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The Review of the Global Seafarers Market

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ABSTRACT: About 90% of world trade is carried by ships and this trade would not be possible without well-trained and experienced seafarers. There are currently over 100,000 merchant ships manned by almost 2 million seafarers. The seafarers market has been characterized by a constant shortage of seafarers for years and as maritime transport continues to grow, a further shortage, especially of officers, is expected in the coming years. This paper provides an overview of the global seafarers market, the analyses of the number of seafarers, officers and ratings, the most represented nationalities, trends and changes compared to previous analyses. Particular attention is paid to the nations that dominate in terms of the number or proportion of the total population of seafarers and why the seafaring profession is more attractive in some countries and less attractive in others. It also identifies measures that could be taken to ensure that the seafaring profession remains attractive regardless of the rise in living standards and the choice of shore-based jobs. The projections in this paper are based on known statistics in the supply/demand of seafarers worldwide and estimates of the growth of the global shipping fleet, including certain political and economic aspects in countries that dominate the seafarer supply chain.

1 INTRODUCTION

The aim of this paper is to analyse the seafarers' market, i.e. the relationship between supply and demand of seafarers, and to identify the main factors that make the profession attractive, looking in particular at the main seafaring nations. The fact is that interest in the seafaring profession is declining worldwide, especially in the more developed countries, but on the other hand there are exceptions. Nations that have resisted global trend and still have an above-average number of seafarers are worth analysing in order to identify key factors based on their examples and finally make some recommendations for long-term sustainability. Accordingly, this paper will provide an overview of supply and demand in recent decades, the expected trend in terms of assessing the development of the shipping industry, an analysis of the main seafarer- supplying countries, and the identification of the nations with the largest number of seafarers per capita and the main reasons for this. From the experiences of these countries, the most important measures for the future attractiveness of the seafaring profession may be derived.

Systematic monitoring of the seafarers' market has been in place for more than 30 years [1], and the data obtained and the associated analyses provide a very good insight into the changes in the seafarers' market and an assumption for the accuracy of future projections of demand and supply. In addition to Bimco, and their manpower reports every 5 years, an annual report has been published by Drewry Manning since 2008, which, like Bimco, covers topics such as the global seafarer supply and demand, but also seafarers' wages and employment terms, and other manning issues [2]. It is also worth mentioning the seafarer statistics in the EU from EMSA (European Maritime Safety Agency) [3, 4, 5]. All these reports confirm a persistent shortage of officers.

Determining the exact number of seafarers is quite a challenge, as there is no standardised criterion for compiling statistics. At the level of national statistics, the number of valid licences is more meaningful, but this does not necessarily correspond to the actual number of seafarers. The monitoring of seafarers on the international market, through temporary contracts and especially outside national flags, makes things even more difficult. For the purposes of this paper, the primary Bimco statistics are used, which are at least somewhat standardised and global and are the most commonly used.

2 SUPPLY AND DEMAND FOR SEAFARERS

The global supply of seafarers and demand over the last 30 years is shown in Table 1. The latest detailed analysis by Bimco was produced for 2021, when the global supply of seafarers was 857,540 officers and 1,035,180 and the demand was 883780 officers and 997540 ratings. The five countries with the largest supply of seafarers were the Philippines, the Russian Federation, Indonesia, China and India [6][7]. The BIMCO report from 2021 also estimates that there will be a need for an additional 90,000 officers by 2026 [8][7]. This confirms the earlier Bimco forecast from 2015, according to which the supply of officers in 2025 will be around 800,000 and the demand around 950,000 [9]. Nearly 60% of the global demand for officers is estimated to be on board ship with around 40% being ashore at any given time, and over 70% of the global demand for ratings is on board ships at any given time. Furthermore, the attractiveness of seafarers profession is higher in the todays main supplying countries, while it is declining in traditional shipping countries. [10]

Table 1. Suply and Demand, 1995-2021

Supply						
	1995	2000	2005	2010	2015	2021
Officers	408946	415389	446000	624000	774000	857540
Ratings	824516	861666	721000	747000	873500	1035180
Total	1233462	1277055	1167000	1371000	1647500	1892720
Demand						
Officers	426916	445367	476000	637000	790500	883780
Ratings	605654	612984	586000	747000	754500	997540
Total	1032570	1058351	1062000	1384000	1545000	1881320
Differences (surplus/shortage)						
Officers	-17970	-29978	-30000	-13000	-16500	-26240
Ratings	+218862	+248682	+135000	/	+119000	+37640
Total	+200892	+218704	+105000	-13000	+102500	+11400

Source: [9], [11], [12], [13]

According to Drewry reports, the officer availability gap for 2023 has reach a deficit of about 9% of the global pool, a significant increase from year before when was 5% shortfall and the highest level since Drewry first began analysing the seafarer market 17 years ago. The Drewry forecast similar deficit levels for 2023-2028 [14]. Demand for seafarers on the world market is directly connected to the demand for the vessels. As for last decades number of seafarers per ship is mostly stabilized, increased demand for ship as a rule results with an increased demand for seafarers. More about the number of seafarers by nation in Chapter 4.

3 WORLD MERCHANT FLEET

The world merchant fleet on the beginning of 2024 reach the number of around 109,000 vessels of at least 100 GT, or about 58,200 ships of at least 1,000 GT. Also this fleet reached a carrying capacity of 2.35 billion DWT, of which 71% accounted to tankers and bulk carriers. [15] Regardless of various negative effects, the world's merchant fleet has been growing continuously since 1990 [16].The growth of the world merchant fleet shows Figure 1.

In world fleet dominate small and medium size ships, smaller of 25,000 GT (84 %), but in categories of large and very large ships, above 25,000 GT, dominates bulk carriers, tankers and container ships, with about 85 % (Table 2). [17]

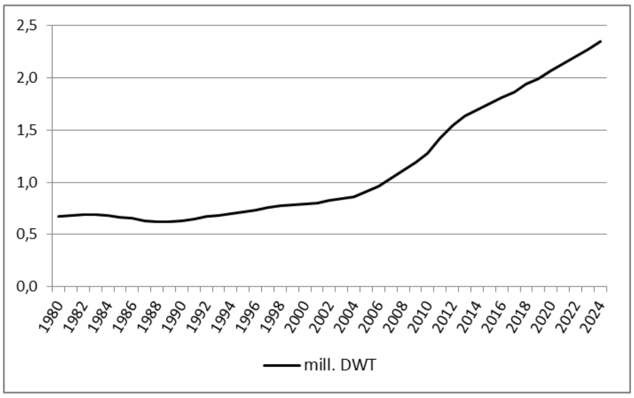

Figure 1. World fleet by principal vessel type (mill. of DWT). Note: Commercial ships of 100 GT and above. Source: [15]

Table 2. World fleet-total numbers of ships, by type and size

Ship type	Small1	Medium2	Large3	Very large4	World	
Bulk	279	3901	7103	1937	13220	10.4 %
Container	19	2409	1684	1624	5736	4.5 %
Fishing	20124	5806	4	1	25935	20.4 %
Gas tanker	34	1182	475	619	2310	1.8 %
General	4105	12181	288	0	16574	13.1 %
Offshore	2871	5097	122	319	8409	6.6 %
Oil & chemical	1985	7513	2827	2291	14616	11.5 %
Other tankers	448	776	16	0	1240	1.0 %
Passenger	4417	2945	299	205	7866	6.2 %
Ro-ro cargo	1025	1111	553	277	2966	2.3 %
Service	3801	3810	38	8	7657	6.0 %
Specialized	8	287	63	9	367	0.3 %
Tugs	19131	920	0	0	20051	15.8 %
World	58247	47938	13472	7290	126947	100 %

1GT<500; 2500⩽GT<25 000; 325 000⩽GT<60 000; 4GT⩾60 000 (for 2022.)

Source: [17]

Liberia, Panama and the Marshall Islands represents the leading flags of registration but should be emphasised that the country of the flag is not necessarily connected to the nationality of the vessel's owner. China, Greece and Japan are major shipowners. Table 3 shows the most dominant flags and counties of real owners. [18]

Table 3. World merchant fleet-number of vessels

Economy of ownership	Flag of registration Panama	China	Liberia	Marshall Isl.	Indonesia	Singapore	China, Hong Kong SAR	World
China	855	5997	303	182	6	77	889	8839
Greece	426	0	1321	1171	2	19	11	4936
Japan	1914	0	308	278	8	187	46	4023
Singapore	278	7	298	175	85	1373	123	2813
Indonesia	24	5	6	6	2335	18	0	2458
Germany	31	0	499	60	1	80	15	2156
Norway	35	0	81	134	3	57	44	1918
China, Hong Kong SAR	420	32	87	65	3	37	842	1842
Russia	46	0	89	0	0	2	3	1841
Turkiye	372	0	139	150	0	11	8	1766
World	6888	6098	4766	4086	2501	2453	2251	56991

Note: Commercial ships of 1,000 GT and above, on the beginning of 2023.
Source: [18] based on UNCTADstat, 2023 & Clarksons Research

Statistics show that there has been a steady growth in the world's merchant fleet for a long time. Current estimates are that this growth will continue in the coming years.

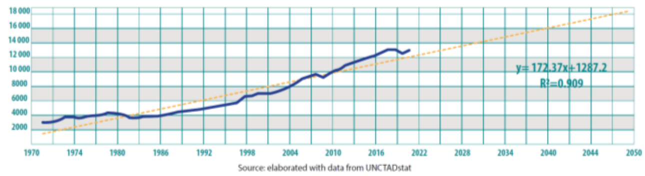

Figure 2. Total goods loaded (mil. metric tons). Source: [19]

The world trade volume from 2005 until 2021 increased by around 49% (Unctad) while number of seafares in that period increased for around 22% [20]. Figure 2 shows the forecast of total goods loaded in mil. metric tons. With the positive trend of world goods traffic it is real to expect positive trend of number of a ships and the number of seafarers as well.

4 THE LARGEST SEAFARER SUPPLY COUNTRIES

According to the latest comprehensive Bimco report (2021) the five largest seafarer-supplying countries are Philippines, Russian Federation, Indonesia, China, and India, Table 4 [6][7]. This is the top five nations, both for officers and ratings.

Table 4. Estimated five largest seafarer supply countries-2021

	For all seafarers	Officers	Ratings
1	Philippines (13.3%)	Philippines (9.5%)	Philippines (16.5%)
2	Russian Federation (10.5%)	Russian Federation (8.4%)	Russian Federation (12.2%)
3	Indonesia (7.6%)	China (8.1%)	Indonesia (8.9%)
4	China (7.1%)	India (6.8%)	China (6.3%)
5	India (6.0%)	Indonesia (6.0%)	India (5.3%)

Source: [21]

Compared to the 2015 report, it is worth noting an increase in the share of seafarers from Russia, a decline in share of Chinese seafarers, and an increase in the share of ratings from India. Seafarers from the Philippines, apart from being the most numerous, have minimally changed their shares compared to 2015, Table 5 [21].

Table 5. Estimated five largest seafarer supply countries-2015.

	For all seafarers	Officers	Ratings
1	China (14.8%)	China (13.1%)	Philippines (16.4%)
2	Philippines (13.1%)	Philippines (9.4%)	China (16.3%)
3	Indonesia (8.7%)	India (9.0%)	Indonesia (10.6%)
4	Russian Federation (5.9%)	Indonesia (6.6%)	Russian Federation (5.6%)
5	India (5.2%)	Russian Federation (6.2%)	Ukraine (3.4%)

Source: [21]

The countries of the Asia-Pacific region are the main suppliers of ship crews, and have been so for more than 30 years. For example, in 1995, the Philippines, China, India and Indonesia accounted for about 36% of the total number of seafarers [13], which is not far from today's share. The number of Filipino seafarers fell slightly (from 20% in 1995 to today's 13%), while the others slightly increased their shares. Nations that once had considerable stakes, such as the USA, Japan, Korea, Turkey, Great Britain, are continuously losing importance [22].

Valuable statistics on the seafarer market are also provided by the European Union, for its member states. EU statistics gives slightly bigger numbers compared to Bimco statistics, and the reason is that EU count holders of the valid certificates, not actual work on board. Figure 3 shows the EU nations that provide the largest number of masters and officers, based on valid certificates.

In 2022 the total number of masters and officers with valid CoCs (CoC-Certificate of Competency) at EU level was 171,539, of which around 59% is deck department and 40% engine department. Female masters and officers participate only with around 2.5%. The total number of ratings holding valid CoPs (CoP-Certificate of Proficiency) in 2022 in the EU member states was 77,322 with 5.4% of them entitled to serve in both the deck and the engine department. Top five countries in 2022 were (masters and oficers): Poland (18,036), Norway (17,563), Greece (15,287), Croatia (14,659) and Romania (14428). For ratings, the top five were: Poland (15,070), Norway (11,298), Spain (7,929), Italy (7,602) and Croatia (6,106) [3]. It can be concluded that of all European countries, todays the Poland provides the most seafarers, both officers and crew.

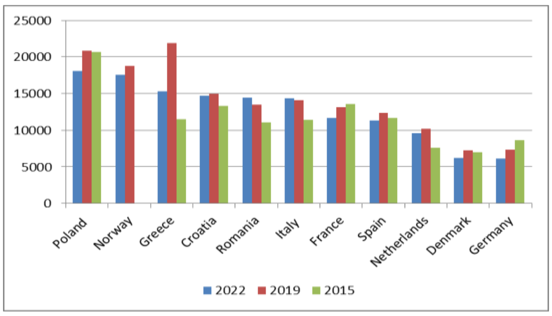

Figure 3. Masters and officers from EU Member States. Source: [3][4][5]

The top five non EU Countries having their CoCs recognised by EU Member States are the Philippines, Ukraine, the Russian Federation, India and Turkiye. Their share is around 34% (in 2022) of all of masters and officers available for service on ships flying the flag of EU Member States, while in 2017 was 26%. These five non-EU countries have maintained their leading positions over the past nine years. As for EU members, in the same period the top five places were shared by nine member states. The percentage of EU nationals (masters and officers) on real board the EU fleet, in 2022, was estimated to 26%. [3]

In 2023 Bimco confirmed that the Philippines is the most important country for the supply of seafarers, with around 350,000 ratings and 200,000 officers. China is in second place, with 120,000 ratings and 130,000 officers, followed by India, Indonesia and Russia [23]. So we can say that these 5 nations maintain their position as most important suppliers of seafarers.

When we talk about the absolute number of seafarers, it should be emphasised that the national statistics are quite different, usually higher. One of the reasons for this is the fact that some nations are less represented on the international market; others are related to data collection, which differs from country to country, as already mentioned. According to the Marina Statistical Report, in 2023, there were around 720,000 seafarers in the Philippines with a valid Seafarer's identity card and Record Book, or around 1.3 million seafarers with valid Seafarer's identification documents. The total number of officers with valid licences was 179,447. [24]

Around 1.9 million seafarers are registered in China, around 540,000 have valid certificates of competency and around 380,000 are on international voyages [7]

Indonesia has almost 1.2 million seafarers [25], India around 280,000, Russia over 110,000 [23].

5 THE MOST MARITIME COUNTRIES

If we look at the total number of seafarers, as mentioned earlier, the top five countries are: Philippines, China, Indonesia, India and the Russian Federation both in terms of masters and officers and ratings. These are very populous countries with low or near-low GDP, with marine tradition, and as such they have already proven to be major suppliers of manning and are expected to remain so. However, what does it look like when we look at the number of seafarers of a certain nationality compared to the population of the respective countries? According to the UN report [21], estimated by the Bimco/ICS based on estimates of seafarers demand, the top five maritime nations according to the ratio of seafarers to population are as follows: Croatia, Panama, Norway, Latvia, Greece and Bulgaria, as far as masters and officers are concerned. In terms of ratings, the top six countries are Panama, Croatia, Philippines, Latvia Bulgaria and Norway (Table 6). It is interesting that the European countries predominate. Turkiye, Ukraine and the Russian Federation are not on the list of EU countries, although they could also be added to this group.

Table 6. Six largest seafarer countries by seafarers to population ratio (per mill.)-2021

	For all seafarers	Master & Off.	Ratings
1	Panama (5627)	Croatia (3709)	Panama (2489)
2	Croatia (5319)	Panama (3138)	Croatia (1610
3	Latvia (4309)	Norway (2965)	Philippines (1460)
4	Norway (4146)	Latvia (2640)	Latvia (1369)
5	Bulgaria (3540)	Greece (2613)	Bulgaria (1337)
6	Greece (2945)	Bulgaria (2250)	Norway (1181)

Source: [21]

It should also be noted that Panama is a flag of convenience, so it is very difficult to separate out from the total mass of seafarers under the Panamanian flag how many are actually of Panamanian nationality. Figure 4 shows the average number of seafarers per thousand inhabitants of the respective country, also and the comparison with the population and GDP of the country.

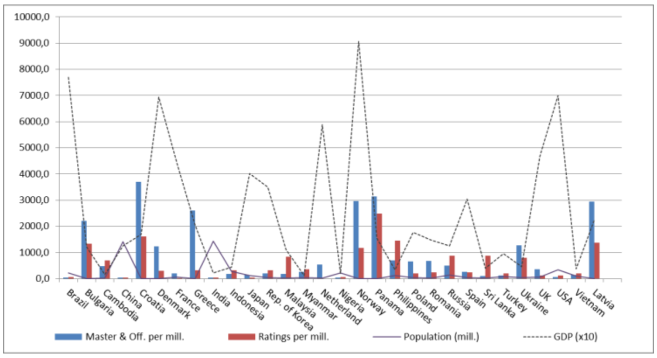

Figure 4. The number of seafarers of a certain nationality per country population. Source: Authors, based on [21][26]

If Bimco statistics are compared with EU statistics, similar results are obtained (Figure 5.). There are minor fluctuations in the absolute numbers of seafarers, but the leading nations are the same as those already mentioned.

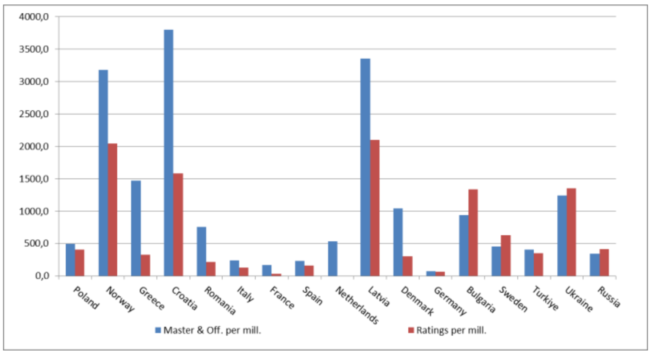

Figure 5. The number of seafarers of a EU contries nationality per country population, including Turkyie, Ukraine and Russia. Source: Authors, based on [3][23]

From the analysis obtained, it can be concluded that a higher GDP is associated with a low percentage of seafarers or a low interest in the profession, with the exception of some countries, notably Norway. Looking only at masters and officers, countries with a medium-low GDP predominate, such as Croatia, Panama, Greece, Bulgaria, Latvia, Ukraine, besides the aforementioned Norway which has an extremely high GDP. In terms of ratings, in addition to those already mentioned nations, there is also the Philippines. India and China, the two main suppliers of crews, besides the Philippines, are countries that have a low average numbers per capita. In general, this means that the large number of seafarers in these countries is primarily a result of their large populations. In the context of the popularisation of the seafaring profession, whose attractiveness is definitely decreasing, especially for ratings, it is certainly important to analyse why there is still an above-average interest in some countries with medium or high GDP.

6 MEASURES TO IMPROVE SEAFARERS SUPPLY

6.1 *The factors of influence*

The factors that influence the availability of seafarers are numerous and it is difficult to generally single out some, especially as they influence changes over time. In any case, it is worth highlighting the factors that somehow stand out in most of the previous analyses.

A 2012 study of 40,000 seafarers found that the most important factor for staying at sea for 76% of all respondents was salary [27]. Furthermore, another study carried out by Mitroussi, K. and Chang, C.J. emphasizes six motivational factors: the salary, opportunity to learn novel skills, personal development and improvement, the possibility of promotion and friendly working environment [28]. In paper Thomas et al, which analyze the impact of seafarers work on family life, pointing out efforts that should be made to make life of seafarers to be more bearable, considering life separated from family [29]:

- shorter trips (if possible up to four months),
- paid leave of appropriate duration,
- employment based on a permanent contract,
- training time outside of leave,
- possibility of boarding a family,
- availability of cheap communications,
- better contact between seafarers' families and seafarers' employers.

The traditional great maritime nations no longer exist, at least not in the sense that the fleet is consolidated at national level, its management as well as the national crews. Shipping has long since become global, so widely dispersed that at first glance it is impossible to link a ship to its actual owners or managers. Seafarers are also recruited worldwide, mostly through intermediaries at the mercy of the global labour market, where the search for cheap labour is a priority. Under these circumstances, it becomes extremely difficult to find and retain good crews. Generally speaking, in order to improve the lives of seafarers on board or increase the attractiveness of the profession, the influence of the countries from which the seafarers come and the companies that employ them is crucial. Countries that do not have their own fleet are in a more difficult position, especially if the standard of living and quality of life are above average. Their efforts to promote employment in the maritime sector are limited. Also we should bear in mind that the interests of companies and the pursuit of profit do not go hand in hand with the welfare of seafarers. According to Wang and Yeo (2016), the recruitment of seafarers for shipping companies depends mainly on the cost of crewing, as this cost is one of the highest of all fixed costs. The same authors also provide a list of factors that influence the decision-making process for seafarers employment, and first on the list is the overall coast of the crew, followed by the quality of seafarers' education and training, cross-cultural management skills, the ability to procure well-trained seafarers and loyalty to shipping companies [30].

Shipowners today favour the two types of indirect recruitment methods, using crewing companies or third-party ship management companies, although they are aware that this practise leads to quality and performance problems and can lead to undue exploitation of seafarers. This is very common in countries such as the Philippines [31]. The same authors [31] emphasise that the abandonment of the seafaring profession is due to lack of promotion opportunities, increasing demand for well-paid shore-based jobs, poor working conditions on board, increased workload, stress, loneliness, isolation, cultural diversity, generational issues, poor human resource practices, unfair contracts, etc. In view of all this, seafarers from East and Southeast Asian countries are the first choice, especially from the Philippines, China and Indonesia, followed by Vietnam and Myanmar. In addition to the low labour costs, maritime tradition and large population, seafarers from these countries are highly disciplined, dedicated and loyal [22]. As mentioned earlier, the Philippines is now the main supplier of seafarers in the world, and has been for many years. The Philippines is a traditional seafaring country, but what additionally characterises Filipino seafarers are: good command of English, quality education and training, cultural proclivity (orientation towards hard work, discipline, strong family ties, adaptability, motivation, etc.), cost competitiveness. Possible disadvantages include cultural differences and language barriers compared to crews from other nations, as well as the need for constant development to remain competitive. [32]

In their analysis of Korean-flagged ships, Wang and Yeo conclude that Filipinos are the best foreign seafarers, although they are more expensive compared to other countries such as Myanmar, Vietnam and Indonesia. The authors emphasise that Filipinos are well educated and trained, have above average communication skills and English language proficiency, and as a nation generally provide a reliable and adaptable market for crew members. As for the other nations, while Myanmar is cheaper and has exceptional loyalty, it cannot provide sufficient and stable numbers of seafarers, especially officers, as a supply country. Indonesia has a shortage of ship officers and seafarers from this country are prone to cultural and religious conflicts with other nations. China has the potential to become the largest supplier of seafarers, but seafarers still have problems with the English language and labour costs are also rising. [30]

An analysis of the supply and demand for seafarers in recent decades shows that, in the context of the factors influencing supply and demand, the market for masters and officers should be separated from that of ratings. We can safely say that the ratings market is simpler to analyse and generally corresponds to what has already been said about the overall seafarer market. This is because the traditional maritime countries can no longer compete with countries such as the Philippines, China, Indonesia and India in terms of labour costs, number of seafarers, long-term supply and other segments. As far as the officers market is concerned, the situation is different. A significant percentage still consists of seafarers from traditional maritime countries, i.e. countries with a higher GDP. Russia and Ukraine certainly stand out as countries with a significant share of the seafarers, but their large share is due to the political situation and current relations in the region, as well as the question of how long they can be counted on in the long term. Due to the ongoing war, the numbers of new seafarers from Russia and Ukraine is likely to be limited for some time, and many experienced crews are also returning home to join the military [14]. When we look at the percentage of seafarers, particularly officers, in the population, it is interesting to note that the top five in this segment are not among the top five largest suppliers. The largest maritime nations according to this criterion are Panama, Croatia, Latvia, Norway, Bulgaria and Geece. Why there is so much interest in the seafaring profession in these countries is difficult to answer. The cost of labour and the quality of life in the country you come from certainly have an influence, but it is mainly something else, namely tradition, but also the guidance of the younger generations and the creation of a positive environment. Take Croatia, for example. The vast majority of seafarers come from the coastal area, whose area and population are less than half of the entire country and where the standard of living is even higher. The national merchant fleet no longer exists, whereas it used to be significant, and the seafarers are on the global labour market, with national incentive measures being minimal. But despite all this, the number of officers has remained within the limits of what it was when the national fleet was numerous, until the early 1990s. Of course, the number of ratings has decreased significantly, and the main reason for this is the price of labour. Therefore, we can safely say that regarding ship officers market, the tradition in Croatia has a greater influence than the standard of living and average GDP. Certainly, there is still a strong education system whose capacity exceeds demand. The main advantage of Croatian seafarers is their adequate education and training, but also, the opportunity of gaining experience in the world's most successful companies and on ships with advanced technologies. Labour costs for Croatian seafarers are not too high and wages are in the middle of the world average. Their competitiveness is jeopardised by seafarers from countries that provide a large supply of labour (the Philippines and the Far East), by insufficient adaptation of Croatian seafarers and the Croatian education and administration system, and slow adaptation of the Croatian education and administration system to constant changes in the world seafarers market [33].

A good example of how it is possible to maintain interest in the maritime profession is Norway, a country with an extremely high GDP and average wages that are well above the global and European average. Norway is the fifth largest among the world's maritime nations, ranked by value [34], has a strong and numerous national fleet, but also a whole series of measures that keep the maritime occupation attractive, from high incomes, benefits, first employment, etc.

Greece is also a strong traditional maritime country, with a significant fleet; it is the second largest ship owner in the world [18]. However, Greece generally has major problems in retaining seafarers, regardless of the incentive policy. Between 1978 and 2000, the number of seafarers fell by 81%. The reasons for the decline in popularity can be found the lack of information about the profession itself, in discouragement on the part of the family, in the outdated infrastructure and equipment in education and in training that has fallen out of trend, in considering the maritime profession as a reserve in case of financial insecurity, in the increased job opportunities on land, etc. [35].

6.2 *The future of the global seafarers market and the improvement of the attractiveness of the profession*

In addition to ensuring a sufficient number of seafarers, it is also extremely important to maintain their quality. The future of the global seafarers market will be challenging. A continued shortage of qualified seafarers can be expected, as well as adapting to the future demands of specialisation, digitalisation and automation [36]. In terms of the impact of technology on seafarers and their future work, the WMU study distinguishes four main categories that should be considered to keep them at the cutting edge of technology: the technology itself, safety and health, required skills and training [37]. The study also states that seafarers must be adequately trained to safely use the new devices and technologies that are coming. In addition, this must be supported by a paid familiarisation period during which seafarers are released from their normal duties and can concentrate on the learning taking place. The skills and competences required of seafarers are changing due to the automation of tasks which affect the division of labour between man and machine. This means that it is not only the seafarers' jobs that are changing, but also the work processes and tasks, as well as the values in the workplace. The most important findings can be summarised [37]:

- for potential seafarers supply count on Africa, the Americas and the Pacific/Oceania;
- In the future, jobs in the shipping industry will increasingly be based on land, even partially or fully automated;
- Soft skills remain crucial for future seafarers;
- Major skills gaps in digital and systems analysis skills as well as technical skills related to new technologies;
- New jobs and new careers will require constant up skilling and lifelong learning,
- The formal education system will be just as important for acquiring new knowledge and skills or adapting to new technical and technological solutions as the non-formal education system;
- It is expected that the market for seafarers will bring some new values in the future, that the jobs will be more specialised, less male oriented, digitally oriented, work-life better balanced, etc.;

The DNV study The Future of seafarers 2030 confirms that digitalization and decarbonisation are the key transformational drivers that will reshape shipping in this decade and beyond, and that seafarers will play a crucial role in this process. To increase the attractiveness of jobs for seafarers, the study emphasises better pay and career development. Particularly insightful is the recommendation that shipowners, operators and managers should take advantage of seafarers' unique skills and offer them opportunities for complementary shore-based roles, such as working in vessel control centres and monitoring facilities, which are expected to be increasingly in demand. [38]:

A Study on the Future Global Supply and Demand of seafarers from Japan International Transport Institute and The Nippon Foundation, within which the questionnaire to students of maritime universities on attraction of seafarers are given, among six countries (India, Philippines, Croatia, Norway, R. Korea, Japan), gave the following results [39]:

- Promoting the importance and attractiveness of maritime life and shipping from an early age is one of the most important ways to attract future generations of seafarers. A result of the questionnaire shows that the ratio of students who have had knowledge of seafarers and shipping prior to entering their universities is only 32.7%;
- 72.6% of students wanted to become seafarers before enrolling at university, but 20.3% of them changed their mind after enrolment;
- Most students from major seafarer supplying countries hoped to be employed in shipping companies, primarily international ones;
- As far as the positive image of seafarers is concerned, the above-average salaries, great responsibility and personal satisfaction should be emphasised. As for the negative image, the inconveniences of working on board should be emphasised, such as the lack of freedom and the rotation without the usual annual leave;
- Many students advice female students not to enroll in maritime faculties due to the lack of job opportunities, difficult working conditions on board, and the long duration of stay on board;
- Half of the students hope to find a job on the mainland later on;
- The students see the solution to making the seafaring profession attractive in improving working conditions, starting with wages, improving the image of seafarers and supporting seafarers ashore with appropriate social and medical benefits, both for them and their families.

7 DISCUSSION

Based on the above, it can be said without a doubt that the Philippines, China, India and Indonesia are the most important supplier countries for seafarers today. And we can assume that this will also be the case in the near future. The reasons for this are low labour costs, loyalty, tradition, the willingness to constantly improve and adapt to new challenges, but also the ability of these nations to ensure a continuous supply of a large number of seafarers.

A considerable number of seafarers, especially officers, come from countries such as Russia, Ukraine, Poland, Greece, Turkey, Croatia, Norway, Bulgaria, etc. The question is whether these countries will be able to maintain these shares or whether they will simply disappear from the list. This applies in particular to countries that do not have a significant fleet of their own but employ seafarers on the international market. To make this assessment, it is of course necessary to know what has led people from these countries to take an interest in this profession in the first place, or what has caused the formerly major seafaring nations to disappear from the list of the more important ones. In this context, the most important factors discussed in the previous chapter can be emphasised:

- the salary in relation to the standard of living of the nation from which the person comes,
- the general situation in the country from which the person comes, employment opportunities, political situation, wars and unrest,
- the promotion of seafaring professions,
- tradition,
- the capacities of educational institutions when it comes to officers,
- company benefits and policies,
- protection of seafarers, legal and other,
- measures to facilitate life on board, flexible rotations, etc.

In all the above analyses of the reasons for choosing or giving up a seafaring profession, the salary, or rather the price of the work always comes first. However, practical examples confirm that this is not always the case. Ship owners do not always opt for the cheapest labour, nor is salary always the deciding factor. Smaller countries can serve as an example, such as Croatia, which does not have a large international fleet, but has a disproportionately large number of officers on the international market. There is also Norway, a country with a high income economy but which nevertheless maintains a respective number of seafarers. A broad maritime environment, tradition and heritage, a strong own fleet, a favourable tax system, ocean based industry, a positive government policy, etc. contribute to the attractiveness of the seafaring profession.[40]

It is clear that the examples of some countries, particularly those with a large number of seafarers per capita, can be utilised for future seafarer recruitment policies both locally and globally. In the context of the ratings, the price of labour is of course still of central importance, but other criteria are just as important for the officer cadre.

Finally, as far as the recommendations for the promotion of the seafaring profession, as well as for remaining on board once employed, we can summarize them as follows:

- early recruitments and dissemination of information,
- good and stable wages, with permanent employment,
- continuous improvements of education and training, with use of sophisticated tools, on board and off board,
- greater female participation,
- better cooperation between educational institutions and shipping companies,
- easy getting first employment,
- better contracts and welfare,
- more flexible rotation,
- easy and affordable communication with families,
- better legal protection, social benefits, and protection in general (in case of wars, piracy, pandemic, smuggling, etc.).

8 CONCLUSIONS

The seafarers market has had an almost constant shortage for the past few decades, and a similar trend is expected in the years to come. Increased demand relative to supply is particularly characteristic of masters and officers. The main reason for this is the constant increase in world maritime traffic, i.e. number of ships, and the inability of the labor market to keep up with these changes.

Given the specificity of the maritime profession, the modern environment, the tendency to reduce crew costs, etc., it is quite understandable that the largest suppliers of ship crews come from countries with relatively cheap labor, especially when it comes to ratings. The market for cheap labor is quite large, and training of ratings is not that demanding or time-consuming. Of course, problems and challenges exist, but they are certainly smaller compared to the officer cadre. In accordance with this, the recruitment of ratings from countries with cheap labor is to be expected in the future, not at any price, but in countries cheap enough, loyal, and capable enough to acquire minimal skills. As for masters and officers, the situation is somewhat different. The increased demand in recent years indicates that the market of the main supplier countries is not enough to meet the demand, which gives room to other nations, primarily traditional maritime countries and former great maritime powers. Training of officers is significantly longer and more demanding, requires significant financial investments, and also requires appropriate prerequisites for the applicant, from physical to social and intellectual, which is a major challenge for countries with cheap labor. On the other hand, traditional maritime countries generally have a decline in interest in maritime professions, caused primarily by rising standards on land, well-paid jobs on shore, and the challenging but also dangerous environment of living and working on board a ship that requires significant sacrifices.

In the context of measures to popularize the seafarer's profession, it is certainly worth emulating those countries that have managed to maintain interest in this profession. There is no general recipe, but it should certainly start from maintaining the capacity of national fleets, improving legal protection and social status, improving work flexibility, providing benefits, and other measures that encourage the profession and ensure rights as in all other national workplaces. Of course, young students and cadets should be able to quickly and easily gain their first experiences.

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