

The Italian Seafarers' labour market: Assessing the demand-supply equilibrium

Gian Enzo Duci*, Lorenzo Galante**, Enrico Musso***

Summary: 1. Introduction - 2. The Italian seafarers' labour market: rationale of the study and research objectives - 3. Data and method - 3.1. The Italian seafarers' market: analysis of domestic and international sources - 3.2. Methodological framework proposed - 4. Main findings - 5. Assessing the demand supply equilibrium - 6. Limitations and conclusions - References

Abstract

The latest outcomes of the "BIMCO MANPOWER 2015" Report, addressing the status of the international seafarers' labour market, show that the global current demand-supply matching is characterized by a significant shortage of officers. In addition, figures are expected to worsen in the next decades, due to trends related to the demand for these professional profiles. An in-depth analysis of the seafarers' market is considered urged since extant academic literature has rather neglected the topic. The paper investigates the actual status of the Italian seafarers' labour market that, despite the maritime tradition of the country, is currently experiencing a dramatic shortage of seafarer candidates, mostly due to the lack of vocation for this job carrier among new generations. In particular, the manuscript is intended to estimate the size of the demand and the supply of workforce in the Italian market, grounding on both theoretical models and empirical data from the industry.

Keywords: Seafarers, Labour market, Demand supply equilibrium

* **Gian Enzo Duci**, Managing Director of ESA Group; Lecturer, Department of Economics and Business Studies, University of Genoa (Italy), E-mail duci@economia.unige.it

** **Lorenzo Galante**, Business Analyst at Enterprise Shipping Agency S.r.l. (Italy), Email lorenzo.galante@esagenoa.com

*** **Enrico Musso**, Full Professor, Department of Economics and Business Studies, University of Genoa (Italy), E-mail enrico.musso@unige.it

Received 29th August 2019; accepted 10th December 2019.

DOI: 10.15167/1824-3576/IPEJM2019.3.1238

1. Introduction

The latest estimates released by “BIMCO MANPOWER 2015” (figure 1.1) indicate that the global current demand-supply match shows a shortage of 16,500 officers (and a surplus of 119,000 ratings). The forecast growth of maritime manpower situation over the next ten years is likely to continue the trend of a global shortage in the supply of officers.

Figure 1.1. Worldwide Shortage and Surplus of seafarers



Source: BIMCO Manpower 2015

At a national level, the Italian legislation has prepared administrative tools for the collection of data about Italian seafarers, whether they are embarked on national or non-national flagged ships; nevertheless, a clear political will is still lacking in making the relevant information effectively available on a wide scale and there has been a rather modest level of data disclosure pertaining to this labour market which, instead, appears to be widely available, compared to many other productive and industrial sectors.

In-depth data on workers engaged both in commercial traffic connected to the maritime transport of goods and passengers, and in the context of nautical services provided in ports and off-shore activities – in Italy and abroad – are not well known to media, public opinion and even politicians.

Questions like “what is the real size of the Italian maritime seafarers’ market? How many Italian shipowners and how many ships and fleets determine the overall demand for seafarers on the national labour market?” are raising cognitive problems even for the most knowledgeable insiders, due to the high level of fragmentation of information sources in Italy. Knowing the characteristics of the Italian seafarers’ market is considered important, at a national level, in order to implement public education policies adapted to market needs, like the need for more specialized professional figures such as masters and first mates.

The lack of specialized professional figures entails a considerable problem for Italian shipowners who are forced to turn to foreign markets in order to find such figures. The knowledge of this market would allow to channel the studies of many seafarers towards such figures (officers) and would avoid seafarers to train and embark under the role of ratings in a market with a remarkable surplus of these

professional figures (C. Bagoulla, P. Guillotreau, 2016, LEMNA - Laboratoire d'économie et de management de Nantes Atlantique, Shortage and labor productivity on the global seafaring market).

Therefore, an in-depth analysis of the Italian seafarer's market has been considered necessary since extant academic literature has rather neglected the topic and a wide understanding of such labour market could feed the seafarers' market with new and more motivated manpower reducing the imbalances of the two different professional categories (officers and ratings) of the Italian seafarers' market. At a national level, no academic literature result to be existing while at a worldwide level some studies have been carried out, such as: "Understanding the seafarer global labour market in the context of a seafarer's shortage" by P. Leong, 2012, "Shortage and labor productivity on the global seafaring market" by C. Bagoulla et al, 2016 or "Seafarers market" by S. Galić, 2012.

The present study aims to develop an overarching conceptual framework providing useful insights on the former seafarers' labour market by focusing on the Italian case, due to the significant shortage/surplus of seafarers (officers/ratings) candidates within the market.

The aim of the paper is twofold. First, the study aims at understanding the size of the seafarers' Italian market and the size of the shortage/surplus of the different professional profiles. Second, the study is willing to detect possible solutions in order to narrow the gap between the demand and supply of Italian seafarers.

Among the potential solutions, this study proposes the reallocation of seafarers ashore after a working period on board ranging from 10 to 15 years (BIMCO, Manpower Report 2015, The global supply and demand for seafarers in 2015).

The opportunity to find a job ashore after a medium-term carrier aboard results in a higher propensity to undertake maritime life and to choose an education that points to specialized professional figures, able to resell themselves at a good price on the ashore market.

The objectives of the studies have been carried out by focusing on the demand-supply characteristics of the 5 segments forming the Italian seafarers' market: the seafarers embarked on Italian flagged ships employed on cabotage routes, or on ships employed on international routes, or embarked on foreign flagged ships through a manning agent, or without a manning agent, and the market of Italian seafarers currently unemployed.

2. The Italian Seafarers' labour market: rationale of the study and research objectives

At a general level, the term "maritime labour" means any work at sea, on board of a boat (B Wu, N Winchester, 2005, Marine policy, Crew study of seafarers: a methodological approach to the global labour market for seafarers). That said, therefore, it is possible to identify three sectors of activities in which maritime work is carried out in the civil sphere: transport, fishing and yachting.

With specific reference to the transport sector, maritime work includes all the different forms of work performed on board of ships used for the transport of goods and/or passengers, on long or short routes (international traffic or national/cabotage traffic), and on board of the special ships with an "offshore" function, such as laying of pipelines, oil extraction, construction and the exchange of structures etc. In addition, the ships used to carry out port services such as tugs, pilots' units, bunkering ships (refuelling), etc., require maritime labour (N Ellis, H Sampson, 2008, Seafarers International Research Centre (SIRC), The global labour market for seafarers working aboard merchant cargo ships).

The Italian maritime seafarers' market (offshore) can be divided according to the different regulations and contributory systems linked to 5 categories (or segments / markets) (Figure 2.1):

1. Italian seafarers' market embarked on Italian flagged ships acting on internal cabotage routes;
2. Italian seafarers' market embarked on Italian flagged ships used on international routes and international cabotage routes¹;
3. Italian seafarers' market embarked on foreign flagged ships hired for embarkation via a manning agent operating in Italy;
4. Italian seafarers' market embarked on foreign flagged ships hired for embarkation via a private enlistment contract signed throughout Italy (foreign boarding on foreign);
5. Unemployed Italian seafarers' market awaiting start-up.

In the context of the market understood in its complexity, it is then possible to identify two fundamental professional macro-categories of on-board personnel, to which correspond two specific labour markets with very divergent and sometimes contrasting structure and dynamics:

- The market of the officers;
- The market of the ratings (petty officers and ratings).

What is the real size of the Italian maritime seafarers' market? How many Italian shipowners, ships and fleets determine the overall demand for seafarers on the national labour market? What share of the total demand is met by the international labour market and how many non-EU seafarers are on board ships belonging to national shipowners or ships connected to the Italian Register of the freshmen (the so called "Registro italiano delle matricole") or to the International Italian Register?

¹ The concept of international cabotage is of importance with respect to the legislative regime which is applied in the matter of crew during insular cabotage routes, where the law of the host country is normally applied and not that of the ship's Community flag, as is instead the case of continental cabotage. "For cargo ships over 650 tons which carry out island cabotage, when the journey in question follows or precedes a journey coming from or going to another state, all matters relating to the crew are the responsibility of the state in which the ship is registered "(Council Regulation 3577/92).

Figure 1.1 The different segments of the Italian seafarers' labour market



Source: Own elaboration

Indeed, the answer to this is clearer, and easier, in any other industry rather than in the maritime sector, despite the Italian public management with of registration registers, boarding shifts, enlistments, crew roles, as well as insurance and social security positions.

It can appear a paradox that in a (private) labour market characterized by one of the highest standards of evidence and transparency of information by the public sector (at least at a formal level) the effective availability of punctual and detailed information from public sources most limited, even at national level. It ensues a lack of easily accessible data sources and information and a low level of general knowledge of the main phenomena related to the labour market of Italian seafarers.

In this study relevant data and information concerning each of the 5 Italian seafarers' markets were collected starting from a complex system of primary and secondary sources. The analysis took into account sources of public institutions (INPS, SISCO) and unofficial sources at national level (BIMCO, CONFITARMA, EMSA, TRADE UNIONS ASSOCIATIONS). Anyway, all the applied sources are widely recognized by market players and stakeholders. Starting from the data collected by the aforesaid sources, estimations on the equilibrium in demand and supply within the Italian labour market has been carried out revealing the magnitude of the shortage of officers (and oversupply of ratings).

3. Data and method

3.1 The Italian seafarers' market: an analysis of domestic and international sources

Although the data on Italian seafarers are not of public knowledge, the Italian legislation has established administrative tools for the collection of data concerning Italian seafarers, whether they are on national or non-national flagged ships; nevertheless, so far a clear political will has been lacking in making the relevant information effectively available on a large scale and there has been a rather modest level of data disclosure pertaining to this labour market which, instead, appear to be widely available in relation to many other productive and industrial sectors.

Given the above, the two main national public sources (primary internal administrative sources) used in the research project in order to acquire an adequate data base for the study of the specificities and the main characteristics of the Italian maritime labour market are:

- UNIMARE CO Model which is an integral part of the Statistical Information System for Mandatory Communications (SISCO)²;
- INPS Foreign Navigation office³.

The compulsory communications system (CO), implemented through a telematic solution on the entire national territory, collects data on employment flows related to the relationships of subordinate work, associated work, internships and other professional experiences, as required by art. 4-bis of Legislative Decree no. 181/2000 (amended by Article 1, paragraph 1184 of Law 296/2006) concerning Italian and foreign citizens, even if only temporarily present in the country, in possession of a regular residence permit (for example: seasonal work). The administrative sources that feed the SISCO system correspond to the different CO models envisaged by the law, namely the models UNILAV, UNISOMM, UNIURG, VARDATORI and UNIMARE. The latter is dedicated to communications relating to maritime labour contracts.

² The term Communications Unified Compulsory (abbreviated CO) Flows UniLav, Unimare, Uniurg, Unisomm and VarDATORI indicates, in the ambit of Italian labor law, a system of communications that are mandatory for various subjects. The COs sent by employers (or their intermediaries) are collected on the National Coordination Node, and subsequently processed for the construction of the administrative database (COB), from which the process of processing and transforming the statistical data (SISCO) starts.

³ Shipowners and seafarers in the case in which they embark Italian personnel on ships flying foreign flags must transmit to the INPS the monthly contributive data of Italian maritime workers embarked on such ships and of the Italian pilots who carry out services in foreign waters. The INPS foreign shipping office collects the technical and personal data of the Italian seafarer embarked abroad.

In order to draw on these data, the research group went to the Ministry of Labour in Rome, where a meeting was held during which it was requested, for purely academic purposes, to be able to exploit the information on seafarers contained in the institution's databases. Despite a first moment, in which it seemed that the competent office was inclined to release, to date we have not yet been able to make use of that "public" information heritage.

In fact, from August 1, 2008, shipowners and shipping companies (as per article 256 of the navigation code) are obliged, via the UNIMARE model, to communicate electronically to the Ministry of Labour the employment relationships on board Italian ships (recruitment, extension, transformation and termination of employment relationships, cancellation, rectification) of personnel of any nationality consisting of:

- Maritime personnel registered in the matriculations of the seafarers (art. 115 of the Navigation Code);
- Personnel belonging to the category of non-registered seamen in the matriculations of seafarers (Article 1 paragraphs 1180-1185 of Law 296/2006);
- All personnel who for various reasons serve on board a ship (Article 2 paragraph 1 letter and of Legislative Decree 71/2005).

The aforementioned communication also applies to INPS and INAIL⁴, and the employment offices of seafarers (INTEMPO)⁵, to which they are forwarded by the Ministry of Labour. The communication, as a rule, is made by the employer or by any delegates such as labour consultants, administration agencies, accountants, advisers.

The data collected thanks to the CO are collected on the National Coordination Node, and subsequently elaborated for the construction of the administrative database (COB), from which the process of treatment and transformation of the statistical data starts.

The system is legally required and ML-SISCO publishes quarterly and annual notes on labour market flows in general terms. Unfortunately, as regards only the UNIMARE model (and therefore maritime work), it does not appear to have ever been processed and disseminated precise data on the matter.

Those acquired by UNIMARE are flow data that, if processed and published, can provide knowledge of the dynamics of the maritime labour market over a period of time between August 2008 and today. This database would enable the acquisition of punctual and detailed data on the maritime industry, concerning: the number and type of labour relationships that have started or have been terminated, etc., the number of shipowners involved, the qualifications of the work relationships started, as well as details on workers' nationality, age, sex, municipality of residence, etc.

⁴ The Istituto Nazionale della Previdenza Sociale (INPS) is the largest social security and welfare institute in Italy and one of the most important on a European level. It has a budget (of approximately 400 billion Euro between receipts and payments) which is second only to state budget. Both private sector employees and self-employed workers are insured at INPS. All companies operating in Italy are registered with INPS

INAIL, the National Institute for Insurance against Accidents at Work, is a public non-profit entity safeguarding workers against physical injuries and occupational diseases.

INAIL's objectives are principally: the reduction of injuries, the protection of workers performing hazardous jobs, the facilitation of the return to work of people injured at workplace.

⁵ On the basis of the Ministerial Decree of November 29, 2013, INTEMPO is in charge of offering research and selection service of human resources within the maritime cluster for both land and on-board professional figures.

The data referred to the aforementioned database (UNIMARE) would not be able to provide a precise representation of the "stocks" that characterize the maritime labour market in Italy. In other words, since the database only considers the contracts started from August 2008, the flows tracked by the system do not include seafarers hired before 1 August 2008 or those that since then have ceased their work relationships with a shipowner or other employer of the maritime cluster. It ensues that, even if all the data contained in the database were available, it would not be possible to identify the exact number of seafarers in Italy because it is cumulated from the past, prior to the obligation to communicate.

To know precisely the stock of employed workers it is necessary to contact INPS and INAIL, who manage the social security and insurance positions. It should be noted, however, that these sources are not yet equipped to provide this type of data, unless with a significant level of approximation⁶.

However, it should be pointed out that the maritime labour market has contractual working characteristics that significantly reduce the distance between flow data and stock data. For this reason, the punctual study of the working flows connected to all maritime labour contracts starting from August 2008 (i.e. since the UNIMARE model was introduced at national level) would still allow us to arrive to an excellent approximation of the "Stocks" data connected to Italian maritime work even without the use of INPS / INAIL sources, using only the UNIMARE data.

In fact, if we exclude contracts in Continuity of Labour Relationship (CRL, contratti in Continuità di Rapporto di Lavoro)⁷, equivalent to permanent employment contracts, that in the context of maritime work constitute a minor share of the total of contracts, in most cases specific contracts are applied, such as: "travel" or "temporary" or "boarding" contracts. The boarding contracts, which are nominally "open-ended", imply that the date of disembarkation is not known in advance.

In conclusion, all maritime labour relationships are resolved with the landing, except those in CRL. At the time of disembarkation the seaman receives the payment of all his expenses, vacation, severance pay, etc., which is accrued during the embarkation period, and after this time, he/she returns to being available on the labour market, and can able to accept another occupation from another employer without having to give the disposals from the previous one.

It is therefore reasonable to suppose that sampling a two-year period of data flows drawn from UNIMARE is possible to detect, net of CRL workers (except those starting

⁶ The INPS is in charge of data on Italian and EU seafarers but not those relating to non-EU seafarers. INAIL ensures the correctness of the data and information about the on-board work positions regardless of the number of workers who take turns on the ship.

⁷ Labour relations in the maritime sector are governed by the Code of Navigation (articles 323 et seq.) and not by the provisions of the Labour Law common. No contract of employment is stipulated in the maritime field between company and maritime worker, but it's stipulated a contract (or convention) of enrolment. The enrolment contract must, under penalty of nullity, be stipulated by public act, by the maritime authority and, abroad, by the consular authority (Article 328 of the Navigation Code).

or ending the relationship in that time window) the stock of the active Italian maritime force⁸.

It is therefore possible to assert that the disclosure of UNIMARE data would enable to deepen scientific research on the subject and, at the same time, to respond to multiple information requests coming from social partners, policy makers, maritime cluster operators, and the public opinion, with regard to the composition of the Italian maritime market, such as:

- the number of Italian seafarers embarking regularly on Italian flag ships;
- the main characteristics (descriptive statistics) of the aforementioned seafarers, with specific reference to personal, social and professional profiles;
- the number and characteristics of Community (non-Italian) and non-EU seafarers who embark on a regular basis on ships flying the Italian flag.

In relation to the study of Italian maritime employment on foreign flagged ships, on the other hand, the most reliable information source at national level, as previously indicated, is the INPS Foreign Navigation Office, which records data relating to contracts, which have Italian maritime counterparts, for seafarers employed on foreign flags who regularly pay contributions, as they are hired for boarding by maritime agents operating in Italy. As already mentioned, however, this data collection and management system, similarly to what was indicated with reference to the "UNIMARE" CO system, is not equipped to supply the aforementioned data except at an aggregate level and with a little level of detail.

Indeed, the data collection system of INPS Foreign Navigation Office does not allow a clear and truthful representation of the state of the art of the labour market under investigation.

The two administrative sources examined so far are the internal sources on which the national legislator has mainly relied to gather information aimed at monitoring the Italian maritime labour market. The primary internal administrative sources however, do not exhaust the complex and articulated framework of primary and secondary sources to which it refers, in order to provide the clearest and most complete representation possible of the current state of the seafarers' market in a way consistent with the purpose of this work. Furthermore, the primary sources, INPS and SISCO, are not of public knowledge yet.

In this respect, documents, reports and opinions prepared and implemented by influential and recognized institutional entities characterized by a broad and widespread knowledge of the topics covered in the research project have been collected, namely:

- EMSA (European Maritime Safety Agency);
- BIMCO;

⁸ With the term "active" it is customary to identify the available and qualified workforce to embark, that is, the workforce that possesses the necessary professional requisites and the mandatory certificates for recruitment due to the professional qualification and the tasks entrusted.

- CONFITARMA;
- Trade Unions (ITF).

The European Maritime Safety Agency is a European source, which carries out statistical processing and empirical surveys on the maritime market at supranational level, starting from data extracted from national registers of EU countries.

BIMCO is a world-class information source, and the data collected come from:

- Maritime certification registration records;
- Ship registration records;
- Companies, training institutes, agencies, trade unions and trade associations; seafarers, etc.;
- Scientific publications and sector reports produced by institutional subjects and bodies with proven industry experience.

For the purposes of this research project some relevant data have been extrapolated from the documentation made available by BIMCO. They regard the employment levels of the maritime world at a worldwide level. The BIMCO reports allow to better understand the characteristics and specificities of the two main professional macro-categories in which it is possible to articulate the world of on-board maritime workers not referable to the hotellerie department, i.e. the "officers" and "ratings" with reference to which will be estimated the supply and demand levels.

CONFITARMA, as part of this project, is a non-administrative source with national coverage. From the CONFITARMA data it was possible to extract the information necessary to produce an estimate of the flow of maritime labour demand in Italy in 2018, formulating a series of specific hypotheses about the type and number of professional figures employed on the different types of naval assets, therefore starting from the size of the national fleet and the jobs offered by the owners who operate the same assets.

It should be emphasized that CONFITARMA provides estimates and not a collection of punctual data, contrary to what occurs in the case of information attributable to the SISCO (UNIMARE)⁹ and INPS systems or to the other additional sources mentioned above (BIMCO and EMSA).

The resort to the examination of some important trade union sources has instead become essential mainly in order to obtain data as precise as possible about the main trends that distinguish the Italian seafarers market embarked on foreign flags.

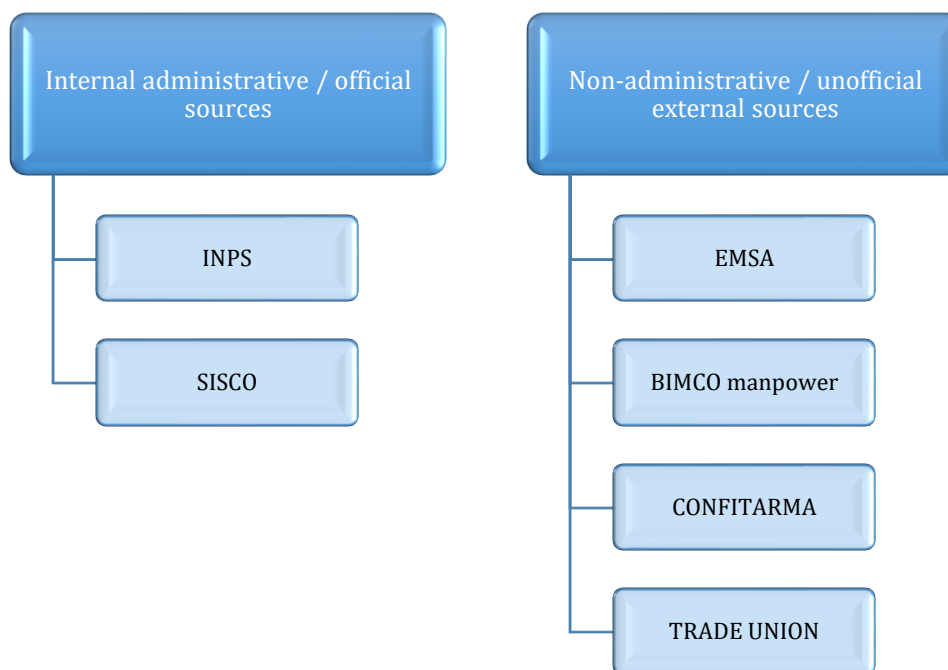
Furthermore, the utilization of Trade Unions sources has been relevant to estimate the level of unemployment recorded within the labour market under this study.

Following the considerations set out above, it is possible to assert that in the context of the analysis of the Italian seafarers market, data and information were collected starting from an articulated and complex system of primary and secondary

⁹ Sisco is the acronym of Statistical system for mandatory communications. The COs sent by the employers (or their intermediaries) are collected on the National Coordination Node, and subsequently elaborated for the construction of the administrative database (COB), from which the process of treatment and transformation of the statistical data starts (SISCO)

sources that include both administrative sources and unofficial sources at national level, but still widely recognized, as briefly reported in Figure 3.1.1.

Figure 3.1.2. Methodological notes: the key data sources applied in the study



Source: Own elaboration

3.2 Methodological framework

In order to estimate the driving forces of the Italian seafarers' market, or to estimate supply and demand through the analysis of the sources available to 2018, it was essential to use secondary unofficial sources, such as the BIMCO, the MESA and the CONFITARMA report, which made it possible to remedy the information gap due to the non-disclosure of data from primary official sources such as INPS and the SISCO system. Hereunder it's summarized the methodological approach adopted for the estimation of the supply and demand of the Italian seafarers' market:

Estimation of demand for Italian seafarers:

- a. Demand for Italian seafarers on Italian flagged ships in 2018: through the method of "safe manning table" shown in the 2019 CONFITARMA report;
- b. Demand for Italian seafarers on foreign flagged ships in 2018: by consulting various trade union sources.

Estimation of supply of Italian seafarers:

- c. Estimation of the employment flow of Italian seafarers' demand on Italian and foreign flags (starting from the cognitive outputs connected to "a" and "b" above);
- d. Estimation of the Italian maritime unemployment;
- e. Overall potential maritime workforce supply: through the sum of the values referred to in points "c" and "d" above.

The average level of unemployment was estimated in two steps:

- a. Demand for the various professional figures attributable to the two macro-categories "officers" and "ratings" through the fixed proportions identified by the BIMCO Report (2015);
- b. Application to the above data related to the demand dimension of the shortage/oversupply ratios derived from the BIMCO Report (2015). This report indicates a shortage of 2.1% for the officers, and an oversupply of around 15.8% for the ratings. For the domestic market, a +1% increase has been applied to these percent ratios, in order to take into account, the fact that Italy – more similarly to developing countries – shows a limited supply of officers (higher shortage) and a much higher supply of ratings (higher oversupply) compared to the global data.

4. Main findings

To quantify the Italian seafarers' labour market one can start by examining the demand side, closely connected to the number of ships, i.e. the "workplaces" or "production units" referred to on the mainland. From the characteristics of the ships belonging to a fleet (number, type, size, etc.) we can obtain information on the crew composition. Hence, it is possible to realise the total number of seafarers who alternate in filling their position onboard within a year of exercise.

The number, type and size of the ships determine with good approximation the job demand to compose the crews. In fact, differently from what happens for a factory or an office on the mainland, the definition of how many and which workers get on board a ship is largely, or even solely, a matter of regulations and union agreements. What is a further evidence of the strong public nature of the maritime sector, always dictated by navigation safety reasons.

The crew of a ship, in particular, is fixed in the "safe manning table", where the minimum number of deck and machine officers with the relative degrees, as well as the composition and minimum strength of the rest of the crew are indicated also taking into account the fact that the operation of a ship covers the 24 hours a day and seven days a week. The Navigation Code assigns to the law or collective bargaining the determination of the table of each type of vessel and unit. The tables are subject to the control of the Harbour Master which has the faculty to prevent the departure of the ships whose crew is composed in different way from how indicated in terms of minimum quantity and qualifications by the safe manning table.

The average deviation between minimum and actual crew in cargo ships is marginal. On the contrary, it increases in Ro-Pax ships, as it also includes the crew dedicated to hospitality, often higher than the minimum standards. The increase in this type of personnel on board ships depends on the growing need on this type of ship to satisfy the growing demand for quality expressed by customers and to ensure the "seaworthiness, safety & security" of the passenger ship, a subject of considerable relevance on this type of ship especially after the recent accident of the Norman Atlantic ship in 2014 that caught fire near the Otranto canal. The average deviation grows for the same reasons but exponentially in cruise ships, which are now considered as "floating hotels" (JGC Kester, 2003, *Tourism Economics*, S Véronneau, J Roy, 2009, *Tourism Management*).

Figure 3.2.1. Estimate of jobs on board Italian ships (ships over 100 gt)

	2017	2018
LIQUID CARGO SHIPS	4.765	4.510
Oil tankers	1.890	1.710
Gas tanker	505	445
Chemical tanker	1.890	1.855
Other tanker	480	500
DRY CARGO SHIPS	4.020	3.840
General Cargo	460	435
Container ships	310	290
Bulk carriers	1.300	1.065
Ro-Ro cargo	1.950	2.050
MIXED AND PASSENGER SHIPS	34.255	33.870
Cruise	20.520	20.495
High speed vessels	1.170	1.135
Ferries	11.475	11.150
Other passengers ships	1.090	1.090
AUXILIARY SERVICES SHIPS	4.065	4.130
Tugboats and supply vessels	2.690	2.775
Others	1.375	1.355
TOTAL	47.100	46.350
of which hotel staff	19.300	19.230

Fonte: own elaboration from CONFITARMA data 2019.

Referring to the source CONFITARMA, the main association representing Italian shipowners, the company publishes yearly estimates of the Italian seafarers' market embarked on Italian flag ships, which are based precisely on the system of minimum safe manning tables.

Based on the tonnage supply of different types of ships belonging to the Italian fleet registered by the association, the association provides the data reported in table 3.2.1 in which it estimates the jobs on board Italian ships.

As each job on board must take into account the mandatory rest periods provided for seafarers (about 4 months/year), each job employs 1.4 seafarers (CONFITARMA Annual General Meeting Rome 19th June 2019). It is then possible to calculate the total number of workers employed in the various estimated positions on board as shown in Figure 7. By adopting this type of approach, the estimate of the demand for seafarers by Italian ships engaged in transport due to the composition of crews during the year therefore amounts to 46,355 seafarers, of which 26,000 are covered by Italian (or European) seafarers and 20,350 by non-European personnel. In relation to the aforementioned jobs, therefore, around 66,300 seafarers take turns.

In 2018, the estimated demand for Italian and European seafarers coming from the Italian fleet was of 36,400 units ($26,000 * 1,4$), 90% of which oriented to Italian seafarers while the remaining 10% to European seafarers (firstly Romanian, German, Latvian, etc.).

Considering the rigid structure of the crew composition and the fixed proportions between the two macro-categories of officers and ratings, it is possible to make a rather reliable estimate of the number of seafarers required by the market for each professional profile.

Indeed, the crew composition is quite homogeneous as for the proportions of professional profiles required on board, distinguishing between officers (master, first/second/third deck and engine officer/mate, chief engineer, etc.) and ratings (bosun, deck boy, able seaman etc.). This enables to formulate a rather precise mapping of the demand for seafarers by roles and degrees; thus providing a much more precise and detailed picture of the "supply".

As already mentioned, the proportions that regulate the profiles of the crew (official and ratings) are those defined by the BIMCO Report (2015), or 40-60: out of 10 crewmen, on average, 4 are official and 6 are ratings. Within 60% of the ratings, the rule known as "20-40" applies: among the ratings, one third are petty officers and two thirds are seafarers with job referred to as "low skilled workforce". If we apply these proportions to the estimates provided by CONFITARMA for the demand for seafarers coming from the Italian fleet, the results are as follows:

- Officers: about 14.560 (40% of 36.400);
- Ratings: 21.840 (60% of 36.400) of which 7.280 are petty officers and 14.560 are belonging to the "low skilled workforce".

In order to provide an accurate estimation of the potential job supply from Italian seafarers, it is possible to use data provided by trade unions sources concerning the Italian workers on board foreign ships.

In particular, during 2018, about 10,000 Italian seafarers are estimated to be employed on foreign flagged ships, of which they regularly pay the statutory contributions in Italy.

Moreover, it is estimated that around 85% of the ships registered in the Italian flag are included in the international register (IR).

Therefore, taking into account the calculations made and the analysis carried out by applying the sources currently available on the subject, it is possible to estimate, with an appreciable level of detail, the actual size of the demand for Italian seafarers in 4 out of 5 "sub-markets of maritime labour" with reference to the year 2018, as reported in the below table (table 3.2.2.):

Table 3.2.2. Demand distribution of Italian seafarers: breakdown by markets and roles

Seafarers's Market	N. of Seafarers	Officers	Ratings	Petty officers	Low skilled workforce
Italian seafarers' market embarked on Italian flag ships acting on internal cabotage routes	5.640	2.256	3.384	1.116	2.268
Italian seafarers' market embarked on Italian flag ships used on international routes and international cabotage routes	30.760	12.304	18.456	6.088	12.368
Italian seafarers' market embarked on foreign flag ships hired for embarkation via a manning agent operating in Italy	7.000	2.800	4.200	1.385	2.815
Italian seafarers' market embarked on foreign flag ships hired for embarkation via a private enlistment contract (contratto di arruolamento) signed throughout Italy	3.000	1.200	1.800	594	1.206
Total	46.400	18.560	27.840	9.184	18.656

Source: own elaboration from various sources.

Overall, therefore, the demand at national and international level for Italian seafarers can be estimated in 2018 in about 46,400 units of which the 60% are ratings (70% low skilled workforce and 30% petty officers) and the remaining 40% are officers.

The estimates carried out, however, do not yet allow us to calculate the potential supply of seafarers, as it is necessary to consider the unemployed Italian seafarers market (see Figure 3.2.3).

In order to estimate the level of unemployment on the Italian maritime market, the percentages of shortage of officers and oversupply of ratings recorded worldwide by the authors of the BIMCO were used on the demand dimension reported in the table 3.2.2.

Taking into consideration the above mentioned data on the demand distribution (table 3.2.2) and focusing on the two main maritime professional macro-categories, we proceeded to subtract or add to these data, depending if considering professional figures in shortage (officers) or surplus (ratings), the worldwide percentage of shortage registered by BIMCO, 2.1%, and the worldwide percentage of oversupply of 15.8%, thus managing to obtain a rough estimate of the flow levels of the off-shore maritime labour supply in 2018 (table 3.2.3).

Table 3.2.3. Distribution of the supply of Italian seafarers within the 4 markets (estimates on 2018 data)

Seafarers's Market	N. of Seafarers	Officers	Ratings	Petty officers	Low skilled workforce
Italian seafarers' market embarked on Italian flag ships acting on internal cabotage routes	6.126	2.208	3.918	1.293	2.625
Italian seafarers' market embarked on Italian flag ships used on international routes and international cabotage routes	33.419	12.046	21.372	7.050	14.322
Italian seafarers' market embarked on foreign flag ships hired for embarkation via a manning agent operating in Italy	7.605	2.741	4.864	1.604	3.260
Italian seafarers' market embarked on foreign flag ships hired for embarkation via a private enlistment contract (contratto di arruolamento) signed throughout Italy	3.259	1.175	2.084	688	1.397
Total	50.409	18.170	32.239	10.637	21.611

Source: own elaboration from various sources.

Finally, comparing the estimated flow data from the demand side (coinciding with the seafarers employed in 2018), amounting to approximately 46,400 units, with those of the estimated supply of Italian seafarers (including also the percentage of surplus and shortage), amounting to over 50,400 units, it is possible to state that the estimated stock of unemployment for the year 2018 is around 4,000 units.

These data must be considered with due caution as they are the result, as already highlighted, of estimates characterized by a certain bias. Nonetheless, they are capable to provide a general indication of the surveyed labour market.

5. Assessing the demand-supply equilibrium

The results of the study have shown that the Italian seafarers' market, relatively unknown by stakeholders, lacks on one hand of strength and specialized workforce, while on the other hand it appears excessively provided with a low-skilled workforce.

The research activities, indeed, are directly aimed at supporting the national (Italian) market of maritime workers in view of correcting its the severe imbalances, and at supporting training programmes capable to fill the gap still existing between the competences required and those offered by the maritime workforce.

This survey emphasizes the need to bridge the gap through training programmes forming specialized workforce (officers), rather than low-skilled one (ratings), which can resell its skills on the ashore work market.

It is highly relevant the identification of the main underlying causes of the mismatch between the required and the actual seafarers' skills, in order to identify corrective measures.

The possibility of reallocating specialized maritime personnel to the ground is proposed as an incentive solution for the resumption of maritime life. The development of specialized skills that can be "resold" ashore after a mid-term career at sea is certainly a possible solution to the reduction of imbalances affecting the Italian seafarers' market.

It is sometimes argued that easier paths for redirecting maritime personnel ashore may increase the risk of abandoning jobs at sea, thus increasing the gaps in the labour market. On the other side, we believe that the opportunity of an ashore job after several years of work on board can balance the effects of loss of interest of the new generations in the maritime career and in the "sea life" (A. Carotenuto et al, 2012,

International Maritime Health, Psychological stress in seafarers: a review). In other words, seafarers may well increase in number, skills, commitment and productivity on board, if they were aware that after years of work at sea, and at a relatively young age (even less under 40 if they started working at about 20), they can expect to find job opportunities ashore related to their specific professional experiences on board. Furthermore, the awareness of greater opportunities for professional development ashore should also increase the propension of Italian personnel to enrol on board, with beneficial effects for the sector.

Since it can be seen as desirable and possible that most maritime workers find job positions ashore within the maritime cluster – which includes companies such as port agencies, terminal operators, logistics operators, etc., or businesses whose ownership structures are often referable to shipowners groups – the benefits for the latter appear to be higher than the potential negative effects presumed by some researchers or sector practitioners. In fact, the possible reduction of the workforce for shipowners on the ship side is counterbalanced by the acquisition of workforce on the land side.

The development of the study is therefore of interest to various stakeholders in the maritime and port sector. In this sense, the players most directly involved in the research activities included in the project are:

- The shipowners, who will be able to have greater workforce characterized by higher levels of productivity;
- The terminal operators, maritime agencies, logistics operators, and many other companies related to the maritime-port cluster, which benefit from a highly specialized and trained maritime workforce;
- The companies operating in the various related sectors within the maritime port cluster (for example the chemical industry, software houses specialized in production for the logistics and transport sectors, the education and training sector, etc.).

6. Limitations and conclusions

As previously anticipated, the sources on which the quantitative estimates of supply and demand of Italian seafarers are based come from unofficial external sources. Indeed, the official sources, such as the INPS and the SISCO system are not yet available in adequate detail for the purposes of this study and it's therefore to be underlined that the estimated results of the study are characterized by a certain limit in term of robustness and accuracy.

Nevertheless, it is known that in Italy the professional profiles of officers are in shortage, due to the lack of vocation to the maritime carrier, while those of ratings are in surplus, mainly because of the use of labour at a lower cost, especially from Asian countries.

Possible developments of the study can be performed by requesting to the INPS foreign office of navigation and the Ministry of Labour data on Italian seafarers

embarked abroad and in Italy, so as to be able to promptly define the dimensions of the demand and supply of Italian seafarers' and its evolution over time.

Furthermore, in order to resolve the proven gap / surplus of officers / ratings it would be advisable to define possible paths of reallocation of maritime personnel to land based job positions so as to stimulate the new generations to resume maritime life.

In this sense, it is assumed that seafarers if aware of the fact that after years of work at sea, at a relatively young age (even less under 40 if they started working at about 20), can expect to find job opportunities ashore related to their specific professional experiences on board, will tend to increase their commitment and their productivity on board. Furthermore, the awareness of greater opportunities for professional development on the ground, after experiences on board, is believed to be aimed at increasing the propensity of Italian personnel to enrol on board, with beneficial effects for the industry.

Education can play an important role within the solution of seafarers reallocating to ashore job positions, as the figures required by the market are not the ratings, figures with non-specialist skills, but the highly specialized officers. Therefore, the school and academies must address the new generations towards specialized training programmes rather than jobs that are now monopolized (mainly) by Asian workforce.

The study of the skills necessary for reallocation to ashore job positions, required by the world of the maritime cluster, is considered to be fundamental in order to develop and complete this research topic. The use of software capable of combining the skills required by the world of the maritime cluster with those possessed by the world of seafarers could change in depth the Italian seafarers' market and bring new and sought-after skills to the maritime cluster.

References

- Bagoulla, C., & Guillotreau, P. (2016). Shortage and labor productivity on the global seafaring market.
- BIMCO (2015). *Manpower Report 2015*. The global supply and demand for seafarers in 2015.
- Carotenuto, A., Molino, I., Fasanaro, A. M., & Amenta, F. (2012). Psychological stress in seafarers: a review. *International maritime health*, 63(4), 188-194.
- CONFITARMA Annual General Meeting Rome 19th June 2019.
- Ellis, N., & Sampson, H. (2008). The global labour market for seafarers working aboard merchant cargo ships 2003.
- EMSA (2017). *Seafarer Statistics in the EU - Statistical review*.
- Galić, S., Lušić, Z., & Pušić, D. (2012). Seafarers market. *International Journal of New Trends in Arts, Sports & Science Education (IJTASE)*, 1(3), 33-39.
- Ghosh, S., Bowles, M., Ranmuthugala, D., & Brooks, B. (2014). Reviewing seafarer assessment methods to determine the need for authentic assessment. *Australian Journal of Maritime & Ocean Affairs*, 6(1), 49-63.

- Lobrigo, E., & Pawlik, T. (2015). Maritime policy and the seafaring labor market. *WMU Journal of Maritime Affairs*, 14(1), 123-139.
- Mitroussi, K. (2008). Employment of seafarers in the EU context: Challenges and opportunities. *Marine Policy*, 32(6), 1043-1049.
- Thai, V. V., & Latta, T. (2010). Employment brand strategy for the shortage of seafarers. *International Journal of Shipping and Transport Logistics*, 2(4), 411-428.
- Thai, V. V., Balasubramanyam, L., Yeoh, K. K. L., & Norsofiana, S. (2013). Revisiting the seafarer shortage problem: the case of Singapore. *Maritime Policy & Management*, 40(1), 80-94.
- Wu, B., & Winchester, N. (2005). Crew study of seafarers: a methodological approach to the global labour market for seafarers. *Marine Policy*, 29(4), 323-330.