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Addressing the EU seafarer shortage

By

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EXECUTIVE SUMMARY

The study addresses the growing concern of the diminishing global maritime workforce. For nearly two decades, BIMCO has been drawing attention to this issue. However, the situation continues to deteriorate, prompting urgent intervention. The primary challenge revolves around a deficit of qualified officers, with Europe being particularly affected. Given the projected increase in global sea trade, immediate action is indispensable. Yet, before initiating and implementing any strategies, it's crucial to conduct an in-depth analysis of the factors contributing to this dilemma. Central to these factors is the attraction and retention of seafarers, which have a paramount influence on the situation.

This dissertation delves into the reasons behind the seafarer shortage and evaluates the efficacy of solutions already implemented at the EU level. Qualitative research was held in the form of semi-structured interviews with 3 HR executives from 2 Greek ship management companies and 3 experienced seafarers from 1 Greek shipping company. The findings of the primary research that was carried out indicated that HR executives and seafarers value the role of human resources the most, both for organizations and governments. They believe that employees need to be highly motivated, satisfied and trained, in order to remain in organizations or be attracted to work in them at first place. For the particular case of the shipping industry, research participants stressed the importance of digitalization and decarbonization as major factors that have constituted the shipping industry as more sophisticated, thereby having led many seafarers in choosing to move away from the industry, as well as new professionals in not wanting to follow the particular profession. Technology seems to have played a pivotal role in the above trend, as well as in shaping numerous functions of how seafarers work and what skills they must have. Both HR executives and seafarers believe that in order for seafarers to be retained in the business and new seafarers to be attracted, they need to be more adequately trained, while also been offered higher safety on board. The role of EU and national authorities was also highlighted as also crucial, mainly in terms of providing resources for the development of shipping academies, as well as becoming strict against shipping companies with respect to offering safer working conditions and more benefits to seafarers, in order to constitute the shipping officers' profession as more attractive for both new and existing seafarers.

Keywords: Shipping industry, labour shortage, EU legislation, digitalization, decarbonization

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CHAPTER 1: INTRODUCTION

1.1. Theory on the importance of labour and factors determining employee attraction and retention

Globalization and the start of the 4th Industrial Revolution caused significant changes in the way of production, upgrading quality of work in the data management space and information, making it more imperative for organizations to occupy accordingly trained human resources (Carlin & Soskice, 2007). The introduction of technology, both production and information, has reinforced this upgrade (An, Ghazi, Prieto et al., 2017). Adam Smith and its 1776 work "The Wealth of Nations" have analyzed that individuals form the wealth of nations, while their acquired skills form a major source of capital for their country (Carlin & Soskice, 2007). Gary Becker, in his 1964 book "Human Capital", also added the contribution of health to capital formation. According to his view, human capital is determined by education, training and medical care (Layard, 2009).

In order for labour to be attracted to work in an organization, as well as in order for employees to wish to remain loyal and stay in the organization they work for, they need to be adequately motivated (Moren, 2013). One of the most important functions of management is to create willingness among employees to perform at their best (Uddin & Hossain, 2015). Apart from motivation, it is also important for employees to be satisfied in their workplace, in order to want to stay in their organization for long (Thompson & Phua, 2012). Employees are attracted not only by company-specific factors, but also by sector-specific factors, such as their consistency with what they have studied, their skills and competencies, the potential to earn an adequate total compensation package, to enhance career development and to enjoy safety in the workplace.

1.2. The global labor trends

Over the past few years, the global labor and employment landscape has experienced profound shifts. These changes have been influenced by geopolitical turbulence,

environmental challenges, and rapid technological advancements. The landscape has further been disrupted by rising food and energy costs, the war in Ukraine, and the unforeseen impacts of COVID-19. These compounding factors have played pivotal roles in reshaping the world's labor markets, thereby influencing the types of jobs available and the requisite skills for the professionals of tomorrow (Industrial Relations and Labour Law, 2023).

Several trends, from the adoption of new technologies to broader macroeconomic and geopolitical perspectives, the push for green initiatives, demographic shifts, and evolving consumer preferences, are anticipated to steer industry transformation in the upcoming half-decade. Notably, two trends stand out as primary catalysts for this transformation: digitalization and decarbonization (Industrial Relations and Labour Law, 2023).

Both of these evolving paradigms exert a substantial and persistent influence on employment conditions and the composition of the workforce. As the urgency for a green energy transition and comprehensive digitalization intensifies, so does its effect on the sectoral make-up of the workforce, leading to new demands for specific occupations and skill sets. Recognizing these shifts, nations around the world are growing increasingly cognizant of the importance of steering successful transitions in decarbonization, digitalization, and demographic shifts, especially against the backdrop of increased inequalities spotlighted by the COVID-19 pandemic.

As we navigate the transition to greener and more digitized economies, there emerges a pronounced need for holistic digital literacy. Equally crucial is the emphasis on empowering the youth with the right technical and digital skills. This ensures they are well-positioned to harness the myriad of opportunities arising from these transitions.

1.3. Digitalization

The surge in digitalization across both the economy and broader society is reshaping our understanding of work in unprecedented ways, and this momentum is poised to intensify in the foreseeable future. While the digital economy offers remarkable potential to catalyze youth employment, there's an imperative to craft informed policies that convert this potential into tangible employment opportunities. The so-called

"platinum" economy, rooted in leveraging the internet as a pivotal platform and digital information as a cornerstone, encompasses the production, marketing, and distribution of goods and services (ILO, 2019).

A hallmark of the digital economy is the explosive growth in machine-readable information over the internet. Digitalization, as indicated by ITU 2020, can be a boon for productivity, income, and societal welfare. However, like any disruptive technological evolution, it presents a double-edged sword, encompassing both risks and opportunities. While it spurs job creation in novel markets and bolsters employment in certain domains, it also augments the vulnerability of certain workers to unemployment or diminished wages. This is attributed to the digital sphere's ability to enhance production efficiency, sometimes at the expense of human labor. Moreover, digitalization also reshapes tasks within professions, influencing skill requirements and reshaping work conditions in specific sectors.

The digital metamorphosis has touched nearly every job, albeit with diverse prerequisites concerning digital infrastructure and expertise. The term "digital employment" pertains to roles facilitated by Information and Communication Technologies (ICTs), perceived as a spectrum rather than a stark digital versus non-digital divide. This realm is marked by a higher proportion of adept professionals, typically equipped with advanced education.

Historically, technology-driven productivity booms have facilitated reductions in working hours, either incorporating more individuals into the workforce or mitigating the adversities of automation. Such strategic reductions in working hours might be a fitting response to increased automation propelled by digitalization.

However, it's imperative to underscore that digitalization isn't devoid of drawbacks concerning employment. The proliferation of ICTs poses challenges, predominantly linked to training imperatives (Frey and Osborne, 2013). A notable concern within the literature exploring technology's impact on employment is that technological advancements aren't universally beneficial across all skill sets. Some skills witness heightened relevance, while others wane in significance, subsequently leading to diminished demand. This translates to a dwindling demand for middle-skilled workers, contrasted by a rising demand for both high and low-skilled roles, a phenomenon coined

as "routine-biased technological change" (EPRS, 2023). Consequently, this has given rise to the trend known as "job polarization" (EPRS, 2023).

In essence, a prominent repercussion of the digital era is the escalating demand for specific skills. Absent a robust framework of training, talent acquisition, and retention, this trend could culminate in glaring skill shortages.

1.4. Decarbonization

Another pivotal force reshaping the employment terrain is the drive towards decarbonization and an eco-centric orientation. The green transition is increasingly emerging as a transformative labor-market trend.

The European Green Deal, endorsed by EU nations in 2020, delineates the vision of transforming Europe into the premiere climate-neutral continent by 2050. Building on this ambition, in July 2021, the EU introduced the "Fit for 55" initiative, targeting an elevation of the greenhouse gas (GHG) emission reductions by 2030 to 55% from the previously established 40%. Notably, research suggests that by embracing strategies centered around enhancing energy efficiency, pivoting to renewable energy sources, and expanding the electric vehicle infrastructure, we could potentially generate an additional 8.4 million employment opportunities for the younger demographic (15-29 years) by 2030 (ILO, 2022).

The present decade stands as a critical juncture, necessitating swift and robust measures to combat climate change, conserve biodiversity, and restrict global warming to a mere 1.5°C above historical levels. As nations globally commit to these objectives, the labor markets are bound to undergo shifts, with the ramifications manifesting differently across regions, sectors, and populations. Certain industries, such as renewable energy, construction, manufacturing, waste management, and recycling, stand to benefit with job proliferation. In contrast, carbon-dense and fossil fuel-centric sectors may witness job reductions. Nonetheless, the ripple effects of this transition will be universal. Every sector will undergo some transformation, with jobs evolving, being displaced, or redefined, all intertwined with other significant factors, including digitalization.

Much like the digital paradigm, the green transition is intricately linked to skill acquisition. Young individuals can only capitalize on the opportunities proffered by an eco-sustainable economy if they are apprised of the underlying technologies, emergent occupations, and requisite skills inherent to this shift. This eco-centric metamorphosis demands a blend of specialized skills tailored to specific occupations, complemented by overarching, foundational competencies (ILO, 2019).

1.5. Workforce shortage

Since 1990, the global labor force participation rate has consistently declined (SHRM, 2023). In fact, projections indicate a staggering shortfall of 85 million workers worldwide by 2030 (Randstad, 2022). This looming labor shortage is emerging as one of the most formidable challenges in contemporary history. The crux of this deficit predominantly lies in the dearth of skilled professionals. This trend is not just a fleeting concern but is taking center stage as a prevailing employment issue with worldwide implications. Reflecting the gravity of this situation, the dwindling workforce ranks as the 8th most critical business risk in 2023, as illustrated in Figure 1 (Allianz, 2023).

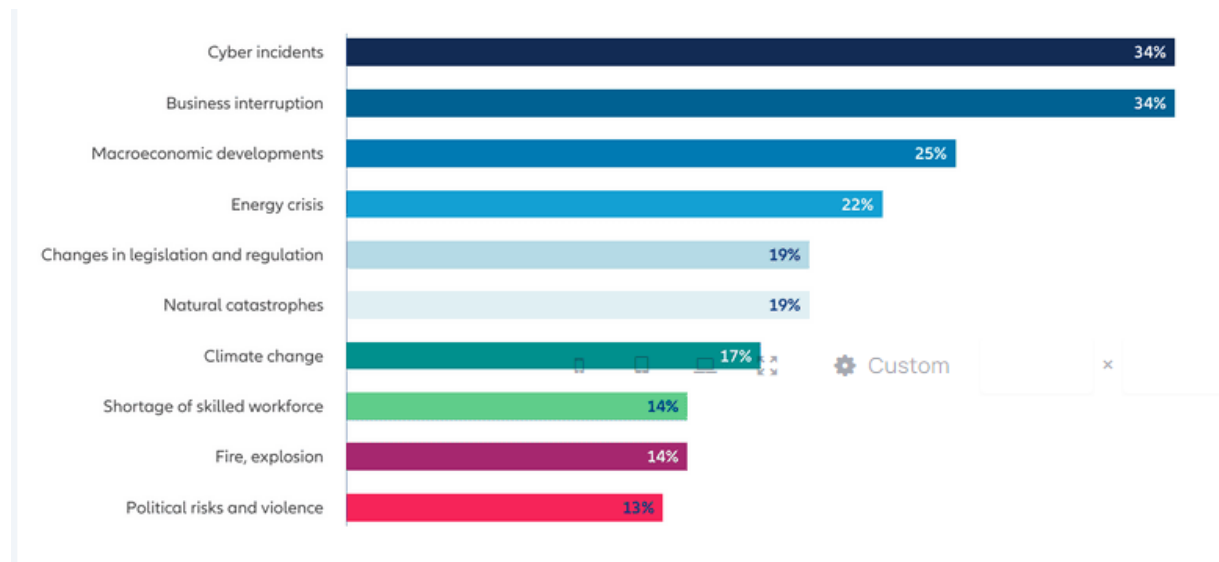


Figure 1: The most important business risks in 2023

Source: Allianz

Several factors are fueling the global labor shortage, including evolving worker expectations, an aging population, a widening technology skills gap, and the adoption of green policies. The skills gap, in particular, stems from the integration of cutting-edge technology, which necessitates continuous reskilling and upskilling by the workforce.

This labor scarcity isn't exclusive to global markets; the European Union (EU) faces a similar predicament. Disparities in labor demand and supply are evident both nationally and regionally within the EU. This imbalance is influenced by various elements: the adoption of new technologies, the transition to a climate-neutral economy, an aging workforce, and the prevailing work and employment conditions. Each of these factors plays a significant role in shaping the dynamic interplay between labor demand and supply in Europe.

One notable sector grappling with a shortage of skilled professionals is the maritime industry.

1.6. Maritime sector

The maritime industry has witnessed substantial transformations since the onset of economic globalization. The rise of Flags of Convenience, technological advancements on ships, and the development of an international regulatory framework have collectively shaped the modern shipping milieu. Central to this framework is the indispensable role played by human resources. A distinct characteristic of the sector is that as technology progresses and regulations around safety and environment tighten, the demand for adept seafarers grows. This demand is further amplified by the anticipated surge in global sea trade.

Multiple international maritime bodies have conducted and published studies analyzing the global dynamics of supply and demand for merchant seafarers. While there are disparities among these studies, they unanimously indicate a sustained decline in the maritime workforce. Projections suggest a potential officer shortage by 2025, predominantly evident in historically maritime-centric regions, notably the EU countries.

Nearly two decades prior, a BIMCO study first spotlighted this impending crisis, predicting an officer shortfall by 2025, predominantly within European maritime strongholds. In response to these alarming findings, targeted initiatives were launched at both IMO and EU levels. Within the EU, these initiatives materialized as Maritime State Aid Guidelines. However, these measures primarily aimed at tackling the flagging out dilemma within the EU, presuming a connected solution might address both challenges.

Regrettably, despite EU interventions, there's been a steady decline in EU seafarers. Subsequent BIMCO reports in 2010 and 2015 reconfirmed this downtrend, with estimates projecting even steeper officer deficits by 2025. These findings were further corroborated by studies from other maritime organizations, like Drewry. The international maritime labor landscape, characterized by its fragmented nature, lacks a standardized system to track seafarer metrics. This fragmentation can cast doubts on the data's reliability, but the overarching trend is undeniable: EU seafarer employment has indeed dwindled, risking global maritime trade's viability. EU officers, heralded for their proficiency over counterparts from developing nations, are often sought-after, especially for higher-ranking roles on EU-flagged vessels.

With a surge in global seaborne trade and growing economies like India and China, the need for seafarers has concurrently escalated. The scarcity of adept seafarers not only endangers the shipping sector but also global economic stability, given the maritime sector's sole reliance on internally-trained professionals. Technological advancements further accentuate this challenge, necessitating highly skilled crews.

To address this crisis, initial global efforts, led by IMO, centered on enhancing Maritime Education and Training (MET). The hope was that refining MET would bridge the gap between supply and demand, ensuring the maritime trade's uninterrupted flow (BIMCO, 2015). These enhancements, epitomized by the review of the IMO STCW Convention, prioritized training in burgeoning maritime regions like SE Asia. However, even with these quality upgrades, the dwindling trend persisted, suggesting underlying issues. Subsequent investigations recognized the need to also incorporate seafarer perspectives, emphasizing attraction and retention strategies. As such, enticing the upcoming generation of seafarers emerged as a paramount challenge for European nations, complemented by the equally crucial task of retaining them.

1.7. Research gap

As it becomes evident from the analysis held so far, there are various factors that could lead employees across sectors to either remain or leave an organization or the sector, or to get attracted or not to them. The shipping industry is a very special sector of global nature, where there are also other more special factors that shall influence the behavior and preferences of seafarers. Although numerous reports have been conducted regarding employment trends in the global shipping industry, there is no previous research regarding how seafarers and shipping executives themselves feel, as well as what are the inner feelings, emotions and mechanisms that lead them to either enter or leave a very demanding industry as the global shipping industry.

1.8. Research problem

The evidence suggests a persistent decline in available officers for shipboard duties, especially in traditionally maritime-focused nations. In light of maritime trade's global significance, targeted interventions have been deployed both internationally by IMO and regionally by the EU. Despite these efforts, the shortfall endures. A closer examination of contributory factors reveals that the root of the issue may lie in the motivation and retention of seafarers.

1.9. Research purpose

Given the outlined challenges, this study seeks to pinpoint the causes of the officer shortfall within the EU. As such the central research question addressed by this dissertation is:

What are the underlying causes for the consistent decline in EU seafarers, when viewed from the perspective of the seafarers themselves?

In particular, the dissertation has the following objectives:

- To identify how seafarers and shipping executives feel about working in the shipping industry
- To investigate the issues surrounding the motivation, attraction, and retention of seafarers
- To evaluate the efficacy of policies and measures instituted at the EU level. In alignment with this objective, the study poses the primary research question
- To provide implications about shipping companies and authorities regarding how the shipping business could become more attractive for seafarers, in order for existing seafarers to be retained and new ones to be attracted.

1.10. Study contribution

As it shall emerge from the thorough literature review that takes place in the second chapter of this dissertation, there are various factors that shall affect the attraction and retention of employees in general, as well as the specific case of seafarers. Through research findings, a more complete view shall be formed regarding why there is a shortage of seafarers in the EU, at least from the perspective of HR executives and seafarers themselves, as well as whether this shortage shall be attributed to common factors in the employment market, or shipping-industry-specific factors.

1.11. Research method

Primary research and specifically qualitative research was carried out, in order to identify the major factors that may have led to shortage of labour in the global shipping industry. Through the semi-structured interviews that were carried out, insights were drawn from shipping HR managers and experienced seafarers working in Greek shipping and ship management companies.

1.12. Data collection

Data was collected through semi-structured interviews with HR officers and older seafarers working in the Greek shipping industry. The qualitative data collected was analyzed with thematic analysis.

1.13. Structure

Chapter 2 is the literature review chapter, which provides the theoretical framework in which the study was based, as well as secondary information regarding employment trends in general and in the shipping industry in a global context. Chapter 3 outlines the methodology that was followed for the primary research that was carried out, justifying the selection for each research method that was used. Chapter 4 presents the findings of the research, which are then discussed in Chapter 5. Finally, Chapter 6 summarizes the key findings of the research, draws key conclusions on them and provides implications for the shipping industry, as well as implications for future research.

CHAPTER 2: LITERATURE REVIEW

2.1. Theory on employment trends and the labour market

2.1.1. Macroeconomic theory on human resources and human resource management

Globalization and the start of the 4th Industrial Revolution caused significant changes in the way of production, upgrading quality of work in the data management space and information, making it more imperative for organizations to occupy accordingly trained human resources. Highlighting the value of workforce in the improvement of production and the economy in general starts with the specialization of the labour sector (Carlin & Soskice, 2007). The introduction of technology, both production and information, has reinforced this upgrade. In addition, the requirements in communication, both within businesses and between businesses and the wider socio-economic environment, accompanied by the need for promoting innovation, has highlighted the important role of human resources (An, Ghazi, Prieto et al., 2017).

Human capital is an important asset for every country and includes all natural and acquired abilities, skills and knowledge possessed by individuals working in this country. These abilities, skills and knowledge are not free goods, but are rather major economic assets, which can be acquired by education apprenticeship or practice (Crook, Todd, Combs et al., 2011). They also form an investment and financial resources for their owner. In this context, human capital is considered as a valuable factor strengthening national economies (Wan, 2010).

Regarding theories of human capital, they have been pioneered by Adam Smith and its 1776 work "The Wealth of Nations", where it is analyzed that individuals form the wealth of nations, while their acquired skills form a major source of capital for their country. Mastering skills, as a consequence of the diligence of the individuals during the period of their education apprenticeship, involves a real cost that is converted into fixed capital and shall be considered as property of the society as a whole. Knowledge or training constitutes a machine or tool that upgrades work, so that while it entails a significant cost, it ultimately yields big profits (Carlin & Soskice, 2007). Later on in 1920, the neoclassical economist Marshall stated in his work "Principles of Economics" that the individual constitutes the center of consumption and production. At the same time, Marshall emphasized on individuals' engagement in education and their

contribution to production and growth, as well as the factors affecting workers' income (Lindbeck & Snower, 2001).

Gary Becker, in his 1964 book "Human Capital", also added the contribution of health to capital formation. According to his view, human capital is determined by education, training and medical care, while also considering education as an economic redistribution tool. In 1974, Mincer specified how personal incomes are formed with the creation of human capital, while also highlighting the level of correlation between education and payment of a corresponding salary. Over the same year, Spence developed her theory of signaling, where human potential acquiring education credentials sends a signal to employers, who in turn adjust their employee-related purchasing behavior accordingly (Layard, 2009). DeVaro & Waldman (2012) added to the signaling theory, stating that businesses that wish to keep their skilled and valuable employees tend to offer a higher salary than the one they were initially willing to pay, exactly because they are under the pressure of the result of signaling. With the expansion of the neoclassical model, the technology variable is added in the original production function, with physical capital and labor being integral parameters of the function. Therefore, long term economic growth is treated as an exogenous phenomenon.

As far as education is concerned, from a microeconomic approach, education can be thought of as human capital investment. Therefore, an increase in individuals' stock of education shall lead to an increase in the future of their income. Macroeconomic theory approaches investment in education as a form of human capital that leads to growth (Malhorta, 2000). According to the principle of diminishing returns, increasing investment in education beyond a certain point shall lead to a decrease in efficiency. On the contrary, according to endogenous growth theorists, an increase in investment leads to increasing returns of scale (ILO, 2006).

2.1.2. Attraction, retention and shortage of labour

In order for labour to be attracted to work in an organization, as well as in order for employees to wish to remain loyal and stay in the organization they work for, they need to be adequately motivated. Motivation is identified with the needs and desires of individuals. It is a process of encouraging people to take action to achieve goals. In the context of work-related objectives, there are various psychological factors that stimulate people's behaviour, such as desire for money, success, recognition, job satisfaction and teamwork, among others (Moren, 2013). For other employees, an attractive workplace is one that offers schedule or overall work flexibility, a novel work atmosphere and reliable partners, as well as safety and security (Brief & Weiss, 2002). One of the most important functions of management is to create willingness among employees to perform at their best. Therefore, the role of a leader is to arouse interest in the performance of employees in their jobs (Uddin & Hossain, 2015).

Apart from motivation, it is also important for employees to be satisfied in their workplace, in order to want to stay in their organization for long. A comprehensive definition of job satisfaction states that it is "a pleasant or positive emotional state resulting from the evaluation of work or professional experience". Job satisfaction is a result of employees' perception of how well their job provides them with things that are considered by them as important. In general, there is a universal perception that job satisfaction is a particularly important fact in the business world (Thompson & Phua, 2012). In the opposite case, i.e. in the case of job dissatisfaction, there is an unsatisfied need that creates phenomena of tension or imbalance, forcing the individual to move in a goal-directed pattern towards the restoration of balance to satisfy a need. Job satisfaction is identified with a pleasant or positive emotional state, which results from the appreciation of one's work and from work experiences (Latham & Budworth, 2007). The more satisfied a person is in her/his job and workplace, the higher the level of job satisfaction shall be, as well as the higher is the probability that she/he will aim at staying in the current occupation for long (Borman, Ligen & Klimoski, 2003).

Of course, employees are attracted not only by company-specific factors, but also by sector-specific factors. Under no doubt, employees are primarily attracted mostly by those sectors that are consistent with what they have studied, their skills and competencies, as well as the profession they have – more or less – chosen to follow in their lives. Further to that, employees all over the world may choose to work in sectors in which they believe they shall earn an adequate total compensation package, including

money and other monetary and non-monetary benefits. Employees also normally choose to work in sectors where they can enhance a prosperous career development, i.e. sectors in which there is the potential for them to develop their career. In order for this to be enhanced, such sectors shall not only be structured in a way that many levels of hierarchy exist for employees to move up, but also there is high earnings and profitability potential, so that employees in this sector shall have the ability to build and maintain a long career. Safety in the workplace is not only a company-specific, but also a sector-specific factor that shall influence individuals' selection of the sector that they shall chose to work in. Indeed, there are some sectors that are generally characterized by job-related hazards, such as noise, working in heights, working in the sea, working in outdoor conditions subject to cold or heat etc. Such sectors may not be so tempting for some individuals, but they in turn offer other benefits that constitute them as attractive for some others. Last but not least, there is always the national context factor to take into account. More specifically, although some sectors may offer specific job characteristics, such characteristics may differ in the same sector from country to country. As such, employees may choose not to work in a sector that they would like to work for in another country, but not in the country of their residence, because conditions in the specific sector in the specific country may not be as attractive as in other countries.

2.2. Factors affecting labour shifts in a global context

"The Future of Jobs Report 2023," which delves into the transformations spurred by the impacts of digitalization and decarbonization. This study outlines how businesses anticipate navigating these labor-market shifts between 2023 and 2027 (World Economic Forum, 2023). One primary revelation from the report highlights the deficiency in youth employment and the escalating demand for specialized professional education. Such educational imperatives stem from the prevailing trends in the labor sphere, notably digitalization and the energy transition. Interestingly, these trends are also the catalysts for evolving job roles. Roles within sectors like Information Technology and Digital Communication, Technology and IT, and those related to Sustainability and the Environment are among the fastest-growing, as illustrated in the Figure 1.

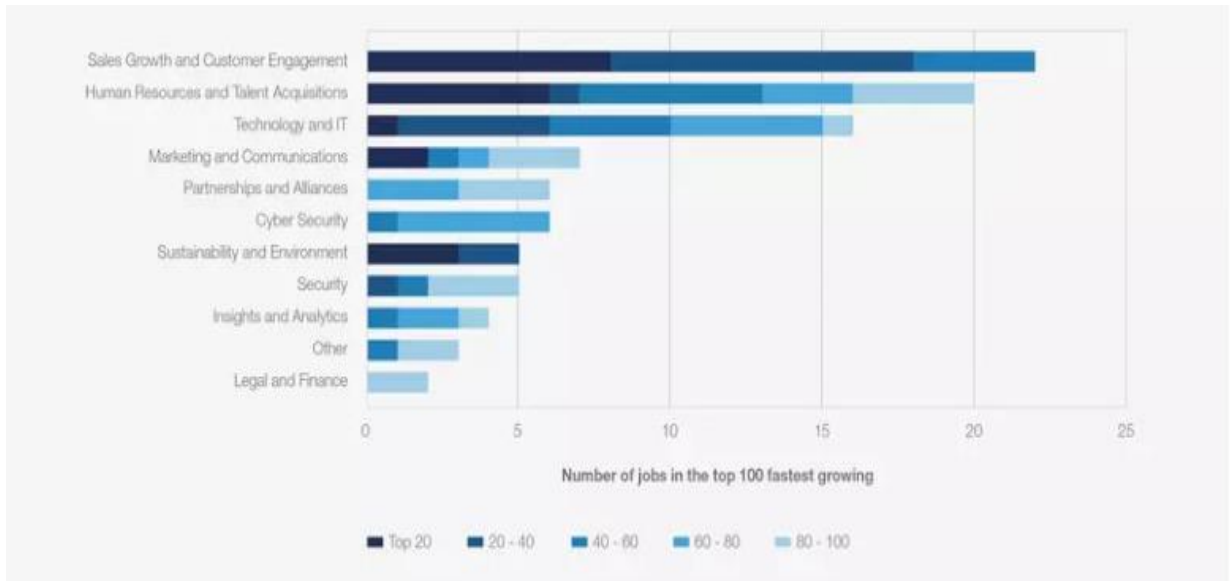


Figure 2: Fastest growing Jobs

Source: World Economic Forum

Among the myriad of influences shaping the future, digitalization and decarbonization emerge as the predominant drivers reshaping the employment landscape and labor market dynamics. As illustrated in Figure 2, digitalization is ranked second, preceded only by new technology. The environmental dimension of labor, represented as Environmental, Social, and Governance (ESG), occupies the third position (World Economic Forum, 2023).

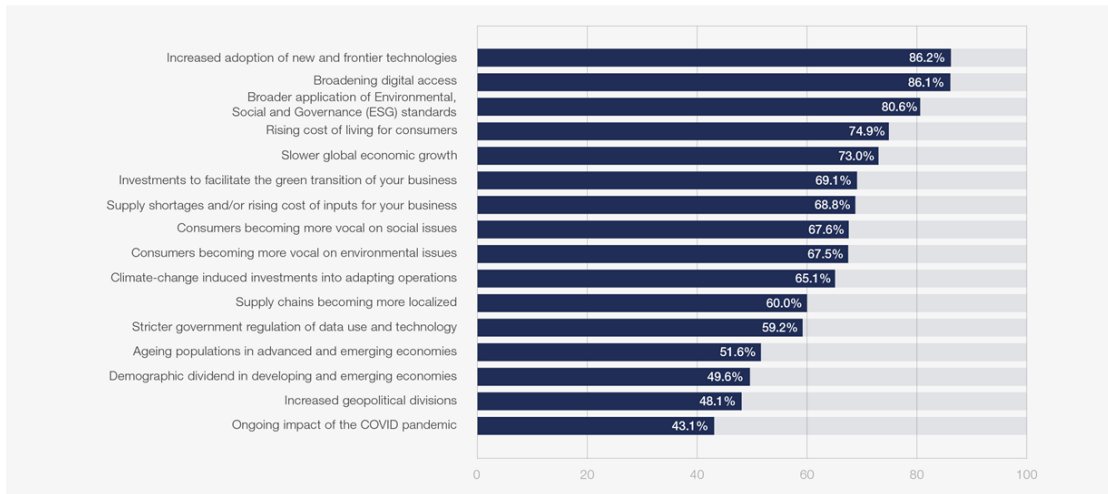


Figure 3: Trends driving labor transformation

Source: World Economic Forum

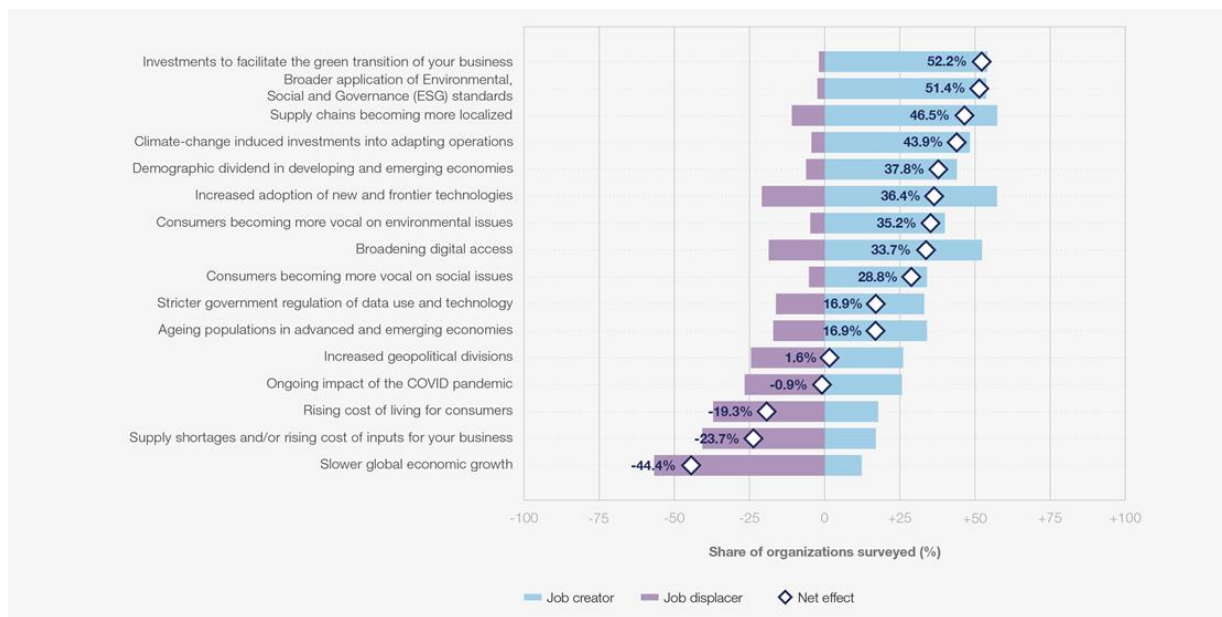


Figure 4: Expected impact of employment Trends

Source: World Economic Forum

As illustrated in Figure 3 above, the most significant influences are investments promoting businesses' green transitions and the broader integration of Environmental, Social, and Governance (ESG) principles.

Employers also anticipate how these evolving trends will influence employment within their establishments. Figure 3 suggests that the majority of these changes are perceived to have a beneficial effect on employment.

A study by the European Parliament Research Service delves into the impact of digitalization on labor, also examining the interplay between innovation, new technologies, and employment. The research underscores the uneven ramifications of digitalization, stemming from the skill-biased nature of technological transformation. It emphasizes that while innovation will undoubtedly generate future job opportunities, these roles will differ from those rendered obsolete by technology. They will predominantly involve fewer routine tasks and demand greater creativity and social skills. A salient observation from this report is the rising imperative for continuous training due to evolving skill needs. Consequently, with the surge of digitalization, the demand for middle-skilled labor has diminished, while high-skilled and low-skilled

positions (with corresponding compensation) have seen an uptick, a phenomenon labeled as 'job polarization' (EPRS, 2023).

The "Global Employment Trends for Youth 2022" report also pinpoints environmental and digital transitions as primary catalysts for contemporary labor market shifts. An escalating number of nations, both developed and developing, are recalibrating their growth strategies, leaning towards green and blue economies to realize sustainable development and job creation. Interestingly, the report indicates that investments in renewable energy and building retrofitting predominantly favor sectors traditionally dominated by men. Training tailored to decarbonization emerges as a crucial prerequisite for successful career progression and securing employment. The study posits that with appropriate training, decarbonization could safeguard numerous jobs.

Investment drives focusing on achieving net-zero carbon emissions by 2050—to limit global warming to 1.5°C above pre-industrial levels as advocated by the Intergovernmental Panel on Climate Change—are anticipated to spawn employment opportunities. This includes roles in clean and renewable energy, construction, sustainable agriculture, recycling, and waste management. Predictive models suggest that green and blue policy initiatives could usher in an additional 8.4 million youth jobs by 2030.

Similarly, the digital economy boasts considerable promise for youth employment, characterized by a significant portion of highly educated skilled workers (ILO, 2022).

The phenomenon of labor shortages is a prevalent global trend, thoroughly explored in numerous studies. An insightful OECD report pinpoints the 2008 financial crisis as the pivotal juncture marking the onset of this shortage, as depicted in the ensuing figure. Rapid workplace transformations, further accentuated during the Covid era, are primarily responsible for this shortfall. The OECD underscores the digital and green transitions as central drivers of this trend, with an aging populace serving as another contributing factor.

Labour shortages before and after COVID-19

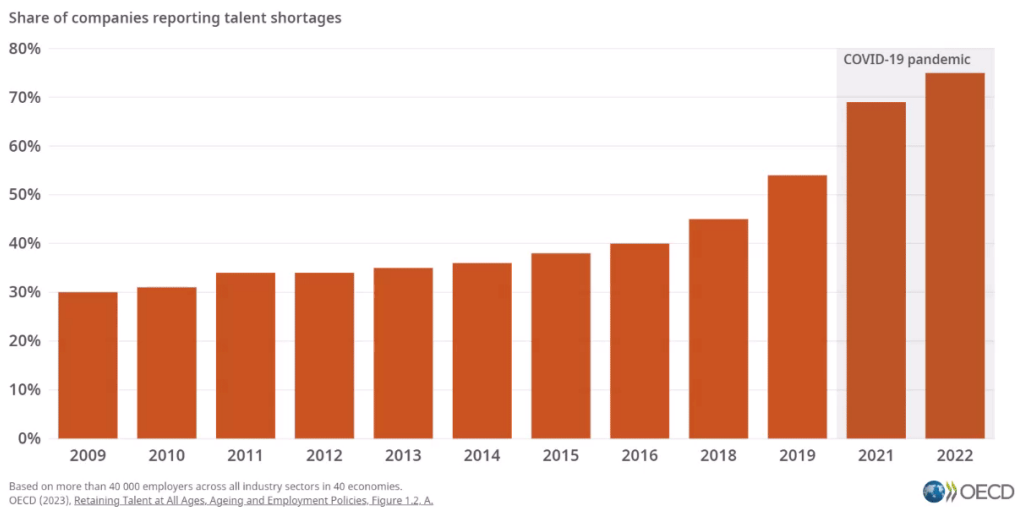


Figure 5: Labour shortage 2009-2022

Source: OECD

The EURES 2022 labor report echoes these findings. Key factors contributing to the labor shortage include the integration of new technologies, the shift towards a climate-neutral economy, an aging workforce, and evolving work and employment conditions. These elements collectively shape the dynamics between labor demand and supply in Europe. The subsequent figure illustrates the intensifying shortage, highlighted by the escalating vacancy rate in the EU (EURES, 2023).

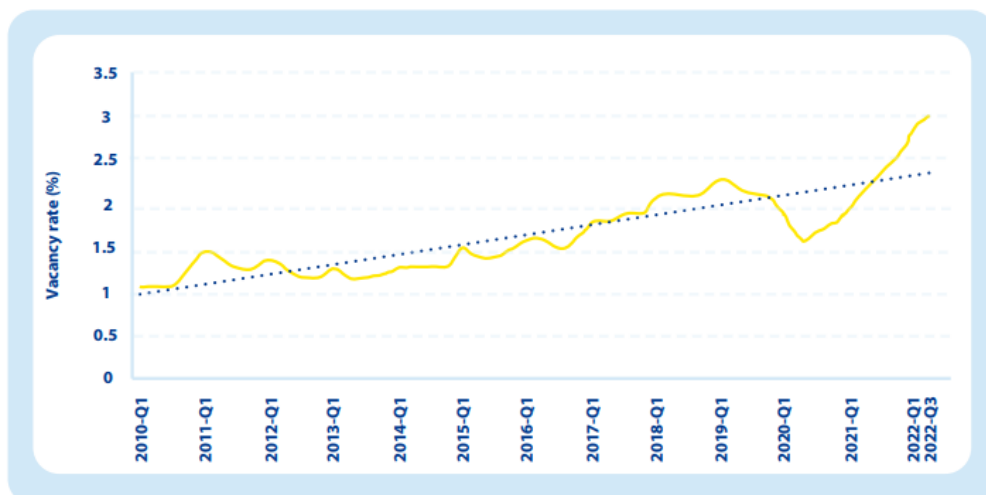


Figure 6: Vacancy rate in EU

Source: EURES

The study emphasizes technological advancements as the primary catalyst for the workforce shortage. Digitalization and emerging technologies challenge the proficiency of existing employees, affecting their effectiveness. Allianz ranks the scarcity of a skilled workforce as the 8th most significant trend in their 2023 barometer, noting its rising importance from 2022. Consequently, the foremost challenge in the global employment landscape is attracting and retaining skilled professionals. The maritime industry stands out as one of the sectors grappling with a notable shortage of skilled workers. The shortage of seafarers, particularly officers, has been documented for nearly two decades. This issue has been highlighted in numerous reports from international maritime organizations, studies from national entities, and independent researchers.

2.3. Trends in employment shifts in the global shipping industry

DNV (2023) presents the results of a very important survey that was carried out with seafarers all over the world, which indicate the latest employment trends in the maritime industry, as well as employment prospects until 2030. Based on the findings of this survey, seafarers require training in the use and handling of new fuels at a rate that could reach 80%. Further to that, more than 80% of participants stated that they definitely need training in the use of new information technologies and on-board equipment, with only about 10% of seafarers that participated in the research declaring that they are well-aware of and well-trained in how to use new shipping technologies. Participants insisted on the need for training in new technologies, which they characterized as vital elements of the future of shipping business, which would make the tackling of on-board duties much easier. The majority of participants expressed their preference in getting personal training, ideally with the use of simulators and other digital technologies, which have helped them to develop and improve their professional skills in general.

Emphasis was placed in the survey of DNV in automation, digitization and decarbonization of the shipping business, which more than half of participants perceived as factors that would help in retaining existing seafarers, while also attracting new ones, thereby dealing with the labour shortage that the global shipping industry is

subject to. According to research participants, training should mainly focus on LNG and batteries, which they characterized as the energy sources of the future, while at the same time also stressing the need for international shipping authorities, shipping companies and academies to identify and deal with the digitization and automation skill shortages that seafarers are subject to. Seafarers show the future of training in the shipping industry as one whereby academies should focus on providing general theoretical knowledge on seafarers' profession and shipping operators should provide on-board and on-the-job training. Overall, the seafarers that participated in the DNV survey highly insisted on the need of shipping companies to develop attraction and retention strategies for seafarers, as a means of preserving the future of the sector, mainly as far as shipping companies having an adequate number of seafarers to operate their fleet. The above shall be combined with offering seafarers additional shore roles, which shall make the profession of seafarers even more attractive for both existing and new seafarers.

2.4 International organizations

2.4.1 BIMCO

Since 1990, BIMCO's quinquennial reports have offered global estimations of seafarer demand and supply, drawing from certification data supplied by national maritime institutions. In 2005, BIMCO/ISF identified a shortfall of 10,000 maritime officers worldwide (BIMCO/ISF, 2005). By 2010, this deficit grew to 13,000 officers (BIMCO/ISF, 2010). The 2010 report raised concerns about an impending officer shortage in the merchant navy. It projected a demand for 89,510 additional officers by 2026, yet there was already a gap of 26,240 certified officers by 2021.

The 2010 report sounded the alarm about a looming shortage of merchant officers, projecting a need for an additional 89,510 officers by 2026, despite the 26,240 officer deficit observed in 2021. In 2015, the number of qualified seafarers stood at 1,648,000, of which 774,000 were officers and 874,000 were ratings (BIMCO, 2015). Over the

decade from 2005 to 2015, there was a consistent decline in the total workforce. When analyzing the demand, the year 2015 reflected a shortage of approximately 17,000 officers, counterbalanced by an excess in ratings, resulting in an overall surplus. That year, the global officer demand was pegged at 790,500, pointing to a deficit of 16,500 officers. BIMCO's 2015 report underscored the widening gap between officer demand and supply in future projections. To counter these challenges, the report emphasized several corrective actions: promoting seafaring careers, enhancing training standards, and bolstering maritime education.

The 2021 report echoed earlier findings, estimating an officer shortfall of 89,510 by 2026. It also pointed to an immediate deficit of 26,240 STCW certified officers in 2021, signifying that demand was outstripping supply. Even with a 10.8% rise in officer supply since 2015, the deficit persists. This can be attributed to an increased requirement for officers aboard ships, with an average of 1.4 officers needed per berth.

BIMCO's 2021 findings stress the imperative for the maritime industry to ramp up training and recruitment to prevent a pronounced officer shortage by 2026. As of the report, the global merchant fleet crew comprises 1.89 million seafarers. Projections indicate the need for an additional 89,510 officers by 2026 to manage the world's merchant fleet. While there's been an uptick in officer numbers thanks to contributions from developing nations, it's still insufficient to meet the steadily growing demand. External disruptions, like the conflict in Ukraine, further exacerbate the officer supply challenge.

2.4.2. Drewry

The Drewry Manning Annual Review & Forecast for 2022/23 offers a detailed analysis of seafarer availability and associated manning costs. The study reveals that manning expenses have seen a modest increase over the past year due to the officer supply shortage, and this trend is likely to continue for the next five years. However, there's a silver lining concerning the officer shortage: it is nearing equilibrium and might even shift to a minor surplus by 2024. While ratings continue to be in abundance and are projected to maintain this status, it's essential to note that these global trends might not reflect the situation in specific countries or flag states, where the shortage can be more

pronounced. Specific ranks and experience levels face greater scarcity compared to the general manning market (safety4sea, 2019). Drewry's data further suggests that overall manning costs increased by roughly 1% in 2019, a figure that falls below the actual inflation rate. Consequently, both ratings and officers experienced comparable pay hikes, with the extent of the increase varying by vessel type. Crewing expenses for dry and container ships are expected to climb more gradually, whereas sectors like LNG and chemicals—where there's heightened demand and competition for certified officers—anticipate steeper cost inflations.

2.4.3. Deloitte

In 2020, Deloitte conducted an Impact Analysis of the Greek Shipping Industry. A notable insight from the study was that the Greek crew taxation system incentivizes Greek officers to choose non-Greek flags, underlining how external factors influence the manning process (Deloitte, 2020). The compensation provided by vessels flying the Greek flag, given the nation's tax policies, lacks competitiveness and deters individuals from pursuing maritime careers. This has contributed to a notable shortage of qualified seafarers. When combined with the manning criteria set by the Greek registry, this paints a clear picture of the deficiencies in Greece's maritime policies, highlighting the need for corrective measures (Deloitte, 2020).

2.4.4. OECD - ITF

The OECD-ITF report assesses the initiatives implemented at the EU level to bolster regional employment and counteract the deficit in maritime officers. To support both national and regional employment conditions, governments provide financial backing to the shipping industry. This assistance aims, in part, to encourage the hiring of European officers on EU-flagged ships. However, the report finds that the current financial aid has been ineffective in resolving the officer shortage, a sentiment echoed by BIMCO's findings.

2.5. National studies

In 2012, the Hellenic Chamber of Shipping delved into the efficiency of Greek merchant officers. Notably, Greece dominates the maritime scene, accounting for 18% of the world's tonnage with its owned vessels, making it a leader by tonnage. Despite Greece's rich maritime heritage and having ten public maritime academies, supplemented by recent private educational initiatives, there's a discernible shortage of officers and crew members. A substantial portion of the Greek fleet opts for open registries, largely due to restrictive manning laws in domestic legislation.

Beyond issues in education and training, the research also spotlighted the growing seafarer shortage. The Greek mandate, which stipulates a minimum quota of Greek officers aboard nationally-flagged ships, is pinpointed as a chief reason for ships registering under foreign flags. This 2012 research by the Hellenic Chamber of Shipping highlighted a worrying 38% attrition rate from maritime academies, a major contributor to the officer shortfall. While such dropout rates might be observed in various educational settings, the specific challenges linked to Maritime Education and Training (MET) in Greece are unique. For instance, maritime academy curricula demand that cadets embark on a training voyage over their four-year study. The onus of arranging these voyages falls on the cadets, a task that can be daunting for someone in their early twenties. Many cadets, facing the hurdle of not completing this requisite voyage, often abandon their academy studies.

2.6. Independent researchers

Numerous studies from independent authors and researchers complement reports from international organizations on the subject.

Shortage: A Different Perspective

A good starting point for a review of this literature is the study by Li and Wonham in 1999. Contrary to the findings of the 1995 BIMCO/ISF Manpower Survey, their research argued that the main concern lies in the quality of seafarers rather than their

quantity. One prevalent example is seafarer certification. Seafarers certified under a particular Maritime Education and Training (MET) system, often region-specific, might not be deemed suitable for employment in another country.

The BIMCO reports highlight a deficit, but Li and Wonham introduced a distinction with the term "active seafarer." They suggest that the "supply" only accounts for seafarers currently available for work, excluding those who, despite being qualified, choose not to work on ships. These individuals might still be employed in maritime roles on land or even in unrelated industries.

However, their study does acknowledge a genuine shortage in traditional maritime nations. This deficit, while evident at a regional level, is offset in the global labor market by the surplus of seafarers from primarily Northeast Asian countries. Over time, these nations are projected to be pivotal in meeting the global maritime workforce demand. Wu and Winchester, in 2005, echoed similar sentiments, highlighting the challenges of accurately estimating global supply and demand due to the variations in regional certification systems. Glen's 2008 study, focused primarily on the UK, resonated with this perspective. He observed a foreseeable shift in the supply of future officers towards developing nations, while numbers from traditional maritime countries keep dwindling. Glen emphasized the inconsistencies in available data, pointing out the discrepancies across different nations. He advocated for a more dependable system to chart seafarer statistics.

In a 2021 study, Tang echoed the sentiments of Li and Wonham, questioning the perceived shortage of seafarers. The crux of Tang's argument revolves around the inherent difficulty in obtaining precise seafarer numbers. It's crucial to distinguish between individuals possessing a Certificate of Competency (CoC) and those actively employed or seeking employment at sea. Other subsets to consider include retirees and those who intend to transition to onshore roles in various maritime sectors.

The general data offered by national maritime authorities, Tang argues, lacks granularity, making it challenging for BIMCO/ICS surveyors to gain a clear picture of seafarer supply. Tang posits that while deployment may indicate actual demand, it doesn't necessarily reflect the true supply, which may be higher. Contradicting the BIMCO report, she believes it overstates the shortage. To support her argument, Tang points to the notable surplus of Filipino officers—a segment seemingly overlooked in

global calculations. This raises questions about their quality and employability. If the BIMCO report had accounted for these 21,492 surplus Filipino officers, the reported 16,500 officer shortage would instead translate into a surplus of 5,000 officers (Tang, 2021).

Another noteworthy observation is that from 2015 to 2017, over half of the officers who were newly certified didn't serve in officer roles. Instead, many of these seafarers, despite holding CoCs, likely served as ratings. This anomaly could explain both the observed officer shortage and the surplus of ratings, especially when taking into account the contributions of the Filipino workforce. However, this situation raises questions about the genuine competency of such seafarers.

Seafarer's Perspective

Cahoon's 2007 research was perhaps a pioneering effort in emphasizing the maritime industry's need to shift its focus from just the industry metrics to understanding the seafarer's perspective.

A decade later, Fei's 2018 study delved deeper into this issue from the vantage point of seafarers. She underscored that the changes in perspective aren't limited solely to the maritime sector but extend to viewing seafaring as both a career and a lifestyle choice. Consequently, there's an imperative to overhaul policies related to the recruitment and retention of seafarers. On the topic of motivation, it's essential to gauge seafarers' expectations. While competitive pay is a key driving factor, it alone isn't enough to ensure retention if other crucial elements aren't addressed.

Nearly every research in the domain agrees that the primary driving force for students enrolling in maritime academies is economic incentives. While this holds particularly true for students in developing countries, those from developed nations are often motivated by additional factors. These can range from the allure of travel, familial maritime traditions, a passion for the sea, among others. Both Fei and Caersar have pointed out the recruitment process's inadequacy in aligning industry needs with the expectations of prospective entrants. Recognizing these aspirations can pave the way to presenting a maritime career as a compelling choice.

Wrobel and his colleagues argue that the appeal of a maritime profession is primarily shaped during the time a cadet spends at Maritime Academies. Therefore,

understanding their goals can provide insights into their respective motivations. When it comes to retaining seafarers, Livingstone's 2015 study identified three pivotal factors: satisfaction with one's job and employer, the prospects for career advancement, and conducive working conditions.

2.7. EU Policy Assessment

2.7.1. Measures

The dwindling numbers of seafarers, particularly officers, is a trend that has been recognized and highlighted in numerous studies and reports over the years. To tackle this challenge, targeted initiatives have been rolled out to bolster the maritime sector. These measures were not just crafted to enhance regional employment opportunities but were components of a more comprehensive strategy aimed at amplifying the competitiveness of the EU flag.

2.7.1.1. Maritime State aid Guidelines

Specific measures targeting European seafarers have been implemented to bolster support for national flags and domestic seafarer employment. Annually, in OECD countries, a minimum of EUR 3 billion is allocated to just three primary maritime subsidies: tonnage taxes, tax exemptions for fuel used in domestic shipping, and fiscal incentives to mitigate seafarers' wage costs (ITF, 2019). Ideally, such financial aid should correspond to a tangible enhancement in domestic employment.

The issue of seafarer employment has been tackled at the EU level both directly and indirectly through the Maritime State Aid Guidelines. One of the indirect mechanisms employed is the tonnage tax. However, the Guidelines also encompass direct interventions. They focus on measures that aim to reduce costs, with the primary goal being to enable the hiring of EU seafarers on vessels flying the EU flag. The intent is to curtail overall employment expenses by slashing costs not directly associated with salaries. This encompasses expenses like payroll taxes and fees related to social

security. By excluding these outlays, the comprehensive manning expenditure for shipowners is reduced, aligning it more closely with the labor costs from non-OECD nations. Such initiatives are designed to render national seafarers more economically competitive.

The measures put in place offer significant incentives for shipowners to opt for EU crews, often perceived as better qualified. While these subsidies may have somewhat stemmed the declining numbers of EU seafarers, it's evident they have bolstered the appeal of hiring EU/EEA seafarers by lightening the financial load on shipping companies.

Yet, the persistently downward trajectory indicates that the initiatives haven't fully met their intended goals. Even with these implemented measures and the ensuing cost-competitiveness, ships crewed with EU/EEA seafarers still incur higher expenses than those manned by non-EU/EEA personnel. This disparity can be attributed to the fact that the guidelines aren't exclusively focused on EU/EEA seafarers. In a move that was potentially detrimental to EU employment trends, the EU Maritime State Aid Guidelines were broadened in 2004 to encompass non-EU/EEA seafarers in labor-centric maritime subsidies (ITF, 2019). This decision, ostensibly detrimental to the trajectory of EU employment, was made to maintain competitive advantages for shipowners (EC, 2004).

A primary goal of introducing these guidelines was to ensure that companies benefiting from subsidies would employ domestic seafarers. However, this aim proved challenging to ascertain because of the intricate structure of global maritime employment (ITF, 2019).

2.7.1.2 Tonnage tax

Although tonnage tax schemes are often deemed the most effective measure, they don't mandate shipping companies to hire domestic seafarers. This assertion is supported by the rise in tonnage alongside a decline in seafarer employment (ITF, 2019).

2.7.2 Additional Aspects

2.7.2.1 National Legislative Initiatives

The EMSA report sheds light on the method utilized within the EU to gather quantitative data concerning the maritime workforce. This system primarily hinges on the count of seafarers possessing valid Certificates of Competency or endorsements issued by the EU. As pinpointed in the literature review, this approach captures those qualified to work at sea, but not necessarily those actively employed on European vessels.

In 2018, EMSA undertook a study aiming to discern the underlying causes for the dwindling numbers of officers in Europe. A salient observation from the study was the maritime sector's unpreparedness for the emergent seafarer deficit. At the heart of the issue was the glaring lack of a data collection system capable of early detection of concerning trends, like the persistent decline in seafarer numbers. The existence of such a system might have not only signaled the onset of the problem but also furnished insights into its root causes.

However, leveraging the available data poses its own set of challenges. Due to the maritime sector's global nature, diverse labor protocols exist, even within the ostensibly unified EU.

The EMSA report concurrently critiques the lack of a comprehensive system to gather data on various facets of maritime professions. Such a system would extend beyond just tracking employment and delve deeper into areas like job satisfaction.

The number of available seafarers isn't solely determined by the overall count of seafarers. Another crucial aspect to consider is the duration of their sea service. These sea time requirements differ across countries, being influenced by national regulations and the guidelines stipulated by the STCW (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers).

The typical duration for sea service varies geographically. For instance, a sea service period of 9 months is commonplace for seafarers hailing from Asia, whereas it might be atypical for those from EU nations. Additionally, seafarers from Asian regions might

opt for extended sea service durations with the intent to augment their earnings (Maritime Zone, 2020).

Sea Time Certificate Defined:

A Sea Time Certificate serves as an official record documenting a seafarer's tenure onboard, along with details on the specific on-the-job training they've undergone. This certificate doesn't just denote the period spent at sea; it also provides insights into the tasks performed, thereby indicating the seafarer's training caliber. The frequent transition between different ships might lead to misconceptions regarding a seafarer's level of training. This is because operational procedures can differ, not just between nations but also across various companies and individual ships.

Different nations have distinct procedures, exams, and policies when it comes to certifying a seafarer's competency. The sea service requirements that a seafarer must fulfill before being eligible for Competency Exams for positions like Master and Mate are not uniform across countries. Thus, a seafarer might fulfill the sea time prerequisites in one country, only to find that these same prerequisites don't apply in another. This complex tapestry of sea time necessities, exams, and certificates of competency underscores the nuances in training standards between nations.

Let's delve into the EU's approach to awarding valid Certificates of Competency (CoC). Within the EU, there are two predominant avenues to obtain a CoC:

Direct Issuance: An EU nation can directly grant a CoC to a mariner who has successfully graduated from an EU-accredited maritime academy.

Endorsement of Non-EU CoC: Alternatively, an EU country can recognize and validate a CoC that's been issued by a non-EU nation. This process, known as endorsement, effectively means that a seafarer from a non-EU nation is equipped with a valid EU-recognized CoC.

Recent statistics shed light on the prevalence of these certificates: 182,207 CoCs have been directly issued by EU members, while an additional 127,452 have been granted through the endorsement process (EMSA, 2023). The intricacies of the seafaring industry further unravel when considering non-EU nations whose mariners pursue Certificates of Competency (CoC) recognized within the European Union. The top five non-EU nations, in this regard, are the Philippines, Ukraine, Russia, India, and Turkey.

These countries consistently provide masters and officers with CoCs that garner recognition by EU member states.

Yet, another layer to this intricate landscape pertains to the countries that predominantly issue Endorsements of Recognition (EaRs) for these CoCs. The data highlights that Malta, Cyprus, Portugal, Norway, and the Netherlands are at the forefront of this initiative, leading in terms of the volume of endorsements they issue. More precisely, we find Malta in the 7th position and Cyprus in the 11th position globally. Both countries cannot be considered as maritime nations, since they do not possess an important merchant fleet that would justify their leading position in the EaRs procedure. These countries, when it comes to the seafaring industry within the EU, seemingly play the role of 'Trojan horses'. The dynamics suggest a superficial abundance in maritime labor within the EU realm. Recent data reveals that the number of certified masters and officers from the EU surpasses the demands of the EU merchant fleet by a substantial 40% (as per EMSA, 2023). This would, at first glance, indicate a comfortable buffer against any manpower shortage.

However, as often the case with statistics, the devil lies in the details. Despite the seeming abundance of certified EU professionals, a significant majority of masters and officers operating within the EU fleet actually hold CoCs issued outside the European Union. This divergent trend implies that a notable portion of seafarers with EU certifications either serve ships flagged outside of the EU or are not currently active on board at all. The logical deduction from this data juxtaposition is that EU seafarers aren't the primary choice for many flag states, primarily due to economic considerations delineated earlier.

Further complicating the manpower challenge are regulatory dimensions that presage a continuation of the seafarer shortage. Evolving norms around work-life balance, such as extended leaves and truncated tours of duty, also diminish the total duration a seafarer remains available for onboard duties, as highlighted by Marinelink (2018). This adjustment, while beneficial for the well-being of the seafarers, places added strain on the availability metric, adding another layer to the complex tapestry of the maritime labor landscape.

2.8. Seafarers' perspective

This section of the project seeks to pinpoint and elucidate the factors contributing to the decline of seafarers in the EU, contextualized within the contemporary maritime landscape. While the foundational attributes of a seafaring career persist, several facets of the work environment and lifestyle have evolved over time.

2.8.1 Modern Seafarer Profile

The milieu in which seafarers operate is perpetually evolving. These shifts bring about both advantages and challenges. Moreover, the image of today's seafarer diverges significantly from those of yesteryears, particularly in the traditional maritime nations of the EU. In the past, being a seafarer wasn't merely a job; it was a lifestyle, a commitment for life. Presently, this dynamic has undergone a profound transformation.

2.8.2 Motivation

The provisions of the 2010 STCW Convention underscore the significance of fostering maritime careers among the youth, with a particular emphasis on women. Like many such conventions, it offers broad guidelines without delving into specific details on effective implementation.

2.8.2.1. Attractiveness

Years ago, the image of a merchant officer, particularly a captain, carried a certain distinction. It was synonymous with a superior financial and societal standing, offering a sense of respect and trustworthiness. The maritime profession was deemed desirable. However, over recent decades, shifts in working conditions have influenced this professional perception, causing it to lose its allure.

2.8.2.2 Travel Opportunities

The allure of the maritime career, which once promised the chance to travel the world, has diminished in recent years. In an intensely competitive landscape, vessels now aim to minimize their time in port. During these brief stops, the crew and officers are preoccupied with cargo activities, leaving no opportunity to explore the port city. There are even instances where the ship doesn't dock at the port but anchors nearby, conducting cargo operations from this remote position.

2.8.2.3. Career

The escalating demand for the specialized skills of ship officers and various seafarer roles in onshore employment is further fueled by the attractive compensation packages being presented for these positions.

Offshore jobs

Working Conditions

Cultural

Fatigue

Responsibility

On Board training

The diverse cultural backgrounds and frequent crew rotations complicate the process of crew training and fostering a safety-centric ethos. Safety culture is widely recognized as pivotal to ensuring maritime safety.

2.8.3 Retention of seafarers

Retention can be defined as the inclination to remain in one's profession, which in this context means continuing to work onboard ships. It directly correlates with seafarers' expectations and their views on the future prospects of their profession. Consequently, understanding their motivations and expectations is pivotal. While monetary incentives are a significant factor, the reasons prompting entrants to join maritime academies

shouldn't be overlooked. The primary challenge in the EU is retaining these seafarers. It's essentially about creating an environment conducive to persuading qualified individuals to stay on board for the long term. A notable segment of maritime academy graduates never embarks on a seafaring career or only does so for a few years. Despite possessing the requisite qualifications, they often pivot to alternative professions, leveraging their maritime skills in different capacities.

In terms of motivation, it's crucial to evaluate what seafarers anticipate from their career. A generous salary, while a prime motivating factor, doesn't ensure retention if other crucial aspects are disregarded. This sentiment resonates with several scholars. For instance, Caesar in 2016 posited that when companies align with the aspirations of their employees, it acts as a potent catalyst for retention (Caesar, 2016). From the provided data, it appears there isn't a worldwide shortage of seafarers. The dearth is predominantly discerned in EU nations.

The preservation of seafarers is a critical aspect intertwined with the observed deficiency of officers willing to commit to long-term sea service. Alarmingly, nearly 10% of officers opt to depart their sea careers ahead of time (BIMCO/ISF 2005). The fraction of individuals who persist in sea service until retirement has seen a consistent downward trend (Livingstone et al., 2015). This trend carries qualitative implications. Given the time investment—four years for a sea cadet to ascend to a junior officer position and another six years to attain senior officer status—an early exit systematically removes seasoned officers from the pool, particularly masters, where the gap is most palpable.

Gleaning insights from the motivations and apprehensions of youth entering maritime academies can furnish vital context for shaping local, regional, and global strategies geared towards enhancing the allure of sea careers and bolstering retention rates. Understanding the rationale that fuels a seafarer's choice to persist or depart is paramount, necessitating research into motivations steering them towards maritime vocations. A majority of global studies earmark salary and the allure of travel as dominant drivers behind choosing a maritime career. Moreover, the bulk of entrants cite salary as the overriding incentive, with a mere eighth highlighting the allure of global exploration (Wrobel et al., 2022).

The urgency to fortify seafarer retention is undeniable. Delving into the catalysts for turnover is integral to devising remedies. Literature underscores several contributing factors: limited avenues for career advancement at sea, the aspirations of young officers to establish or expand their families, unforeseen shoreside opportunities, and subpar onboard work conditions. These conditions are exacerbated by mounting work pressures, stress, feelings of isolation, loneliness, and the challenges posed by multicultural interactions. Although the retention challenge has been under scrutiny and discussion for several decades, tangible solutions remain elusive, with most discussions still hovering at theoretical levels.

2.8.4. Safety downgrade

Proficient crews are indispensable for the safeguarded functioning of contemporary, technologically sophisticated vessels, which are premium assets. In tandem with the escalating importance of skills within the maritime realm, the associated expenses for maritime training and education are on an upward trajectory. When ship owners' concerns are primarily rooted in the financial facets of crewing, they often inadvertently neglect other critical areas that bear long-term implications on vessel efficiency and safety. With costs predominantly shaping decisions around the nationality and qualifications of crews, the expected long-term benefits can be overshadowed, leading to a general decline in safety standards.

Ship Crewing and Safety

"Poorly operated, subpar vessels and inappropriately chosen, insufficiently trained crews are invariably interconnected."

This assertion by Ugland vividly encapsulates the interrelation between crewing practices and the overarching competence of a ship. Therefore, even when there might be immediate financial advantages, focusing solely on cost-cutting in crewing can erode crew caliber. Such an approach not only poses imminent risks to ship safety but also has a cascading detrimental effect.

2.8.5. Safety culture

The maritime industry is notably marked by its global nature. Governed by a blend of international and domestic regulations, this industry encapsulates a wide array of sectoral nuances. Crewing is particularly influenced by this intricate regulatory structure. A vast global network seamlessly connects crewing managers and agencies with ship owners, culminating in a melting pot of multinational crews aboard most contemporary merchant ships.

Every day, ship owners are tasked with maximizing the efficiency of their fleets while concurrently striving to reduce expenses. Given that manning expenses constitute roughly 23% of the total operational costs, as stated by the Bank of Greece in 2018, it's evident why ship owners are increasingly gravitating towards cost-effective labor markets worldwide. Their aim is straightforward: to employ crews at the most affordable rates, all the while ensuring adherence to regulatory standards and maintaining safety norms. This intertwining of adherence to safety mandates and economic considerations becomes a defining feature of global crewing policies.

Today's crewing landscape also confronts a rising challenge: an impending deficit of adequately trained crew members, especially officers, set against the backdrop of an ever-expanding global fleet, as pointed out by UNCTAD in 2022. Complicating matters further is the surge of open registries, progressively superseding their traditional counterparts. These registries afford ship owners the luxury of handpicking crew nationalities with little to no constraints.

Given this milieu, a shipping company's crewing decisions become a delicate balancing act, juggling an assortment of factors. While fiscal considerations have increasingly taken center stage, such an approach might not be sustainable in the long run. This shifting paradigm underscores the imperative need for a comprehensive, forward-thinking approach to crewing.

2.8.6. Criminalization of sea farers

One frequently overlooked aspect pertains to the onerous responsibilities and potential criminalization faced by ship officers, particularly the ship's master. A review of the ten significant maritime pollution incidents between 1989 and 2012 reveals a troubling trend: ship masters were detained and incarcerated for an average span of 7.5 months

prior to their release. In such circumstances, seafarers find themselves ensnared in foreign detention, often bereft of a fair trial or adequate representation. They grapple with the challenges of a foreign legal system, including a language they might not understand, limited access to legal assistance, and an inability to actively engage in the ongoing investigation due to cultural and linguistic barriers.

Prominent examples of this phenomenon include the Prestige incident, the Tasman Spirit case in Pakistan, the Costa Concordia tragedy, the Sewol disaster, and the Ocean Centurion incident, among others. These cases underscore the precarious position of seafarers when maritime mishaps occur, highlighting the need for more equitable treatment and robust legal support systems for them worldwide.

2.7. Role of MET

The prevailing trend indicates a pronounced concern primarily with senior officers, and more specifically with Masters. Beyond the reasons already pinpointed at the EU level, unique regulatory frameworks in Greece further exacerbate this shortage.

CHAPTER 3: METHODOLOGY

3.1. Research Design and Type

An interpretative research design was occupied for the purposes of this research study. This research design is based on the assumption that reality is not absolute, but is rather created by the feelings, emotions and the social context of research participants (Macionis & Gerber, 2011). In this context, qualitative research was carried out, whose main characteristic is that it gives the ability to researchers to gain deeper insights for a subject under investigation (Denzin & Lincoln, 2011). The above characteristic was totally consistent with the aims and objectives of this study, which were to gain a deeper understanding regarding the feelings of seafarers and HR shipping executives regarding working in the shipping industry, thereby leading to the selection of qualitative research.

3.2. Method of Data Collection

Qualitative data was collected through semi-structured interviews, which were carried out

by phone. Semi-structured interviews were selected, because they offer the advantage that they allow researchers to make additional questions and participants to freely express their views in their own words, thereby increasing the potential to gain deep insights about a subject under research. Phone interviews were selected, because they offer the ability to researchers to reach their participants no matter their geographical distance, thereby not narrowing the research participants' base.

The semi-structured interviews that were carried out were based on an interview guide that is available at Appendix 1 of this study.

3.3. Sampling

A convenient sample was developed for the purposes of qualitative research that was carried out. This is the method whereby researchers choose participants from people they know, or people whose characteristics are convenient with respect to the research subject. In this context, the research sample consisted of 3 HR executives from 2 Greek ship management companies and 3 experienced seafarers from 1 Greek shipping company, all belonging to the familiar environment of the researcher.

3.4. Data analysis

The qualitative data collected was analyzed with thematic analysis. This is the method whereby themes and sub-themes emerge from the common content of participants' responses. It was selected, because it offers the ability to summarize large qualitative

data sets in a few themes and sub-themes, thereby constituting data analysis as easier and quicker. The themes and sub-themes that were developed from the data that the six participants provided are available at Appendix 2. Themes were developed through manual coding.

3.5. Research process and ethics

The research was carried out in September 2023. Research participants were contacted by phone, in order to be invited to participate in the research. They were fully informed about the nature and scope of the research, as well as that their participation would be voluntary, holding the right to withdraw at any time and for any reason. Participants were also reassured that their data would be kept and treated as confidential and would be used and published only for the academic purposes of the proposed research. After their participation, the HR executives and seafarers that participated in the research were given the researchers' contact details, in case they wish to withdraw from their participation within 2 weeks, or in case they wanted to receive a copy of research findings.

CHAPTER 4: RESEARCH RESULTS

As mentioned in the previous chapter, the results of the thematic analysis that was conducted are presented at Appendix 2. Based on the thematic analysis that was carried out, three main themes were developed from participants' qualitative data, namely "Human resource management", "Factors leading to labour shortage" and "Recommendations for change".

4.1. Human resource management

The first central theme, "Human resource management", comprised of three sub-themes, namely "Importance for organizations", "Importance for countries" and "Role of technology". Taking the sub-theme "Importance for organizations" first into consideration, research findings indicated that both HR executives and seafarers

perceived human resources as the most vital asset for organizational success, effectiveness and efficiency. Below are some indicative participants' responses:

P1: Human resources are the most valuable asset of organizations

P2: It is important to educate the workforce, if you want to be effective and efficient as a business

P3: No company can succeed without human resources

In terms of the second sub-theme, "Importance for countries", participants connected the labour strength of a country with its GDP growth and competitiveness. Indicatively, participants commented the following:

P4: I can say that a country's GDP is determined by the productivity of its labour

P5: If a country invests in labour education, then its national economy shall prosper

P6: A country's labour power is the country's competitiveness

In the third sub-theme, "Role of technology", the HR executives and seafarers that participated in the research stated that technology has totally changed how work is done, stressing the importance of job automation, distance working and substituting humans with machines.

P2: Technology has changed everything. Higher automation, remote working, everything

P4: Technology has changed the nature of job duties, as we knew them

P5: The whole world has changed. For me, gradually substituting humans with machines is the biggest change

4.2. Factors leading to labour shortage

The second central theme, "Factors leading to labour shortage", was developed from participants' responses with respect to the factors that could influence employee attractiveness and retention, as well as the factors that participants perceived as those

that could lead to shortage of labour. This theme comprised of two sub-themes, namely “General employment market factors” and “Shipping-industry-specific factors”.

Taking into consideration the sub-theme “General employment market factors”, participants named factors like motivation, satisfaction, safety and recognition.

P3: If you do not offer good motives to cover labour needs, then it is not easy to retain employees

P5: Employees need to be satisfied by all means, in order to want to stay in the company

P6: It is safety and recognition that for me are the most important

As far as the sub-theme “Shipping-industry-specific factors” is concerned, research participants named safety on board, flexible working schedules, as well as digitalization and decarbonization of the shipping industry as those factors that shall have led to a shortage of labour in the shipping industry, mainly as far as seafarers are concerned.

P1: Safety on board is the major aspect. And flexible working schedules

P5: The digitalization of the shipping work is a major issue. For some, it makes life easier on board. For some others, it makes it complicated and unattractive

P6: Decarbonization could be an issue, yes. It has made the shipping industry much more sophisticated, so it has become hard for some to follow, or to want to work in the industry

4.3. Recommendations for change

In the third and last central theme that was developed, “Recommendations for change”, the following sub-themes were identified: “Working conditions”, “Training”, “Legislative actions”. In terms of the sub-theme “working conditions”, research participants stated that in order for existing seafarers to remain in the business and new seafarers to be attracted to enter it, it is essential to improve working conditions on board, mainly in terms of safety and fatigue.

P3: I think seafarers need to feel safe on board

P4: Fatigue definitely needs to be reduced

P5: I think it is essential to improve safety standards and the overall safety culture on board

Regarding the sub-theme “training”, all participants stated that it is important for seafarers to get adequately trained on their job duties, mainly as far as using new technologies is concerned.

P4: There is need for training more than ever

P5: If seafarers are to stay, they need excessive training in new technologies

P6: Things have changed and more excessive training is required

In the third and last sub-theme, “Legislative actions”, participants emphasized on the need for legislative action regarding the development of training academies for seafarers, as well as the need for shipping authorities in a national and regional context to become stricter towards shipping companies in terms of providing safety and benefits to seafarers.

P1: The EU has to ensure that adequate training academies are available for all new and existing seafarers and officers to get adequately trained

P2: Shipping authorities need to become stricter in terms of safety on board

P3: Each country needs to offer additional benefits to its seafarers, because it is a very hazardous and demanding job

CHAPTER 5: DISCUSSION

Taking human resource management from a theoretical point of view first into consideration, research findings highly indicate the importance of human resources for organizations and governments. Indeed, the HR executives and seafarers that were interviewed were all absolute in that human resources form the cornerstone of success of any business, as this is also verified by the analysis of Carlin & Soskice (2007) and An et al. (2017). Therefore, it is highly important for organization of all types, sizes and sectors to carefully manage their workforces, in order to ensure that they retain their talented and skilled employees, while at the same time also attracting new ones. Although this seems to be some thing that has to do with organizations, research findings indicated that it shall be the concern of governments to also ensure that talented people are occupied in corporations in their country. Indeed, verifying the theoretical framework developed in Chapter 2 (e.g. Crook et al., 2011; Wan, 2010), the HR executives and seafarers that were interviewed seemed to have adequately realized how important human resources are for countries, their national economies, their GDP growth and competitiveness. It follows from the above that governments shall also play

their role in providing an employment marketplace, whereby all corporations shall offer what employees need, in order to maintain a competitive national workforce.

The role of technology and its association with how organizations work and human resources function since its introduction and constant growth was also highlighted by research participants. Indeed, in consistency with the analysis provided by World Economic Forum (2023) and EPRS (2023), HR executives in shipping and seafarers have well acknowledged that new information technologies have changed almost everything in the global labour market, both in terms of how job is done and how companies use their workforce. This last aspect was also the concern for some seafarers that participated in the research, who noted that the introduction of new technologies is likely to lead to a gradual replacement of new technologies by machines.

With respect to the factors that could lead employees in staying at their company or leaving it in turn, research findings verified the analysis of Moren (2013), Uddin & Hossain (2015) and Thompson & Phua (2012) in that safety at the workplace, motivation and job satisfaction are the most important of these factors. Of course, as also analyzed by Borman et al. (2003), it is not only company-specific, but also industry-specific factors, which could contribute to increased levels of retention, attraction or shortage of labour. This is why apart from general factors, participants were also asked to comment on industry-specific factors, which could have possibly contributed to the shortage of seafarers that has been observed in the global shipping industry. In this context, seafarers highlighted safety on board, as well as the digitalization and decarbonization of the shipping business as the major industry-specific factors that have led fewer seafarers in wanting to continue or to begin working for this profession. For safety, it seems that both HR executives and seafarers have witnessed a downgrade in the safety culture of shipping companies, which has led to a downgrade of safety standards on board, as the above are also consistent with the analysis of Bank of Greece (2018) and UNCTAD (2022).

Regarding digitalization, the fact that it has highly transformed working in the shipping industry verifies the analysis of ILO (2019) and EPRS (2023). Both these international organizations have stated in their official reports that the digitalization of the shipping industry has led in the demand for highly-skilled seafarers to join the industry. However, both existing and new seafarers have started perceiving the industry as very

demanding after some point, thereby being highly reluctant regarding their potential to work in this profession. This was also highlighted by research participants, who on the one hand acknowledged the usefulness of the higher automation that digitalization offers, but on the other hand expressed their concern about how specialized the shipping industry has become, as a result of digitalization.

As far as decarbonization is concerned, this has also led to higher specialization of the shipping industry, as this is also verified by the secondary findings from World Economic Forum (2023). However, despite the fact that ILO (2023) has perceived decarbonization as a very important factor that could boost employment in the shipping industry, due to the higher demand for skilled labour, research participants also expressed their reluctance, stating that this high specialization that decarbonization has caused to the industry could in turn have adverse results, i.e. moving seafarers away from this profession.

The recommendations of participants regarding how the global shipping industry could deal with the shortage of seafarers that has been mainly identified in the EU explain the concerns that they expressed during their interviews. Indeed, research participants highly emphasized on the need for offering adequate training to seafarers, not only at an organizational, but also at an EU-policy level. Indeed, this high emphasis on the current lack of training shall explain why HR executives and seafarers perceived decarbonization and digitalization as challenges, rather than opportunities, for seafarers. It is not that they find it difficult to come up with the new requirements of the shipping industry. It is rather that they feel that they will not be able to anticipate such changes, if training standards are those offered today. Therefore, in consistency with the analysis of Li & Wonham (1999), it becomes evident that it is the fundamental role of EU authorities and shipping companies to foster the development of maritime academies, where seafarers shall become highly-skilled in using new shipping technologies. In this way, not only will they feel more confident with working in the industry, but also safety at sea shall further increase, which is also a factor that seafarers and HR executives that were interviewed also perceived as essential for existing seafarers to be retained and new seafarers to enter the particular profession. Then, at a national level, also in consistency with the analysis provided by Maritime Zone (2020) and the EMSA report, every country of the EU shall offer additional benefits for such

a hazardous job, as the job of seafarers is, in order to better attract them to work as seafarers.

CHAPTER 6: CONCLUSION

The COVID-19 pandemic and the associated economic and employment shock reinforced a pre-existing trend towards greater digitalization of employment, particularly in areas such as platform-based work, and especially among young people. As countries recover from the crisis, it is clear that investing in both the digital and creative economies can help to increase the availability of good-quality employment opportunities for young people. In one sense, the expansion of digitalization is more a necessity than a choice. The digital transformation of production and employment is ever more pervasive in the world of work and, indeed, underlies current technological progress. Digital technologies can increase productivity and have the potential to improve the quality of job opportunities, especially for young people. However, it is important to ensure that such technologies promote inclusive employment, rather than exacerbating existing inequalities.

Like the green and blue economies, the digital economy has considerable potential to create jobs for young people. Increasing digitalization of the economy and society is profoundly affecting the world of work, and the trend is expected to continue and even accelerate in the years to come. Appropriate policies are required to address the challenges while transforming the potential into actual decent work opportunities

The allure of a maritime career is gradually waning for many young Europeans. Hence, there's an urgent need to encourage the younger generation, especially women, to consider seafaring as a viable profession. Solutions such as enticing maritime training initiatives aim to invigorate interest in this field and promote long-term commitment.

The 2004 Guidelines, primarily through the implementation of tonnage tax, played a role in stemming the tide of flagging out. However, when it comes to employing seafarers, the goals weren't fully achieved. One significant obstacle was that, while the cost-reduction scheme seemed promising by leveling the playing field in terms of costs, it was also extended to non-EU seafarers. This nullified the potential benefits. Moreover, tonnage tax schemes typically don't mandate shipping firms benefiting from them to hire local seafarers.

Modern crewing practices, while efficient in some aspects, tend to compromise safety. This often leaves senior officers exposed to risks and held accountable for situations beyond their control.

In order to address the issue of lack of adequate number of seafarers and shipping offices in the EU shipping industry, qualitative research that was held in the form of semi-structured interviews with older seafarers and HR shipping executives. The findings of the primary research that was carried out indicated that HR executives and seafarers value the role of human resources the most, both for organizations and governments. They believe that employees need to be highly motivated, satisfied and trained, in order to remain in organizations or be attracted to work in them at first place. For the particular case of the shipping industry, research participants stressed the importance of digitalization and decarbonization as major factors that have constituted the shipping industry as more sophisticated, thereby having led many seafarers in choosing to move away from the industry, as well as new professionals in not wanting to follow the particular profession. Technology seems to have played a pivotal role in the above trend, as well as in shaping numerous functions of how seafarers work and what skills they must have. Both HR executives and seafarers believe that in order for seafarers to be retained in the business and new seafarers to be attracted, they need to be more adequately trained, while also been offered higher safety on board. The role of EU and national authorities was also highlighted as also crucial, mainly in terms providing resources for the development of shipping academies, as well as becoming

strict against shipping companies with respect to offering safer working conditions and more benefits to seafarers, in order to constitute the shipping officers' profession as more attractive for both new and existing seafarers.

Based on the secondary research that was carried out, a tighter correlation between maritime subsidies and the employment of EU/EEA seafarers could also be beneficial, especially when vessels predominantly operate within European waters, such as ferries and short-sea shipping vessels. One viable approach could be to exclusively reserve maritime subsidies, like the tonnage tax and reductions in wage costs, for ships that maintain a certain quota of EU/EEA seafarers on board.

Last but not least, this dissertation was subject to certain methodological limitations. More specifically, the primary research that was carried out was qualitative. Future researchers could conduct the same research in the form of a survey with questionnaires with a large sample, as a means of producing research findings that shall be more representative of the wider population of HR executives and seafarers under research. Further the, research was carried out only with Greek HR executives and seafarers. Future researchers could conduct the same research with people from shipping working in other countries of the world, as a means of identifying whether the measures taken in different countries for seafarers change their perceptions of the shortage of labour in the shipping industry, not only in the EU, but also the rest of the world.

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APPENDICES

APPENDIX 1: INTERVIEW GUIDE

- Educating and managing human resources is an investment for both organizations and governments? How important do you think this investment is for both governments and organizations?
- How important do you think technology is in shifting the dynamics of the employment market and how human resources are managed?
- What do you believe are the factors that could lead to attracting and retaining employees in an organization? Would the absence of such factors lead employees to leave their job, thereby leading to labour shortage?
- Based on the research carried out by official international organizations having been occupied with the global shipping industry, digitalization and decarbonization have emerged as the predominant drivers reshaping the employment landscape and labor market dynamics. How do you believe digitalization and decarbonization have shaped labour market dynamics in the shipping industry?
- What do you think are the factors that have led to a shortage of labour in the shipping industry?
- What are the factors that seafarers need in their shipping workplace, in order for existing seafarers to remain in the industry and new ones get attracted to follow this professional path?
- How would you comment on the EU legislation governing the employment of seafarers? Does it promote measures to deal with shortage of sea officers?

APPENDIX 2: RESULTS OF THEMATIC ANALYSIS

Themes	Sub-themes	Indicative responses
Human resource management	Importance for organizations	<p>P1: Human resources are the most valuable asset of organizations</p> <p>P2: It is important to educate the workforce, if you want to be effective and efficient as a business</p> <p>P3: No company can succeed without human resources</p>
	Importance for countries	<p>P4: I can say that a country's GDP is determined by the productivity of its labour</p> <p>P5: If a country invests in labour education, then its national economy shall prosper</p> <p>P6: A country's labour power is the country's competitiveness</p>
	Role of technology	<p>P2: Technology has changed everything.</p> <p>Higher automation,</p>

		<p>remote working, everything</p> <p>P4: Technology has changed the nature of job duties, as we knew them</p> <p>P5: The whole world has changed. For me, gradually substituting humans with machines is the biggest change</p>
Factors leading to labour shortage	General employment market factors	<p>P3: If you do not offer good motives to cover labour needs, then it is not easy to retain employees</p> <p>P5: Employees need to be satisfied by all means, in order to want to stay in the company</p> <p>P6: It is safety and recognition that for me are the most important</p>
	Shipping-industry-specific factors	<p>P1: Safety on board is the major aspect. And flexible working schedules</p> <p>P5: The digitalization of the shipping work is a major issue. For some, it makes life easier on board. For some others, it makes it complicated and unattractive</p> <p>P6: Decarbonization could be an issue, yes. It has</p>

		made the shipping industry much more sophisticated, so it has become hard for some to follow, or to want to work in the industry
Recommendations for change	Working conditions	<p>P3: I think seafarers need to feel safe on board</p> <p>P4: Fatigue definitely needs to be reduced</p> <p>P5: I think it is essential to improve safety standards and the overall safety culture on board</p>
	Training	<p>P4: There is need for training more than ever</p> <p>P5: If seafarers are to stay, they need excessive training in new technologies</p> <p>P6: Things have changed and more excessive training is required</p>
	Legislative actions	<p>P1: The EU has to ensure that adequate training academies are available for all new and existing seafarers and officers to get adequately trained</p> <p>P2: Shipping authorities need to become stricter in terms of safety on board</p>

		P3: Each country needs to offer additional benefits to its seafarers, because it is a very hazardous and demanding job
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