Year of introduction	Exemption measure
Ireland	1996-1998	Refund of Pay Related Social Insurance (PRSI) social security contributions; special EUR 6 350 income tax allowance for seafarers at sea for at least 169 days/tax year
Norway	1996	Net wage scheme (refund scheme for seafarers' employment)
Belgium	1997	Full exemption of basic employer's social security contributions (maritime transport and dredging), partial exemption of employees' social contributions
Germany	1998-2016	Deduction of 100% (40% prior to 2016) of the total amount of wage tax payable for crew members (if > 183 days on ship; prior to 2016); reduction of ancillary labour costs in ocean shipping
United King dom	1998	Employers' National Insurance Contributions reduction; Seafarers Earnings Deduction (SED) (100% tax exemption on foreign earnings under certain conditions)
Italy	1999	Relief of seafarers' social security charges in maritime cabotage
Finland	2001-2005	Exemption from withholding tax on seafarers working on board passenger ships engaged on international voyages between EU ports; reimbursement of employer's social security contributions, seamen's pension contributions, unemployment insurance contributions, accident and life insurance contributions; 100% allowance of seafarers' income tax
France	2001	Reduced rates of social contributions of seafarers (employees' and employers' contributions)
Sweden	2001	Full refund of employers' social security contributions and of general payroll tax
Latvia	2002	Personal income tax reduction for seafarers
Netherlands	2006	Reduction of wage tax and national insurance contributions
Spain	2006	50% income tax allowance for seafarers under the Canary Islands register
Estonia	2007	Up to 100% of the social tax paid on wages
Iceland	2008	Gross wage support system (ship-owners may be paid grants amounting to 90% of the income tax calculated on the gross wages of the employed seafarers)
Australia	2012	Seafarer Tax Offset for withholding payments made to Australian seafarers for overseas voyages
Portugal	2018	Partial exemptions to seafarers and their employers from the general obligation to pay income tax and social contributions (vessels eligible for tonnage tax)
Korea		Income tax allowance: deductible amount of KRW 1.5 million per month; employment support for national essential fleet
Japan		Japanese Seafarers Securing Plan (compensation granted to employer); on board daily allowance (non-taxable income)

Tax exemptions for ships

Accelerated depreciation – that is: accelerated cost recovery – of ships makes it possible for shipping firms to minimise the profits they report to tax authorities. As such, it minimises the corporate income tax they will have to pay. Via such schemes, shipping companies could depreciate their vessels over a limited period, generally between eight to ten years (Table 4), whereas the average economic life of ships is approximately twenty-five years. There are different methods deployed for accelerated depreciation, either assuming straight line depreciation or diminishing value depreciation. Some countries apply more favourable tax depreciation rates for ships constructed domestically: in Canada, vessels constructed and registered in Canada have a prescribed annual depreciation rate of 33%, whereas this rate is 15% for vessels constructed outside Canada. Some countries, such as France, apply the accelerated appreciation also to second-hand vessels. As a result, a vessel can be depreciated by each of its successive owners, which means that the subsidy extends to the entire lifetime of the ship. Although countries may offer accelerated depreciation as a tax option to many industries, the shipping sector benefits disproportionately given its capital intensity. Accelerated depreciation is not considered state aid under EU rules, except for a few cases in which national legislation conferred benefits to the

sector and limited the option to specific activities and domestic manufacturers. This is the case for the first version of the Spanish Tax Lease Scheme, which was amended in 2012.

Table 4. Accelerated depreciation for vessels in selected countries

Country	Description of accelerated depreciation
Australia	Accelerated depreciation reducing the effective life of qualifying vessels from twenty years to ten years.
Belgium	For newly built and second-hand seagoing vessels, depreciation rates are 20% for the first financial year, 15% for the second and third financial years, and 10% for subsequent years.
Cyprus	Accelerated tax depreciation at the rate of 20% per annum for assets acquired during the tax years 2012 to 2018 (inclusive).
Denmark	Accelerated capital amortisation allows for deduction of the purchase price of ships acquired for research and design purposes only.
France	Seagoing vessels may be depreciated over eight years. Annual depreciation rates of 28.125% (first five years) and 33.33% (remaining three years). Vessels acquired in 2009 can be depreciated at an annual rate of 34.37% during the first six years and 50% for the remaining two years.
Germany	Accelerated depreciation of 40% on the purchase or building price of a ship registered in a domestic shipping register during the first five years after payment has started.
Japan	Useful life for tax: four to thirteen years. Declining-balance (15.4%–50%); Straight-line (7.7%–25%).
Netherlands	Annual depreciation rate of 20% of the initial cost.
Norway	Declining-balance method, applicable tax depreciation rate of 14%.
Spain	Accelerated depreciation of up to three times the accounting amortisation of the vessel with an early depreciation as from the date of the steel cutting.
United Kingdom	Straight line method and reducing balance method, rate dependent on the useful life of the asset.

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Deferred *taxation of capital gains* realised on ships also makes it possible to minimise taxable profits over time. Another related scheme in France allows the front loading of capital allowances in tax lease schemes, which creates fiscal benefits.

Some countries offer *investment deductions or capital allowances* in addition to the accelerated depreciation. In Belgium, shipping companies can apply an investment deduction of 30% of the acquisition value of vessels, in addition to the accelerated depreciation of the vessel over eight years. Such measures cannot be combined with the use of tonnage taxes, but they could be sequenced, so firms with large investments in ships could initially benefit from investment deductions and accelerated depreciation, and enter the tonnage tax scheme after a few years (EY, 2016). From 2019, France offers a 30% capital allowance for investments in ships powered by LNG, hydrogen or other forms of energy considered to be green. In the United States, it is possible for citizens to establish a capital construction fund for replacement vessels or new vessels - built in the United States - and use deposits to this fund as a deduction from US taxable income. Finally, some countries (e.g. Canada) provide relief from customs duties when importing ships.

Vessels and services to vessels are often *exempted from value added taxes (VAT)*. In many countries a zero rate VAT is applied to the supply of various types, including commercial sea-going vessels, and related services. The services to vessels include repair, maintenance, chartering and leasing. The supply of goods, e.g. the necessary equipment to be used on board, is also regularly zero-rated. The VAT exemptions sometimes also extend to cargo handling services in ports. This is for example the case in the United Kingdom. International shipping services are themselves also often exempted from VAT. This does not present a subsidy to shipping companies, but rather a subsidy to exporters and importers.

Fuel tax exemptions

Ship fuel is frequently exempt from or not subject to taxation. Countries generally do not levy VAT or excise duties on ship fuel for international transport maritime transport, while these are common taxes on road transport fuels. For EU Member States this is even explicitly forbidden. The Council Directive 2003/96/EC states that shipping shall be exempt from taxation on "energy products supplied for use as fuel for the purposes of navigation within Community waters (including fishing)" (European Council, 2003). However, Member States may limit the scope of the exemptions to international intra-Community transport. Various countries also provide fuel tax exemptions for domestic commercial shipping, either cargo and/or passengers (Table 5). However, there are exceptions, including Canada, Colombia, Switzerland and the United States (OECD, forthcoming). The State of California only applies a partial exemption of the sales and usage tax (SUT), taxing on the ship fuel needed to get from California to its first out-of-state destination (LAO, 2007). The SUT exemption was repealed between July 1991 and December 1992 (during which they taxed all ship fuel), but not considered successful (LAO, 2001, 2007). Estonia taxes marine fuels used inside their territorial waters (OECD, forthcoming).

The tax exemptions for ship fuels are generally justified by the mobile character of shipping and a relatively large choice in ship bunkering options, which means that ships would no longer re-fuel in any country that would have higher bunker prices because it taxes ship fuel.

In addition to the revenues foregone related to this tax exemption, there are negative externalities related to ship fuel that result in additional public expenditures, e.g. health care costs related to cardio-vascular and respiratory diseases related to shipping emissions (Corbett et al., 2007) and costs related to climate change caused by shipping's greenhouse gas emissions.

Alternatives to regular ship fuel can also be exempted from taxes. In the EU, countries can request tax exemptions or reductions for a temporary period of five years. These alternatives include electricity for ships with batteries and for shore power installations that provide energy to ships at quay. Some countries provide exemptions from the taxes on these sources of energy and subsidise power charging facilities in ports. For example, Swedish ships using shore power are exempted from the electricity tax. Without such tax exemptions, using cleaner energy sources would be less attractive than the regular less-clean ship fuel, given that the latter is generally tax exempted. These exemptions are likely to grow over the coming years with the expansion of electric ships and shore power facilities.

Table 5. Fiscal exemptions for ship fuel in domestic shipping selected countries

Country	Since	Exempted from	For which navigation?	Scope?
Australia	1983	Excise tax	Ships using fuel oil	Ships using fuel oil
Sweden	1991	CO_2 tax	Commercial	Domestic
Italy	1993	Excise tax	Goods and passengers	Domestic and EU territorial waters
Finland	1998	Energy tax	Commercial	Domestic
Norway	2000	Basic tax on mineral oil	Commercial (goods and passengers)	Domestic and foreign
Greece	2001	Excise tax		Domestic
Mexico	2002		Commercial	
Turkey	2003	Fuel consumption tax	Commercial	Cabotage lines registered with Turkish ship registries
Latvia	2004	Excise tax	Commercial	Domestic
Norway	2007	NO_x tax	Commercial	Domestic
Spain		Sales tax for petroleum products	Commercial	
Sweden		Energy tax	Commercial	Domestic
Portugal		Excise tax	Commercial, and public maritime leisure	Coastal and inland

Source: OECD Database on Fossil Fuel Subsidies, http://www.oecd.org/fossil-fuels/data/

Exemptions from infrastructure fees

Ships can be exempted from port dues. These are fees supposed to recover public infrastructure costs incurred in ports. In some countries, certain shipping firms can be fully or partially exempted from these fees, especially where port authorities have discretionary powers to exempt fees in individual cases. A fairly new category of port fee exemptions is related to environmental performance of ships calling the port. Various ports apply such reductions of port dues, often for ships with relatively limited air emissions. These reductions in port dues represent revenue foregone for the port authority, most of which are public authorities. In Singapore, for example, the port authority applies a 25% port dues reduction for ocean-going vessels propelled by LNG or other low sulphur fuels, as well as vessels with approved scrubber technology.

Ships also regularly get reductions on other infrastructure fees. Relevant infrastructures for sea-borne trades are the inter-oceanic canals, such as the Panama Canal and the Suez Canal. The canal authorities make investments to accommodate more and larger vessels, by increasing existing and adding new locks (Panama Canal) or expanding, widening and deepening canals (Suez Canal). Canal fees are supposed to recover these investments. Yet, they are constrained in their possibilities to do this considering that shipping firms have alternatives; e.g. Asia-Europe traffic could bypass the Suez Canal and have their ships take the route across the Cape of Hope. The Suez Canal Authority was forced to offer a 65% fee reduction in 2016 to recapture market share. These fee reductions can be considered government revenue foregone.

Transfer of financial risk to government

This sub-section covers indirect shipping-related subsidies in the form of risk transfer to the government. It also covers financial vehicles for relevant production factors: capital (vessels and technology), infrastructure and knowledge (research and innovation). The financial tools described in this section

differ from other state aid measures, such as grants or tax exemptions, in that the state accompanies the access to finance of firms. Such transfers of financial risk to government are described here for the sake of comprehensiveness, but are different in nature from the subsidies identified above. These transfers of financial risk will not be dealt with in the sections that follow. So their monetary value will not be assessed, nor the impacts that they have.

Financing of shipping companies

Favourable loans; loans on preferential terms for shipping companies are granted by various state-owned banks, such as Korea Exim Bank, the Development Bank of Japan, Chinese state-owned banks and some European banks.

French, German, Korean, Chinese Taipei, and other governments have assisted in restructuring firms that face financial difficulties. In Korea, this has resulted in the creation of the Korea Maritime Corporation, a state-owned financing vehicle that also engages in buying stocks and bonds from shipping companies, as well as engaging in the purchase and lease-back of vessels from companies at favourable charter rates to provide additional liquidity. Sale and lease-back has also been supported by Chinese public lending institutions, although this activity has lost its solely domestic focus since Chinese creditors increasingly service a large international clientele on commercial lending terms (Marantidou, 2018). In the past, states have also been involved in restructuring and recapitalising shipping banks hit by the financial crisis (e.g. the German HSH Nordbank, bailed out and privatised in 2016). This type of regulatory capital relief for shipping banks may also include the purchase or underwriting of losses on asset portfolios.

A state *credit guarantee* is a promise by the state to assume the debt obligation of a borrower if that borrower defaults. The guarantee can cover the full loan or a percentage. For the borrower this can lower the cost of financing because the guarantee can lead to an increase of the credit rating and hence the borrower can obtain better financial terms than those normally offered on the financial markets.

According to the European Commission (2008), state guarantees imply the realistic diminution of the risk borne by the lender and therefore constitute a transfer of financial risk to the government.[8] Even though a guarantee does not necessarily imply a payment by the state, the European Commission considers that state guarantees might constitute state aid under Article 87(1) of the TFEU. While a guarantee is usually remunerated by a premium, the state foregoes all or part of such a premium when offering loan guarantees to companies. This can constitute both a benefit for the company and foregone revenue for the state (EC, 2008).

Some countries offer guarantees to shipping companies without specific reference to an investment purpose of the loan in question. This is particularly the case when governments decide to back shipping companies in financial difficulty. Guarantees may help a failing company avoid closure or restructuration by facilitating access to finance that could not have been obtained otherwise.

Support for financing capital investments

Beside general financing vehicles, shipowners and shipping companies can benefit from purpose-bound or conditional financing support to make capital investments. These support mechanisms can apply to the acquisition of ships or spare parts and vessel upgrades, e.g. to increase their energy efficiency.

Credit guarantees are often used as part of the toolbox to finance large capital investments. For example, Spanish resident companies may obtain a state guarantee to acquire or renovate vessels. This state guarantee however may not exceed 35% of the financed amount. In France, guarantees may cover the financing of the acquisition of civil ships by a shipowner located in France from a supplier located in

France, when the latter is in competition with a foreign offer benefiting from official export support. Some countries such as the Netherlands are currently exploring opening state guarantee facilities to the shipping sector, and plan to reserve these to domestic shipowners. Beneficiaries of this guarantee can be a financial institution providing a loan to the purchaser, or the supplier itself. In the United States, the Federal Ship Financing Program (commonly referred to as "Title XI") guarantees debt of United States or foreign shipowners for the purpose of financing or refinancing either US flag vessels or eligible export vessels constructed or reconditioned in US shipyards.

Export Credit Agency (ECA) backed funding has been central in financing capital investments in the maritime sector.[9] In order to support local exporting industries such as shipyards or marine and port technology manufacturers, most of the countries examined in this report especially assist foreign shipowners in financing the purchase of vessels and other marine equipment. From the perspective of the importers, this type of support greatly simplifies their acquisition of ships, machinery, spare parts, technology, port equipment and other capital. Export credits include public bank financing, guarantees, insurance or interest rate support provided to buyers in a different country. Export credit facilities for ships are usually administered by export credit agencies and state-owned development banks. They exist for example in China (China Development Bank, China Eximbank, Bank of China, Industrial and Commercial Bank of China, Sinosure), Denmark (EKF), France (bpi, SFIL), Finland (Finnvera), Germany (Euler Hermes), Japan (Japan Development Bank), Korea (Korea Development Bank, KEXIM, K-Sure), Norway (GIEK), Poland (KUKE), Spain (CESCE), Sweden (EKN), and the United Kingdom (UKEF).

The German public bank KfW IPEX also finances capital investments of other foreign clients, supporting for example the financing of port technology produced by a German manufacturer. Some of these capital investments may be bound to conditionalities such as environmental criteria.

The European Investment Bank, a lending institution of the European Union owned by its Member States, has made guarantees available for fleet renewal and the retrofitting of ships with sustainable technologies jointly with private banks. Through the Green Shipping Programme, EIB provides up to 50% of debt financing on new vessels and 100% of green components of retrofitting operations. Other credit guarantees are targeted at specific circumstances. The state-owned bank K-sure in Korea for example offers an export credit guarantee that covers a refund of a shipowner's advance payment to the shipbuilder (refund guarantee). As opposed to general guarantee schemes, states may also decide to grant individual ad-hoc guarantees.

Support for financing infrastructure

In the United Kingdom, port authorities can benefit from interest rate subsidies and loan guarantees for infrastructure, such as under the Welsh Government Support Scheme for Maritime and Inland Ports 2017-2020 and the Scottish Enterprise Regional Airports, Maritime Ports and Inland Ports Scheme 2017-2020. Similarly, in Spain, ports can benefit from a subsidy on interest rates paid on loans.

The European Investment Bank also provides financing for transport infrastructure. Loans and guarantees can be provided to public and private entities. In the case of a grant, the award is contingent on co-financing between EIB, a national bank or private finance. Eligible projects are works at existing ports such as rehabilitation and expansion of infrastructure (breakwaters, access channels, maritime locks, capital dredging, navigation aids, quay walls, etc.), environmental compliance projects and LNG bunkering infrastructure. The Bank also finances the development of new terminals, such as basic terminal infrastructure by a port authority or superstructure and equipment by a terminal operator (EIB, 2018).

Support for financing maritime knowledge and innovation

In most cases, innovation loans are available to shipyards and other marine technology companies. In Norway, shipyards may apply for such a financing scheme. In France, repayable advances may be granted to companies that engage in experimental development of technologies that increase the energy performance of ships (e.g. Programme d'investissements d'avenir).

Research, development and innovation loans for the maritime sector are also available via the intergovernmental network Eureka, which regroups mostly European countries, but also Canada, Chile, Russia, South Africa and South Korea.

Maritime subsidy expenditure

How much is spent on the variety of maritime subsidies described in the first section? That is the focus of this section. To determine this, official statistics and own data concerning subsidies were collected based on a range of different sources.

The monetary value of maritime subsidies

Overviews of maritime subsidies were common a few decades ago, but this is no longer the case. This means that giving an overview of the monetary value of maritime subsidies throughout the world is a daunting challenge. Below are the existing sources and the complementary information collected to estimate the amount of some maritime subsidies.

European Union State Aid Scoreboard

Maritime state aid in European Union countries totalled approximately EUR 1.4 billion per year in 2016, according to the European Commission. This estimate comes from their EU State Aid Scoreboard that aims to monitor the amounts of state aid in EU countries by sector. These numbers are based on annual reports submitted by EU Member States to the European Commission and are available from 2009. Based on these numbers, total state aid to the maritime sector over 2009-2016 in EU countries (and Norway) would represent EUR 12.2 billion. The total state aid amounts are more or less stable over time, with a slight decline in maritime state aid after 2012.

According to these numbers from the European Commission, the countries providing most state aid to the maritime transport sector include the Netherlands, Norway, Sweden, Belgium and Denmark. Whilst the last four countries were reported to spend between EUR 150-200 million each in 2016 on maritime state aid, the Netherlands would have spent around EUR 350 million in the same year. Development of maritime state aid over time is fairly stable for most countries but shows volatile patterns for countries like Belgium and Norway. According to the European State Aid Scoreboard, maritime state aid in the United Kingdom dropped from more than EUR 100 million per year to almost zero from 2013 to 2014. Such volatility could be explained by the fact that countries are reporting on actual expenditure: for some forms of state aid (in particular the tonnage tax) actual expenditure depends on the amount of tax that shipping firms would have paid without the shipping-specific tax: as many shipping firms struggled to make profits over the last years, their benefits from a tonnage tax (and thus, the actual tax expenditures by governments) are much more limited. Another reason for the volatility of maritime state aid over these years might be incompleteness of the data.

For the following reasons, the EU overview of maritime state aid is likely to underestimate the amount of maritime subsidies:

- The overview is likely not complete. Data collection done for this report alone shows higher state aid amounts for certain countries, e.g. the United Kingdom, Germany and Italy.
- The countries with the most generous schemes for shipping, such as Greece, Cyprus[10] and Malta, paradoxically have the lowest reported amounts on maritime state aid, whereas only five

states (the Netherlands, Norway, Sweden, Belgium and Denmark) seem to be responsible for 70% of the maritime state aid in EU countries. This is in part due to the way tax expenditures are calculated, namely as revenue foregone because of the special regime for shipping. Another explanation is that the estimation of tax expenditure is often presented in comparison with the situation before a certain measure such as the tonnage tax. In certain countries, the shipping sector was subject to very little taxation, even before the tonnage tax. So, the revenue foregone in this situation is often reported as marginal, even if the shipping sector clearly would have to pay more taxes if treated as any other economic sector. This is an issue that should be looked into, for example by developing alternative methodologies to quantify maritime subsidies.

- Countries that have monitored *actual* expenditures are not accidentally among the "highest spenders". The European Commission asks countries to report on *actual* expenditures rather than *budgeted* state aid. The differences between these can be large, as subsequent studies on spending on the Dutch tonnage tax has shown (Table 6). The Netherlands, Norway and Sweden – the top countries on maritime state aid in the EU State Aid Scoreboard – all regularly evaluate their maritime state aid schemes and are thus in a position to adjust estimates to reflect actual expenditures – which means upwards in most cases. In contrast, countries such as Malta and Cyprus[11], budget marginal amounts for their tonnage tax schemes, but do not seem to monitor the actual expenditures related to it.

Table 6. Differences between budgeted and actual revenue foregone of Dutch tonnage tax

Period	Budgeted annual foregone revenues EUR million	Actual annual foregone revenues EUR million
1997-19	11	59
2003-05	50	92
2007-11	80	153

Source: Panteia (2014).

- The period following the 2009 global crisis has seen a contraction of certain maritime state aid. Actual spending on the tonnage tax has gone down in various countries; many shipping companies did not report any profit, so did not benefit from being in the tonnage tax regime. The tax expenditures related to the tonnage tax were considerably higher before 2009 than after 2009.
- Certain categories of subsidies are not covered by this overview. This is only logical because maritime state aid is not the same as maritime subsidies. Moreover not all maritime state aid is likely to be notified or reported.

Most common maritime subsidies

The majority of the maritime subsidies in OECD countries can be categorised as tax expenditures, or revenue foregone. Three main categories – tonnage taxes, special fiscal treatment of seafarers, and tax exemptions for ship fuel – will be covered here in more detail, with estimations of their monetary value.

Tonnage tax

Tonnage taxation represented at least EUR 1.1 billion in foregone revenues in 2015 in OECD countries. The countries with largest tax expenditures on the tonnage tax include Germany, Japan, United Kingdom, the Netherlands and France.

The revenue foregone related to tonnage taxation in these countries has increased since the 1990s until 2008 – and then decreased. The drop in tonnage tax expenditures is associated with the decline in profitability of the shipping sector after the 2008 global economic crisis. The increase until 2008 can be related to three issues:

- an increasing number of countries applying a tonnage tax
- the types of qualifying ships and activities has increased over time
- the definition of the tax base has become more generous over time.

An increasing number of countries apply a tonnage tax. Until the late 1990s only five European countries had a tonnage tax: Greece, Malta, the Netherlands, Norway and Germany. In 2019 this number had increased to 22. In various countries, the tonnage tax replaces a favourable tax system related to investments in ships. These schemes were in many cases fairly invisible and difficult to express in terms of revenue foregone. In this way the introduction of a tonnage tax has made tax expenditures to the shipping sector somewhat more visible.

Various countries have expanded the coverage of their measures, in most cases accepted by the European Commission. E.g. the tonnage tax scheme in Denmark was expanded to cover offshore vessels; the proposed tonnage tax scheme in Malta explicitly included cruise shipping. In certain cases, the Commission has declared aid granted to certain activities that do not qualify as maritime transport compatible with the internal market after notification from Member States. It has done so by applying the requirements by analogy to the activities in question, even if they cannot be considered to be maritime transport. This has, for example, been the case for cable layers, pipeline layers, research vessels and crane vessels. At the same time, the scope of the allowed ancillary activities has also expanded and now includes activities such as cargo loading and unloading.

Finally, the definition of the tax base has become more generous. The tax base of the tonnage tax is for most countries the virtual profit of the company based on the tonnage it operates, also called the tonnage tax profit. This is the tax base on which the regular corporate income tax is applied.[12] There are two ways to show that the tax base has become more generous. The first is that the definition of the tonnage tax base in a particular country has become more generous over time. This is for example the case with extensions of the tonnage taxes in the Netherlands and Finland (Figures 1 and 2). The second way is new tonnage tax schemes that set lower standards than the schemes that existed before.

One could argue that the addition of new tonnage tax schemes in Europe has increased the divergence rather than harmonised them. There are two cases in particular that have set the standard for other countries to offer more generous schemes: the tonnage tax scheme of Belgium in 2003 and the tonnage tax scheme of Poland in 2011. The scheme of Belgium was particularly generous for large ships. The Belgian scheme inspired the Dutch to add a similar provision to their scheme for the benefit of large ships, in their revision of the tonnage scheme in 2009. The Polish scheme was far more generous than any other EU scheme and has since given rise to more or less similarly generous schemes in Malta and Croatia. The result is a fairly heterogeneous picture with regard to the corporate taxes to be paid by shipping firms: for example, a company with one ship of 100 000 dwt would have to pay less than EUR 10 000 in Malta, but EUR 40 000 in the French tonnage tax scheme (Figure 3).

Figure 1. The tonnage tax base in the Netherlands, 1996 and 2009

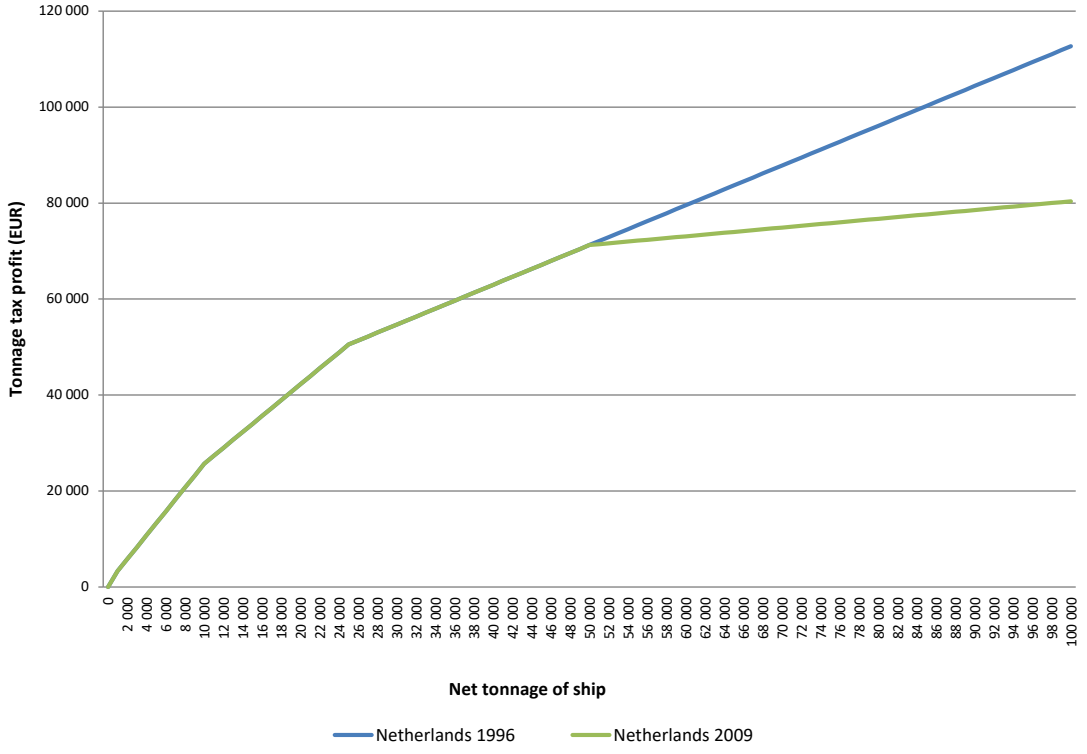


Figure 2. The tonnage tax base in Finland, 2003 and 2011

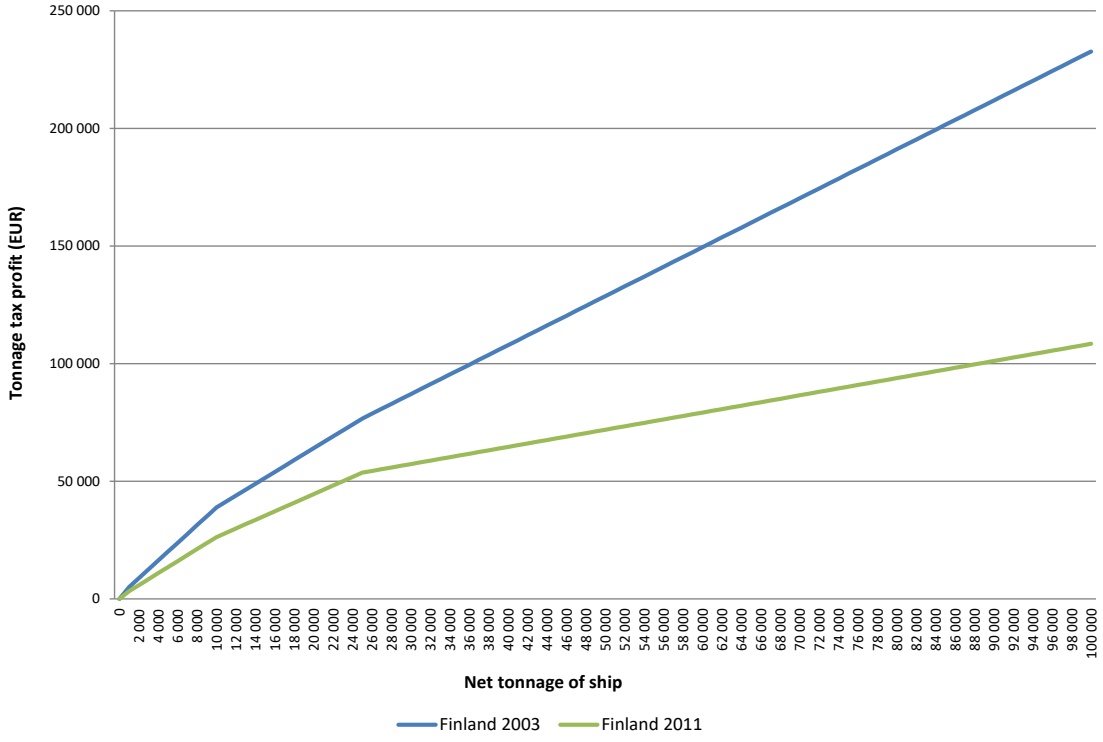
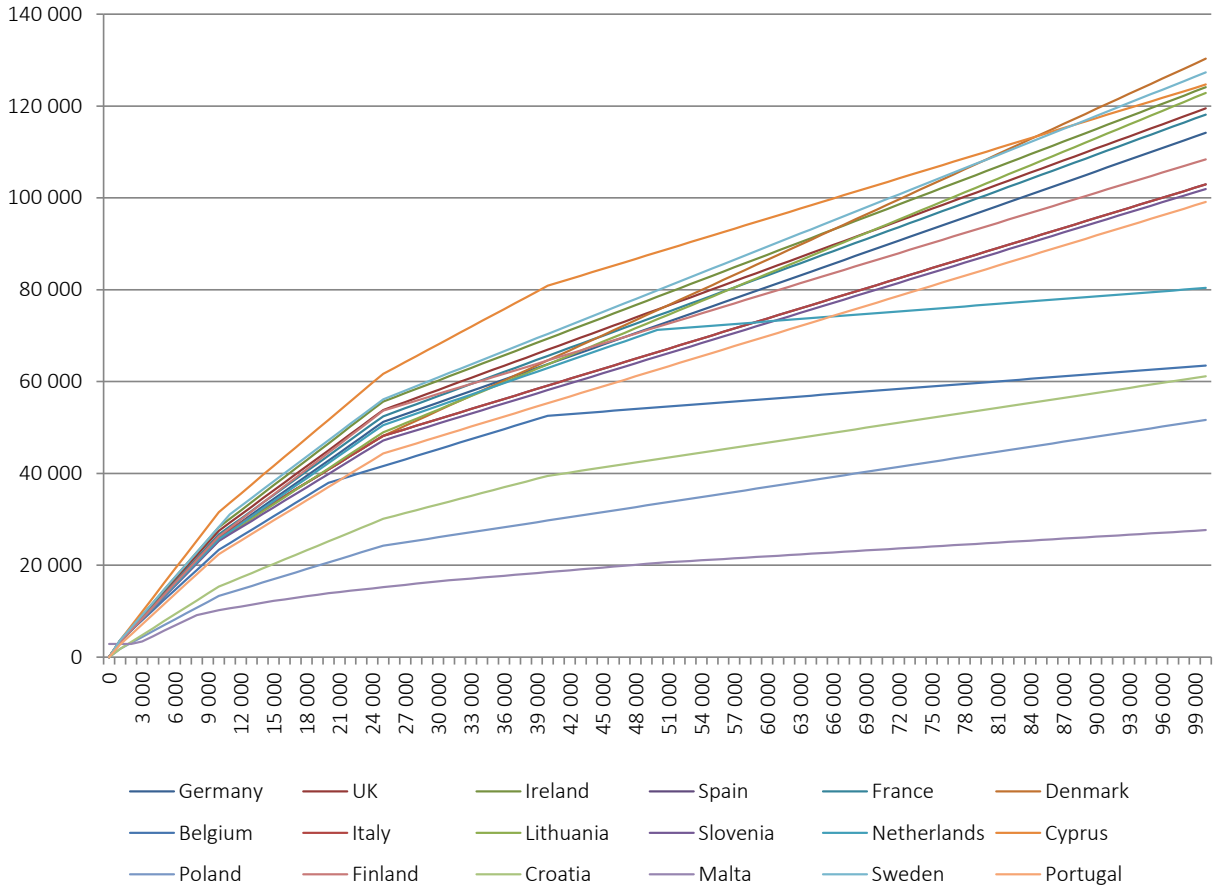


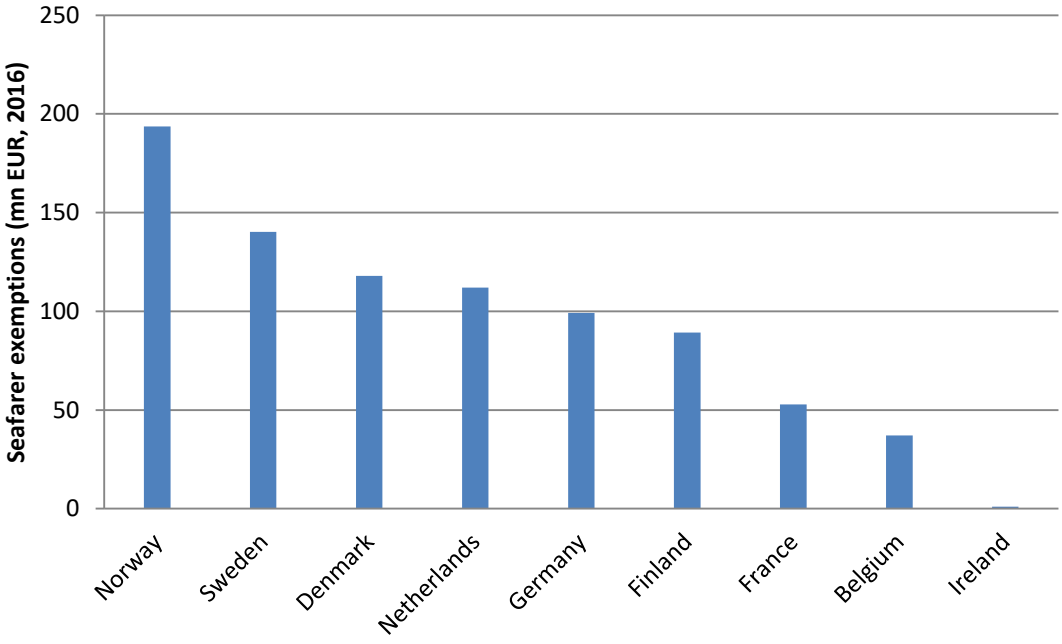
Figure 3. Tonnage tax to be paid per country for a similar ship



Fiscal exemptions for seafarers

Fiscal exemptions for seafarers are common in OECD countries and represented around EUR 0.8 billion in 2016. These are exemptions of payroll taxes and social contributions that should normally be paid for seafarers. The countries that apply these exemptions are mostly Northern European countries that generally have relatively large wage costs and social security contributions (Figure 4). Some countries have several schemes. For example, Germany has a separate scheme that exempts the wage tax and another scheme for exempting social security contributions. The costs of these schemes are combined in Figure 4.

Figure 4. Fiscal exemptions for seafarers in 2016 in selected countries



An increasing number of countries have introduced such schemes since they emerged in the 1990s. Moreover, various countries have extended the scope of the schemes and made them more generous. For example, Germany extended the exemption for payroll tax for seafarers from a 40% exemption to a 100% exemption in 2016. Norway extended the sorts of seafarers to whom the scheme applies in 2017, so that the scheme now also covers seafarers on ferry ships and seafarers on ocean-going ships registered on the Norwegian International Register.

Tax exemptions for ship fuel

There is an almost generally applied tax exemption for ship fuels throughout the world. Prior estimations on the amount related to this fiscal exemption could not be found in this study, with the exception of EEA (2007) that estimated the value of this exemption in the EU-25 represented EUR 3-19 billion for both domestic and international shipping. With regards to the tax exemptions of ship fuels for domestic shipping, various OECD countries have made estimations that are included in the OECD Inventory on Fossil Fuel Subsidies (Table 7). The amounts of these fiscal exemptions amounted to around EUR 1 billion in 2016, using in most cases the regular fuel tax rate as applied to other fuels.

Table 7. Fiscal exemptions for ship fuel in domestic shipping, 2016

Country	Tax measure	Relevant tax benchmark	Tax subsidy EUR million
Australia	Excise tax	Tax rates on regular petroleum products.	n.a.
Finland	Energy tax	Energy tax rate levied on all energy products.	3
Greece	Excise tax	Regular fuel excise tax rate.	5
Italy	Excise tax	Regular fuel excise tax rate.	457
Latvia	Excise tax	Excise tax rate on diesel oil.	5
Mexico	Tax credit for marine diesel	Tax credit to final consumers of "marine" diesel fuel	75
Norway	Basic tax on mineral oil	Standard rate (NOK 1.603 per litre)	76
Norway	NO_x tax	Standard rate (NOK 21.59 NOK/kg in 2017)	77
Norway	CO_2 tax	Benchmark price per carbon delivered from CO_2 tax on petrol	7
Portugal	Excise tax	Regular fuel excise tax rate	25
Spain	Sales tax for petroleum products	Regular fuel excise tax rate	26
Sweden	Energy tax	Energy tax rate on gasoline in environmental class 1	36
Sweden	CO_2 tax	Standard CO_2 tax rate of SEK 1.13 per kg of CO_2	29
Turkey	Fuel consumption tax	Regular fuel consumption tax rate	198

Source: OECD Database on Fossil Fuel Subsidies, http://www.oecd.org/fossil-fuels/data/

Which monetary value?

The monetary value of the three maritime subsidies covered above – tonnage tax, tax exemption for domestic ship fuel and fiscal measures account for around EUR 3 billion for OECD countries. Systemic gaps in the data mean the picture on the monetary value of maritime subsidies is incomplete, but likely to be much higher. A study by EEA (2007) identified EUR 14-30 billion of annual subsidies for the maritime transport sector in the EU-25. That study included port infrastructure subsidies and tax exemptions for international shipping that have not been calculated in our study.

Value for money?

This section provides an assessment of whether the value of maritime subsidies is worth the money invested in terms of their effectiveness and efficiency in serving identified public policy objectives. It starts with an overview and review of existing impact studies. This is followed by a more in-depth assessment of the different motivations of maritime subsidies, related to flags and ownership, seafarer employment, maritime clusters, transport modal shifts and the environment.

Recent impact studies

Of the recent and publicly available impact assessments on maritime subsidies (Table 8), relatively few studies provide a thorough assessment. Very few governments provide a yearly evaluation of their subsidies to the shipping sector, the Swedish being one of the notable and laudable exceptions. Most evaluation studies commissioned by governments tend to be very light on the evidence of the value added by these subsidies. A review of existing evaluation studies commissioned or carried out by government agencies shows that they use descriptive statistics in most cases. Further empirical studies would be needed to confirm the extent to which developments in maritime employment, turnover or value-added to the economy was actually influenced by the respective subsidy. In some studies, the actual use of subsidy programmes is considered a measure of success (Panteia, 2014). The relative lack of thorough impact assessments could also be related to the fact that many maritime subsidies have loosely-formulated goals that make quantified performance review more complicated (Thöne, 2016).

Table 8. Selection of impact studies of maritime subsidies

Study	Country of study	Period	Subsidy	Key criteria/indicators	Findings	Method
Marlow (1991c)	United Kingdom	1963-1987	Fiscal investment incentives	Level of investment in ships	Not significant	Regression
Chiu (2007)	Chinese Taipei	1952-2004	Construction subsidies, financing programs, tax incentives, depreciation benefits, scrap-and-build aids, and restructuring aids.	Liberalisation of shipping markets	Gradual removal of most incentive schemes for shipping did not decrease the quality of maritime transport in Taiwan.	Survey and policy analysis
Panteia (2014)	Netherlands	2008-2013	Tonnage tax, exemption of social security contributions, accelerated depreciation	Budget, usage, effectiveness	The fleet managed from the Netherlands has grown. The instrument of accelerated depreciation is not used.	Survey
Ecorys (2007a)	Netherlands	1996-2006	Tonnage tax, exemption of social security contributions, accelerated depreciation	Flagging, location of ship management activities	Shipping companies highlight the importance of the fiscal measures. For the shipping companies that re-flagged the tonnage tax was an important reason	Survey

Ecorys (2007b)	Netherlands	1987-2005	Tonnage tax, exemption of social security contributions, accelerated depreciation	Employment and value added of shipping sector and maritime cluster	No effects can be quantified	Regression analysis
Leggate and McConville (2005)	United Kingdom	2000-2005	Tonnage tax	Domestic fleet, seafarers	Decline in UK seafarers has not been reversed or stabilised	Policy analysis
Yang (2014)	Chinese Taipei, Korea, Japan	2001-2011	Administrative aid measures, Fiscal aid measures	The number of vessels, Gross Tonnage, Deadweight Tonnage, the number of Seamen, Cargo Volume	The cases of Korea and Taiwan suggest that an aggressive shipping-aid policy will achieve better performance. There is a positive but not significant relationship between shipping competitiveness and shipping aid policy.	Gray relational analysis
Gekara (2010)	United Kingdom	1999-2006	Tonnage Tax (including the maritime training obligation built into the tax, to revitalise the national seafaring skills base)	Fleet, seafarers	The fleet grew from 5.6 million gross tonnage in 2000 to 12.1 million gross tonnage in 2006. Cadet intake improved only minimally and remained far less than initially projected. The training obligation was ineffective because it only emphasised recruitment and training but ignored the core question of employment.	Survey, interviews
Econ (2010)	Norway	2002-2010	Reductions of income tax for seafarers, exemptions of social security contributions	Socio-economic benefits	Socio-economically unprofitable in the long term. For highly specialized functions, schemes have little effect	Modelling
Jakobsen et al. (2014)	Norway	2006-2012	Loans, grants and advisory services	Growth of shipping companies(key economic indicators), impact on innovation,	Such aid results in increased investment, innovation and research and design due to increased credit in the companies.	Econometric analysis, surveys, interviews
Magnussen et al. (2008)	Norway	2008	All schemes (all sectors) that have adverse environmental impact - Grants for employment of seafarers, Innovation Norway- Research and Development Contracts, Innovation Norway- Maritime Development.		Aid to the maritime industry helps maintain an industry that contributes to polluting the environment by GHG emissions, chemical and environmental hazards, and other ways of air and water pollution.	

CEBR (2017)	United Kingdom	1986-2015	Tonnage Tax	Fleet, Sea transport services trade balance, GVA impacts of shipping industry, employment impacts, contribution of exchequer	Tonnage tax regime as compared to alternate scenarios shows that the fleet is higher, GVA is higher, employment contribution is higher, Contribution to UK exchequer is higher, and the sea transport trade balance is largely positive as compared to the other scenarios where it would have been negative.	Comparison of estimates of indicators in counterfactual scenarios (without tonnage tax regimes) with the actual data on the indicators
Trafikanalys (2013, 2014, 2015, 2016, 2017, 2018)	Sweden	2011-2017	Reductions of income tax for seafarers, exemptions of social security contributions	Turnover, profitability, return on equity, Swedish employees on-board	Support presents contribution to turnover ranging from 1% to over 50% depending on company. Number of Swedish employees decreasing	Modelling
Oxford Economics (2014)	Nine EU countries	1994-2012	Tonnage tax and reduced income tax and social security contributions for seafarers	Value added and employment	Economic contribution of the European shipping industry could have been 50% lower in 2012 if countries had not introduced tonnage taxes and other state aid measures.	Comparison of estimates of indicators in counterfactual scenarios (without tonnage tax regimes) with the actual data on the indicators
Jimenez et al. (2018)	European Union	2016	Maritime passenger subsidies	Prices	Firms set higher mark ups for routes with resident subsidies (because results show that such routes have higher prices, which act as indirect subsidies to these firms).	Regression analysis

Tonnage tax is justified by most commissioned studies by the fact that the tax is applied in all significant maritime economies worldwide. Unilateral abolition of the tonnage tax would imply high risks for the domestic maritime sector. None of the studies analysed have identified an alternative measure with similar incentive effects.

Flag and ownership

Flagging and re-flagging is one of the objectives of maritime subsidies. It is mentioned in many subsidy programmes and it also forms an important part of the motivation of the EU Maritime State aid Guidelines. One of the general objectives of the 2004 guidelines is to encourage flagging or re-flagging to Member States' registers.

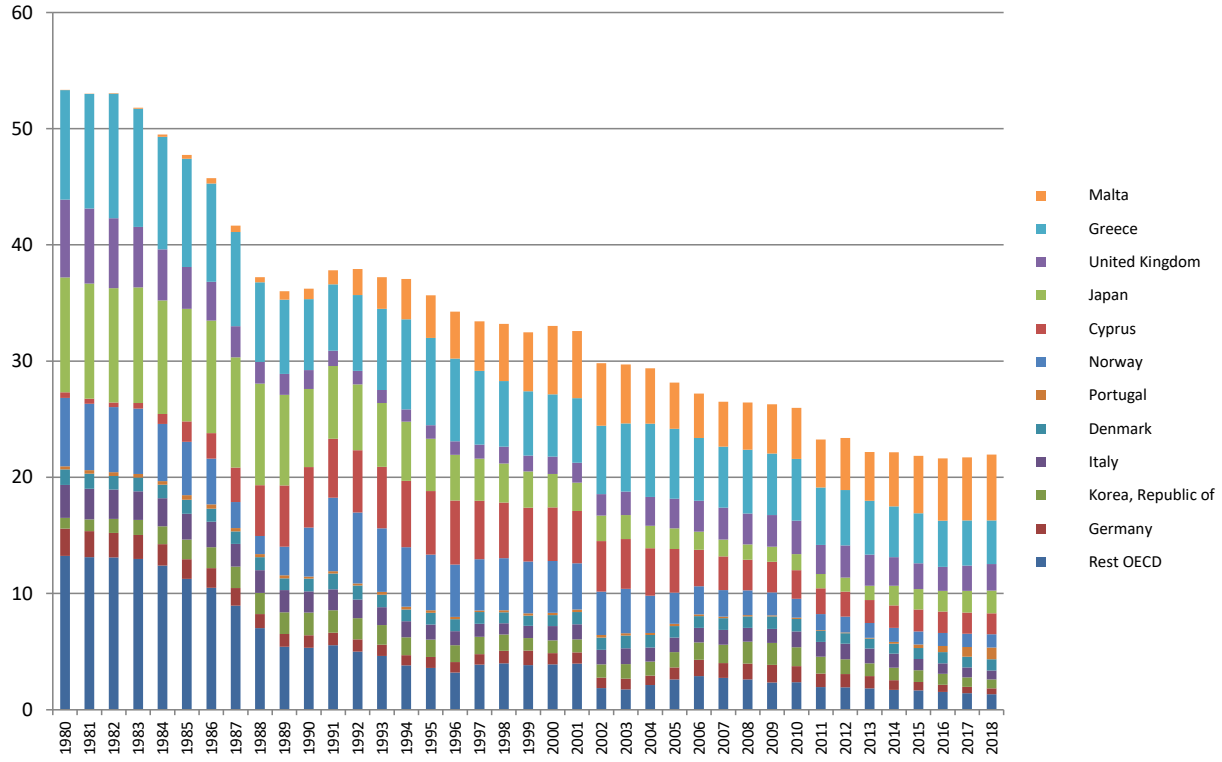
There are various determinants for flagging out, the term used to describe the tendency of ship-owners to register their ship in a foreign registry – so to fly a different flag than their national flag. At the heart of the decision on flagging is a risk-return trade off: flags of convenience will provide lower costs and less regulation, but also a higher probability of vessel loss, mainly due to more lenient application of safety regulations (Kavussanos and Tsekrekos, 2011). Fiscal reasons form one of the reasons for flagging out, but it is unlikely to have a large impact. Until the mid-1990s, fiscal advantages were considered by the academic literature to be a substantial factor in the choice of the flag decision, but it appears no longer

to be the case (Bergantino and Marlow, 1998). The reason is that many traditional maritime nations have introduced tonnage taxes and second registries, so this can no longer be considered a differentiator. The mere introduction of a favourable tax regime will not be enough to result in flagging in.

Arguably the most important determinant at the moment is crew costs (Luo, Fan and Co, 2013; Mitroussi and Arghyrou, 2016). Reduction of crew costs could be achieved by relaxing domestic crew requirements related to shipping registries. This would reduce the number of domestic seafarers on board these ships, thus exposing the trade-off between policies focusing on retaining domestically-flagged vessels and those focused on retaining domestic seafarers on that country's vessels.

In OECD countries, domestic flags have decreased dramatically over the last four decades, from 54% of the global fleet in 1980 to 16% in 2019. European flags have also declined over this period, albeit at a slower pace: shipping registries in EU countries represented 34% of the global fleet in 1980, but only 18% in 2018 (Figure 5). The decline was steepest in the 1980s, and was followed by a slight recovery in the 1990s with a further steady decline since 2000. The countries with the sharpest declines were traditional maritime nations such as Greece, Japan, the United Kingdom, Norway, France and Germany. The clearest exception to this development is Malta, while over the last few years, Portugal has also managed to grow as a shipping registry. The decline in the shares of traditional maritime nations is also caused in part by the emergence of other shipping nations, as demonstrated by the fact that there has been a much less marked decline in absolute fleet capacity in EU nations than in market shares.

Figure 5. Share of total global fleet by flags for OECD countries plus Malta and Cyprus, 1980-2018



Source: Own elaboration based on https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=93

Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

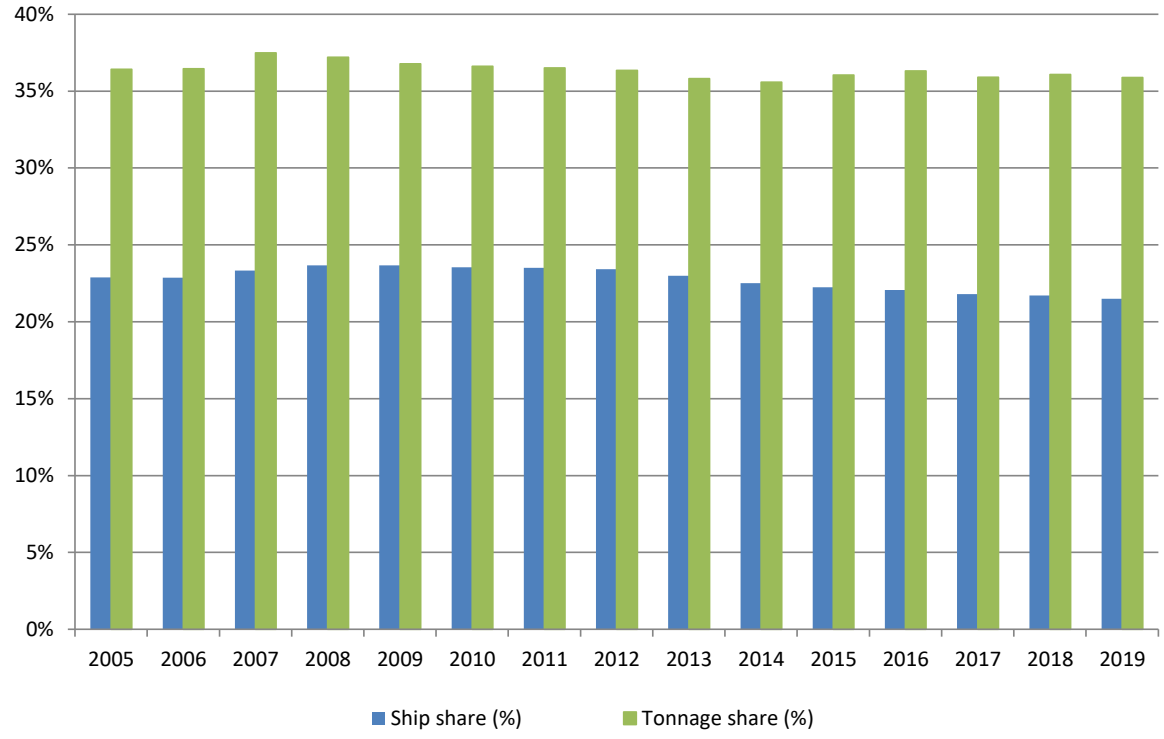
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

In contrast, shipownership within OECD countries has remained fairly stable since 2005, but with a slight decrease since 2016. The share of the total global fleet owned by OECD nationals was 61% in 2005 and 59% in 2019. Throughout this period, ship ownership in the European Union remained stable at 36% (Figure 6). There has been a slight decline in the EU share of ship numbers (from 23% in 2005 to 21% in 2019), but this is due to increases in ship size, that have grown faster in EU-owned fleets than globally.

Within OECD countries, a growth of Greek-owned fleets and a decline of German and US-owned fleets can be observed. The share of Greek-owned fleet capacity increased from 17% in 2005 to 19% in 2019, making it the first ship owning nation in the OECD. The second is Japan, whose share of global ship ownership remained stable at 14%. Over the same period the German-owned fleet decreased from 5% to 3% and the US-owned fleet from 5% to 4%. The Greek fleet represents now more than half of the EU-owned merchant fleet. Despite its decline, Germany remains the second largest European ship-owning nation. Other EU ship-owning nations have considerably smaller merchant fleets, but their shares of the global fleet have remained more or less stable over the last 15 years (Figure 7).

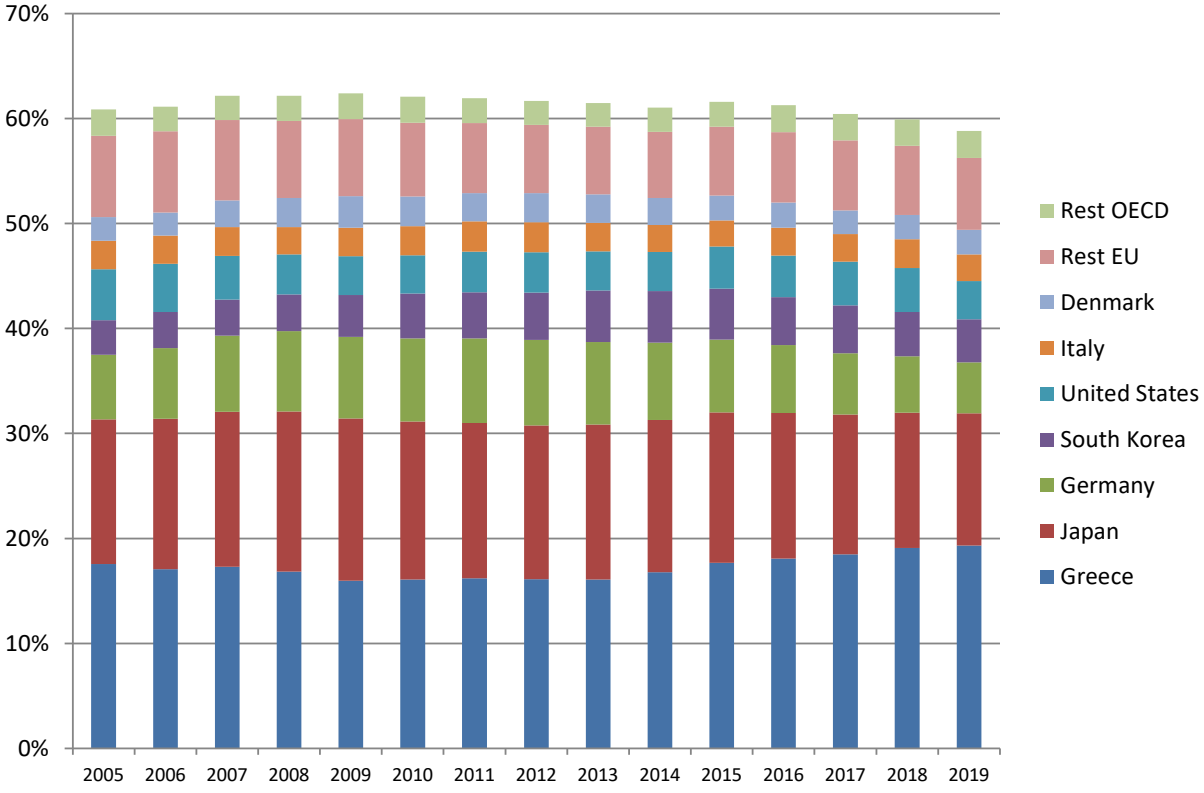
Figure 6. European Union ship ownership rate, 2005-19

percentage share of the total global fleet



Source: ITF elaboration based on Clarkson Research Database

Figure 7. Main ship-owning countries in OECD, 2005-19
percentage share of the total global fleet



Source: ITF elaboration based on Clarkson Research Database

Most countries examined justify the introduction of tonnage tax against the background of the special structure of maritime transport, the high-level of capital and labour mobility in the sector, international competitive pressures and the national economic importance of the sector. To a greater extent than most other sectors, the tax burden in maritime shipping is decisive for the location of the activity. Therefore, and especially with regard to competitive pressure, countries intend to ensure a level playing field with other countries by introducing tonnage tax. However, the initial competitive effect of introducing tonnage tax is eroded once most countries adopt a similar regime. Thus, some impact studies have found a first round effect of tonnage taxes leading to re-flagging or prevention of further flagging out that does not last very long, as other countries react, which means that the original competitive effect is eroded (the second round effect). In line with this, Marlow and Mitroussi (2008) detected a stimulus effect of the tonnage tax in Greece as compared to other regimes applicable in the United Kingdom, the Netherlands, Panama and Liberia. However, they draw attention to the reduced current significance of incentives through a tonnage tax, now that all relevant maritime countries apply a comparable system. In Germany, the share of German-flagged ships with German owners has continued to decline despite substantial subsidies (Schifffahrtsinstitut Warnemünde, 2008).

Subsidies targeting re-flagging often suppose that a larger domestically-flagged fleet has a positive impact on maritime employment and value added. This assumption is implicit in subsidy schemes and in many impact studies assessing these subsidies. Tonnage tax schemes have, since their inception, assumed that a more competitive national flag would have positive effects on national seafarer employment. For example, the case for the adoption of a tonnage tax in the United Kingdom was made

on the basis of boosting employment in the industry as well as benefitting shipping businesses. This assumption has also been used in impact studies on tonnage tax schemes. E.g. a study by CEBR (2017) estimated the economic impact of the tonnage tax regime in the United Kingdom by comparing the current scenario with tonnage tax and three other counterfactual scenarios where it is assumed that the tonnage tax had not been put in place, and for which they assume lower employment numbers for UK seafarers.

However, there does not seem to be a lot of evidence of the wider domestic employment effects of subsidies to support re-flagging, such as tonnage taxes. An evaluation of UK tonnage tax by Leggate and McConville (2005) concludes that although the UK tonnage tax has increased the total tonnage, it has not substantially increased the number of vessels and the jobs created have mainly benefitted non-EU nationals. This finding was confirmed in Gekara (2010), who noted that while the UK fleet grew from 5.6 million gross tonnage in 2000 to 12.2 million gross tonnage in 2006 the cadet intake only increased from 500 in 1999 to 630 in 2006. Even though the UK tonnage tax scheme contained a training obligation, this proved ineffective as increased training activity did not translate into more national seafarer employment. Moreover, Leggate and McConville (2005) observed that many companies in the regime have opted out of the training obligation and paid compensation instead.

Seafarer employment

Seafarer employment can be targeted indirectly - via subsidies such as the tonnage tax – but also directly. A substantial part of maritime subsidies consists of wage-cost reduction schemes that aim to make hiring national seafarers more attractive – or EU seafarers in the case of EU countries. This is done by reducing non-wage labour costs – such as payroll taxes and social security contributions – which bring total seafarer labour costs into closer alignment with those of non-OECD countries (in particular the countries that supply large amounts of seafarers globally, such as the Philippines). One of the reasons for these subsidies in the EU is that the EU does not regulate the labour market at sea. For example, shipping is exempt from the EU Posting of Workers Directive and vessels from open registries are free to call EU ports and navigate in EU waters, which makes it complicated for EU/EEA seafarers to compete without subsidies.

The effect of these subsidies is difficult to establish, considering a lack of comparable data on seafarers. There are various ways to measure the number of seafarers and measurement varies across countries. E.g. seafarers have been counted according to membership of a professional association, holders of certificates and endorsements and contributors to a social security system. This makes it difficult to compare seafarer data across countries. Moreover, coverage and definitions for seafarer statistics in countries frequently change over time, further complicating the task of identifying trends.

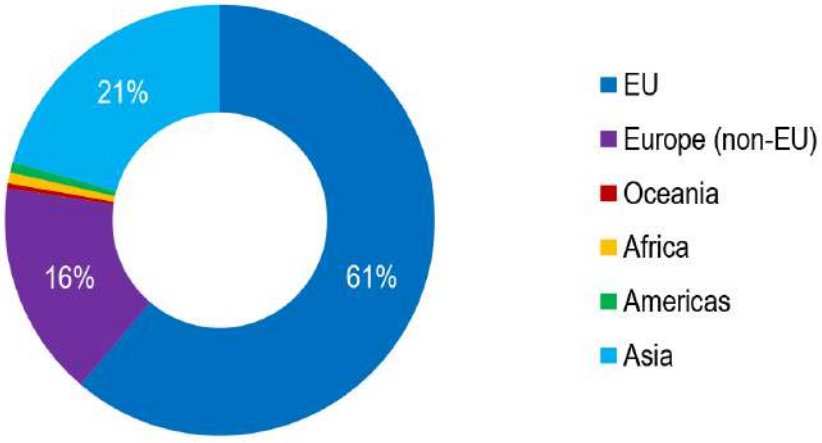
The most sustained effort in providing global seafarer statistics is offered by the BIMCO/ISF Manpower Reports. These five-yearly reports have provided estimates and forecasts of demand and supply for seafarers world-wide and per world-region since 1990. Their definition of ‘national seafarers’ is based on the number of certificates issued by national maritime institutions. In most cases, these certificates give the certificate-holder the right to be employed on vessels flying the national flag (or EU flags in case of the EU countries). In the large majority of cases, certificates are issued to nationals, so this definition is a good proxy for the availability of domestic seafarers, but not necessarily of the employed domestic seafarers. These estimates are based on a variety of sources: answers to questionnaires sent to national administrations and ship-owner associations, expert estimates and other sources. The estimates are complemented with BIMCO/IFS’s own manning estimates by ship type.

However, the BIMCO/ISF data are not fully comparable over time. Changes in country coverage and methodology since 1990 make it difficult to compare country numbers in these reports over time. The numbers provided by the countries participating in the data collection have been irregular and show a range of inexplicable and drastic variations over time for some countries.

A recent initiative by the European Maritime Safety Agency (EMSA) provides potential for more reliable time-series data in the future. The reports published by EMSA since 2016 are the most thorough attempt to gather comparable and reliable data on seafarer employment to date. The EMSA reports count the number of seafarers holding valid certificates[13] and endorsements for EU-flagged vessels, so provide data on seafarers that are available. This does not mean that these seafarers were actually active on EU Member State flagged vessels. The data are also exclusively focused on seafarers on international merchant ships. As numbers are available only since 2014, no clear trends are detectable as yet. Future data publications will possibly include the activity status of seafarers and trends might emerge in the coming years.

Current data show that 61% of the masters and officers on EU-flagged vessels are EU citizens (Figure 8). However, the two largest nationality groups represented are non-EU countries (Philippines and Ukraine). The share of EU citizens has slightly decreased compared to the previous year (-3%).

Figure 8. Masters and officers on European Union-flagged vessels by nationality, 2016

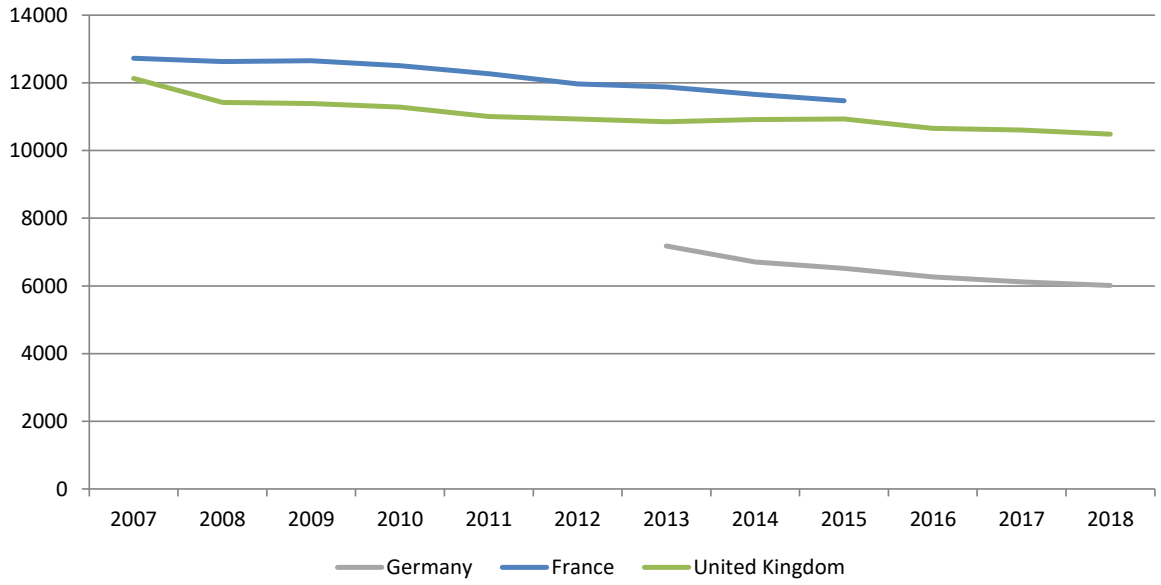


Note: Information on nationality was available for 258 750 masters and officers, representing 99% of staff available to serve on EU-flagged vessels. The data is based on the number of seafarers holding valid certificates and endorsements in 2016 (may include inactive holders).

Source: EMSA (2016).

The number of EU seafarers seems to have declined in main European maritime countries. Trends observed in countries like France, Germany and the United Kingdom, suggest a steady decrease in the number of domestic seafarers (Figure 9).

Figure 9. Seafarer employment in France, Germany and the United Kingdom, 2007-18



Note: For UK: certified active seafarers. Germany and France: social security affiliates.

Source: France: http://www.enim.eu/lenim/regime-social ;
Germany:https://www.kbs.de/DE/UeberUns/ZahlenundFakten/ZahlenundFakten_node.html;jsessionid=40C778EAA97D470557DDB950584A1BE9;
United Kingdom: https://www.gov.uk/government/statistical-data-sets/seafarer-statistics-sfr

This trend could be explained by different factors. On the one hand, there is demand for EU seafarers. In response to growth in worldwide seaborne trade, the number of ships in operation and the demand for seafarers has consequently increased. Oxford Economics reports that the increasing technical complexity of vessels has led to disproportionate growth in demand for workers with the highest skill levels (Oxford Economics, 2016). This is confirmed by a trend of increasing shares of officers among the total demand for European seafarers (BIMCO and ICS, 2016). For higher grades, there appears to be a preference for EU seafarers due to qualification levels and experience. On the other hand, minimum-sized crews have decreased on sea-going merchant vessels in conjunction with a ship capacity increase over the last decades.

Subsidies have likely halted the decline of EU seafarers to some extent. They might even have increased the attractiveness of employing EU/EEA seafarers by reducing cost burdens for shipping companies. For the highest-skilled seafarers, the effect of subsidies might have been the most limited. As developed countries were faced with more scarcity in this segment, ship-owners generally employ all the available high-skilled domestic seafarers. For this reason, a societal cost-benefit analysis carried out in Norway did not find net positive benefits of focusing the wage cost reduction scheme to high-skilled seafarers.

This might change in the future, with non-OECD seafarer qualifications going up and some concerns arising as to declines in EU qualifications. E.g. stakeholders in France have pointed to the decreasing quality of maritime training in France due to a lack of funding which has intensified competition with highly qualified non-EU seafarers, trained in institutes that have gained in quality. Moreover, the recent BIMCO/ISF reports point to a low level of cadet entries from European countries compared to forecast demand. It can take more than ten years before a trainee reaches a position as a senior officer. This development might contribute to a rise in non-European seafarers and could lead to further replacement of EU seafarers with similarly qualified seafarers from Asia.

There are mixed findings on the effectiveness of maritime training subsidies. A study by Deloitte and Oxford Economics found that the calculated benefits of each additional UK trained seafarer were greater than the associated costs. The scheme in place in the UK was evaluated positively against other policy options to ensure seafarer training, but the authors conclude that it could be more focused towards areas where the demand was greatest (e.g. officer training). Other studies are more negative. Leggate and McConville (2005) observed increased dropout rates in the United Kingdom during the training period between 1997 and 2003. The study by Deloitte and Oxford Economics (2011) concludes that SMarT, the UK government training scheme, has not been able to stop the decline in the number of UK seafarers. The study finds that the majority of shipping companies did not guarantee a job upon completion of a certificate.

Anecdotal evidence also suggests that a significant proportion of people trained to be seafarers will never work in that role. A significant proportion of trained seafarers in the United Kingdom have seemingly never attempted a career at sea but have used their certificates to work in shore-based jobs. In Italy, a substantial proportion of certified seafarers are not active seafarers, but are employed in other fields of work. In Turkey, seafarer training has been used as an avenue to avoid mandatory military service rather than to start a career at sea. This does not necessarily mean the investment is unproductive, as long as the skills they have acquired are being employed effectively in these other jobs – i.e. needed trained labour is being supplied, albeit indirectly.

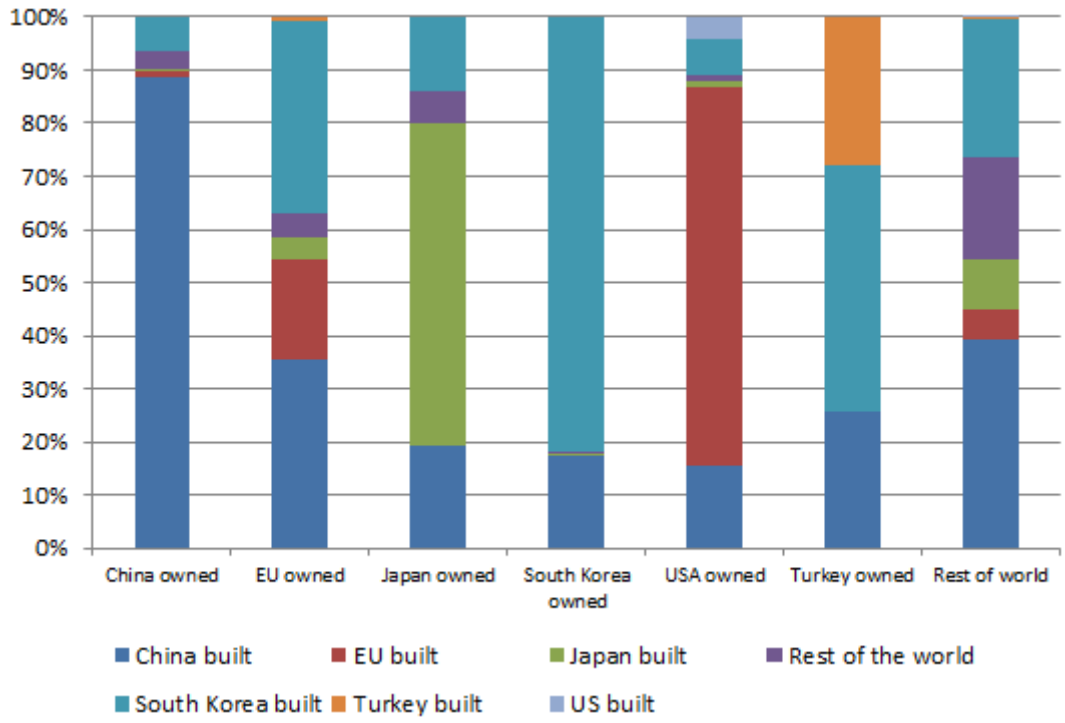
Maritime clusters and shore-based employment

Several subsidy schemes assume that the support for national registries, ship-owners and seafarers will translate into maritime cluster effects that contribute to national economic development. Various studies have attempted to calculate the contribution of shipping to national or European GDP (e.g. Oxford Economics, 2014; CEBR, 2017), but the link between the main targets of subsidies (national registries, ship-owners and seafarers) and their contribution to a maritime cluster is much less straightforward, as will be set out below.

The link between national registries and maritime clusters seems to be tenuous. The countries with the largest shipping registries – such as Panama, the Marshall Islands and Liberia – have not developed into leading maritime clusters, and registries have not attracted much additional shore-based maritime economic activity. A study on Panama concluded that the shipping registry was one of the maritime activities that generated the least economic spillovers (Intracorp, 2014). At the same time, many leading maritime clusters – e.g. London, Hamburg and Oslo – continued to be competitive despite the decline of the national flag.

In some countries, such as China and South Korea, subsidies to shipping companies are strongly linked to domestic shipyards. Maritime subsidies in this case stimulate national shipping companies to renew their fleet at one of the domestic shipyards, e.g. via scrap-and-build subsidies. Such a link does not exist in the EU and less than 20% of the ship order book of EU ship-owners is with EU shipyards, according to data from IHS Fairplay, in sharp contrast to the main Asian ship-owning nations that place a majority of orders with their domestic shipyards (Figure 10). As a result, the manufacturing of the main merchant ship types – tankers, bulkers and containerships - has shifted from Europe to Asia over the last decades. Asian shipyards are now also starting to make major advances in the ship types in which European manufactures remained competitive, including ferries, LNG ships and cruise vessels.

Figure 10. Orderbook by ownership and building areas, 2018



Source: Data provided by SEA Europe based on IHS Fairplay

Similarly, high rates of ship-ownership rates do not necessarily translate into competitive maritime clusters. Greece has very high ship ownership rates, but the economic effects of these remain fairly marginal, if only because many Greek ship-owners are actually based in London. Rather than ship ownership, it might actually be the presence of large ports that drives a lot of maritime activity and demand for maritime services (OECD, 2014).

Seafarer competencies might have some effect on the quality of the maritime cluster. Often, many seafarers stop working at sea after a certain period of time and get onshore maritime jobs where their seafarer competencies could be beneficial. Such a link between on-board and shore-based employment is often assumed, but hardly ever proven. Evidence from Norway suggests that seafarer competencies are in demand among employers in marine equipment manufacturing and maritime service provision, as these sectors absorbed much of the abundant labour after the oil and gas price spike in 2014 that resulted in massive layoffs in the offshore oil and gas sector in Norway. In the United Kingdom, a certain amount of seafarer certificates of competency are used to target employers onshore rather than for a seafarer career. However, justifying seafarer training aid on the basis of its potential spill-over effects seems dubious, particularly if these spill-over effects are only presumed and not demonstrated thoroughly.

Where maritime subsidies have stimulated shipping companies to renew their fleet with larger ships, subsidies might have actually resulted in fewer shore-based cargo handling jobs. As documented elsewhere (ITF, 2015; ITF, 2018d), the combination of larger container ship and industry consolidation has resulted in calls at fewer ports and more peaks and troughs. Economies of scale of the largest container ships can only be realised if the time in port is minimised, which has increased the pressure on terminals to automate terminal operations.

Transport modal shift

Expected modal shift towards the maritime sector plays a major role in strategies to reach the EU objective of reducing 60% of transport generated greenhouse gas emissions by 2050. This is true particularly for the transport of goods. However, the EU countries lag relative to their pledges to shift freight towards cleaner transport modes. Eurostat produces an indicator of the potential to transfer road transport of containers over longer distances (more than 300 kilometres) towards other modes of transport, such as short-sea shipping. Around 90 million tonnes of long-distance container freight could have been transported by an alternative, cleaner transport mode in 2016. These "potential modal shift" numbers have been stable over time and do not suggest that major modal changes have been induced by public modal shift support or Eco-Bonus schemes.

Eurostat data also shows that road transport still accounts for the largest share of European freight transport, and, despite public support measures, neither the absolute volumes nor the relative share of intra-EU shipping has changed significantly in recent years.

While the European Union has a strong interest in promoting short-sea shipping in Europe, there are significant obstacles to developing this sector. Studies show that port efficiency and port charges are considered as barriers when choosing an intermodal transport chain with a sea leg (Merk and Notteboom, 2015). Further, the maritime leg continues to have poor connections to inland legs. The cost of modal transfers and time spent with heavy administrative formalities required in intra-EU maritime trade are also considered a hindrance towards increased modal shift towards the short-sea shipping sector.

Subsidies spent on developing short-sea links, such as the Motorways of the Sea[14] programme, or national Eco-Bonus schemes, are not effective if no progress is made on the efficiency of customs and maritime Single Windows that would make this transport mode more attractive. Hence, special treatment for formalities in the intra-EU short-sea segment and a smarter linkage with policies to encourage the efficiency of inter-modal transport chains could be levers to attract freight volumes to the segment. While there are practically "no borders" for road transport in Europe, maritime transport of goods between two EU countries involves at least 12 checks and reporting formalities. Formalities for ships arriving in and/or departing from ports of the Member States are currently set out in the Reporting Formalities Directive (RFD). However, since its implementation in 2010, many issues persist regarding harmonisation, as found by the European Commission's ex-post evaluation.

Some cases have shown that ending subsidies to a specific maritime link, e.g. in the framework of the Motorways of the Sea programme, simply leads to disappearing services. While start-up aid may be justified, these links must become financially autonomous and attractive in the long run.

Environment

There are a few subsidies aimed at environmental objectives in shipping, but their effectiveness remains to be seen. Some of these are established to finance pilot projects that might prove valuable in the future. Some others are put in place to accelerate the greening of the maritime sector, but it is not entirely clear if that would not have happened without the subsidy. Conversely, exemptions from fuel taxes or absence of fuel taxation reduce incentives for the shipping sector to decarbonise. A variety of studies have highlighted the need for carbon pricing in maritime transport, as a means to increase the attractiveness of alternative fuels and renewable energies (Smith et al., 2016; ITF, 2018c).

Environmental objectives are rarely incorporated in the design of the main maritime subsidies. E.g. the only tonnage tax schemes that include environmental incentives – providing further deductions for the greenest ships – are the Norwegian and Portuguese scheme. Other tonnage tax schemes, for example in Malta, provide additional deductions for the youngest vessels, which might also have environmental effects. However, the effect of these environmental incentives has not been measured, so it is not clear if these policies are effective. An increasing number of ports provide reduced port fees for the cleanest ships, a policy that is most likely not effective at the moment in most ports (ITF, 2018b), but that can be effective if there is a real differentiation between ships according to their environmental performance, as for the fairway dues in Sweden (OECD, 2014).

Subsidies and shipping policies

Ocean shipping operates in a market environment that is globalised and liberalised. This has limited the room for national shipping policies, but increased the relevance of maritime subsidies. In many countries, subsidies are one of the few remaining levers for governments. This section assesses the policy choices of governments with regard to maritime subsidies: how are these integrated into shipping policies, how are level playing fields guaranteed and what conditions do governments impose on shipping companies that receive subsidies?

Shipping policies

Shipping policies have traditionally focused on which ships were allowed to carry the cargo originating from or destined for a country. Many countries had navigation acts that protected a national shipping sector. A common way for countries to trade was via cargo sharing policies that could guarantee that a share of the bilateral trade between two countries was carried by the shipping sector of one country, and the other share by the other country's shipping sector. Domestic shipping was in many cases reserved to domestic shipping companies, via maritime cabotage regulations.

Policies protecting national shipping industries have gradually been removed. This is particularly the case for international shipping. The number of cargo sharing arrangements has significantly decreased. Liberalisation has been less pervasive in domestic shipping, which remains reserved for national fleets in most countries.

Regulation of shipping has become increasingly globalised in recent decades. Within the framework of the International Maritime Organisation (IMO) and the International Labour Organisation (ILO), countries have adopted a gradually increasing number of international conventions that regulate safety, security and pollution from ships, as well as labour standards in maritime transport.

This globalisation of regulation has reduced the scope of national shipping policies. On the one hand, policy making has moved to the international level, so national shipping policies have in many areas been moved into the field of international diplomacy in order to achieve outcomes in line with national priorities. On the other hand, the levers of national policy makers have been reduced. In Europe, the remaining policy space for national governments has often been further constrained by EU regulations. This means that the relevance of subsidies, as one of the remaining national policy levers, has increased. How subsidies fit in with other elements of national shipping policies are assessed below.

Supporting shipping: flags and ownership

Many traditional shipping nations have been confronted with the emergence of open registries that generally offer lower costs and less-stringent regulatory standards for shipping companies. Some countries have actively promoted the development of such open registries, e.g. the United States with the Liberian and Marshall Islands registries (Carlisle, 1981). In response to these open registries, various traditional shipping nations have now created second registries or international registries that offer more or less the same advantages as open registries. The subject of maritime subsidies is closely linked to that of open registries. Many maritime subsidy schemes, such as the tonnage tax, have been justified by a

need for a global playing field. That is, to provide shipping sectors in developed countries more competitive opportunities in line with shipping registries in developing countries.

One the one hand, ship-owners have defended their use of open registries by claiming that the alternative – namely closing the cost difference between national and foreign flags – would require huge subsidies (Naess, 1972). On the other hand, many countries have justified maritime subsidies as a means of avoiding large reductions in the size of the nationally flagged fleet in the presence of open registries. Open registries have also introduced international tax competition in shipping. The tonnage tax has been introduced by many countries with the justification of adjusting to tax regulations other countries have put in place, which could lead to a "race to the bottom".

Economic development: maritime clusters

An increasing number of countries define shipping policies within the context of a broader economic agenda. Maritime subsidies have often been embedded in policies to stimulate maritime clusters. As mentioned in earlier sections, some of the maritime subsidies are explicitly focused on creating maritime clusters, whereas other maritime subsidies suppose spill-overs from a healthy shipping sector to other parts of the maritime cluster, although not much evidence suggests that seafarer employment or national registries are essential for establishing maritime clusters.

In essence, the establishment of maritime clusters requires a platform for different maritime sub-sectors to meet and exchange. Governments can be the initiators of facilitators of this. Depending on local preoccupations, policy orientations of such maritime clusters can cover labour markets, innovation, environment or other fields. Attracting the next generation of seafarers is recognised as a challenge for many European countries. Certain countries, such as Sweden and the Netherlands, systematically monitor the development of the maritime sector for its economic effects.

Promoting a level playing field?

No country can formulate its shipping policies in isolation: their policies are interdependent, considering the global nature of this sector. Ships can change flag, ship-owners can relocate and seafarers from all corners of the world can be deployed. Thus, government subsidies are ultimately costly, seem to achieve fairly little at the moment and are likely to remain ineffective if there is no level playing field. This would require data transparency and some sort of common rules with regard to maritime subsidies, which is what the EU has attempted to do with its Maritime State aid Guidelines. Such common rules could help to limit the use of costly but ultimately zero sum subsidies, if they could be applied at the global level.

Data transparency

Most governments do not currently tend to systematically collect data on the amount of their maritime subsidies. Maritime subsidies often take the form of both budgetary and tax expenditures, which means that in many cases at least two ministries are involved (Ministry of Transport/Maritime Affairs and the Ministry of Finance), which seems to complicate the formation of a comprehensive view on existing subsidies. Even countries that systematically monitor developments in the shipping sector, usually do not integrate data on maritime subsidies in their reporting. As a result, there often is a lack of data on maritime subsidies.

The EU has a state aid database, which makes it possible to identify a significant part of the maritime subsidies. However, not all maritime subsidies are notified as state aid, so the EU database does not

provide a comprehensive database of maritime subsidies. It should also be noted that not all documents on the state aid database include monetary amounts, so extracting the relevant information for the shipping sector is time-consuming. Yet, the EU state aid database is laudable in that it improves transparency. At the international level, there is no organisation that collects information on maritime subsidies.

Data on the effects of maritime subsidies are even scarcer. Only a few governments regularly report on this. One of these is Sweden, which releases annual reports on the use of maritime subsidies and the likely effects on the shipping sector. Other governments prepare such documents but do not necessarily make these public. Various governments sometimes evaluate certain maritime subsidies, such as the tonnage tax but many such evaluations lack rigour.

The EU Maritime State aid Guidelines have provisions for Member States to assess use and impacts of maritime subsidies. Member states need to provide an assessment of the effects of the maritime state aid during the sixth year of the implementation of the state aid measure. In the case of tonnage taxes granted under derogation from the flag link, EU Member States must report every three years on the effects and how these compare to the previously expected effects. In addition, many decisions on notified tonnage tax schemes also require an annual report on uptake and budgets.

In practice, these assessments are not made public, unless the member state itself decides to, which is rarely the case. As a result, there is limited public information available on uptake effects and impacts of maritime subsidies in EU countries. Only fairly recently has the European Maritime Safety Agency (EMSA) started to develop and collect maritime employment data. An alternative source of information could be the ITF inspectors active in Europe to collect information on EU/EEA seafarers on vessels visiting their ports.

Common guidelines: the case of the European Union

Maritime subsidies risk distorting competition. By nature, they aim to favour certain undertakings or the production of certain goods – namely maritime transport services – which could distort competition. In the case of the European Union, if these subsidies affect the trade between Member States, they are considered state aid and considered incompatible with the EU internal market. This is established in Article 107 (1) of the Treaty on the Functioning of the European Union (TFEU).

Under certain conditions can state aid be considered compatible with the internal market, in particular when it does "not adversely affect trading conditions contrary to the common interest"?[15] The European Commission can adopt guidelines to provide clarity on when support measures of Member States are compatible. There are two such guidelines relevant for maritime subsidies:

- Maritime Guidelines - officially called Community guidelines on State aid to maritime transport - adopted in 2004
- Ship Management Guidelines, adopted in 2009.

Both guidelines are binding on the Commission, but they cannot be considered legal acts of the European Union. They simply give greater legal security and predictability, as they ascertain how the European Commission will decide in an individual case (Werner 2016), when Member States notify new maritime state aid measures or when the Commission investigates existing measures. Similar guidelines are in force in the European Free Trade Association (EFTA); this means that large maritime nations such as Norway are guided by similar principles.

The Maritime Guidelines cover aid measures in favour of maritime transport, such as fiscal measures, including the tonnage tax. The 2004 Maritime Guidelines build on earlier Maritime Guidelines by the European Commission from 1989 and 1997. The 1997 Guidelines introduced tonnage tax schemes for the first time. The 2004 Guidelines maintained most of these provisions and eased the conditions for granting aid on certain aspects. The European Commission launched a consultation to revise the Maritime Guidelines in 2012 but decided to keep the current version "after strong lobbying from the shipping industry" (Werner, 2016). The 2009 Ship Management Guidelines are complementary to the Maritime Guidelines and set the conditions for ship management companies to qualify for the tonnage tax or other tax arrangements for shipping companies.

Maritime aid measures need to have at least one of the following aims, according to the Maritime Guidelines:

- improving a safe, efficient, secure and environment friendly maritime transport
- encouraging the flagging or re-flagging to Member States' registers
- contributing to the consolidation of the maritime cluster established in Member States while maintaining an overall competitive fleet on world markets
- maintaining and improving maritime know-how and protecting and promoting employment for European seafarers
- contributing to the promotion of new services in the field of short sea shipping following the White Paper on Community transport policy (EC, 2004a).

The two Guidelines identify a number of possible beneficiaries of tonnage taxes: ship-owners, ship management companies and, under certain conditions, companies that are neither ship-owners nor ship management companies. Although the Maritime Guidelines do not define the concept of ship-owner, its definition of maritime transport[16] clarifies that these could be understood as to pursue shipping activities. Ship management companies do not own ships but engage in crew and technical management of ships – either separately of jointly. The 2009 Ship Management Guidelines extend the application of the provisions on tonnage tax of the Maritime Guidelines to these ship management companies. In addition to these two beneficiaries, the Commission has accepted that under certain conditions there might be other beneficiaries as well, namely shipping companies that charter out their vessels on a bare-boat basis in the case of temporary over-capacity, time-chartered tonnage vessels and natural persons. Pure ship lessors and pure ship brokers cannot benefit from tonnage tax schemes.

The conditions for ship management companies are stricter than for ship-owners. They need to fulfil a number of cumulative conditions, related to their economic contribution to the EU, compliance with international and EU standards, training of seafarers and social conditions for crew members.

Not all ships or shipping activity can qualify for tonnage taxes. Ship types that cannot qualify are fishing vessels, non-propelled barges and oil rigs, as these are not intended to provide maritime transport. The Guidelines define maritime transport as "transport of goods and persons by sea". Certain activities are considered to be ancillary to maritime transport and can be included for the purpose of the tonnage tax advantage; this will be expanded upon in the section below. Not all of these ancillary activities can benefit from tonnage tax schemes; this is particularly the case for commercial activities carried out on board of passenger vessels with no direct link to maritime transport, such as profits arising from gambling, casinos and the sale of luxury goods.

Towage and dredging ships can only benefit from tonnage taxes to a certain extent. Both activities cannot be considered to entail straightforward carriage of goods or passengers by sea, even if they do in

part. The Maritime Guidelines are applicable to towage and dredging when more than 50% of the yearly activity of a tug or dredger constitutes maritime transport.

The Maritime Guidelines provide various ways to avoid abuse of the tonnage tax regimes. One of the risks (for national treasuries) of the tonnage tax scheme is cross-subsidisation of shipping to non-shipping activities within a company. In other words, fiscal engineering to make sure that the company gets maximum benefit from the tonnage tax scheme. The Maritime Guidelines mention various measures that can avoid this. These include separate accounting for activities eligible and non-eligible to the scheme. Another measure consists of the "all or nothing options", requiring companies that are part of a group of undertakings to make the choice of entering jointly the scheme for all their eligible activities, or staying completely outside the benefits of the scheme – to avoid that firms choose the vessels based on their profitability (Werner, 2016). The Guidelines also mention an obligation to remain in the tonnage tax schemes for a period of at least ten years, which prevents companies from switching from the tonnage tax scheme to the general corporate income tax scheme when they suffer losses.

The Maritime Guidelines also indicate the fiscal schemes that are allowed to reduce the fiscal and other costs borne by EU shipowners and seafarers, in comparison with the global norms. They mention two measures in particular: reduced contribution rates for the social protection, and reduced rates of income tax for EU seafarers on board of ships registered in an EU member state. The 2004 Guidelines explicitly mention the possible application of such measures to Ro-Ro ferries providing scheduled passenger services between ports of the EU. A similar explicit mention was absent in the 1997 Guidelines.

A race to the bottom?

The EU Maritime Guidelines aim to avoid "a subsidy race" or tax competition, as this could lead to "cumulation of aid levels disproportionate to the objectives of the Community common interest" (EC, 2004a). The Commission uses three avenues to avoid such a subsidy race. First, by defining a restricted scope: e.g. the tonnage tax is meant to cover only shipping activities and prevent spillovers to other sectors. Second, the Commission will only approve schemes that give rise to "a tax-load for the same tonnage fairly in line with the schemes already approved." And third, the Maritime Guidelines define a ceiling for the aid that is allowed, which is defined as the combination of tonnage tax loads in line with schemes already approved and zero taxation and social charges for seafarers. Other systems of aid may not provide any greater benefits than this. The Guidelines also state that the total amount of aid related to fiscal exemptions, crew relief, investment aid and regional aid cannot exceed the total amount of taxes and social contributions collected from shipping activities and seafarers.

The Commission has been successful to some extent in harmonising the scope of the different tonnage taxes. Many of its comments in assessing notified aid have been on limitations needed to the scope of schemes that were notified. For example in the case of France, the tonnage tax scheme of 2015 was changed at the request of the Commission to make sure that there were some limitations in scope for time-chartered ships.

Despite this, the scope of certain subsidies, such as the tonnage tax, has become stretched. Various countries have expanded the coverage of their measures, in most cases accepted by the European Commission. The tonnage tax scheme in Denmark was expanded to cover offshore vessels; the proposed tonnage tax scheme in Malta explicitly included cruise shipping, provided that the majority of their revenues stem from core shipping revenue. In certain cases, the Commission has declared aid that was granted to certain activities that do not qualify as maritime transport nevertheless compatible with the internal market. It has done so by applying the requirements by analogy to the activities in question, even if they cannot be considered to be maritime transport. This has, for example, been the case for

cable layers, pipeline layers, research vessels, crane vessels and offshore vessels. At the same time, the scope of the ancillary activities allowed has also expanded.

The European Commission's success in avoiding tax competition via tonnage tax rates has been more limited. One could argue that the addition of new tonnage tax schemes in Europe has increased the divergence rather than harmonised them. The tonnage tax scheme of Belgium in 2003 and the tonnage tax scheme of Poland in 2011 are cases that have set the standard for other countries to offer more generous schemes.

The scheme of Belgium is particularly generous for large ships. This provision was only accepted by the Commission under two conditions: it would only apply to new ships and for ships that were flying non-European flags before entering the Belgian scheme. These conditions were formulated to avoid the Belgian scheme provoking intra-EU tax competition. The Belgian scheme inspired the Dutch to add a similar provision to their scheme for the benefit of large ships, in their revision of the tonnage scheme in 2009. The Commission applied similar conditions to the Dutch scheme. Based on existing information, it is not possible to confirm if these conditions have actually been met – nor that they have not been met.

The Polish case is more remarkable. This scheme was far more generous than any scheme previously approved by the Commission and clearly presents an outlier in terms of tax base and taxes to be paid per ship. Contrary to other cases, no benchmark was made to the tonnage tax rates of previous schemes approved by the Commission and the Commission did not make a remark on this in its assessment of the scheme. Poland's subsidies have since been used to justify schemes in Malta and Croatia that are less generous than Poland, but more generous than the schemes approved prior to the Polish scheme.

It should be noted that the test of a tonnage tax load "fairly in line with existing schemes" (EC, 2004a) has given rise to ambiguity in the different assessments of the Commission. The Guidelines acknowledge that corporate tax rates might differ significantly between Member States, which means that the tonnage taxes to be paid might be very uneven between countries. The Guidelines obviously do not cover harmonisation of corporate income tax rates. At the same time it mentions the intention to "keep the present equitable balance" (EC, 2004a) which in this context only makes sense if it can be understood to refer to the homogeneity of notional tonnage profit rates that has been observed in the Guidelines. The assessment of this aspect by the Commission mirrors the ambiguity; most of the earlier assessments compare notional profit rates with those of earlier approved schemes, whereas quite a few of the recent assessments compare the tax load, understood as the amount of tax to be paid per ship.

The fact that there are two different types of tonnage tax scheme that cannot always easily be compared without taking corporate tax rates into account clouds transparency. However, corporate tax rates do not form part of the assessment, and tonnage tax schemes carry no obligation to notify the Commission if corporate tax rates fall. Although the tonnage tax rules seem to be predicated on the idea of harmonising tax rates across EU countries, the broader context is one in which generally applicable corporate tax rates are not harmonised, so it is perhaps unrealistic to expect to achieve such harmonisation in the context of an alternative, sector-specific, corporate tax regime. The considerable diversity in maritime subsidies, including fiscal measures – despite efforts for harmonisation – also makes it possible for European shipowners to "pick and choose" the schemes that are most lucrative for their specific operational model, without having to pay much consideration to employment of EU/EEA seafarers.

Distorting markets for cargo handling?

Neither the 1997, nor the 2004 EU Maritime Guidelines make mention of terminal operations as a shipping-related activity that can be covered by the tonnage tax (EC, 1997, 2004a). Both guidelines stipulate that the fiscal advantages of a tonnage tax must be restricted to shipping activities.

In practice however, many tonnage tax schemes introduced since the 1990s cover terminal operations (Table 9). This trend was set by the Dutch tonnage tax scheme in 1996, followed by Ireland in 1997, Norway in 1999 and Belgium in 2004. At the same time, other tonnage tax schemes from the same time explicitly excluded terminal operations. A clear example of this stand is given in the United Kingdom tonnage tax scheme from 2000 that explicitly mentions operations of ports and commercial services to third parties within the port area as non-qualifying activities. Commercial port activities are in that context defined as any activity carried out as a discrete function for commercial gain and billed to customers or third parties, giving rise to a revenue stream and potential tax liabilities. In case such handling services are provided to a tonnage tax company by a connected party, the ring-fence rules apply to ensure that open market prices are used for that provision (EC, 2000).

Since 2011, the European Commission has publicly accepted that port terminal operations can be covered by tonnage taxation via its decisions in the Finnish tonnage tax case (EC, 2011, 2017c, 2017d). In its questionnaire for its 2012 Review of the Maritime Guidelines it explicitly stated that terminal operations in ports were allowed to be included in the scope of the tonnage tax (EC, 2012). As this Review did not lead to a revision of the 2004 Maritime Guidelines, this reality never entered the guidelines. As a result, the "guidance" of the Guidelines is no longer aligned to practice.

Many of the new or extended tonnage tax schemes now have explicit provisions that allow the scheme to cover revenues from terminal operations. Since 2011, there have been four new tonnage tax schemes that have explicitly mentioned cargo handling. Some of the older schemes that have been renewed now also mention cargo handling. This is for example the case for Denmark where the 2001 scheme only mentioned self-handling to be covered, but the extended scheme from 2018 now also covers cargo loading and unloading activities in the port.

Cargo handling activities that can be brought under the tonnage tax need to be related to ships over which a shipping company pays tonnage tax, and carried out by an operator that forms part of the same legal entity (or tax group) as the shipping company that applies the tonnage tax regime. So, if a shipping company applies the tonnage tax regime for certain vessels and would also own a terminal, the profit of these shipping activities and terminal activities regarding these vessels could be taxed under application of the tonnage tax regime. This requires that the ships are operated by the same taxpayer that also operates the terminal. This generally means: the same legal entity, but it could also be another legal entity in the same tax group. The terminal would generally be situated in the same jurisdiction as the company that operates the vessels. In a specific set-up, the terminal could be situated in a branch in another country and still benefit from the tonnage tax regime from the jurisdiction where the vessel company is located (has it tax residency).

Table 9. Tonnage tax schemes that cover terminal operations

Country	Since	Terminal activities covered
Netherlands	1996	Self-handling Terminal operations Sales of terminal equipment.
Ireland	1997	Loading and unloading of cargo, moving of containers within a port area immediately before or after the voyage; Consolidation or breaking of cargo immediately before or after the voyage; Rental or provision of containers for goods to be carried on a qualifying ship.
Norway	1999	Loading and unloading of goods; Temporary placement of goods in or near the port pending further transportation, Transport of goods in the port area, Rental of containers for goods on board.
Spain	2002	Cargo handling by shipping companies.
Belgium	2004	Cargo loading and unloading.
Italy	2005	Loading and unloading of cargo; handling and transport of containers in the port area Cargo consolidation and de-consolidation Rental and provision of containers.
Finland	2011	Cargo loading and unloading services Transport from port area to the vessel included in the price of the transport service Temporary storage of goods.
Lithuania	2017	Cargo loading and unloading services Transhipment services Packing/unpacking before loading or immediately after unloading.
Sweden	2018	Cargo loading and unloading services.
Denmark	2018	Cargo loading and unloading services.

Coverage of terminal operations under the scope of tonnage taxes might distort the market for liner shipping companies and terminal operations. Liner shipping companies that own container terminals and use these to handle their own ships could receive fiscal benefits that are not open to liner companies that do not own container terminals. Carrier-controlled and independent terminal operators compete on the same market, so providing special tax treatment to one group but not the other presents a distortion. Coverage by the tonnage tax would mean that carrier-controlled terminals can account for profits generated from tonnage tax ships that are handled in their own terminals as tonnage tax profit – which means in practice that they would not need to pay taxes on these. On the other hand, independent terminals are obliged to pay corporate income tax over the profits of their terminal operators. Allowing terminal operations to be included in tonnage tax schemes implies fiscal incentives to facilitate carrier-controlled terminals. Calculations of revenue foregone from tonnage taxes probably do not take this into account.

Schemes that have tried to avoid this distortion were adjusted because shipping companies found it too burdensome. The Spanish 2002 tonnage tax scheme includes terminal operations by shipping companies, but only if these terminal operations are priced at cost price in order to avoid that profit from terminal operations falls under the tonnage tax, and therefore would not get taxed (EC, 2002). This

provision was changed in 2003 in light of shipping companies not using the scheme, because it was considered too burdensome (EC, 2004b).

The emergence of vertically integrated terminal operators – controlled by carriers – over the last decade might have been facilitated by this distortion in the tonnage schemes. The share of carrier-controlled terminal operations has increased over the last decade: from 18% in 2001 to 38% in 2016 world-wide. Growth rates of carrier-controlled terminals have been higher. It is not impossible that this is related to the coverage of their terminal activities by tonnage taxes.

This provision does not only distort competition with independent terminal operators, but also with freight forwarders. Their business consists of providing door-to-door logistics solutions, by providing the most attractive package of services to their customers. Various container carriers have the ambition to provide similar services as freight forwarders. There are possible market distortions of competition between carriers that are subsidised and freight forwarders that are not subsidised; these distortions are more significant if carriers are more vertically integrated and if services like cargo handling, but also storage, demurrage (as ancillary service) – like in the Slovenian tonnage tax scheme - can be covered by the tonnage tax. In those cases, tonnage tax schemes provide incentives for carrier haulage (door-to-door transport arranged by the carrier) rather than merchant haulage (where door-to-door transport is arranged by the shipper or freight forwarder).

This distortion is likely facilitated by alliances, consortia and vessel sharing arrangements. This can be deducted from possible application of the tonnage tax to profits from the terminal that is in the same tax group as the shipping company that applies the tonnage tax. If this terminal would also handle ships from third parties, or from other group companies, the profit realised with these terminal activities would be taxed under the ordinary tax regime (so, no tonnage tax). If this terminal would handle containers from third parties but on ships over which the company pays tonnage tax (for example in case of alliances, consortia or vessel sharing agreements), it is likely that the profit realised with these terminal activities would be taxed under the tonnage tax regime. In other words, the vertically integrated liner company has an incentive to attract containers from other liner companies via vessel sharing agreements, rather than attracting ships from third parties outside vessel sharing agreements.

Distorting markets for port services?

The 2004 EU Maritime Guidelines contain a few provisions on whether tonnage tax schemes could cover towage services. The Guidelines state that tonnage taxes can only apply if more than 50% of towage activity carried out by a tug constitutes “maritime transport”, so that means transport at sea. The guidelines clarify that towage activities that are carried out in ports, or that consist in assisting self-propelled vessels to reach port, are not considered to be maritime transport. These provisions can be understood as a way to provide clarity on a practice that existed prior to 2004 in various countries to provide aid to tugboats even if they are not active at sea.

Towage is currently covered by some tonnage tax schemes, whilst excluded in others. This lack of level playing field has resulted in concerns from some parties, that were expressed in the course of decision processes of the Commission on notified tonnage tax schemes, but that were never really resolved. Examples of tonnage tax schemes that were opposed by various parties on the grounds of market distortions for towage were Belgium (2004) and Poland (2011).

Enforcement of state aid policies

Market distortions are likely amplified by difficulties to enforce certain provisions in the Maritime State aid Guidelines. Examples of provisions that seem difficult to enforce are the ones on towage and dredgers. Both sectors can be covered by tonnage taxes as long as 50% of the activities of tugs or dredgers qualify as "maritime transport". It is difficult to see how tax officials could control this. This is apparent from the view of Poland that in its tonnage tax scheme proposed that the eligibility for tonnage tax of dredging and towage activities be based on the level of generated income on maritime transport, rather than on the operating time. Their argumentation was that this would make it possible to verify data included in the accounts kept by the taxpayer, which would be more difficult to control if operating time is the criterion (EC, 2009). In terms of vertically integrated activities, there is always the possibility of profit shifting, which could result in tax avoidance. A way to avoid this would be separate invoicing for the maritime transport leg and for related services, such as cargo handling. In practice, this does not seem to take place. The 2002 Spanish tonnage tax scheme that introduced this principle was amended one year later, because the scheme was not used; carriers found it too burdensome.

Most tonnage tax schemes include provisions on separate accounting, to avoid that non-shipping activities carried out by the shipping company are exempted from regular corporate income taxes. One could wonder if this is applied and controlled.

Limited conditionality of subsidies

Most maritime subsidies are provided without strict conditions on the effects that they should have. Many schemes aim to achieve outcomes related to re-flagging, domestic seafarers, national security and the environment, but the conditionalities are generally weak or non-existent. The sections below explore which conditionalities have been expressed in the different subsidy schemes.

The flag link

Many maritime subsidies have been justified with reference to the competitiveness of the national flag and the risk of out-flagging to flags of convenience. The US Operating Differential Subsidy was supposed to compensate domestic operators for their higher costs of operating ships in comparison with other flags. The impulse to further out-flagging was promoted by operators with the argument that the only alternative measure would be much higher maritime subsidies; considered unfeasible (Naess, 1972). Paradoxically, massive out-flagging did not reduce the demand for maritime subsidies, but instead increased it. Many maritime subsidies aim at increasing the competitiveness of the national flag and – in the case of the EU – of the flags of countries in the European Union (EU) and the European Economic Area (EEA). Considering this objective, it would seem logical to link these subsidies to a condition of using the national flag.

The EU Maritime State aid Guidelines (2004a) also make this link. It states: "… as a matter of principle, tax relief schemes require a link with the flag of one of the Member States". Shipping firms can only benefit from a tonnage tax if there is a link with an EU flag. This "flag link" is the general rule. Derogation from this general rule is possible if the shipping company that flies a non-EU flag commits itself to at least maintain the share of tonnage that it operated under the flag of EU Member States on 17 January 2004. This is called the "share requirement". This share requirement does not apply to undertakings that operate at least 60% of their tonnage under the EU flag. Derogation of the flag link is only "exceptionally granted" and comes with requirements for information to be provided every year that all the conditions

for the derogation from the flag link have been fulfilled. In addition, evidence must be provided that the tonnage share requirement has been observed and that each vessel of the fleet complies with the relevant international and EU standards.

This flag link is stricter for ship management companies, charterers, towage and dredging companies. Although the Ship Management Guidelines declare the flag share requirements in the Maritime Guidelines applicable to ship management companies – taking as a benchmark 12 June 2009 – in practice, the Commission has considered this criterion fulfilled when a tax scheme requires ship managers to fly exclusively under the flag of an EU member state. The Maritime Guidelines do not allow derogations from the flag link in the case of towage and dredging.

In practice, derogations have become the rule, rather than the exception. Tonnage tax requirements in France and the United Kingdom do not bind companies to register vessels under the national flag or even a country's international registry. In 2006, only 15% of the tax-privileged vessels were flying the German flag. Some countries however require a certain percentage of the company's fleet to be registered in EU/EEA registers, or at least require the share of vessels registered in Member States to increase over a certain time period. Requirements often relate to the location of management, which is linked to the objective of maintaining the strategically important "maritime location" within the respective country.

To prove a scheme's effectiveness, countries would need to establish that the maritime location is secured when ships under other flags are operated by locally managed companies. EU/EEA countries have also used second registries or international registries to compete with the open registries. Such second registries are generally very light on constraints and conditions – for example with regards to domestic crew requirements. They might convince ship-owners to re-flag, but they generally would not generate the employment for EU/EEA seafarers that domestic flags are supposed to generate. It would make sense to consider if these second registries could still be considered EU/EEA flags for the purpose of the EU tonnage tax schemes. In addition, there could be a stricter link between maritime subsidies and flying a EU/EEA flag, in particular when the ship is operating mainly in European waters, e.g. in the case of ferries, cruise ships and short sea shipping.

Maritime employment

Most maritime subsidies provide an indirect link to domestic maritime employment. The most prevalent link is often national ownership or national flag. It is often assumed that at least part of the seafarers employed by national shipping companies getting subsidies will be domestic seafarers – or Community seafarers in case of the EU. However, developments over the last decades can raise doubt about the accuracy of this assumption.

Most OECD countries have developed their own international registries, also called second registries, in reaction to the open registries ("flags of convenience") that attracted many of their ship-owners. The characteristics of the second registries are similar to those of the open registries: less administrative and regulatory burdens and lower costs for registering vessels. OECD countries with such international registries include Netherlands, Denmark, France, Norway, Spain, Portugal and the United Kingdom.

An increasing number of countries provide subsidies to ship-owners that use these international registries. For example, ships registered at the Danish International Registry can apply for tonnage tax in Denmark, but have reportedly no Danish/EU seafarers employed on their ships. The link of maritime subsidies, such as tonnage taxes, with national seafarers risks weakening when maritime subsidies are extended to international registries. An additional point of concern is that trade union representation on these ships is often not allowed.

Tonnage tax schemes do not generally require the shipping companies that benefit from it to employ domestic seafarers. This can explain the paradoxical situation where OECD seafarer employment has decreased despite increase in tonnage taxes in OECD countries – and despite increased supply of OECD seafarers. The UK's tonnage tax scheme is unique because of its training requirement, which requires each company entering tonnage tax to recruit and train one officer trainee each year for every 15 officer posts in its fleet. If that is not possible, it requires the tonnage tax firm to make payments to the Maritime Training Trust in respect of each training place which it is unable to offer. Such policies will not fulfil their purpose if there is a lack of demand from shipping companies for EU seafarers due to cost considerations.

This is the motivation of various wage cost reduction schemes that reduce the amount of payroll tax or social security contributions to be paid by ship-owners. Such schemes aim at making national seafarers more competitive. Despite such schemes aiming at increasing cost competitiveness, costs for ships with EU/EEA-seafarers are arguably still more expensive than those with non-EU/EEA-seafarers. One of the reasons for this could be that the schemes are not necessarily limited to EU/EEA seafarers. The EU Maritime State aid Guidelines have in 2004 been extended to also include non-EU/EEA seafarers in labour-related maritime subsidies. The justification of this expansion was that preventing Member States from granting tax relief to all seafarers active in international freight transport would have "very negative effects on the competitiveness of European ship-owners, which would be encouraged to flag out" (EC, 2004a). As a result, some of the labour cost reduction schemes also apply to non-EU seafarers. For example, the Dutch wage reduction also applies to non-Dutch (and non-EU/EEA) residents that are liable for wage tax in the Netherlands, although the deduction is smaller (10% instead of 40% for Dutch, EU or EEA residents).

There could be a stricter link between maritime subsidies and using EU/EEA seafarers, in particular when the ship is operating mainly in European waters, e.g. ferries and short sea shipping. An option could be to exclusively open the possibility for maritime subsidies – such as the tonnage tax and wage cost reductions – for ships with a certain share of EU/EEA seafarers. Another option would be to link it to active involvement of shipowners and operators to support EU/EEA seafarers, e.g. via participation in seafarers' education, assistance with stipends, provision for mentoring at nautical schools, cadetship programmes and direct selection of seafarers during the academic year. Similar local content requirements could be considered with regards to ship manufacturing of ships operating in EU waters, in case multilateral negotiations on shipbuilding subsidies would stall.

National security

The clearest link of maritime subsidies to national security is present in various US subsidies. Under the US Maritime Security Program direct annual stipends are provided to active, commercially viable, militarily useful, privately-owned US-flag vessels and crews operating in US international trades, in return for the owner/operators' agreement to make the vessels available to the US government in times of war or national emergency. Some subsidies are even more explicitly targeted at strategic sealift capacity in times of wars and emergency. In the United States, the National Defense Reserve Fleet (NDRF) consists of a reserve of inactive ships – mostly merchant vessels - that can be activated within 20 to 120 days to provide shipping for the United States during national emergencies, of either military or non-military nature. Part of the NDRF is the Ready Reserve Force (RRF) that must be ready for operation within five days for transport of military cargo to critical areas of operation.

The availability of a strategic fleet could also be one of the motivations of state-owned shipping companies. These state-owned companies are supported by their governments, often via subsidies.

These can take the form of a government financing operational losses and debts. Countries with considerable shares of state-owned shipping companies are China and South Korea. In the case of China, certain state-owned shipping companies are supposed to actively implement China's geopolitical strategies, such as the Belt and Road Initiative.

Most maritime subsidy programmes are less explicit. One of the arguments often implicit in the objective to guarantee a national fleet or national flag is the idea that this might provide a reserve fleet in terms of emergencies and war. Some countries seem to have made arrangements with their national ship-owners in this respect. A way to make this more explicit is the idea of a "strategic fleet" as proposed for the French maritime policies. A related question is whether a merchant fleet still has a role to play in 21st century warfare.

Environmental performance

There are a few promising examples of maritime subsidies that are explicitly linked to environmental performance. Governments can do this as part of their procurement for shipping services (Rehmatulla, Smith and Tibbles, 2017). For example, in Sweden, the public procurement procedure for the maritime connection between Stockholm and Gotland incorporated GHG emissions (ITF, 2018e).

In countries with specialised government-owned shipping banks, governments can translate their climate change mitigation and other environmental strategies in a mandate for these shipping banks to facilitate ship financing in line with these policies (ITF, 2018e). An example of such a policy is the application of Responsible Ship Recycling Standards in shipping loans by the German KfW IPEX Bank.

Another way to increase effectiveness with regards to environmental performance would be to roll back tax exemptions for ship fuel. This could be done by taxing ship fuel and stopping the fuel tax exemptions for ship fuel where they exist. Contrary to most other transport modes, fuel for shipping is not taxed.

Taxing ship fuels should ideally be done at a global level, as the bunker options for shipping are global: unilaterally imposing a tax on ship fuel might mean that shipping companies avoid bunkering in the jurisdiction where ship fuel is taxed. Such is the discourse on taxing ship fuels and – using a similar argument – on market-based mechanisms or carbon pricing in shipping. Although the argument is used often, few attempts have been made to implement such a policy. One of the few examples of a unilateral tax on ship fuels was the introduction of a Sales and Use Tax (SUT) for ship fuels in California between July 1991 and December 1992. Although the example of California is frequently used to warn against unilateral tax policies, the official evaluation results are mixed.

They observed that bunker fuel sales dropped significantly in the period of the fuel tax, but the main reasons identified were a severe economic crisis in California accompanied by a drop in refinery capacity and more limited port activity. The tax on ship fuel was only a secondary factor; in the words of the evaluation report: "some of the decline in the industry was likely due to the revocation of the SUT exemption" (LAO, 2001). Although full taxation of ship fuels was withdrawn, California still taxes ship fuel purchased in California that is consumed in California and at first out-of-state destinations (up to the next non-Californian port) – and has done so for decades.

The possibilities for tax avoidance are limited for domestic and regional shipping – e.g. intra-European shipping and domestic shipping in the United States, Japan etc. – so repealing fuel tax exemptions could effectively be implemented for these types of maritime transport. This could take the form of a tax levied on bunker fuel providers for the ship fuel provided for intra-European shipping (Hemmings, 2011) or used between the last leg of incoming voyages to Europe and the first leg of outgoing voyages from Europe (Faber el al., 2009; Kageson, 2011). The potential for tax avoidance to such an extent is fairly

limited: the leakage effect has been estimated not to exceed a fifth of the potential emission reductions due to the measure (Faber et al., 2009). An alternative way would be using a regional CO_2 tax as a proxy for a fuel tax, which would avoid this "bunkering leakage" effect. If the levy would be on journeys from, to and inside certain waters – using ship level data such as the EU-MRV (monitoring report and verification) – this would provide a disincentive on emissions, irrespective of where those ships purchased the fuel.

Repeal at a regional level (such as EU level) of tax exemptions for ship fuel for all shipping (including international shipping) could help to achieve carbon pricing at the global level. A feasible proposal, as formulated by Heine and Gäde (2018), would tax consignees and consignors for the emissions released on the whole route from the source port to the destination port of the cargo. In this proposal, taxation could be combined with granting subsidies if actual subsidies are proven to have remained below certain values (Heine and Gäde, 2018). The idea of such a workable scheme at the regional level is that it could help to unblock negotiations at IMO on carbon pricing.

Conclusions

Many countries apply subsidies for maritime shipping although their full extent remains unknown because of systemic data gaps. The principal challenge for policy-making is the limited evidence that maritime subsidies achieve their stated aims, for example with regard to defending domestic ship registers and seafarer employment. Reorientation of maritime subsidy policies could improve outcomes and halt a race to the bottom between subsidy regimes. Global convergence of reforms would be the ideal for ensuring a level playing field for competing flags but incremental improvements could be achieved and subsidies would be more effective if their objectives were clarified and they were made conditional on positive impacts, e.g. on decarbonisation and employment. The most economically distorting schemes should be the priority for reform. Overall, more transparency around maritime subsidies should lead to improvements in effectiveness in achieving overall policy objectives.

Notes

1 Such as the OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels (OECD, 2011)

2 See Council Regulation (EEC) No 3577/92 of 7 December 1992.

3 The Fonds Stratégique d'Investissement is a public limited company 51% owned by Caisse des Dépôts et Consignations and 49% by the French State. The Caisse des Dépôts et Consignations is a French public sector financial institution.

4 See also https://www.poseidonmedii.eu/.

5 European Commission database on Funding and tender opportunities, see https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/.

6 Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

7 See note 6.

8 This transfer of risk can be expressed by letters of comfort and also political declarations (oral public commitments) when announcing that a company can rely upon the support of the state.

9 "Obtaining ECA support has, in the context of current market conditions, become a necessary element of securing finance for larger, more expensive projects", see http://www.wfw.com/wp-content/uploads/2014/09/WFW-Maritime-ECAs.pdf.

10 See note 6.

11 See note 6.

12 There are a few countries – Greece, Malta, Norway, Croatia amongst others – with different tonnage tax schemes, where the operated tonnage can be considered the tax base, on which a specific tonnage tax rate is applied (so not the regular corporate income tax rate).

13 These refer to Certificates of Competency (CoCs) consistent with the 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) adopted by the International Maritime Organisation (IMO). A CoC is usually valid for five years unless stated otherwise.

14 The EU programme 'Motorways of the Sea' aims at "concentrating flows of freight on sea-based logistical routes in such a way as to improve existing maritime links or to establish new viable regular and frequent maritime links for the transport of goods between Member States so as to reduce road congestion and/or to improve access to peripheral and islands regions and State.", see https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C:2008:317:FULL&from=EN.

15 Article 107 (3) (c) TFEU of EC (2004a)

16 More specifically its reference to Regulation (EEC) No 4055/86 and Regulation (EEC) No 3577/92

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Maritime Subsidies

The shipping sector receives subsidies, tax breaks and other forms of financial support from governments. This report gives an overview of direct and indirect subsidies available to maritime transport in OECD countries and assesses whether they provide value for taxpayers' money. Based on this, the report offers recommendations on how policy-makers can increase the effectiveness of maritime subsidies.

International Transport Forum
2 rue André Pascal
F-75775 Paris Cedex 16
+33 (0)1 73 31 25 00
contact@itf-oecd.org
www.itf-oecd.org

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Published: 09/2019 | Photo credit: joyfull/Shutterstock