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Global shortage of maritime qualified officers

by

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II Abstract

The shortage of qualified officers (see chapter 1.1) is an existing problem that has been disturbing the maritime industry for decades. Demand has outstripped supply even in times of economic growth which makes this labour shortage the biggest challenge that crewing agencies and shipping companies are currently facing. This raised the question of how an improvement in determinant variable that affect this shortage would increase the attractiveness of the industry. A qualitative research, through in-depth interviews and questionnaires has looked into the views and opinions of different stakeholders with strong relation in the supply of qualified labour. Findings showed that different strategies, especially in the recruitment and retention of their seafarers, are being adopted in the Philippines by manning agencies and shipping companies, in order to gain competitive advantage and avoid being affected by the problem. However, no global approach has been found among these stakeholders to address the problem in a collaborative and proactive way. This paper has also looked into what maritime schools, and international and governmental organizations can do to facilitate or eliminate the 'bottleneck' existent from shore to sea-based employment, decreasing the large knowledge spill-over that the maritime industry experiences.

Key-words: labour shortage, supply and demand of qualified officers, maritime education, recruitment and retention, trainings.

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Abbreviation	Term
APEC	Accreditation of Seafarer Manning Agencies
AB's	Able Bodied seafarers
BIMCO	Baltic and International Maritime Council
BMS	Bourbon marine Services
CAGR	Compound Annual Gross Rate
CHED	Commission of Higher Education
CoC	Certificate of Competency
CPSC & RB	Proficiency in Survival Craft and Rescue Boats
CMS	Crossworld Marine Services
DFA	Department of Foreign Affairs
EMSA	European Maritime Safety Agency
FOC	Flag Of Convenience
GMDSS	Global Maritime Distress Safety System
IBF	International Bargaining Forum
ICS	International Chamber of Shipping
IMO	International Maritime Organization
ICS	International Maritime Services Federation Pvt. Ltd.
JMC	Joint Maritime Commission
MARPOL	Convention for the Prevention of maritime Pollution
MCA	Maritime Coastguard Agency
MET	Maritime Education and Training
MTC	Maritime Training Council
NROTC	Naval Reserve Officers Training Corps
NGO's	Non-governmental Organizations
OECD	OECD
OFW	Overseas Filipino Worker
OOW	Officer of the Watch
OS	Ordinary Seaman
PMMA	Philippine merchant Marine Academy
POEA	Philippine Overseas Employment Agency
Ro-Ro	Roll on-Roll off system
SOLAS	Safety of Life at Sea
SIRC	Seafarers International Research Centre
STCW	Standards of Training Certification and Watch Keeping
TUCP	Trade union Congress of the Philippines
UNCTAD	United Nations Conference on Trade and Development
WMU	World Maritime University

1. Introduction. Seafarers in the maritime industry

1.1.Historical background

A global shortage in qualified officers can be seen in the maritime industry, all over the world. As so is the case, this paper gives special attention to Philippine officers, due to the fact that it is the main country supplier and thus a shortage of this nationality is a "hot topic" and of main concern in the actual shipping industry (see table 1 below for the main country suppliers selected by geographical region). Firstly, a clarification of what is generally meant by "qualified" will be provided, followed by a short background study to give the reader an overall view of the situation and how this nationality became the main supplier worldwide.

Table 1. Seafarer supply by country, 2011

	Officers	Ratings
Far East		
Philippines	70.000	80.000
China	51.800	104.200
India	42.000	56.000
East Europe		
Ukraine	35.400	40.000
Russia	25.000	34.500
Poland	18.000	10.000
West Europe		
UK	15.000	5.000
Norway	12.000	9.000
Greece	10.000	15.000

Source: BIMCO/Drewry Maritime Research/PAL

The meaning of "qualified", when talking about officers, is not such an easy concept as it appears to be. The most standard definition that has been found was the one provided by the international Labour Organization (ILO) and defines it as the education, trainings, skills and certifications that seafarers are required to meet in order to carry out their duties on-board of a ship (ILOd 2013). Additionally, Article VI from the International Convention STCW (1995, as amended), states the following: Under international law, certificates shall be issued to those candidates who, to the satisfactions of national administration, meet the requirement for service, age, medical fitness, training, qualifications and examination in accordance with the appropriate international regulation and standards (STCW 2010).

This means that that a seafarer shall not work on a ship unless he/she has undertaken Merchant Navy training involving college time and sea time to work towards an Officer of the Watch Certificate of Competence (CoC). They also require to complete STCW 95 basic safety training courses, covering personal survival techniques, fire prevention and

advanced firefighting, elementary first aid and personal safety and social responsibilities and hold an ENG1 seafarer's medical certificate. Additionally, they require a GMDSS (Global Maritime Distress Safety System) and a CPSC & RB (Proficiency in Survival Craft and Rescue Boats). However, the meaning of "qualified" can differ among researchers and has been treated in different ways (Glen 2008). An interesting opinion has been given by K. X Li et al, (1999; 295-303) who considers that the number of supply of a country's officers should be the number of 'active seafarer's' rather than the number of 'qualified seafarers', which is used by many researchers or institution such as BIMCO/ISF (2010) or Drewry (2012). There is an important difference between the two, for instance, there are many qualified officers that, for whatever reason, have no desire to work at sea (Glen 2008).

K. X. Li (1999; 295-303) has set forward a useful way of measuring seafarers numbers and divided them in five groups; (1) number of seafarers at work (working on-board at any given time), (2) number of posts for seafarers (minimum personnel required to operate the ship safely according to managerial, technical and legal requirements), (3) number defined by the people who maintain an employment contract with shipping companies, manning agencies or ship operators (including all seafarers on-board, plus the ones on leave or ill), (4) the 'active' seafarers, those who are qualified through the holding of a recognised seafarer's record book and identification, who are at the same time employed or looking for employment at sea, but excluding those who are qualified but not looking or aiming to work on-board. The last group (5), is made out of those who are qualified in terms of holding a recognised certificate of competency (CoC) (Li & Wonham 1999).

Two of those groups can be directly related to the supply and demand of seafarers which can be very useful. On one hand, category (2) is normally used to measure the demand for seafarers as the number, age and type of the world fleet are well known (Gekara 2009). On the other hand, category (5) which, despite excluding ratings, whose qualifications do not require revalidation (*see the list of certificates, for training requirements for seafarers serving on board of vessels in appendix 1.2*), is often used to calculate seafarers supply. It allows to obtain an approximation of the number of officers, using the amount of valid certifications. This last group has been used to calculate *Table 1* above and which shows the overwhelming dominance of the Philippines as country supplier.

As mentioned by the STCW (95), a quality seafarer is the one who has been certified for on-board service by his national administration, this however, raises the question whether the aim of most maritime education and national administration is to provide seafarers to their own fleet. And if these are trained and certified for their national fleet, they may not be considered as 'quality seafarers' when they serve on non-national vessels (Lloyd's 1998). The reason behind it could be different cultures, languages or management styles which affect the communication on-board, and could even affect its safety (Bin Wu, Shujie Yao 2013).

According to BIMCO/ISF's (2010) report, which has calculated the worldwide supply based on the number of holding STCW certificates, reflects a significant increase in seafarer's supply in some countries over the past 5 years, especially China, India, and Philippines, as in some western European nations. However, there is an underlying concern about the current and future availability of senior officers (BIMCO/ISF 2010). The report provides evidence of a slight 2% shortage of officers, but it is said to be more

acute in specialized sectors such as tankers and LNG vessels. Despite a smaller estimated shortage than its previous report (BIMCO/ISF 2005), it states that there is evidence of continuing recruitment and retention problems especially in eastern countries such as the Philippines and India and which could affect the "quality" of the future pool of seafarers (BIMCO/ISF 2010). Form the report it can be deduced that it considers the meaning of 'qualified seafarer' as a high calibre seafarer capable of adapting to the continuous changes and handling the technological improvements and wide range of tasks now required from them. It additionally stresses out the need to ensure that this quality is not compromised by the need of increasing quantity and that, unless measures are taken to ensure a continued rapid growth in qualified officers by standardizing training programs and education, the existing shortage is likely to intensify over the next decade (BIMCO/ISF 2010).

Other authors such as Leggate (2007, 4-10) or Perkins (2010, 46-48), agree on the fact that the ongoing maritime literature discussion, about the seafarers labour market should not be about the shortage of the seafarers themselves (as they do not consider this as a major problem), but more about the concern for the future numbers of quality seafarers (Leggate 2004). Despite of the continuing efforts of traditional maritime nations (OECD) to keep the high standards of training and education, there is a continuing decline in the supply of officer seafarers in favour of Western Countries which standards vary and differ from the traditional supplying nations. This is putting in doubt the quality and skills of seafarers provided by countries such as the Philippines (SmartCompt 2013, p.92). As a consequence, organizations such as EMSA is forcing the country to upgrade their maritime training programs nationwide in order to avoid the EU ban on hiring Philippine seaman (discussed further in section 1.2).

The Philippines has a wide maritime education sector and in which the teaching personnel are, in general considered skilful and the maritime studies also appear appealing to students (SmartCompt 2013). However, Gille et al (2010), or Sentruk (2011) state that the maritime education is weakly linked to the industry's needs. Practical skills are often not taught sufficiently which creates a shortage of skilled and managerial workers (Gille & Bruce 2010). In contrast, authors such as Finpro (2012, 90-95) or Conti (2013) consider that, the combination of the country's favourable circumstances for seafaring, with its suitable geography and the population's fluency in English, will keep supplying a great and sustainable maritime manpower (Conti 2013). Nevertheless, many other authors such as Baylon et al, (2011), Leggate (2007) or Glen (2007), agree on this fact but emphasize on the country's need to face some challenges in upgrading their training and educational programs (Baylon 2011).

Geographically, the Philippines is a country with more than 7.100 islands (depending on the season) and it has a coast line of about 36.000 kilometres. The majority of the population centres are close to the coastline, making Philippines' well exposed to the sea and its weather elements (The World Factbook, 2013). Because of its unique geography, the nation's socio-economic progress has largely been affected by the maritime industry.

The industry is widely diversified in all provinces of the country, taking part in activities such as: ship operators, ship management companies, ship building and repairs and,

especially, what is of interest for this thesis, is the extensive number of seafarers that the country supplies to international ship owners and shipping companies. The Philippines supplies about one third of the global labour market for seafarers and, even though the magnitude is a recent phenomenon, there is documented history of seafaring as a tradition. The history in the supply of Philippine seafarers occurs in a context of widespread poverty, high unemployment and an economic situation facing pressures from trade deficits with US$ 58.0 billion foreign debt as of June 2013 (BSP 2013).

Going back in time, the number of seafarers had a rapid expansion from 1986 to 1990, with an average increase of 100%, doubling this way, its number every year. From 1996 to 2000 the number of seafarers still increased, but at a much lower annual rate (POEA, 2003). As a consequence, accredited manning agencies grew rapidly in number from 869 in 2006 to 1.157 in 2009 (POEA 2011), meaning that agencies are becoming the main suppliers of crew and their role towards ship owners and charterers is essential.

The migration of Philippine workers is also a fact to take in consideration, as part of the increased establishment of sea-based migrant Philippine workers, is caused by the establishment of shipping companies and ship owners in European or other Asian countries (Sekimizu 2012). A growing number of European and Asian shipping firms are disbanding their national crews, and replacing them wholesale with Filipino seafarers (IMO, 2009).
Most seafarers in the nation came from poor areas in Mindanao or Visayas, were school owners and training centres encouraged young students to pursue a “seafaring career”, and with promises to “see the world for free” and earn dollars, in order to escape from poverty (Amante 2003).

Furthermore, the maritime trainings and educational systems have been influenced by the State’s powers which have historically been constraint by the need to promote overseas employment (Magramo et al. 2010). The reason was to increase the source of foreign remittances and to balance out, that way, the debt and trade payments supporting the economy as a whole (Ellis, N., Sampson 2003). The actual need to stabilize the global labour market, with skilled and competent seafarers is now strongly influenced by an external framework of labour regulations, global governance and representative organizations such as the IMO or ILO among others (Amante 2003).

Through literature it is seen that the Philippine shipping industry is currently in a good shape and in a stable condition by 2014 and over the forecast period to 2017 (Drewry 2012). However, some estimates show that the growth of the country’s shipping economy will slightly slow down, being affected by the global request of their key export markets, such as the US, Japan, China and the Eurozone (Business Monitor International 2012). Nevertheless, and following estimations made by some crew management companies, together with the Philippine overseas employment Association (POEA), show that the growth of Philippine seafarers is still very impressive considering that there is crisis in most parts of the world (POEA 2011). The number of deployment for seafarers abroad is very encouraging and indications have surfaced that it may even break records in the coming years (POEA 2011).

As it may be observed, the Philippines is strongly driven by a maritime culture, where the seafaring industry plays a big role in developing the socio-economic factors of the country. It has to be mentioned that currently, mandated by the Philippine regulation, it is mandatory for seafarers who work abroad, to send back a minimum of 80% of their basic wage to a bank account in the Philippines, the rest is left as a free option for the seafarer. This way the country will be benefited from all those seafarers who, despite the fact that they work abroad, still contribute to the Philippine economy. It will also encourages national organizations and governmental authorities to provide support to sea-based jobs and to the industry in general.

The next section will provide a deeper insight on the issue of the shortage and how this paper will approach the problem.

1.2. Introduction of the maritime industry and importance of seafarers

As said, Philippine crew is the largest group of seafarer's worldwide, ranking number 1°, with a 28'5% of the total seafarer's employed (UNCTAD, 2013). The Philippines is the leading supplier of the global maritime manpower (SmartCompt 2013), with 1.5 million seafarers accounting for this nationality.

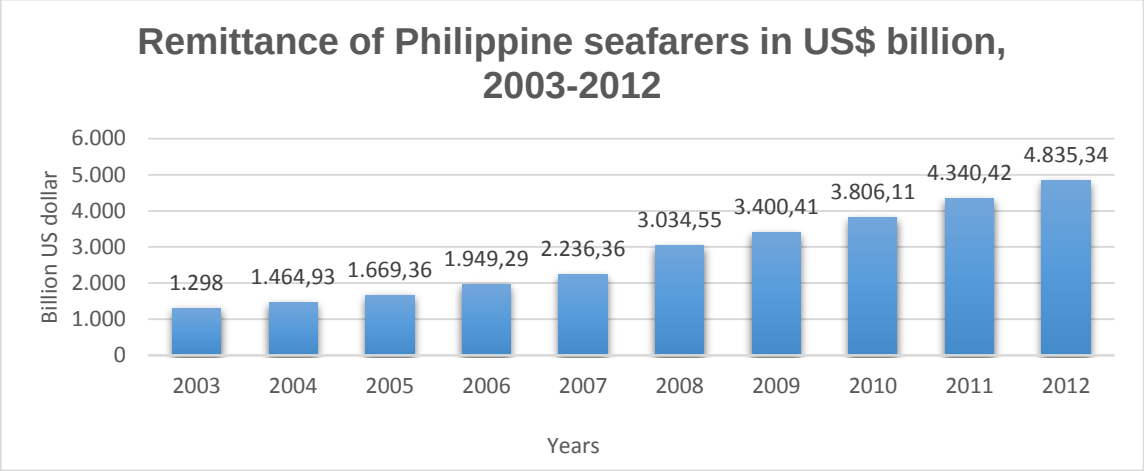
The amount of remittances sent back by seafarers has shown growing figures since 2003 with an average growth of 14% through the years (*see figure 1*). It is however, slightly slowing down since 2012 (BSP 2013). In 2003 the remittance of Philippine seafarers in US$ was 1.298 billion with almost a 13% growth rate, 2007 was a year in which the strongest growth could be seen with an average of 36% and were Philippine seafarers sent back home US$ 2.236 in remittances. The reason behind this big growth, was the optimistic economic environment with a massive amount of new-building orders coming up and with no-one expecting the posterior hit of the financial and economic crisis (Asyali 2009). With the fall of Lehman Brothers the financial crisis hit Western European countries and the US, as a consequence, remittances fell back to a growth rate of 12% in 2008 and 2009 however, never showing negative figures (Marina 2013).

From 2012 until the current date (2014), a negative growth of on average 3% can be seen compared with the previous year (2011), nevertheless, the amount of remittances is still growing and accounted in 2012 for US$4.835 and in 2013 for US$5.215. Despite the slow growth expected since 2012, it seem to be recovering as the latest update from BSP (Bangko sentral ng Philipinas, 2014) shows that the personal cash remittances sent home at the current date (January 2014), reached a record of US$5.5 billion, which means almost a 9% growth bringing it back to the highest levels reached in the previous year 2013. This seems to have its reason behind Europe's strong appetite for Philippine seafarers (Marina 2014).

A growing number of Philippine seafarers are being dispatched to Europe, especially to Germany, the UK, Norway, Greece and The Netherlands, said the Trade Union Congress of the Philippines (TUCP 2014). However, the top source of remittances from Philippine seafarers, still remains from the US (US$1.3 billion), followed by UK (US$238 million) and Germany (US$195 million). Cash transfers from sailors grew twice faster compared to the remittances from land-based migrant Philippine workers in the first semester of this

year (BSP 2013). The increase of these remittances is of extreme importance for the Philippine economy as it heavily relays in dollars for debt payments and importation of products for domestic consumption (Baylon 2011).

Figure 1. Remittance of Philippine seafarers in US$ billion, 2003-2012



Source: BSP. Central Bank of the Philippines

It is interesting to mention that, there is recent news about the possibility of Philippine seafarers being blacklisted on European ships (SeaShipNews 2013). This is due to their unsatisfactory compliance with international standards and the lack of a single administration system that regulates the National Quality Standards (Burgonio 2013). However, there are strong efforts being made by the Marina to become this premier maritime administration in Southeast Asia, propelling the Philippine maritime industry to global competitiveness by 2016 (Marina 2013). Marina is the Philippine Maritime Authority which is currently integrating the development, promotion and regulation of the maritime industry in the country. Despite this fact, it does not consider educational matters nor the issuance of documentation such as CoC, seaman's book etc., which is done by other administrative organizations (ECSA 2013). Currently it is broadening its responsibilities and further expanding by integrating these educational and documentation matters which need to be harmonized and centralized in order to meet EU standards (Marina 2013).

The interest throughout time for Philippine organizations to remodel their organizations and make improvements in their educational and training system has however been discouraging (Lindgren 2011). The reason behind it does probably relay on the fact that they are the number one seafarer's supplier and banning their certificates is not an option.

Now, with the present possibility of EMSA (European Maritime Safety Agency) banning all STCW certificates, issued by Philippine institutions to seafarers working on European vessels, is enforcing the country to take certain measures among which; the reduction of administrative facilities and centralize the issuance of certificates to one single authority, and also forcing an improvement its educational and training programs.

It is interesting to observe the controversy of this matter, as on one hand Europe is strongly increasing its demand for Philippine seafarers and on the other hand, creating burdens (such as imposing stronger regulations and educational improvements) to Philippine authorities and academies. However, the EMSA (2013) considers it necessary in order to maintain the safety and security levels of the world fleet (EMSA 2013).

Furthermore, a conservative calculation made by the Trade Union Congress of the Philippines (TUCP 2014), showed that if the total number of seafarers deployed on foreign EU vessels, which is almost 400.000 thousand, would be banned, as a consequence of inadequate education, permits or uncertificated documents, and the average number of family dependants per seafarer is 5, the total number of Philippines that would be directly affected scales up to the amount of 2.0 million (360.000 x 5). This number can be significantly higher if one takes into account their extended family system, but it is not only a matter of remittances. An EU ban will also affect indirectly manning agents, training centres, maritime schools, medical clinics, doctors, maritime lawyers or even looking further, grocery stores or shopping malls.

As a logical consequence of the impossibility to ban such a big employment pool, the Department of Foreign Affairs (DFA) confirmed that the EU Commission Directorate for Mobility and Transport (DGMOVE) acted favourable on the department's request for additional time, after de-recognising Philippines CoC's last 23rd of April (2014), and will allow the Marina to implement structural and policy changes to meet regulatory standards set by the STCW 1978 Convention (as amended), before the next EMSA audit (TUCP 2014). Despite this fact, the Philippine administration, will have to report every three months to EMSA, which will continue to undertake inspections but will also offer technical assistance in order to comply with the required standards (Hand 2014).

Other authors such as Sadjadi and Perkins (2010, 63-69) also highlight the importance to harmonize the requirements of safe shipping between all different nationalities. The advent of the IMO, STCW, ISM and SOLAS, among others, have seen prophets of doom predicting this demise of the Philippines manning industry for a long time (Del Rosario, 1996). As these previous authors do, also others such as Magramo et al. (2012, 397-400), or Aldanese (2009, 471-474) question the quality of Philippine seaman, they complain that seafarers are not as competent as they used to be. This will lead us to take a close look at the educational system and focus on how training centres and manning agencies approach this problem and where the challenges lie.

Furthermore, the BIMCO/Manpower report (2010), also stresses out the important issue of addressing the shortage by improving the educational structure. Bottlenecks from lower qualified seafarers (i.e. ratings) towards the "top four" (which will be discussed in the next chapter), must be eliminated and tend towards northern European systems which avoid short track courses (such as the ones in the Philippines), allowing the seafarers to develop further their careers. The shortage of officers is and has been an increasing problem which many ship owners and crew manning companies are facing today and which is affecting the global shipping industry. Drewry agency (2012) reports, that the officer shortage may be as high as 34.000 in 2012, a figure that could triple in the coming four years (Drewry 2012).

Some of these underlying reasons are provided by authors such as Glen et al. (2010, 46-57) or Amante (2003, 2-7) and will be studied further on.

Drewry Shipping Consultant (2012), in conjunction with BIMCO/ISF (2010) and PAL (Precious Associates Ltd, 2008), warns the risk of employees being promoted to jobs for which they are not competent (PAL Annual report, 2008). The reason could be due to the fact that it takes on average between 8 and 12 years to reach top officer positions, such as master or chief engineer. The Maritime Training Council (MTC), has strengthened its monitoring in order to upgrade the standards of training and ensure that all schools comply with international regulations and standards. This led to the high passing rate of 80% to decrease to 15%, permitting only the fit and qualified to succeed (Magramo et al. 2010). In addition, Aragon and Magramo (2010), studied that less than 20% of the students gets on board of a ship during their trainings. The main cause of this is the mismatch generated between the massive amounts of new builds that is being ordered by ship-owners, with the lack of provisions made for cadets on-board. Creating this way, a 'bottleneck' between the theoretical and the practical education.

There are many factors that provoke the shortage such as; the aging workforce in the throes of retirement, the difficulty in recruiting seafarers with sufficient experience and qualifications and the balance needed between seafarers and family life among others (BIMCO/ISF 2005; International Labour Organisation 2001; Thompson Clarke Shipping 2002). Researchers such as Lewarn (2009), Kokoszko et al. (2007), Cahoon et al. (2008), all recommend greater attention to marketing efforts of the shipping industry as a whole, eliminating the existing bottlenecks of a future shift towards a land-based job and facilitating this way mobility by improving working conditions. This would help to raise the profile of seafaring as a career option; *"We have to position the industry as an Industry Of Choice (IOC)"* (Haugstetter et al., 2008). Other authors agree on the need to increase the attractiveness in terms of retention, training and education, encouraging lower hierarchical levels to progress to higher ranks. Simultaneously, Wilkinson et al. (2008, 3-8) or Goulielmos et al. (2014), focus on the importance of preparing seafarers for careers in shore-based jobs, giving them this way long-life career opportunities with attractive future perspectives. This is needed to retain the experience and the knowledge of these seafarers within the industry, which is strongly needed to educate the next generation of young seafarers.

More reasons that lead to the shortage are widely discussed by the literature of Minghua et al. (2003, 59-76) and Noriel (2008, 37-42), stress out the difficulty of reaching managerial levels as you need on one hand, to be graduated from a good academy if you want to succeed and, on the other hand, many years of experience. This can be seen in every sector however, the difference with seafarers, is that it is not caused by their lack of skills but on their bad educational structure as the short courses that many academies offer do not allow them to grow in their profession. This is an additional reason for making seafaring unattractive as a career option and which causes the big amount of seafarers quitting their jobs at early ages.

There are other types of challenges to encounter such as the threat of piracy attacks covered by Bargo et al. (2013) or the limited role of woman in the industry. Not to forget, the fact that too much wealth in western countries makes seafaring unattractive and shifts these jobs to more Eastern countries such as the Philippines, China or India (Cross 2011).

Furthermore, capital labour substitution and future trends such as improvements on-board vessels might make it more interesting to enter the maritime industry. As life at sea has always involved living in an isolated micro-environment, on one hand, the new information and communication technologies has improved the contact between seafarers and their families, which can now be done more frequently decreasing home sickness and increasing their life quality. As way of contrast, on-board isolation is at the same time increasing as crew levels are being brought to the minimum. This is done in order to reduce shipping costs, but indirectly decreases the interaction between crew members. Imagine, for instance two seafarers sharing bridge during watch-keeping hours on a 'mega ship', as the span of it may be up to 50 meters, the contact between them will be minimum.

Other factors such as safety on-board or piracy are also be factors which reduce the attractiveness of the industry and make youngsters decide for other career options. These issues are however being addressed by conventions such as IMO and especially the Safety of Life at Sea (SOLAS) convention which has the aim of harmonizing and standardizing safety regulations reducing this way accidents produced by human errors.

The aim of this research will in conclusion be, to define the global impact that the shortage in qualified officers is having on the maritime industry, which factors are affecting the problem, and how an improvement in determinant variables, increase the attractiveness of seafaring as a career. A specific focus on how companies and crewing agencies deal with this problem will be provided as part of the future solution. Additionally, a case study of the K-Line Ltd training centre is provided, and is an example of the strategies taken by international companies to deal with this issue. Many rules and regulations guided by conventions have an important role on this cluster and will also be taken in consideration.

2. Main country suppliers and study of nationality differences

2.1.Introduction

During the years, there has been a shift in the supply of seafarers in relation to the different nationalities and to changes in the size of the world merchant fleet (Drewry 2012). This chapter will provide a wide overview of where the global supply is coming from and how this has changed since the 1990's. A country analysis of seafarers' supply/demand from 1990-2016 has been done, also a breakdown of Master's wages, including market sentiment, and a future demand for the top 12 country suppliers. We do not have to confuse the global supply of seafarers with the supply of the so called "top 4" which includes only "senior officers". The global supply includes lower rankings such as ratings, or the utilities department, here the quality shortage is not an issue as the level of responsibility for the safe operation of the vessel is smaller as for a senior officer. Their training is less rigorous and more orientated to short seminars focusing on safety at sea rather than technical and managerial aspects considered for the officer level. They do also not require a bachelor degree without which they are not eligible for promotion (Deloitte 2011).

First of all, and as form of introduction, a crew histogram is shown below (*see figure 2*), by indicating from top to bottom the total crew on a ship;

Figure 2. Seafarers Breakdown

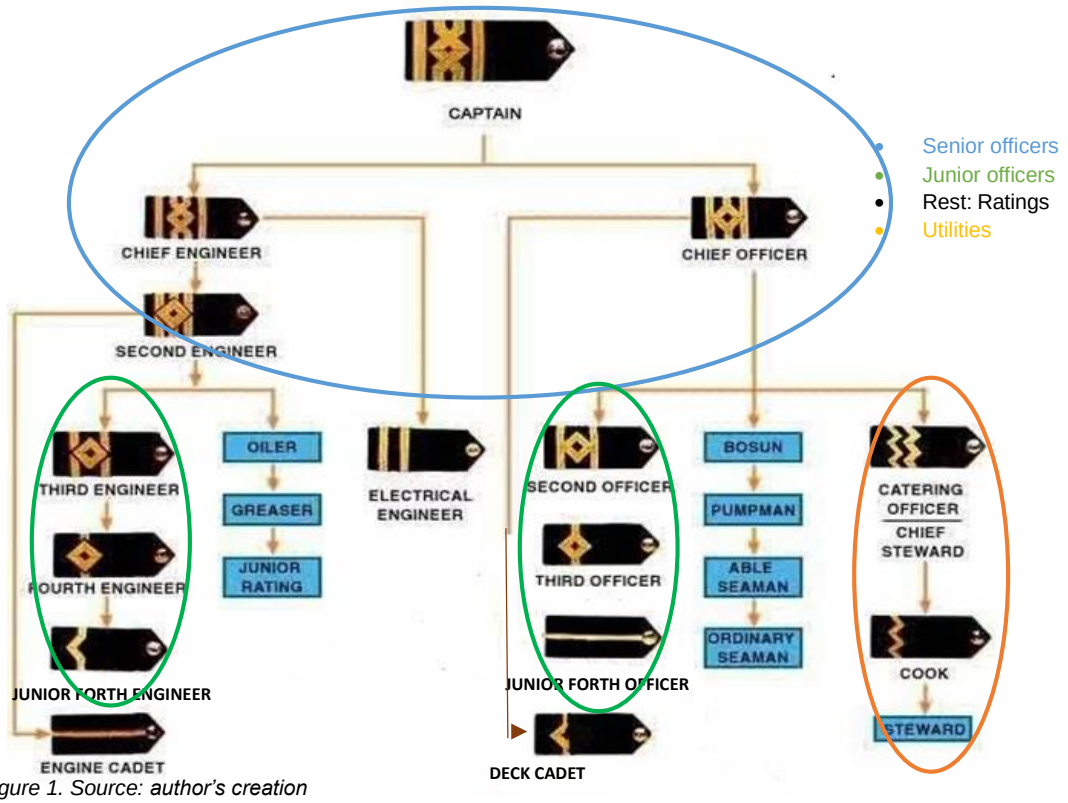


Figure 1. Source: author's creation

Seafarers could be divided in four large groups. The officers level, as so called “the top four” or senior officers, the junior officers, the ratings and the utility members. The first group is formed by (from top to bottom), the Captain or Master, Chief Officer, Chief engineer and Second engineer. The Captain has the main responsibility and is a licensed mariner in ultimate command of the vessel. He will be responsible for the safe and efficient operation including the management of the crew but also ensuring that the vessel complies with the local and international laws, as well as company and flag state policies. The arrows indicate who is responsible for who and upon which crew member a lower hierarchical level will have to report to. The second layer is the junior level (lower responsibility), which forms part of the watch keeping of the ship and is the division of qualified personnel which operates the ship continuously. This layer includes the 3rd, 4th, and junior 4th engineer and 2nd, 3rd, 4th junior officer. The officers are licensed members of the deck department as the engineers obviously, from the engine. The lowest layer is formed by the cadets, which are trainees who observe and learn, while helping out where possible. The last group is the steward’s department, also called “utilities”, and is formed by the catering officer or chief steward and chief cook. The position of the chief cook corresponds to that of the Bosun (in the deck department), the Pump man (in an oil tanker) and the Electrician in the Engine department (in a container ship or general cargo ship).

Now that we have a clear overview of the hierarchy of crew on-board, we proceed to study the main country suppliers and the divergence among countries between senior officers and ratings. This chapter will contribute to how the shortage in officers will affect the maritime industry and why there has been a shift in supply from certain countries to others.

2.2. Global trends in seafarer’s supply and demand

The global size of the cargo carrying fleet is expanding alongside with the number of seafarers. The worldwide total population of seafarers that serves on the international trading merchant fleet, has been estimated to be in the order of 1.4 million (2013), split between 624.000 officers and 747.000 ratings (ICS 2013). This is based on the number holding STCW certificates. However, the latest reports providing the number and yearly trend of global seafarer’s supply are the BIMCO/ISF Manpower report (2010) and the Drewry report (2012). Based on this last (*see table 2 below*), we can observe a modest increase in the number of officers, from 404.000 in the year 2000 to 544.000 in 2011. This means an increase of almost 35% nevertheless, the opposite can be seen with the number of ratings which experienced a decrease of almost an 8% (from 823.000 to 758.000) regarding the same period of time. This means that the total growth of worldwide seafarers in the last decade can be attributed to the increase in the number of officers rather than ratings.

One of the main reasons behind this event, is the big amount of new buildings entering the market and which still requires the officer level employees however, due to the modernization of the vessels, less ratings are needed to manage them. This comes along with the fact that most of the maintenance work is currently being outsourced to land-

based companies and not done while sailing by the crew anymore (Gailitis & Fjodorova 2014). The reduction of the number of ratings during this period of fleet growth is especially attributed to LNG, Chemical tanker and container vessels. However, as these vessels are now being manned by the minimum safety crew required, it could impose changes in employment, leading to longer working hours and less free time to socialize as work on-board still needs to be done.

A global view of seafarers supply by range during the last decade can be seen in the next table;

Table 2. Changes in seafarer supply by range 2000-2011

Year	2000	2005	2011	%CHANGE 2000-11
Officers	404,000	466,000	544,000	34.70%
Ratings	823,000	721,000	758,000	-7.90%
Total	**1,227,000**	**1,187,000**	**1,302,400**	**6.20%**

Source: BIMCO/Drewry Maritime Research/PAL

Besides this, Drewry reports that there has been an increase in absolute vessel size. An example of this can be seen in the average increase of size in oil tankers in service (2000-11), these increased by one-third, becoming longer and wider, which is one of the reasons why a lower growth in vessel number of this type can be seen (BIMCO/ISF 2010). On the other hand, the big increase in absolute number of vessels can be seen especially in the LNG and container fleet.

2.3. Main country suppliers

As explained previously, there is a distinction between officer supply and ratings. Hence, focusing on the officer side, there has been a large increase in supply from Eastern and central European countries such as Ukraine, Poland, Croatia or Rumania , but the largest growth can be seen especially in the Indian subcontinent and in China (Baylon, Angelica M. 2011). The growth in these countries can be attributed to an increased seaborne trade, especially in China and India where there has been a domestic/national growth, but also by the growth of national shipping companies in the oil and dry bulk sectors (SmartCompt 2013). Even though, nationalities such as Chinese and Indian can still not be seen in a large number on European vessels, this number is likely to increase in the near future as these nationalities provide even cheaper labour than the one provided by the Philippines.

Furthermore, Indian seafarers have a good availability in junior officers whereas in the senior rankings, especially in the engineering disciplines, we observe how wages rise due to the scarcity (Drewry 2012). Latvian officers are also included in the “top 12” country suppliers of officers, as in the past years many ship management companies have opened offices in this nation in order to supply competitive crew and which is wanted for the supply of sophisticated vessel types such as oil tankers, chemical ships and gas carriers.

On the other hand, the supply of ratings looks quite different. Even though countries such as the Philippines or the UK are big suppliers of ratings, a fairly large fall can be seen in the last years. This fact would help to explain the reductions seen in the OECD and Far East countries (BIMCO/ISF 2010). However, rating supply in countries such as China, due to the previously mentioned increase in the domestic fleet, are on a rise. Over one billion tons of cargo of all types are moved on Chinese coastal and inland waterway trades each year, creating the need for a massive amount of new crew (Drewry 2012).

Anyhow, Philippine seafarers are especially found on international waters and Flag of Convenience ships, the largest number of seafarers still remains within the ratings and junior positions, which has been historically the case. Nevertheless, they can nowadays be seen increasingly in senior positions even though they remain in short supply.

Poland has evolved over the years and is now attracting many of the main ship managers who want to establish in its country. It has become one of the main supplying nations of seafarers within the EU. Historically they have worked mainly on dry bulk vessels but are currently extending to all types of types of cargoes, including the upcoming LNG carriers.

As observed, especially the Far East countries, such as China, India and of course the Philippines, are the main players. On the other hand, countries in Eastern Europe, due to the financial crisis, are increasing the seafarer's supply, including countries such as Ukraine, Croatia and Latvia (ICS 2013). The Philippines and Indian seafarers are very significant maritime labour supply nations, with many seafarers from these countries enjoying employment opportunities on foreign flag ships operated by international shipping companies. On one hand, China and Ukraine, as said, have seen a large increase in the number of officer positions, as on the other hand, supply for officers in India and Russia have seen a static growth or even a decline (BIMCO/ISF 2010). The growth in the rating number can also be seen largely in the Chinese fleet as in the Ukrainian and especially in the Romanian one. The Chinese case can be attributed to the large growth of Chinese fleet, but at the moment, most of these seafarers remain in their own country as they have to meet domestic requirements (Burilkov & Geise 2013). For Indian ratings and Philippines there has been more of a general decline.

2.4. Future demand and seafarer requirements

The future of seafarers depends on several different factors, these mainly include: economic situation of countries, the on-board manning levels needed, number of ships in service and terms of employment provided to seafarers. This last factor affects the attractiveness of seafaring as a profession, which has suffered a decrease over the past decades. On one hand, it can be due to the characteristics of the profession itself, such as, long periods away from home. On the other hand, it could also partly be due to the lack of information and misperception of the job itself (Thomas et al. 2003; Cahoon 2008).

The European Community Ship owners Associations (ECSA) together with the European Transport Workers Federation (ETF), have produced a study whose major objectives are to increase this attractiveness of maritime careers as well as to provide the possible tools

to seafarers, in order to facilitate their career to sea and from sea to shore. The issue will be discussed further in chapter 4.

Furthermore, the consequences of a fleet change strongly affects the demand for officers. (*See table 3 below*);

Table 3. Projected fleet change to 2016

	Fleet 2000			Fleet 2011			CAGR % 2000-2011		Fleet 2016	Proj. CAGR 2011-2016
	No.	Capacity Million	Average Size	No.	Capacity Million	Average Size	No.	Capacity	No.	%
Oil tanker (dwt)	2.884	270.4	95.077	3.130	398.7	127.380	0,70%	3,60%	3.402	1,70%
Chemical Tanker (dwt)	1.618	22.6	13.968	4.045	83.0	20.519	8,70%	12,60%	4.302	1,200%
LPG	873	13.0	14.891	1.140	19.6	17.193	2,50%	3,80%	1.201	1,00%
LNG	127	14.2	111.811	358	52.8	147.486	9,90%	12,70%	425	3,50%
Dry Bulk (dwt)	5.540	276.2	49.856	8.818	604.8	68.587	4,30%	7,40%	10.185	2,90%
Containers	2.500	4.3	1.736	5.090	15.2	2.986	6,70%	12,10%	4.878	-0,80%
Total	**13.542**			**22.581**			**4,80%**		**24.393**	**1,60%**

Source: BIMCO/Drewry Maritime Research/PAL, complied by author.

The projections of the fleet changes up to 2016 give a good idea of the evolution and future forecast. It can be seen how the global fleets had a major increase from 13,542 vessels in 2000 to 22,581 in 2011. The forecast made by Drewry Marine research, estimates it to rise to 24,393 vessels in 2016, with a Compound Annual Gross Rate (CAGR) of 1.6% during the period between 2011 and 2016. Accordingly, this period shows an additional fleet of 1800 vessels joining the global market. This growth is especially due to the large number of new builds in dry bulk and LNG vessels, with projected CAGR (2011-16) of 2.9 and 3.5% respectively.

The main concern among international and governmental organizations that arises with this massive fleet growth is; how will all these new vessels be manned? Is it possible to provide such a large amount of qualified seafarers, in such a short period? In terms of ratings, this should not be a problem, as the average amount of years needed to provide a 'qualified' rating is 3 to 4 years (depending on the country and the educational system). However, the bigger problem is the supply of officers, especially of senior officers. In order for these to reach higher positions, they need on average 10 to 12 years and fulfil, as mentioned in chapter 1, all minimum requirements, including documentation and mandatory courses in order to safely sail the vessel. This divergence between the big amount, in a short term, of officers demanded by the market, and the years needed to fulfil this demand does not match (Leggate 2004). As growth of fleets has outstripped the supply of crews for most shipping companies in Europe and North America, in response to this, they found it necessary to seek crews outside of their own country, raising the pressure by Eastern countries (especially the Philippines and India), to cover all those

new vacancies (Deloitte 2011). The reason behind the preference for these countries can be attributed to the significant commitments of these countries to provide marine education, their good command of the English language and to an absence of alternative employment opportunities within their nation (Glen 2008). However, the controversy of this matter is that they started providing fast track courses in their academies and schools and which became the reason for questioning the quality of their system by European institutions and as a consequence, the quality of their seafarers (Stamford 2005).

The additional officers required will vary depending on the type of vessel (*see Table 4 below).* This depends on their size, complexity and cargo handled. For example, if we consider a VLCC, they entail more operations and they may for that reason need a larger crew. This comes along with the propensity for ship-owner's taking on-board one or two extra cadets for training purposes.

With an average of 23 members on-board, officers represent about 35 to 40 percent of the total crew (BIMCO/ISF 2010). With this percentage it has been estimated that the additional officers needed between the period of 2011 and 2016 is almost 31.000 (Drewry 2012).

Table 4. Projected additional officer requirements 2012-16

Sector	Vessel Net Change End 2011-2016	Additional Officers Required
Oil Tanker	272	4.022
Chemical Tanker	257	3.192
LPG Carriers	61	894
LNG Carriers	67	1.078
Dry Bulk Vessels	1.367	20.960
Container Vessels	-212	-1.974
Other Vessels	300	2.782
Totals	**2.112**	**30.954**

Source: Drewry Maritime Research, complied by author

The biggest need in officers it to be seen in the dry bulk fleet, with an additional requirement of 20.980 over the mentioned period. Also oil and chemical tankers will need an additional number of 4,022 and 3,192 officers respectively. LNG will require 1,078 new officers with a net change of 67 vessels. A vessel net change of -212 in the container fleet, leads to a decrease in the need of officers by the number of 1,974. Hence, with an overall requirement of 30,954 officers by the end of 2016, the biggest need will relay on dry bulk, oil and chemical tanker vessels. Despite the large amount needed within the dry bulk fleet, there are bigger concerns in the future supply of qualified officers for tankers and LNG vessels (Lewarn 2009). The reason is the higher certification requirements and

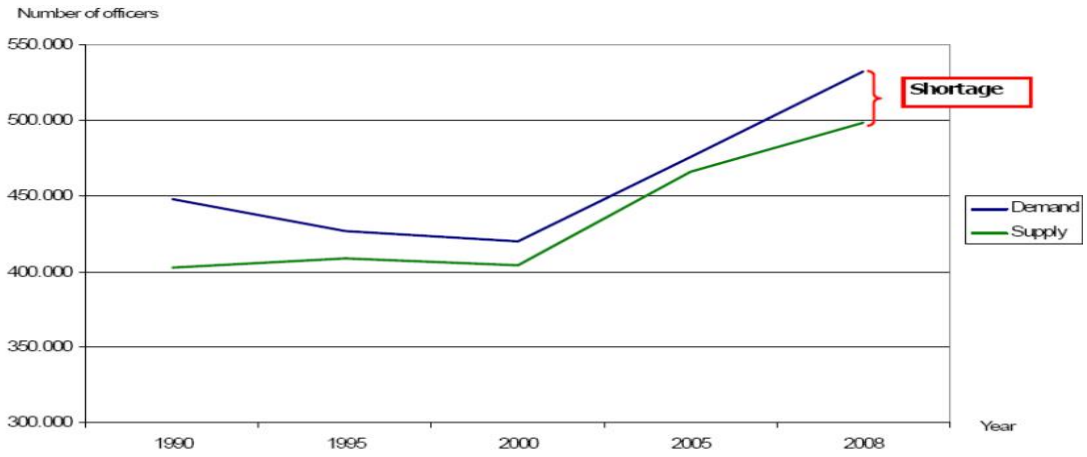
quality standards attached to those type of vessels and that must be satisfied by the country suppliers (Drewry 2012).

In conclusion, the future demand for seafarers will be driven by several factors such as the general future growth rate, specifically as has been seen, the growth in the world's fleet (new vessel orders), but also the quality provided by the academies and schools of the present and upcoming country suppliers (this will be discussed further in chapter 4). Additionally, the future growth in ship productivity or the characteristics of the vessel type that needs to be manned, will define the future need of qualified officers and will have to meet the standards required by national and international conventions in order to avoid a future shortage of this labour force.

2.5. Global quality shortage in officer's supply and demand

The discussion of an officer shortage within the maritime industry, has been going on for a long time and can be seen all over the past and present literature. However, the discussion should be redirected as the shortage is more in terms of quality rather than quantity (O'Connor et. al, 2003). In a study made by Deloitte (2011), shipping companies confirmed that they are having problems in crewing their vessels with skilled competent seafarers and which is a growing global problem high on the list of business issues for the maritime industry (Deloitte 2011). The following graph made by the Labour market observatory (2012) (*see figure 3 below*), shows us the trend of the worldwide shortage of this qualified labour pool.

Figure 3. Worldwide shortage of qualified marine officers.



Labour market observatory, 2012

The calculation of such a shortage is not that easy (LMO 2011). As the focus is on quality rather than quantity there are numerous external factors that affect the supply and demand of seafarers. For the above graph is to mention that the variables that had been taken in consideration are the following; number of vessels to be delivered in the future, number of vessels in fleet, average age of seafarers, duration of mandatory training and seafaring experience, universities and career drop-rate statistics and the average number of consecutive months on-board (LMO 2011).

As can be seen, from the 1990's to 1995, there has been a decrease in shortfall and were a convergence between supply and demand can be seen. This can be attributed to a moderate fleet growth during that period (LMO 2011). Nevertheless, this phenomenon did not stand for long and the breach was kept stable between 1995 and 2005 with a big amount of new builds entering the market and many academies and schools increasing (especially in the Philippines) the supply of maritime labour (CHED 2005). Worries started originating since 2006 when a larger amount of Eastern countries started manning EU vessels and when the MLC (Maritime Labour Convention, 2006) entered into force setting minimum requirements and standards, in order to harmonize and maintain the quality of the labour force supplying the international fleet.

The existent gap in 2008, is verified by another combined market study made by BIMCO, Drewry Maritime Research and PAL (2012), and which, besides the previously mentioned factors that have been included in the research, additionally they took into account the increased leave entitlements from European and US seafarers attracted by land-based jobs (Drewry 2012) meaning that look at the issue in a broader aspect (*see table 5, below*). Additionally, the countries which were used for the study included the largest seafaring suppliers from West Europe (9), East Europe (7) and the Far East (9).

Officer's supply is expected to rise in line with changes in demand, with the theoretical shortfall staying roughly similar in the period estimated from 2011 to 2016 (Drewry 2012).

Table 5. Projected officer supply/demand balance ('000)

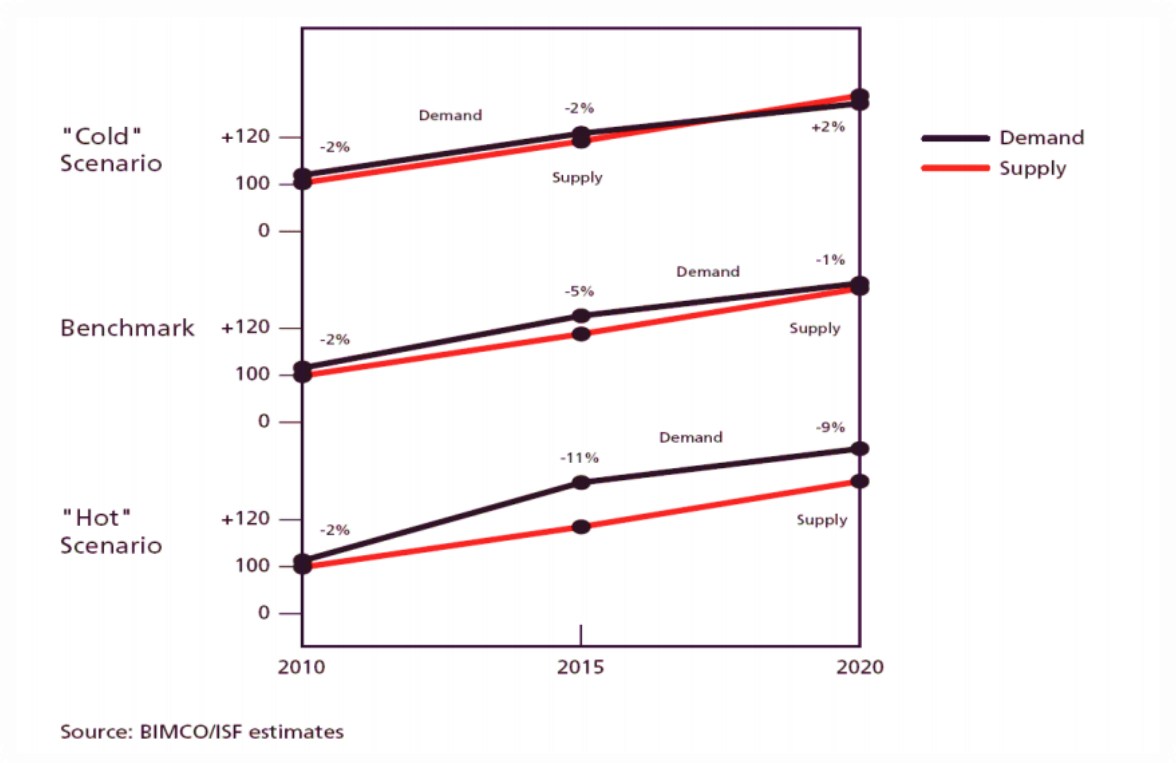
	1990	1995	2000	2005	2011	2016
Officer Demand	448	427	420	476	560	591
Officer Supply	403	409	404	466	544	575
Apparent Surplus/(Shortfall)	-45	-18	-16	-10	-16	-16

Source: BIMCO/Drewry Maritime Research/PAL, compiled by author

The shortfall in the past was mostly accounted for officers taking shorter break periods between assignments, as for ratings, availability has always exceeded demand in the past and is expected to remain this way (Bhattacharya 2014).

Furthermore, an estimation of three possible future scenarios in the shortage of maritime officers has been made by BIMCO/ISF, with a forecast up until 2020 (see figure 4 below).

Figure 4. Shortage of maritime officers: possible scenarios.



It shows a first “cold scenario” where supply may outstrip demand by 2% in 2020 and overcome the long-term shortage against which the maritime sector has been fighting. This scenario, nevertheless, is unlikely to happen if we compare it with the forecast done by Drewry (2012). The second scenario is a benchmark which aims to achieve a small shortage in officers, in which demand exceeds supply by only 1%. The third and most realistic scenario, “hot scenario”, is where demand exceeds supply by 11% (2015) and will slightly converge but is still predicted to have a gap of 9% in 2020.

In addition, an external factor such as the actual economic situation, is an element to be taken in consideration. Through literature it can be found that the economic and financial crisis, which is still strongly affecting some European countries, is said to make a job in seafaring attractive again. One of the reasons behind it is that high levels of unemployment can be seen and people will consider going back to sea (Asyali 2009). The crisis has been influencing employment negatively in various industries since September 2008, but a reverse employment effect could possibly take place due to better salaries on sea-based jobs (Shicheng 2009). Also, they are able to earn in dollar currency and circumvent the depreciation of the Euro or other Western country currencies.

Moreover, the next section will cover the most important crewing costs as it is becoming the main focus points of ship-owners. Special attention will also be drawn on wages earned amongst 10 different countries and compared in terms of the GDP of their country. This will enable to understand how attractive it becomes to a seafarer to work in one country or another. Officers and rating levels will also be studied amongst these

countries, providing an evolution of these labour groups between the periods of 1995 and 2010.

2.6. Wages and terms of employment; salary comparison among countries and earnings as a function of their GDP

In terms of wages, some general waves can be seen in correlation with the economic situation of a country. Since 2008, the economic and financial crisis did not help the maritime industry as freight rates had reached levels that did no longer cover the costs of running a vessel (Cullinane 2011). Similarly, this can be seen in the second hand market, where the big amount of vessels offered slumped prices to the minimum. The main priority for shipping companies now became cost-focused. Take in consideration that the cost of running a shipping company can be classified into five main categories which are: capital costs and cargo handling costs, periodic maintenance costs, and voyage and operating costs (Stopford 2002). The main components of the operating are: manning costs, insurances, routine repair and maintenance and administration. This structure mainly depends on the nationality and the size of the crew, age, maintenance and insured policy of the ship and the administration efficiency of the owner itself.

Nevertheless, besides other strategies and practices that ship-owners to reduce costs, the main focus still relays on cutting crew costs. These costs can account for up to 26 to 32 percent of, i.e. a capsize bulk carrier (Cullinane 2011). They however, include all indirect and direct charges incurred by crewing the vessel (*see table 6, below*), and will depend on the employment policies adopted by the owner, nationality mix of crew, its size, the ship's flag state or the service conditions offered on-board (Asyali 2009).

Table 6. Categories of Crew Costs

Wages	Other costs	Travel
Basic pay Overtime Special work payments Leave pay Leave subsistence Bonuses Social security Superannuation Crew overlap	Medical examination Medical treatment Union payments Manning agent's fees Cadet training Levies Training costs Study leave and pay Standby pay Recruitments Victualing	Rail, road, ship, air Accommodation Subsistence Baggage costs

Source: Downward, 1999, compiled by author

Besides the many influencing factors are affecting the final earnings of seafarers, wages have gradually been rising along with inflation levels, the reason for this was because of

the strength of the shipping market and especially due to the shortage in qualified crew (ILOa 2011). Nevertheless, in some countries, officers have seen their wages fall relatively since 2009 as inflation levels were high, whereas in other countries, a strong dollar has led to an increase of it. “There is an increased trend for some ship-owners to move towards regionalised pay scales”(UNCTAD 2013). However, in 2007, once the economic crisis hit on a global level, average seafarers wages kept on growing but slower than in previous years, and stagnated in general from 2008 onwards (Drewry 2012). The case for qualified officers specifically, walks along the same path even though the important factor of the shortage plays a crucial role. The economic crisis did have an impact but was much weaker on the wages of senior officers than on rating ranks.

What can also be seen, is a differentiation in wages among countries and depending on the type of cargo carried. A comparison among qualified master’s wages (see *table 7 below*) has been made and, in order to see the difference among Eastern and Western countries wages, the UK has been added to the main country suppliers such as; China, India and the Philippines as comparative point. Furthermore, dry bulk vessels and tankers are demanding the largest amount of qualified officers for the future fleet (*see table 4*), however, it is interesting to see the significant differentials existing between officer’s wages of dry cargo vessels and oil or chemical tankers, this seems to be mainly caused by the complexity of cargo handled and the machinery on-board (Li & Wonham 1999).

Table 7. Officer wage trends- Master ($ per month)

	Countries	2008	2009	2010	2011
Tankers	China	6,000-9,000	8,000-12,000	9,000-12,000	9,000-12,300
	India	9,700-11,300	10,700-16,000	11,000-16,000	11,300-16,400
	Philippines	5,800-10,000	7,800-13,500	9,000-13,500	9,200-13,800
	UK	15,000-23,000	15,000-23,000	15,000-23,000	14,400-20,000
Dry Cargo	China	4,500-5,500	5,500-6,500	5,500-7,000	5,500-7,000
	India	6,100-7,700	6,400-8,900	7,000-10,000	7,000-10,000
	Philippines	4,900-6,400	6,000-8,000	6,500-8,200	6,500-8,200
	UK	13,000-22,000	10,000-19,000	11,000-20,000	12,000-20,000

Source: Drewry Maritime Research, compiled by author

Important differences can be seen between countries, if we compare, for instance, the average salary ranges for a Chinese Master in 2011 (9,000-12,300) and for an English Master in the UK (14,400-20,000) on a tanker vessel. The maximum average salary for

a Chinese does not even reach the minimum average salary for a UK Master. However, the wages for Indian Masters come the closest to the UK ones, remaining the Philippines, together with the Chinese with the lowest average wages becoming this way highly competitive in the seafaring labour market. Taking in consideration an overall lower salary in the dry cargo that in tanker vessels, a similar scenario can be seen, in were the minimum average wage of a UK Master doubles the maximum average wage of a Chinese one. The only exception here is the UK, where the average range remains similar among the two vessels types. One of the reasons for this could be the faster wage increase earned in dry bulk vessels against tankers. This can be seen in data provided by the UK recruitment group Fast Steam, which shows a 2.6% increase in wages for masters in tanker vessels (2011 to 2012), whereas a 16.4% increase in dry bulk vessels.

Moreover, increased wages can be seen from 2008 up till 2011 in most eastern countries, partly due to inflation rates but mostly, induced by the higher demand for these nationalities (Asyali 2009). This is strongly related to the lower wages earned in comparison to western countries, as in this case the UK.

Additionally, the wage trend for officers on a CAGR (Compound Annual Growth Rate) has been growing steeply (Drewry 2012) one of the reasons is that it is strongly influenced by organizations such as ILO and MLC were in the Committee on wages of the Joint Maritime Commission (JMC) enforce salaries upgrades yearly. Also the International Transport Worker's Federation (ISF) has a global influence when it comes to salaries.

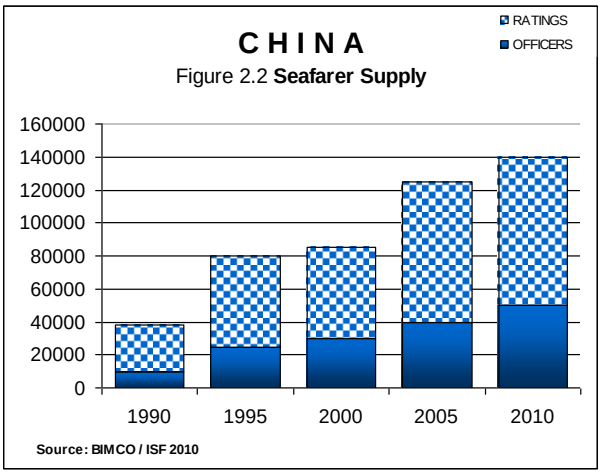
Despite the fact that salaries can be set by external institutions and organizations, these normally affect minimum salaries and not the higher wages earned by junior and senior officers. Nevertheless, this could have an indirect effect among the attractiveness of the industry in general, as these minimum salaries are the ones earned by the younger generation and fresh graduated students who enter the market (*this issue is further discussed in chapter 7*). The variations that exist are strongly linked to the country's material standard of living. The indicator which is often used to measure this is the Gross Domestic Product (GDP). It has to be said however, that the GDP per capita is not a measurement of the standards of living in an economy, but the rationality behind the use of it, is that all citizens would benefit from their country's increased economic production. The frequent measurement of this indicator (quarterly basis), allows trends to be quickly seen and as it is measured widely in almost all countries over the world, it allows for inter-country comparisons.

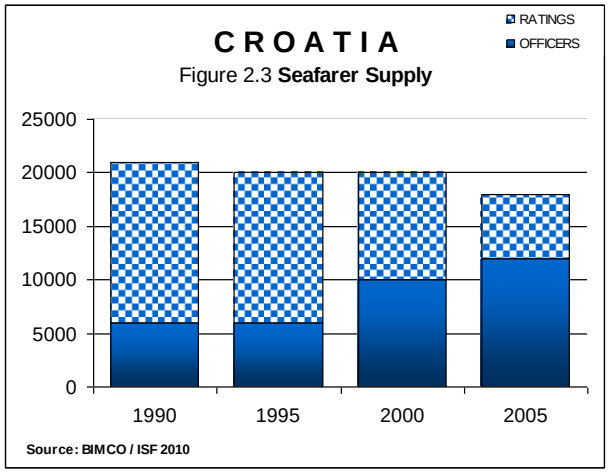
The next subsection will dive in deeper to this aspect, providing a comparison in wages that seafarer's earn, in terms of the GDP of their countries. This should give an idea of the attractiveness of the job as, the bigger the gap between salaries earned on a sea based job and the GDP of a country, the more appealing the seafarer's career will be.

2.7. Income per country in terms of GDP

In China, as in contrast to more western countries, the maritime career is considered to be very attractive (Bin Wu, Shujie Yao 2013). The reason for this is the high wages that seafarers earn, especially in senior positions. For instance, a 2nd officer's income is almost three times the average GDP per capita of the average working population. In case of a Master this gap becomes even bigger, and is around eight times higher than the GDP per capita of the country. In contrast, this cannot be said for junior seafarers. They seem to have the worst labour situation worldwide, not only in terms of wages but also for the poor labour conditions (Bin Wu, Shujie Yao 2013). Labour terms are set mainly by Chinese recruitment agencies and which are defined according to the demand and supply needed in the spot labour market (Wu 2008). *Figure 5*, shows a distinction between the Chinese seafarers supply in terms of officers against rating levels. While both groups have continuously been growing along the years, their labour conditions have not done so (Bin Wu, Shujie Yao 2013). Senior officers experience growth of their wages and improvements of their working conditions whereas ratings are more likely to be excluded from these increasing benefits (Ellis, N., Sampson 2003). It is to mention that, despite the fact that China is a huge seafarer supplier and is continuously growing, they supply mainly their own national fleet. This is due to the development of their national economy. The China's shipping industry is growing very fast but together with a huge demand in seafarers at the same time. This labour force could be considered in a near future, to fill the existent shortage of officers, however they are currently not considered to be qualified enough to man the on an international fleet due to their difficulty of communicating in English, a prerequisite for operating efficiently the vessel (Burilkov & Geise 2013).

Figure 5 and 6. China seafarer supply and Croatia seafarer supply





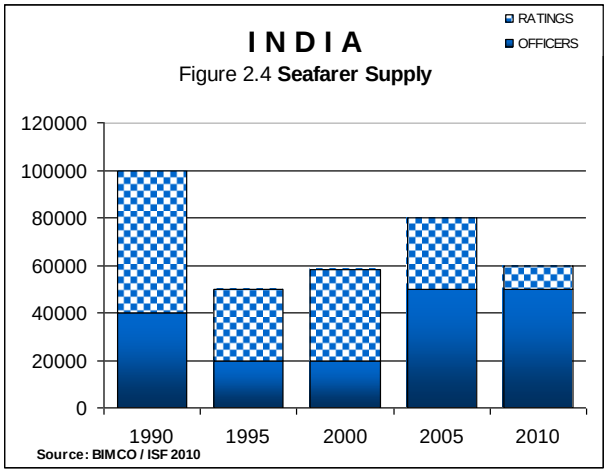
Source: BIMCO/ISF 2010, compiled by author

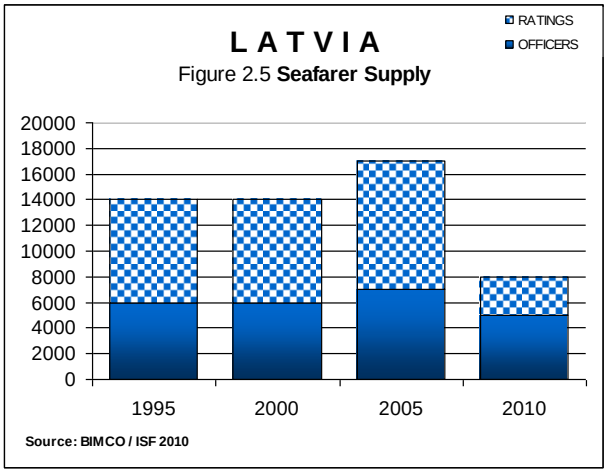
Croatian officers also feel attracted by seafaring as a career. This can be seen from data reported by BIMCO in which a significant growth of officer level is appreciated. There are

reports stating that Croatia is highly demanded for qualified officers, in particular for tankers vessels (Zvonimir 2012). Masters have resulted in scarce availability and a great number of officers are now being recruited from the Far East and Eastern European countries, including also Ukraine and Latvia. In terms of income, a Croatian Master's wage is approximately five times higher than the average GDP per capita of the working population (BIMCO/ISF 2010). In contrast, Croatia has undergone a strong fall in their ratings numbers and, now that it has joined the EU (2013), a further fall in this nationality is to be seen (Drewry 2012). (*See figure 6 above*).

Furthermore, for India, the situation in the supply of officers has faced a strong growth from 2000 to 2005, however it has slowed down from 2005 to 2010 (Drewry 2012). They are currently also facing difficulties in supplying their own fleet with qualified officers as 70% of the well-trained senior seafarers prefers to work on foreign flagged vessels due to more favourable tax relieves (Leggate 2004). India, as well as Philippines, have a long tradition in supplying seafarers to the international maritime industry but the availability of officers is becoming a problem. In contrast to the Philippines, the existence of maritime schools in India is very small in comparison to their total population (Deloitte 2011). Master's income in India is approximately seven times higher than the GDP per capita of the working population, making seafaring as a career option very attractive. Thus, as India continues to develop into a world power and continues establishing a greater number of maritime academies and schools, a strong future growth in supply of qualified officers will be expected (Drewry 2012), (See *figure 7*).

Figure 7 and 8. India seafarer supply and Latvia seafarer supply.





Source: BIMCO/ISF 2010, compiled by author

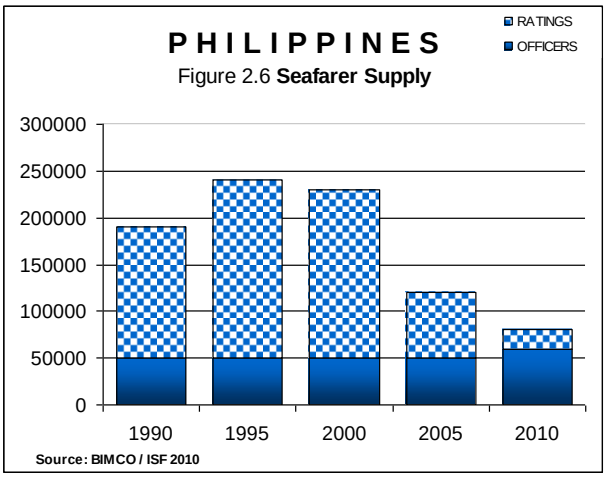
Latvia has joined the EU in 2004, since then the labour market has opened up which makes the Latvian still be an important supply of seafarers within the EU (Gailitis & Fjodorova 2014). The quality of their education and trainings is very well accepted by other countries and international institutions such as IMO or MLC, which consider it a high quality and skilful labour force (Cockroft 2003). However, the small number they yearly supply, mainly covers their own fleets and provides employment to very few other

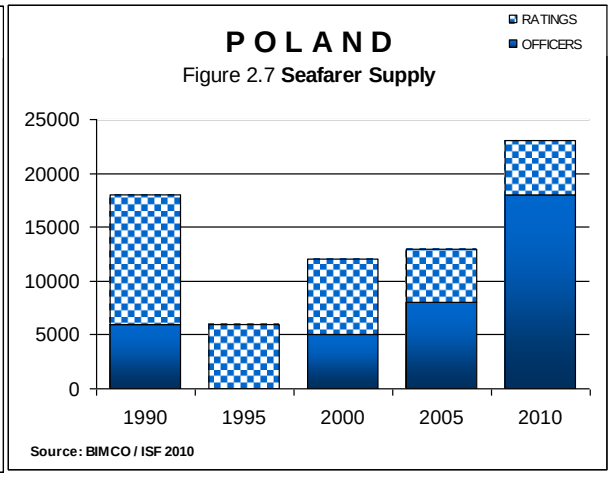
European countries such as Denmark, Belgium or The Netherlands, manning especially tanker vessels (Ellis, N., Sampson 2003).

As the world economy continues to struggle, the maritime career in this country is likely to stay attractive (*see figure 8 above*). A Master's income is close to five times higher than the GDP per capita of the working population (BIMCO/ISF 2010).

The Philippines, as principal supplier of the international fleet, will continue to provide a substantial number of seafarers. Despite this fact, a decrease can be seen in the supply of ratings, whereas the officers have slightly increased (BIMCO/ISF 2010). (*See figure 9 beneath*).The reason is mainly due to the inclusion of specialized positions on chemical tankers and LNG vessels (Lindgren 2011). The most impressive difference in terms of GDP compassion is to be seen in this country, where a Master's income is approximately fifteen times higher than the GDP per capita of the working population (Drewry 2012). Due to the lack of land-based opportunities in addition to the high salaries that can be earned, the attraction for seafaring is kept high in comparison to other vocations in the country. It has also been clarified that maritime institutes are increasing their capacity of students in order to respond the increase in demand expected however, as currently the quality of their institutions and academies in put in doubt, certain measures will have to be taken in order to continue providing the requested skilled and qualified seafarer's pool.

Figures 9 and 10. Philippines seafarer supply and Poland seafarer supply.

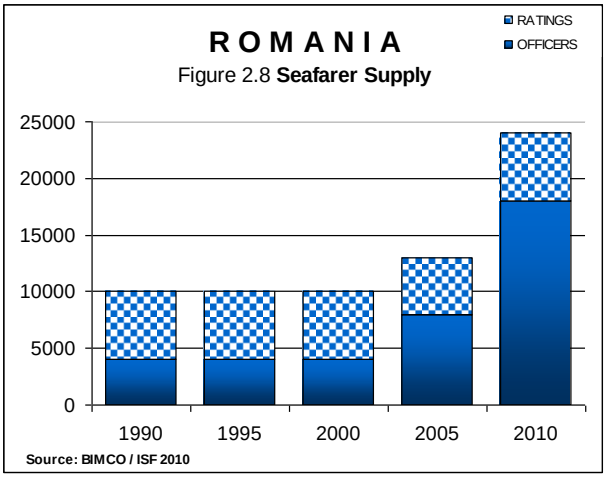


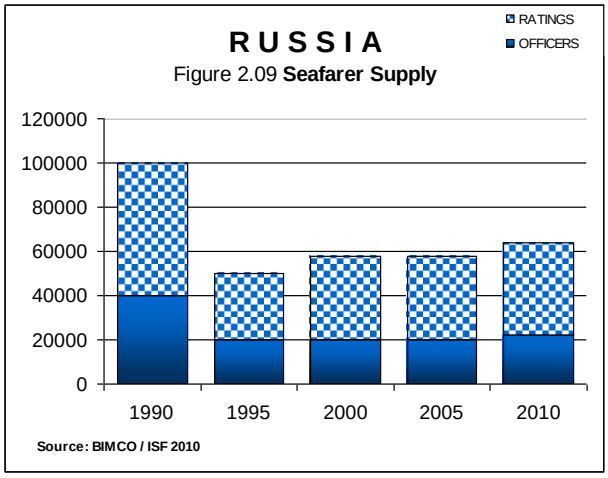


Source: BIMCO/ISF 2010, compiled by author

Continuing with Poland and Romania, they have both experienced a big increase in supply during the period between 2005 and 2010. Especially this can be seen by the growth in officers whereas ratings remained slightly equal (*see figures 10 and 11).* In Romania the maritime career is seen as a prestige and it is a pathway into higher education (Thomas et al. 2003). The respective Master's income for Poland and Romania are seven and five times the GDP per capita of the average working population.

Figures 11 and 12. Romania seafarer supply and Russia seafarer supply.





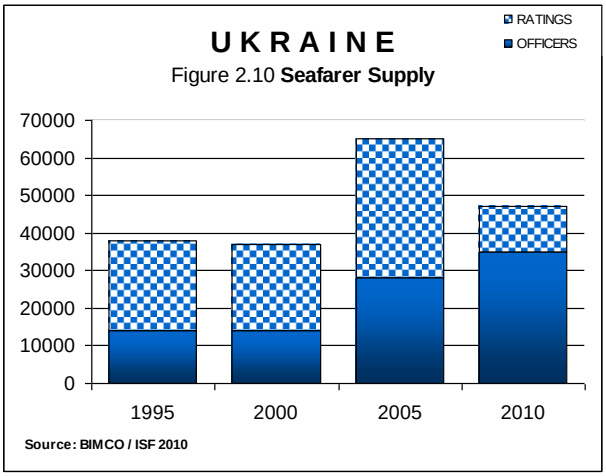
Source: BIMCO/ISF 2010, compiled by author

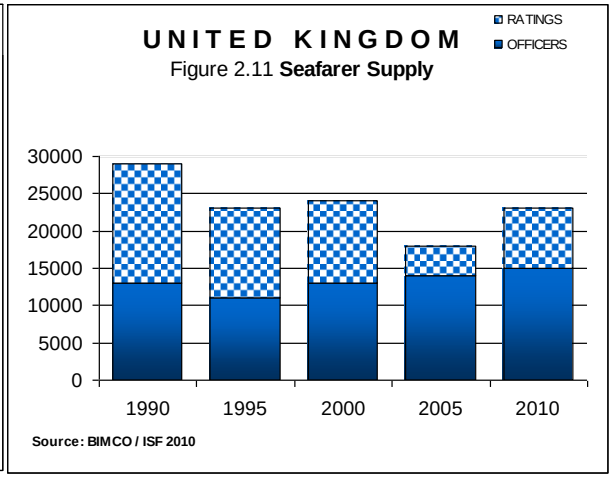
The supply of the Russian seafarers has remained quite constant for over the last decades and is not likely to change. The career is regarded well and the possibility of earning foreign currency, as well as in the Philippines is of added value for them (Burilkov & Geise 2013). Nevertheless, an increasing shortage of more qualified officers, especially engineering ranks, is expected (BIMCO/ISF 2010). A Master's income is close to five times higher than the GDP per capita of the working population (*see figure 12 above*).

Last but not least, the Ukraine seafarers have experienced a big increase in the number of officers as shown by the Drewry report (2012), in contrast to the number of ratings which shrank by a large amount between the period of 2005 and 2010 (*see figure 13 beneath*). It is currently the largest officer supplier within Europe with on average 5 officers for every 10 ratings. The quality of their education is considered to be good meeting all standards imposed by international organizations and European commissions (Drewry 2012). The Master's income is close to eleven times the GDP per capital of the working population which again, makes seafaring very attractive as career option.

The downturn of these countries which provide seafarers with good skills and highly qualified, is that they are in short supply and basically man their own fleets (Deloitte 2011).

Figures 13 and 14. Ukraine seafarer supply and UK seafarer supply.





Source: BIMCO/ISF 2010, compiled by author

Finally, the last country that has been studied is the UK. Since 2000 the recruitment of seagoing officers has six folded, this is due to the implementation of the "tonnage tax" which has allowed the country to stay competitive (*see figure 14*). This tax allows companies "commercially and strategically managed" within the UK to have their taxable profits from shipping activities determined according to the carrying capacity of the ships (Oxford 2013). It is a measure that creates a positive fiscal environment in both, to keep shipping companies within the country and at the same time, creating incentives for inward investors. This implementation has important positive outcomes in terms of jobs as they retain skilled labour and contribute to the economic growth (Brownrigg et al. 2001). It is quite usual to see that companies in the UK have the obligation and must commit to train new recruits every year nurturing and protecting new talent (Brownrigg et al. 2001). The Chamber Of Commerce (COS), states that this additional activity supports around 70,000 extra jobs currently within the UK (ICS 2013). To conclude, a Master's income is approximately two and a half times higher than the GDP per capita of the working population.

2.8. Conclusion

In terms of absolute numbers, the Philippines remains the main country supplier as we observe by the BIMCO (2010) and the Drewry (2012) reports. They have traditionally been occupying rating and junior positions, however, they can be found increasingly in senior ranks including specialist positions such as LNG tankers.

However, a future supply of qualified seafarers is needed to cover the large amount of positions for especially dry bulk and tanker vessels that are entering the market. The main concern will be how to provide such a big pool of qualified seafarers in such a short

period of time and still meeting with the standards required by international institutions and organizations (discussed in the next chapter). The educational systems of the main country suppliers has to be upgraded and avoid the fast track courses if they want to meet the European standards and get rid of the existent doubts in the quality of their seafaring labour force.

Furthermore, as doubts arise and demand for senior officer's increases, wages will do so in the same way. It will be especially seen in the so called the "top four officers" as the skills and qualifications needed are much higher than the ones for ratings which do not even require a bachelor's degree.

This increase has been studied by making a comparison in terms of the GDP per capita and shows that salaries are, in some cases, even 15 times higher than the GDP per capita of the working population.

In addition, younger generations lost the attractiveness in traditional maritime nations (Western countries) and shifted towards Middle-East and Eastern countries such as Croatia, Latvia, Ukraine or Russia China, the Philippines or India. As has been seen, the major sources of seafarers are from underdeveloped countries and which reason relays behind the price of their labour force. An exception to this is the United Kingdome, which maintains high skilled seafarers thanks to the implementation of the tonnage tax. This system allows the country to stay competitive in terms of taxation systems and allows them to provide a continuous pool of high skilled and qualified senior officers. Despite this fact, the number of officers supplied by them will not cover the big amount of officers needed in the coming years and which will shift more the attention towards countries such as China, India and the Philippines which potential maritime labour force is much larger.

Other factors will also influence the nationality election such as; a great dedication at work, discipline and employer's confidence, acceptance of cultural differences but, especially and most important, the knowledge of spoken English, as it is the main language spoken on-board.

Another factor that has been taken in consideration are the economic conditions, which is considered by many authors, to make a life at sea attractive again in western countries. Given the rise to high unemployment levels in European countries, this may make people re-consider stating a seafaring career and gain higher salaries.

Furthermore, the type of vessel has an influence on the wages, the more sophisticated the vessel is, (LNG, chemicals or containers) the higher the wage, in comparison with, for instance, bulk carriers. This is due to the higher skills and qualifications needed for these more complex vessels.

In conclusion, market demands are large with more ship builds coming up and less qualified seafarers to fulfil this demand. As the pressure relays by the main country suppliers such as the Philippines, India or China, they are developing various short courses and fast track education systems with will meet the fast prescribed minimum based on STCW certificates but as a result, will create an unfinished product, with no possibilities to grow to higher rankings (officer positions), and which will have negative results for the company, the ship, the crew itself and the global environment.

For this reason, strict regulations and minimum standards should take place and will have to be set by external organizations.

The next chapter will provide the most important institutions and organizations affecting the field and which companies, training centres/schools and the seafarers themselves, will have to meet in order to qualify and provide a safe labour force.

3. Conventions and documentation affecting the maritime industry; importance of the harmonizing of standards

3.1. Introduction

The supply of seafarers is influenced substantially by national and international institutions. Both type of institutions function on an independent way in the industry and establish the minimum requirements and standard guidelines that should be followed to ensure the safety and the quality of seafarers as for any other activity related to the maritime industry (McLaughlin 2012).

Furthermore, this responsibility of ensuring and setting labour and mandatory and regulatory standards has been transferred in most countries from the State to international organizations such as ILO and IMO. However, despite the fact that it has positive outcomes for the shipping industry in general, they lack of authority to ensure that states comply the with guidelines and regulations set by them and, is dependent on the voluntary co-operation of each nation (ICONS 2000).

This chapter will also cover the influence the Flag of Convenience (FOC) can have on the crew and its quality. Shipping firms have currently a wide choice when deciding where to register their ship and what flag and consequent jurisdiction will apply on their vessels. Shipping firms will then be subject to the standard national rules concerning the company, financial regulations (especially taxation matters) and the employment regulations (Strandenes et al 2013). These may influence minimum standards or manning levels, but also affects the quality on-board for the crew itself in terms of meals or working hours (which increase if manning levels a brought to the minimum).

Furthermore, the IMO established the first basic requirements on an international level, which is known as the Standards of Training Certification and Watch keeping (STCW). It was firstly established in 1978 and has undergone two major revisions; one in 1995 and the second one in 2010. The convention was set up in order to determine and set qualification standards for masters, officers and watch personnel on merchant ships (STCW 2010). Before that time, they were composed of a variety of practices in individual counters and they were very diverse among states and regions (Baylon, Angelica M. 2011). The STCW mandates the minimum standards (including sea experience), that global training institutions such as the Maritime Education and training (MET) and governments must meet. This license is now recognised worldwide and became an essential document for the profession.

These different organizations reflect the industry's acceptance of a universal standard of seafaring competence, regardless of where the seafarer has had his education and trainings.

3.2.IMO

The IMO is the United Nations specialized agency with responsibility of the safety and security of shipping and the prevention of marine pollution by ships. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented (IMO 2014a) .

This international organization is strongly aware of the necessity of harmonizing the industry as a whole and provides help and guidance to the maritime sector. In 2010 the BIMCO/ISF Manpower Update, urges the necessity for qualified officers more than the supply for ratings as their supply is not an issue. The IMO states that "the global shortage of qualified seafarers, especially officers who meet the minimum standard requirements, is growing and threatens the very future of the international shipping industry, which is the lifeblood of world trade (IMO 2014a). The organization is for that reason, actively involved in promoting seafarers to start a maritime career, this can be seen i.e. in the "Go to sea!" campaign. This initiative was launched in November 2008 in association with the ILO, the "Round Table" of shipping ship owner associations, including; BIMCO, ICS/ISF, INTERCARGO and INTERTANKO, and the International transport Workers Federation. The aim is to promote seafaring as an attractive option for young people of the right calibre, stimulating them and providing them with long-term career prospects, not only at sea but also on a future land-based job.

"If the global pool of competent and skilful seafarers is to meet future demand, then seafaring must be presented to younger generations as a viable career choice" (Cahoon 2008).

Furthermore, it created "The Day of the seafarer" on the 25th of June 2010, it is the day in which the revision and update of the IMO international convention of seafarer training, the STCW Convention, and its associated Code, were adopted at a Diplomatic Conference in Manila, Philippines. The aim is to provide an opportunity for everyone to show their appreciation (through social media), for the world's 1.5 million seafarers who face hardship and danger every day in order to keep the global economy afloat.

A beautiful message brought by the IMO Secretary General Mr. Koji Sekimizu was;

"On the Day of the Seafarer, let us pay tribute to the world's 1.5 million seafarers for the unique and all-too-often overlooked contribution they make to the well-being of all of us. Let us take the opportunity to remember all those things that came by sea and which we could not live without. And, most importantly, let all of us make this the occasion on which we say 'Thank you, seafarers'." 25 June 2012 Day of the Seafarer.

Mr. Koji Sekimizu

3.3. International labour organization and the importance of the MLC

3.3.1. ILO

The ILO is, as the IMO, a United Nations organization including 185 of the 193 UN Member States. It has been devoted to promote social justice and internationally recognized human and labour rights. Its main aims are; to encourage rights at work, promote decent employment opportunities (for all woman and men), enhance social protection and strengthen dialogue on work-related issues (ILOc 2014).

The organization recognizes that seafaring will always pose special hazards to life and health because of the hostility of the sea and the force nature and conditions of working on a ship (Greg 2013). It recognized that much could and can be done in order to prevent accidents on ships and increase safety and security of their crews. For that reason it implemented in 2006 the MLC (see in next paragraph), in order to design a better playing field and safety features for seafarers. Furthermore, it points out that still much can be done to improve quality at sea, regardless of the rigours of modern ship operations, the flag that they are sailing under or the type of trade they are in, seafarers should be entitled to good living conditions, with guarantees of regular pay, repatriation, medical care, regular communication with their homes, as well as social security and welfare benefits for them as for their families.

As a result, it identifies the need for these conditions to be harmonized and uniformed worldwide, which is particularly important for an international qualified workforce of a global and mobile industry.

3.3.2. MLC 2006

The MLC is an International labour Convention, also known as the seafarers "Bill of Rights" (MLC 2012) and was adopted in Geneva by the ILO in 2006, but despite this fact, it did not enter into force until seven years later, on the 20th of Aug 2013. This convention was the combined work of international seafarers and ship-owners organizations and which was later supported by Governments. It has the ambition to become one of the "*four pillar*" of international maritime law and embodies "all up-to-date" standards of existing international maritime labour Conventions and Recommendations, as well as the fundamental principles to be found in other international labour Conventions (Goulielmos et al. 2014). The other pillars are the SOLAS, STCW and MARPOL and will apply to all ships entering the port states as well as to all states flying the flag of a state party.

The MLC overwhelmingly supports new international law to protect abandoned seafarers and provide security for death or long-term disability of seafarers. The latest news from the Marine Philippine newspaper; Buhay Marino Dyaryo (June 2014), published that finally the Philippine government voted in favour to the amendments of the MLC and will soon enjoy better protection and address concerns on abandonment and ship owners' liability on seafarers' injury, illness or death. The Secretary Rosalinda Baldoz also stressed the need to review the rules, regulations on the recruitment, employment of seafarers and to align them with the standards prescribed by the MLC convention. This

is a very important step made by the Marina and which aim is to enhance the current doubt about the quality of Philippine seafarers by European countries.

The MLC is widely organized into five general areas;

- Minimum requirements for seafarers to work on a ship
- Conditions of employment
- Accommodation, recreational facilities and food and catering
- Health protection, medical care, welfare and social security protection
- Compliance and enforcement

Each of these titles consists of a number of Standards and Guidelines. The Standards will have mandatory force whereas the Guidelines do not, and will be left to the willingness of the parties to adopt them and is strongly related to the flag that the ship decides to fly. For this reason, the MLC places great responsibility on the maritime authorities of the flag states, for the implementation of the Convention, and requires them to report regularly on their compliance. A supervisory body, established by the ILO, will monitor the implementation of the standards, and is currently (2014) offering a guiding service to more than 100 countries all over the world. They will offer help by any misinterpretations and will track their courses and training regimes, especially in those countries which may have difficulties.

As it stands, the MLC 2006 has no direct effect on the security of ports nor security of ships, but it helps to improve the working conditions and quality standards of seafarers and therefore the quality and safety of the maritime industry.

This convention will definitely have an impact on the quality of the future pool of seafarers. In the long term, as many schools and academies are being forced, but at the same time, guided and helped to implement higher standards in their educational and operational courses and activities, the final product will meet higher standards in terms of qualifications and skills and provides a larger quality labour force to the maritime industry. However, these implementations may take time, and during this process, the qualified labour pool might seem smaller until the country fully adopts the new requirements (ILOc 2014).

The latest example can be seen in the Vietnamese country, which has recently led to the adoption of the MLC 2006 convention on the 8th of May, 2013. The standards of their educational system is not in accordance with international guidelines and many improvements will have to be made (ILOb 2013). These include the upgrading of domestic marine laws by 2015, comprehensive assessments and certifications for all Vietnamese academies, the establishment of a tripartite consultation mechanism and investment of public information for seafarers by 2020. This great efforts made by the country to bring the standards and quality of their ships and seafarers to international levels will positively contribute to the future pool of a qualified labour force.

In contrast, the number of qualified officers in the short term, will seem to decrease. In many countries such as Vietnam, Indonesia or the Philippines, seafarers will have to undertake new examinations to upgrade their certificates in order to meet international standards (ILOd 2013). This was said in an interview held to an Auditor from Bureau Veritas in Manila; Santos G. Maraida on June the 15th (2014), he mentioned that the MLC's 2006 enforcement is being a burden as it enforces on one hand, companies and educational centres, to meet higher standards and qualification levels, which will make the path for students to pass their exams and reach higher rankings even more difficult and, on the other hand, the existing pool of junior and senior officers will not be happy in having to take those additional examinations and will have to deal with the doubts of being considered as "unqualified".

Nevertheless, he also mentioned that besides this short to medium turn drawback, it is strongly needed as it guarantees an international and harmonized seafaring industry, eliminating inequities and standardizing labour rights.

3.3.3. STCW

The need for standardization came together with the need of an acceptable minimum level of competence and knowledge for the global seafaring population. The growing need for International Organizations to develop sets of rules and regulations, gave birth to one of the most important conventions which is the STCW.

Previously to the STCW, traditional maritime nations were the ones providing trainings and establishing rigorous examinations, but the real cost of trainings for cadets and apprenticeships was assumed by the ship operators (Checks et al. 2012). It has been seen, as a result of seeking the optimal relation between a quality crew and a cheap crew, standardizing education is a fundamental way of acquiring basic and additional knowledge for the ship's crew (Zvonimir 2012). As currently most of the ships are being crewed by a mixture of nationalities, especially when it comes to an officer level, the need for standardizing language, acceptance of cultural and ideological differences as well as mutual understanding between crew members, has become a main focus in order to diminish the negative effect that it could have on the overall safety of the maritime transport.

Furthermore, the introduction of the STCW 95 as amended, has introduced considerable changes in the training methodologies worldwide, but, as it has been so politically influenced, there are still many ways (depending on the country) of achieving the required licences (IFSMA 2007). Nevertheless, if you want to become a seafarer you will, on one hand, have to complete a shore-based training program and on the other hand, fulfil a period of sea service (the different educational paths are explained in chapter 4). This will allow the employee to obtain the required documentation. It will be mandatory for the officer's that pertain to the ratified countries by the STCW 95, to hold a Bachelor's of Science degree (to start at a junior officer level), a Continuous Discharge Certificate and Identity Document (CDC), most commonly known as Seamen's Book, a Certificate of Endorsement (CoE), which will be issued to officers holding a Certificate of Competency

(CoC) and a title endorsement from a “White listed” country under Regulation I/10 of the STCW 1995 Convention (IMS 2013).

The CoC is an internationally recognized document issued by flag states, to certify that the holder is authorised to perform the duties of a specific capacity like deck or engine and at a specific level of rating like, operational or management, on-board of a sea-going vessel (ECSA 2013). The document will also include the capacity and the limitations of the vessels that the holder is authorised to serve. All mariner CoC’s must be STCW 95 compliant and the 133 IMO signatory countries have the obligation to ensure its compliance (IMO 2014a).

Furthermore, on the 25th of June 2010, the Manila amendments to the STCW Convention and Code were adopted, marking a major revision and addressing issues that are anticipated to emerge in the foreseeable future (IMO 2014a). Amongst the amendments adopted, there are a number of important changes concerning seafarers working conditions and standards such as;

- Working hours and rest;
- Improved measures to strengthen the evaluation process;
- New certification requirements for AB’s (Abled seaman);
- New requirements related to training in modern technology such as distance learning and web-based learning;
- Updating of competence requirements for personnel serving on liquefied gas tankers (LNG);
- New requirements for security training, including piracy attack prevention, among others.

The STCW Code, amongst other guidelines, specifies the minimum amount of sea time that employees should fulfil before they obtain their professional certification. This sea-service period will reflect the experience and practical training that individuals have gained before they qualify, and will be then able to get examined for their professional qualification. This practical training period will depend on the vocation of the seafarer itself, if it belongs to the deck or engine department or depending on their rank (Crossworld 2014).

The STCW 2010 also accommodates new and innovative training methodologies like e-learning, simulator systems, specialized training in transport of liquefied natural gas, petroleum gas, and oil and chemicals tankers. This will help to provide a well-trained and quality labour force to supply the future high demand of those type of vessels and which becomes an area of new challenges in the coming future for the shipping industry.

3.3.4. International Convention for the Safety of Life at Sea (SOLAS)

The SOLAS convention is to be mentioned in this chapter as it is regarded as one of the most important of all international treaties concerning the safety of merchant ships (IMO 2014a). The first version was adopted in 1914 in response to the Titanic accident. But yet, the convention today in force is the SOLAS 1974, as amended. Its main objective it to specify the minimum standards for the construction, equipment and operation of ships, compatible with their safety. The convention includes Articles setting out general obligations and amendment procedures, followed by an Annex and divided into 12 chapters (IMO 2014a). Some of them include;

- Technical and general provisions
- Fire protection or life-saving appliances
- Safety of navigation
- Carriage of cargoes and dangerous goods
- Management for the safety operations of ships, etc.

The SOLAS amendments have, as well as the previous conventions, an influence on the quality of the seafarer's skills as they secure minimum standards and courses that have to be taught by academies and schools to the students in order to enhance and maintain the safety at sea.

Besides these different conventions created by the IMO and ILO, other important factors play a role in determining the hiring of seafarers and the standards that have to be met by companies and ship-owners. The "flagging out" is definitely one of these important determinants and will thus be covered in the next paragraph.

3.3.5. Flags Of Convenience (FOC)

Back in 1915, the crew members of a ship, the ship's flag (nationality) and the owner, used to have the same nationality (ITF 2012). The State was at that time, more concerned about maintaining an ample supply of seafarers for its national fleet rather than looking for cheaper labour overseas. A substantial change however, could be seen since the U.S Seaman's Act that entered into force that same year. This Act was the responsible for setting many aspects of safety, working conditions and for instance, meals standards on the US merchant fleet. The consequence of this Act considerably increased the vessels operating costs and American flagged vessels found themselves loosing competence among other foreign counterparts (Bruno 2010). The result of this, was a massive flagging

out of their vessels towards third countries which provided taxation and low wage advantages. Nevertheless, it was not until 1949 when the first open registry of a Greek ship "World Peace", was assigned to a Liberian flag, since then, it grew exponentially (Tobin 2008). The largest fleets by flag of registration as by January 2013 (in terms of dwt), can be seen in Panama 21.5 % of the world total dwt), Liberia (12.2%), Marshall Islands (8.6%), Bahamas and Malta (*see table 8 below*);

Table 8. Top Flags of Convenience.

Flag of registration	Number of vessels	Share of world total, vessels	Deadweight tonnage (thousands dwt)	Share of world total percentage
Panama	8.580	9,87%	350.506	21,52%
Liberia	3.144	3,62%	198.032	12,16%
Marshal Islands	2.064	2,37%	140.016	8,60%
The Bahamas	1.446	1,66%	73.702	4,52%
Malta	1.794	2,03%	68.831	4,23%
Cyprus	1.030	1,18%	31.706	1,95%
Isle of Man	422	0,49%	22.629	1,39%
Antigua Bermuda	1.302	1,50%	14.142	0,87%
Bermuda	168	0,19%	12.378	0,76%
Cayman Islands	174	0,20%	4.310	0,26%

Source: Compiled by author on the basis of data supplied by UNCTAD

By 2013, the first three countries account for almost 43% of the world's tonnage transportation which includes Panama, Liberia and The Marshal islands.

The downside of this so called 'flag of convenience vessels' is reported (ITF 2005; ILO 2001, Sampson 2003) to be exploiting opportunities to employ seafarers at lower rates that may even fall below the minimum requirement levels designed by ILO (Sampson, 2003). In contrast, shipping companies from traditional maritime nations such as Greece, Denmark or the UK, are reported by the same sources as offering better conditions of overall employment, better wages, backed up by payment contracts (Sampson 2003).

The ITF closely monitors the list of FoC registries as they consider this act as "the ability and willingness of the flag state to enforce minimum social standards on its vessels and it is a threat to the safety and the environment" (ITF 2012). In many cases the flag state cannot even identify the ship owner providing an environment for criminal activities, supporting terrorism and providing poor labour working conditions for seafarers (ICONS 2000). Furthermore, there is an overall criticism on the FoC registries as they poorly enforce regulations, with seafarer's often working long hours under unacceptable conditions, to the detriment of their well-being, health and safety and the safety of the vessels they work on (ILOc 2014).

Through literature it is observed, that vessels registered under FoC's do not help upgrade the standards for seafarers, little can be done to protect them as rules that apply on-board

are the ones of the country of the flag's registration. Even where the structural properties of the open registries are not openly deployed, the 'ideology prevails' of externalizing employment and prioritizing opportunism over more developmental investment in human capital in the search of sustainable competitive advantage (Sadjadi 2010). In contrast, Alderton et al, (2004), argues that ship owners in for instance the UK, were struggling to break even and often incurred in big financial losses by crewing their vessels with national people and with extremely high salaries. However, now under the new system, they are able to use the flag of Panama, or any other rather than its own, allowing the ship manager or owner to recruit qualified, but much cheaper seafarers (Alderton et al, 2004). Anyway, a statement made by a Chinese researcher Bin Wu (2008) is that;

"*Management may still say they wish to invest in seafarers , but in the most cases the human element ranks low in the order of strategic importance*" (Wu 2008).

However, other authors such as Sanders et al, (2013, p.10), consider that ship-owners carefully select the state under which they will fly their vessel. The financial and tax laws are important matters but they will not be prioritized over naval safety and security nor they will risk the qualified and competency of their crews (Strandenes et al 2013).

There is one last Act that will be covered in this chapter as it is considered to be relevant for this study. This is the so called "Jones Act ".

3.3.6. Merchant Maritime Act (1920)

The Merchant marine Act, which is more known by the name of Jones Act, is a US Federal Statute which provides for the maintenance and promotes the American Merchant Marine (MarineLink 2013). This law has experienced support due to the important economic and security benefit it provides to the nation. The essence of the Act is that all cargo carried by water between US ports, must be shipped on vessels constructed in the US, US-flagged, that are owned by US citizens, and that are crewed by permanent US residents or US citizens. Because of this reason, it supports a strong commercial base of seafarers, vessels and shipyards, generating annually 500,000 jobs (Malia & Hill 2013). Every American shipyard spawns four jobs elsewhere in the US economy, contributing with $29 billion in wages and $100 in total economic output according to a study by PricewaterhouseCoopers (2012) for the transportation Institute.

Once that the background of this Act has briefly been addressed, what concerns to this paper, is that it positively contributes to the global shortage of qualified officers and seafarers in general (MarineLink 2013). The act has been seen as a vital factor in helping to maintain strong workforce of trained, skilled and merchant mariners for commerce as well as for national emergencies. Furthermore, it protects seafarers from deplorable working and living conditions often found on foreign flagged ships (Maritime Law Center 2013). We only have to imagine what would happen if this Act would be abolished. This would gradually imply that vessels that are now being manned by US citizens, would gradually be substituted by crews from Eastern countries such as the Philippines or India, becoming this way more competitive in terms of wages. As these countries already have

high pressures in meeting the actual demand of qualified officers (Malia & Hill 2013), this shift would only increase the problem.

For this reason, '*ceteris paribus'*, it is believed that this act should not be abolished because it would considerably increase the shortage in qualified seafarers.

3.3.7. Globalization and harmonization of standards

The globalization of the shipping industry shows evidence that it does indeed create a downward pressure on regulation. It allows a large number of players to choose lower levels of regulation than would have been possible before the industry became truly global (Dauvergne 2005). Different strategies are undertaken by ship-owners in order to decrease operational costs such as, flagging out their vessels which allows them to be competitive in the global market and enables them to have an economic advantage and avoid costly regulations. Several mechanisms have persuaded registries to rise their levels of regulation including; port state controls, insurances and classification companies, international labour unions and seafarer's employment unions.

"As long as the flag states gain from running open registries and ship owners can benefit from avoiding international standards; the phenomenon is not going to disappear" (Braithwaite & Drahos 2000).

There is no doubt that a global regulation, by consensus of the whole shipping industry, is representing a big challenge (McLaughlin 2012). However, organizations such as the IMO and the MLC 2006 are playing a very important role in this process as already created around 40 conventions and more than 800 recommendations and codes through their organizations and will thus, play a main role towards a global and harmonized maritime industry.

As there are many players involved in the industry, including; ship owners, cargo owners, charterers, shipbrokers, ship managers, insurers, surveyors and inspectors, classification societies etc., the IMO as a global organization, has imposed its efforts in the international shipping (as said in a speech by the Secretary General of IMO, 2000) and has been able to standardize its activities.

The international community, through the IMO channels, has fully recognized the importance in the effort of maintaining and improving the maritime safety and environmental standards. A consequence of this, is that the human element must be properly selected, monitored and adequately trained (IMS 2013). In order to achieve these goals, international conventions like STCW and SOLAS have been thoroughly amended and are guiding and helping the increased number of countries which are joining them.

3.4. Conclusion

Maritime nations realized the need for a set of policies and public intervention in setting global regulations and standards to provide a continuous pool of qualified seafarers. This will facilitate the exploitation and bring opportunities in sustaining and creating jobs in the maritime industry, as they will provide security, protection to seafarers and increase the attractiveness of the profession. However, an interesting fact found, is that some needed measures that have been taken such as the enforcement of the MLC, are believed to be more of a burden concerning the education of qualified officers in the short run, as it implements strong guidelines which make it more difficult to reach higher ranking levels. However in the long run, as they more countries are attaching to it becomes a positive measure for the near future in order to achieve a harmonized and a standardization of labour rights, conditions and minimum standards worldwide.

Actions taken by the IMO, such as the “Go to Sea” campaign or “The Day of the Seafarer”, are very welcome in the industry and will, with no doubt, foster the attractiveness of younger people to join the career and enhance seafaring as a job.

Furthermore, the STCW ensures that the minimum levels of training are being met, and is a globally recognized document which will ensure that both, practical and theoretical knowledge for the global seafaring is obtained.

In addition, actions taken by ship-owners of flagging out their vessels will not be a positive measure to attract new seafarers into the industry, whereas the Jones Act should be kept active as it contributes to the supply of a consistent workforce of qualified officers within the maritime industry.

In conclusion, there should be a systematic exchange of information on the maritime industry and labour market on a bilateral, regional and multilateral basis, an exchange of information on maritime labour legislation, a harmonization of policies, educational standards (including the English language), and considerations should be given to encourage international cooperation between Members and relevant organizations in the maritime industry in general.

Now we have seen some of the most important external forces that influence and regulate the maritime industry such as international organizations or regulatory counterparts, weather that will be in a positive or negative way, the paper will now focus on how and what academies and schools of the different main supplying nations are able to meet these standards and supply with the qualified pool of seafarers strongly needed. Differences among countries will be addressed as well as an insight view of how training centres and crewing agencies deal with the ongoing issue of having to provide a fast growing pool of qualified and certified labour in short period of time.

4. Nautical education and training

4.1. Introduction

In the previous chapters we have already covered some of the variable that affect the labour market of qualified officers in terms of wages, economic factors, global trends in officers supply and demand, differences among nationalities or officers needed in terms of vessel type. All these factors are monitored by external international organizations which aim to harmonize and standardize the global maritime industry, eliminating inequities among countries in terms of education, training practices or labour rights. However, large differences can still be seen among their educational programmes and mandatory courses and which will be covered in this chapter. The educational structures of some main country suppliers have been chosen and which allows to study and compare the advantages and disadvantages that one structure has upon the other. Where are the bottlenecks created? Which system is considered to be more efficient? Why is the Philippine system being so criticized?

Additionally, a case-study of the K-Line training centre in Manila has been made in order to see how international shipping companies overcome the issue of the shortage in qualified officers by inbounding their education and trainings, especially for their own crew. This will make sure that they comply with all the necessary requirements and standards to serve on an international fleet. Furthermore, additional benefits such as an increased employee engagement and retention or the possibility of making all necessary adaptations when required, in terms of upgrading courses or handling new technological developments, will make this a pioneering way of providing updated, skilled and qualified labour for future demands.

4.2. Different paths of becoming a qualified seafarer

Before qualifying for junior positions, cadets are required to undergo on-board training programmes and document this in an approved record book of training. Part of this training will be under the supervision of a senior officer. In addition, they will have to pass an oral examination leading to the issue of the next rank and they will have to show confirmation of the required amount of sea service hours undergone (Crossworld 2014). In order to obtain their professional certifications, the normal route is the foregoing one, in which seafarers climb up by taking the necessary trainings, courses, and following educational programmes. The only possibility nowadays to make the step from ordinary Seaman (OS) to junior officer is by graduating with a Bachelor of Science degree in maritime studies. However, there have been other ways to become an officer in the past, as for deck officers, some may have started their careers as OS and became Able Seamen working themselves up and embarking consequently on an officer training programme (Crossworld 2014). This is not accepted by the STCW (95, as amended) standards anymore and a minimum period of three years of sea-going service is now required by the STCW as evidence (STCW 2010). In addition, they must attend an approved STCW shore-based preparatory course before embarking. However,

Regulation 1.3.4 of the STCW (2010) Convention for the minimum requirements for seafarers training and qualifications, states that; *any member which, at that time of its ratification of this Convention, was bound by the Certification of Able Seaman Convention (1946), shall continue to carry out the obligations under that Convention unless and until mandatory provisions covering its subject matter have been adopted by the International Maritime Organization (…)*.

For the engineering level, they can gain entry into the labour market by several alternative pathways, additionally to the one mentioned above. Engineers with for instance a degree in mechanical and/or electrical Bachelor of Science, can complete a conversion programme and become this way eligible for their marine engineer certification (Crossworld 2014). Another way of qualifying for engineers, is by being trained via apprenticeship schemes, gaining their experiences and knowledge from working on shipyards or heavy engineering industries and which consequently allows them to qualify and work as junior officers on a vessel. This will imply that they have to take several mandatory courses to fulfil the minimum requirements. In conclusion, to enter the labour market, candidates will have to attend to theoretical training courses additionally to working and training on-board but, depending on the country and academic institution differences will be found.

The problem that arises here, is the availability of vacancies for cadets, in order to fulfil their necessary sea service requirements which is a pre-requisite for obtaining their "professional title" (STCW 2010). These vacancies are determined by the available training berths that the industry provides in general, which is determined by the amount of cadet position that companies and ship-owners are willing to invest in (Leong 2012; Baylon, Angelica M. 2011). It is therefore a variable that cannot be very much influenced by external parties as the supply of potential cadets exceeds by far the demand (Ćorović, 2013).

4.3. Nautical education and different structures among countries

Now a days, the markets demands, when it becomes to qualified officers is large. A statement from the President of the Philippine- Japan Manning Consultative Council, Mr Eduardo Manese in 2009 was; "the plan is to hire 10,000 seafarers from the Philippines between the period of 2010 and 2012. This shows that despite the doubts of the quality of Philippine seafarers, some countries, in this case Japan, do not share this opinion and are happy with this labour nationality.

Despite this fact, more ships are being build which generates higher pressures for supplying countries to fulfil this high demands, reason for which standards have to be kept high in educational centres. MET (Maritime Education and Training) institutions should be enhanced in terms of curriculum design, facilities and equipment, quality of instructions, learning methodologies, and in all aspects that ensure a pool of high qualified and competent marine officers and engineers (Lewarn 2009). The necessity in this market is to invest time in the product needed (, in order to get supreme quality (Magramo et al. 2010). Unfortunately, what has been seen lately, is that various

academies and schools especially in the Philippines, have been introducing short courses which, despite the fact that they meet the minimum standards of the STCW (2010, as amended), these will create a labour force with no possibility to obtain higher degrees nor become officers in the future as they will not have a bachelor degree (Crossworld 2014). During the International Maritime Conference (2008), Ambassador Stale Torstein of Norway, encouraged maritime schools, especially within the Philippines, to give importance to quality-based maritime education and training to meet the demands of the global shipping industry.

Becoming a seafarer does not only imply graduating in certain courses and obtaining a degree, it requires constant upgrading of certificates, taking extra courses during leave periods, or updating the their skills to manage the outcome of new technological developments which might affect the operations on-board. Learning on the job has traditionally been the way to acquire this practical experience however, and according to ship owners, this option has become obsolete and the preferable choice became the new simulation systems (Baylon 2011). These might be provided by academies or by the shipping company themselves (Cross 2011). The obvious reason behind this, is to avoid the extra manning on-board thereby reducing operational costs (McLaughlin 2012). Additionally, it eliminates the provision of a mentor which needs to supervise this cadet and errors committed by the apprentice will have no serious consequences when working with simulators. For this reason, the application of lifelike simulation equipment is found to be a good alternative and will be discussed in the K-Line case study further on.

As many organizations and researches mention, the maritime education should be practice oriented and enhance these simulator based learning however, with the current reality that seafarers do not stay at sea for long, the need to provide a good theoretical background is of extreme importance (Magramo & Eler 2012). This implies the need to identify and develop more defined career paths that will enable them to transition successfully to life on shore after fulfilling their commitment at sea (Deloitte 2011).

Through the existent literature, three different systems were found;

- The traditional system,
- a gradient system and
- the University system

The first, combines theory and learning through practices, which usually makes career development easier. It is made out different blocks of 2 to 3 months (including different types of courses) and with a total length of 5 to 7 years, depending on the student and on the position for which they are being prepared. Countries using this system are eventually the UK and some Asian and African countries. However, the tendency is gradually being replaced by other more efficient systems, such as the gradient one. This type of education path is much more popular, and it is applied in most of the seafaring supplying countries like Philippines, India, West Europe, US, Australia, Canada and Egypt. This system includes a navigation practice of 6 to 12 months and a total period of 3 to 4 years after which, the student will acquire a Bachelor of Science degree and an STCW certificate OOW (officer of the Watch), for deck or engine. The gradient system is being applied on independent Universities, colleges, academies and State Universities.

As the Bologna plan entered into force, an extended number of countries (especially European countries) started using this system for the education of their seafarers, having as a result a trained and well educated and qualified employment pool (Ćorović 2013).

Concerning the third system, which is much alike the gradient one and which is still being used in countries such as Spain, Greece, China, Poland, Russia, France, Bulgaria, Rumania and Slovenia. This will, as well as in the previous system, provide with a BSc diploma and with the further option to extend their education on postgraduate studies.

The importance fact here, is that the quality of the MET institutions that impart these educations varies significantly by country, lacking of a universal degree standard for MET to be recognized across borders (Baylon, Angelica M. 2011). This will need significant investments to be made in establishing and supporting MET programmes which can be done by; encouraging partnership of the public and private sectors, standardizing MET programmes and credentials so that degrees and graduates are accepted across borders, recognize certificates from maritime universities and academies as equivalent to bachelor degrees, ensure that STCW certificates issued by countries such as the Philippines are recognised in all countries or by encouraging shipping companies to cooperate with MET institutions and ensure effective education and training, based on scientific rigor (Magramo et al. 2010). Additionally, the need for a linkage between practical skills and management techniques will enhance the quality of the final product (Ćorović 2013).

Difficulties will however be found by the MET institutions to establish these improvements such as; the continuous pressure to meet the latest technological developments (simulators and other supporting technologies), the need of high qualified instructors preferably with hands on experience or the willingness of the ship-owners to invest and collaborate with the private sector.

4.3.1. Philippine educational system

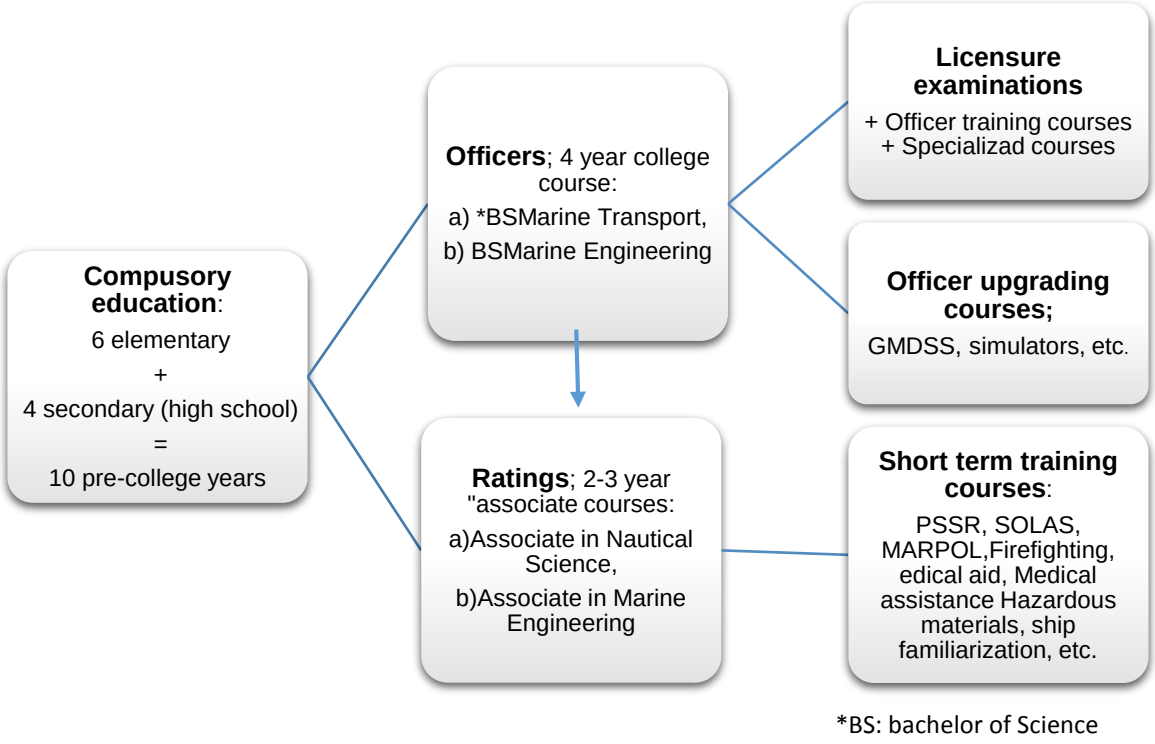
First of all, the educational structure of the Philippines will be approached, as it is considered to be the largest seafarer supplying country and has the world's largest number of (Maritime Education and Training) MET institutions (95), followed by Russia (38), Ukraine (26) and the UK (25) (IMO 2014a). The average enrolment is of 71,200 students between the period 2006-2010, and with about 16% of the students graduating after four years of school work (Amante 2003). Besides most of the maritime schools offering short (upgrading) courses, they will alongside, offer the regular degree programs. It is to mention that, the only governmental educational owned facility is the PMMA (Philippine Merchant Marine Academy), the rest of the academies are entrepreneurs with commercial interest (Lewarn 2009).

In order to approach the Philippine educational structure, the chosen academy to gather information has been the Philippine merchant Marine Academy (PMMA). This state-owned organization is located in Zambales and is considered to be one of the "top 3"

most reputable centres in the country. The path to become a qualified seafarer is as follows;

The Philippine education consists out of a four to five year college degree programme for junior officers (deck and engineers). In order to be admitted by the academy, the student will have completed six years of elementary school plus four years of secondary education. However, many maritime schools offer a “ladder-type” or “short track” program after completing 2 to 3 years of schooling. Students will then be given an “associate in nautical or marine engineering degree” prior to cadetship and, with which thereafter hopefully they find a job as ratings (Lindgren 2011). The downside of this system is that it will not generate officers in the future as no BSc is obtained, contributing only the demand of ratings which is not of concern in this paper (*see figure 15 below*);

Figure 15. Philippine Maritime Education



Source: Seafarers International Research Centre, compiled by author

Seafarers will get their diploma upon completion of all requirements. This includes both practical and theoretical experience. After that period they will be eligible to take their licensure examinations, as can be seen in the above figure, and become marine junior officers. For the ones who fail or do not finish the licensure examination they could find employment as ratings.

In this four year program, many subjects will be covered with a combination of general courses such as social sciences, mathematics, physical sciences or humanities, in combination with nautical related and technical courses. Additional military trainings are undertaken by the Naval Reserve Officers Training Corps (NROTC) and which will require 4 to 5 hours a week (PMMA 2014). As English is the most spoken language on-board vessels worldwide, all schools adapt it as their main and only language to impart their courses plus additional communications skills, such as written, grammar and literature will be required as part of the program (Amante 2003).

In the Philippines there is a Commission of Higher Education (CHED), which is a governmental agency regulating education on a general level, including also the maritime sector. All accredited institution shall be subject to regular monitoring and assessment and if found not complying with, or not maintaining the standards, said institutions shall be deleted (CHED 2005). As follow, CHED will require all institutions to follow a similar structure in the educational process. Nevertheless, some variations can be found such as the 3-1 model; this model consists in three years of theory plus one year on-board as a cadetship training. The 2-1-1 model; two years of theoretical study, one year on-board, and the last year "as refreshment" of what they have learned, back to the classroom. A last and third model is the 1-1-2 model; which is one year theoretical practice, one year on-board plus two years classroom schooling. However, the last two models are especially used for students under the sponsorship by the "*Project Alpha*" of the Norwegian Ship-owners Association. This program has sponsored over 5000 cadets graduated with Bachelor's Degree in Marine transportation and engineering by 2013 and works in strong collaboration with "Top 4" Universities from the Philippines, including PMMA (NTC-M 2014). This collaboration is positive however there still exist the need of creating a pattern of professional education integrating a university first degree, professional training with the sufficient work experience, professional registration and the option of higher degrees, along the same lines as other professions such as medicine, architecture or law (Lewarn 2009).

4.3.2. UK educational system

Secondly, an outlay of the UK system will be interesting to understand; currently the training establishment is made up with a diverse actors, these are; government agencies (funding and licensing), ship-owners, training agencies and MET institutions (Gekara 2009). Since a new system was introduced in the mid 90's, the government does now play an important role in the industry as, on one hand, it co-finances the maritime Trainings through the SMarT (Support for Maritime Training) scheme and, on the other hand, it regulates training and licensing standards through the Maritime Coastguard Agency (MCA).

The average period for the whole cadet training course is four years in order to qualify with a third's mate Officer of the Watch (OOW) certificate. During this period, cadets go through five to seven different phases which combine college and sea-based training and which respectively have a duration of 16 and 22 months (Gekara 2009). However, there are three roots to achieve the final officer certification and qualification degree;

- Higher National diploma (HND) in nautical studies
- The Foundation Degree (FD), introduced in 2006 and,
- The Bachelor of Science (BSc) degree in maritime studies

Firstly, the undergraduate level, is the BSc or BEng (in engineering), which is the first level of University degree and which implies three years full time or four years with one year spent on-board. Secondly, there is the possibility for a postgraduate level, in which the student, after the BSc can continue with further education and can become a Master of Science in Maritime Operations or in Maritime Engineering (MSc). The can be a 1 full-time year or 2 year part-time. Additionally, the Fleetwood Nautical Campus offers all levels of education and which allow you to step in at any time of your educational track (B&FC 2014). Furthermore, there are some abbreviated training courses; the Certificate of Compliance "Chief Mate Unlimited", which has a duration of 36 weeks and, once the student passes this course it will be awarded with the HND in nautical science (certificate of achievement) plus the Chief Mate (unlimited) CoC (STCW 95 II/2). After the completion of a 36 months watch keeping training, with at least 18 months of watch keeping service (while holding Chief Mate CoC), enables the candidate to apply for the Master Oral examination.

4.3.3. US Educational system

Thirdly, the US educational system will be approached with data collected from the US California Marine Academy (CMA), this is a State owned Academy, as most of them are within the US, since the Merchant Marine Act came into force in 1936 (Watson 2012). In contrast with, for instance the Philippines or India, where the vast majority are private owned institutions, in the US just three privately owned have been found from which just one, The Maritime Institute Inc, in San Diego, is offering accredited US Coast Guard (USCG) approved courses. Furthermore, there is one federal State Merchant Marine Academy which offers fully State paid education funded by the US Department of Transportation but, which obligates the recent graduates to fulfil 5 years of active service for the US coast guard (USMMA 2014) and which is not the future which many youngsters are aiming for (Lane 2000). The rest of the state owned academies have an average cost of $25.000 which accounts mostly for the room, medical or transportation fees as the tuition fees are largely public funded (CAL 2014).

As a consequence, the path to attain an unlimited third Mate's license in the US is as follows;

The CMA structure followed is similar to almost all other academies and this will consist of a four to five year study wherein, depending on if it is a deck or engine student, it will undertake different types of courses such as natural science, maritime business, as well

as practical simulation hours. A last fourth year will be done on-board of an Academy-owned vessel and which will complete their education providing fully qualified and skilled students ready to embark (CAL 2014). After their graduation they will have a broad educational background which has been complemented with management skills and which offers them a wide variety of future career opportunities. Eventually, at this point of their career, the student still has the option to decide whether or not to embark or start a land-based career. If the student choses for the second option, he could decide for a career in law, management in a shipping company, or start a career as teacher which is highly demanded (Sampson 2003).

Furthermore, if the student choses to go on-board, after exactly one year of working experience he might be promoted to second mate, depending on his performance, and work his way up until obtaining his chief mate license (CAL 2014). This will however, include several board exams and additional theoretical and practical courses during 13 weeks to be fully qualified. The final step in order to become a Master Officer within the US, is that the candidate must add one additional year of experience to his CV while holding a chief's mate license.

4.3.4. India's Educational system

As said before, in India as well as in the Philippines, all academies are privately owned, by the exception of the Indian Maritime University (IMU) and which is the only university in the country imparting education in the maritime field (IMU 2014). As the vast majority of graduates provided to the industry are thus from private academies, the Vels Academy (one of the best know private academies within India) of Maritime studies has been chosen as an approach. In order to become a certified and qualified seafarer, the student must achieve firstly an undergraduate level (BSc) which is the first level of university degree. This consists of a three year, full time study or, in the case of aiming for an engineering position, a Bachelor of Engineering (BEng) will have to be obtained. This second will have an additional year (total of 4) as the complexity and tasks that need to be carried out on-board are higher than the ones of the deck categories. Furthermore, for cadets to become navigating officers on Merchant ships they will have to add one-year of practices with simulation systems or, when possible, on-board as junior officers (ISCF 2014).

4.3.5. Russian Educational system

In Russia the education is based on studying in State Academies or State Marine Collages and were there are no privately owned Maritime Educational centres in the country (Valmars 2014). This is a total contrast with countries such as the Philippines or India were the opposite can be seen. The total duration of the study is five to six years depending on deck or engine department. All training programs will be IMO and STCW

95 compliant and all National Marine Academies, Universities and Colleges are equipped with the highest technology and 'state of the art' simulation systems. This creates a final product with highly qualified and skilful seafarers, which have been trained with the newest technologies and are prepared and accepted by the international fleet. Despite the fact that this labour force is in strong demand, the number of seafarers supplied by these state academies is still very low in comparison with countries such as the Philippines or India (Burilkov 2013). There English level is also often put in doubt (Zvonimir 2012).

4.4. Advantages and disadvantages

What has been seen by studying the different structures is that, especially those countries in which the amount of privately owned academies was significantly larger than state owned ones, have a higher variability in courses and abbreviated educational tracks that lead them to become an officer. This is especially seen in less developed, Eastern countries such as the Philippines and India. However, it also appears that renowned shipping companies "impose" these type of educational shortcuts because of the highly demanded number of seafarers coming from those countries (Kennerley 2002). This provokes that the education for future officers is determined by a prescribed minimum knowledge to meet international standards and start this way their career on-board as soon as possible (Lewarn 2009). This does not enhance the needed quality of the seafarers and creates bottlenecks in the student's career paths for further development.

Despite this fact, countries in which marine training is controlled by the state or where private training centres are not allowed by law, as in the case of Russia, tend to face the most serious shortages of available seafarers. In contrast, if we observe countries such as the Philippines or India, were the opposite can be seen, as they encourage the private sector to develop maritime training facilities, becoming this way leading providers of seafarers to the industry (Deloitte 211).

It has to mention that shipping companies turned to cheaper markets as the Philippines, India or China where the quality of education has considered to be consistently 'different' in comparison with Western countries (Lane 2000). This is especially an issue in the theoretical part of their careers whereas on the practical skills there are no main concerns (Deloitte 2011). This differentiation has seem to grow due to the lack in the basic education in some countries, such as mathematical skills or the lack of the English spoken language (*Yu 2009, p.6*).

Advantages

Short courses;

- The student will be able to start their career in their early ages and become a seafarer and travel the world however

- The courses are created with similar subjects as the university degree but lacking of general knowledge subjects and with no focus on the English language
- Another important advantage is the experience they gain already in their early years on a ship, like life style, working ethics, familiarization, etc.

University degree;

- Broad theoretical knowledge
- Good comprehension of the English language as it is a mandatory course to be followed during the studies. Better future career perspectives, as the shift to a shore based will be easier having a broad background

The disadvantages

Short courses;

- The lack of theoretical and, general knowledge courses
- Poor English language as the student will normally learn it “on the job”, this can cause frustration among crew members as they are unusually created out of different nationalities

University degree;

- Later start with on-board practices, thus no previous experience on a ship
- Short adaptations/adjustments in their knowledge, especially on the practical side will be needed for their adaptation on-board

In conclusion, short courses offered by private schools that, as far as they do meet the minimum standards required (STCW 95, as amended), creates a divergence in knowledge among those that did go to university. These last will gain excellent knowledge and will need little time to put this knowledge into practice. You create a better final product if the curriculum comprises a wider amount of subjects such as multimodal transport, port operations and in general, subjects pertinent to the effective management of a modern shipping company (Haralambides 2006). Furthermore, the questionable English, especially from Eastern Europe and Asia creates barriers and could represent major problems in the near future (McLaughlin 2012). Thereby there is a need for those colleges to address the problem by, on one hand, impart all courses in English and secondly introduce an English course within the program, solving this way the future problem.

Additionally, without taking in consideration whether they have a university background or not, to keep the quality of seafarers they have to constantly update their knowledge, especially because of the advanced navigational technology, higher standards in maritime safety, new administration systems or environmental aspects. Today ships are becoming more automatic and in some cases the requirements are higher than those

defined in the STCW (95) Convention (Shicheng 2009). For this reason, among others, many large international companies inbound their training and educational facilities, being able to supply their own qualified crew.

In order to understand how this is done I have been given the possibility to walk around the K-Line facilities and observe their educational and training methods they use.

For K-line shipping company, a “Quality seafarer” is the one with good experience on-board, perfect English language, excellence in seamanship, computer operations, ship management knowledge, interpersonal communication and professional virtues and commitment. I order to ensure that their crew members hold all those qualities, the only method is the “do it yourself” one. For that reason, the next pages will be dedicated to this matter.

4.5. How international companies approach the manning shortage. A short case study of the “K” Line Maritime Academy (KLMA) in the Philippines

4.5.1. K-Line (case study)

The K-Line (Kawasaki, Keisen, Kaisha, LTD.) Maritime Academy (KLMA) has been chosen as a case study in order to offer a descriptive-qualitative method of research. This centre has won many awards and is pioneer in training their own future crew and overcome this way the shortage in qualified officers, with which all crewing agencies and shipping companies are struggling with. It will show how this company is inbounding their trainings and are capable of delivering optimum training services to its clients despite the global economic recession, which greatly affected the shipping industry (K-Line Academy 2014).

“The schools are the producers of seafarers”. These important words were said by the president of K-Line Maritime Training Centre, Mrs. Virginia Linesis. The competence of new graduates are constantly being questioned and this affects the future career of the seafarers as the one of the company. One observed issue is the competency of the teachers. Teachers are eventually retired senior seafarers as their knowledge of the industry and experience is incomparable to others who have only a theoretical background. The next issue is that these teachers have not recently disembarked from the vessels so their knowledge and skills, as far as new vessel types are concerned, is insufficient (Eler et al. 2012). In K-Line additional programmes for them have been setup in order to update their knowledge and continue providing, this way, top class education.

K-Line has set up five different Academies extended over different continents. The first one, which is located in Japan is specialized for instance, in cultivating senior officers for dangerous cargo carriers, the other ones are more generally dedicated and provide top quality seafarers at the end of their careers. The rest of their Academies are located in India, a third one in East Europe, a fourth in North Europe, and the one visited, which is the Academy KLMA Academy in Manila (Philippines). In total they provide 56 Training

courses, and has almost reached the number of 50,000 skilled seafarers trained, since they started in 1993. The aim it to accommodate 10,000 trainee per year (Company profile report).

They provide training beginning with the very youngest, as cadet trainees, up until the highest rankings such as 2nd officers and Master's. As they have inbounded the complete training process, they will be able to head hunt those who are talented and promote them by offering scholarships. This is a strategy used to ensure the coverage of qualified officers for the K-Line fleet.

K-Line is not only pushing student's forwards but also keeps strong relations with the collegiate levels such as high schools. The reason for this is that some graduates are not even able to add fractions as they graduate after school and lack of basic skills which are needed to enter the Academy. This is observed through several tests which they will first need to make as they apply by the Company. That way the Academy will be able to give extra attention to some lacking skills and equalize their knowledge with the rest of the students. It is an increasing problem, especially in third countries that the elementary basis of youngsters is missing! As Stephen J. Cross stated in an interview;

"It is important to invest in the bottom, as it is the fundamental basis of the future"

After the first year of the course, if they have chosen to proceed, they will have to undertake a philological examination to determinate who among the current students is fit to continue. If they pass this aptitude test they will then be educated and trained to become officers. The company will not sign anyone on-board unless he/she is ready and well trained because, the confidence even of a cadet, is essential (President Captain Edgardo, T. Baratang). They will thus, be fully familiar with the type of vessel they will be joining.

Furthermore, as the industry has been suffering a shortage, especially regarding the engine officers, K-Line has been the first company to offer a “bridging program”. This consists in providing the additional education to mechanical engineers in order to become marine engineer and balancing out, this way the shortage. However, these additional trainings will be fully STCW compliant and approved by international standards (K-Line policy, 2014).

In K-Line different working environments are perfectly simulated, including; state-of-the-art Bridge practices, engine rooms, cargo handling simulations, a brand new fuel purifier system, a refrigerator training unit (including two different types of reefer containers), boiler combustion control trainer, additional welding and lathe machines, cooking laboratory, and the installation of multimedia projection equipment is available in all class rooms to ensure effective instructions can be given together with a hands-on training. One of the most distinguished features in K-Line is the impressive Marine Diesel Main engine training facility set up in Manila. This $2.5 billion Kawasaki-MAN B&W S46-80MC-C Diesel Engine, housed in a 4-storey equivalent building and provider marine engineers practical hands-on skills which ensures vessel’s effective maintenance and safe operations at all times. The training facility is said to be a “one-of-a-kind” in Asia.

The similarities with real-life practices are impressive, where even sounds and movements of the vessel are simulated. Real life trouble shooting situations are created in order to prepare seafarers to deal with equal problems on-board, this way action can be taken with shorter lead times and reactions is more accurate.

Furthermore, the revised version of the STCW Convention (2010) fully recognizes this type of training and is considered an essential element in the improvement of the level and safety of seafaring operations. There is though, a financial draw back in acquiring these teaching tools as the investment for this very complex equipment can have a similar cost to the one of buying a real vessel. However, this method of own-crew supply could have very favourable benefits in the future by increasing considerably the retention and recruitment problems and eliminating the uncertainness of officer’s shortage.

4.6. Conclusion

It has been seen that there are several paths of becoming a qualified seafarer, differences among nautical education structures have been seen but can be broken down to two. The first is the traditional system which combines at the same time practice and theory and especially still used in the UK and in some Asian and African counties. However, this system is being replaced by the Gradient system which has been implemented, like in all Universities, by the Bologna plan, and became much more popular using a four year theoretical approach with additional and mandatory practices before embarking on-board. This system is currently applied in most seafarers supplying countries like the Philippines, India, the US or Western European countries.

Furthermore, the short courses which are given by some academies have the advantage of combining theory with practice since the beginning, allowing this way seafarers to start their career in their early years. However, the downside of it is the lack of general knowledge which can be used in future shore-based jobs. Additionally the limited English skills will also become a burden on today's multi-cultural vessels. In contrast, the wide knowledge needed will certainly be covered in the University's approach (Bologna 4-year system).

Schools and academies should take these differences in consideration and add English as a basic and only language spoken during the education process and provide not only the courses needed to embark a vessel, but complement them with a wider program which will allow seafarers continue their careers in the future. There cannot be seen a harmonized and general educational system among the different countries studied which creates uncertainties in the quality of the seafarers (Cahoon 2008). This is negative in a broad sense, as it affects shipping companies which doubt of the seafarers abilities, crewing agencies and the most important of all, it creates insecurity to the seafarers themselves.

The ability among countries to pursue a maritime education is a key concern in preparing qualified seafarers. As technology rapidly transforms the shipping industry, educational institutions and shipping companies must continue to make considerable investments to ensure that their programmes are current and relevant, or risk falling behind (Deloitte 2011).

As has been seen with the K-Line case study, some international companies are already foreseeing this problem and started inbounding their trainings by providing themselves with simulation equipment and making sure that the provision of qualified officers will constantly be available. New technological developments can be implemented in short periods of time keeping the crew totally updated.

The next chapter will embrace this issue in more depth as these technological developments are taking place in a rapid tempo and do considerably impact the maritime industry. As a consequence of the previous, there is a gradual capital-labour substitution, future trends are changing the way the market operates becoming more capital rather than labour intensive. Many authors address this issue and state that, it improves the quality of seafarers on-board and additionally embraces safety, security and regulatory

concerns. But what effect does it have on the quality of seafarers? For this reason, the next chapter will address the main points to take in consideration, in order to understand how it is having an effect on the number of seafarers supplied by the market and what the future trends will be. It will also include other variables such as the importance of labour recruitment and retention, the attractiveness of sea based jobs in comparison to shore-based, and the influence of woman in the industry.

5. Capital labour substitution and other factors and variables affecting the shortage

5.1. Introduction

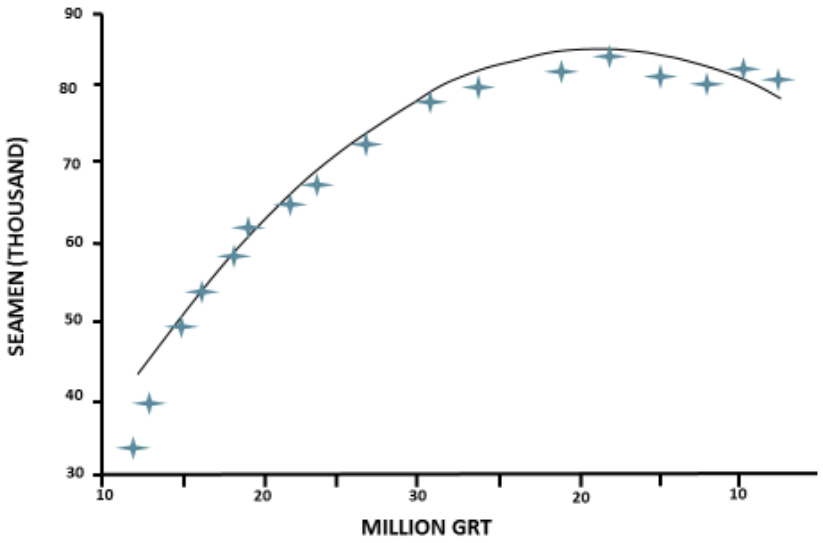
As mentioned, this chapter will address some other factors that are considered important in the twenty-first century and which have a considerable impact on the amount of officers supplied world-wide. The human factor is of essential importance, but is at the same time the number one cause of maritime accidents (75-96%) (Sadjadi 2010). However, this percentage includes architects and engineers who built the ship and related equipment, on-shore managers who handle the ship commercially and technically and of course the seafarers working on-board. This means that an increased use of technology, which implies standardization of processes, could reduce the amount of accidents and injuries (Magramo et al. 2010). Furthermore, the importance of retaining seafarers in the market is essential as the loss of know-how becomes big when seafarers do not want to continue their sea-based career or even worse, they definitely abandon the maritime market and search for a job in a different industry. The need of presenting the maritime industry in a more attractive way is crucial, as eventually the image cannot be considered very positive if we look at it in a broad contest. Thus the marketing for new entrants plus the recruitment and further retention of seafarers must be considered in the company's management. Last but not least the role of woman will be studied and some reason of their small contribution will be given.

5.2. Capital labour substitution

The future of ships is not so much a technological challenge but more safety, security and a regulatory concern (Goulielmos et al. 2014). Nowadays, conventions are rapidly adapting and changing in order to improve safety of navigation. The burden can be found however, on the requirement of additional education and trainings in order to keep up with these developments. It is not easy to track all new and sophisticated equipment, so it is the task of the human resources and the management within the company's to assure their employees gain these additional skills, education and trainings needed staying fully qualified to sail on modern vessels (Ćorović 2013).

It has been seen that there is a direct relation between the size of a merchant fleet and the requirements for sea-going labour in chapter 2, affecting that way not only the quality but also the quantity of seafarers required on-board. However, professor Haralambides (1991, p.18) in his econometric analysis of the sea-going labour market, studied that, the rate of increase on employment at sea has been growing in a considerably lower rate than the rate of increase in tonnage (Haralambides 1991, p.18). Even though the data has not been upgraded, the quadratic curve (*see figure 16*), which shows the least-cost combinations of capital and labour required, to produce various levels of sea transport service, would have a similar shape nowadays.

Figure 16. Capital- labour substitution in shipping (1960-1970)



Source: Haralambides, 1991, compiled by author.

The curve shows a relative decline in seaman towards bigger levels of gross tonnage. Thus the bigger the ships, the smaller the relative increase in labour needed. I also suggests a declining factor price ratio and a subsequent substitution of labour for capital (Haralambides 1991, p.19). This model estimates that an increase of, for instance, 700 GRT in the average ship size would reduce the industry's labour requirements by more than 5000 seamen, which means that technological developments in ship size and automation has an impressive effect on the demand for sea-going labour. Besides the impact on crew, new technologies now have less emissions, meeting more environmental standards, higher standards of equipment, more energy efficient and greater levels of automation. Most of the new-builds are designed to run with less human intervention and with less maintenance required at sea. What is then left for the crew, is the mundane housekeeping activities such as painting, oiling or greasing with the rest of the tasks being outsourced to onshore maintenance crews (Cahoon 2008).

Furthermore, officers still need to pass difficult navigational examinations, even though the calculation of routes is not done manually anymore being replaced by electronic charts. The bridge is now been monitored rather than being handled, where thus higher level decision making skills are being reduced towards more operational decision-making (Goulielmos et al. 2014). If we think about it, this could cause frustration among seafarers which ask themselves why they are currently being trained on star navigation with obsolete tools if the vessel requirements are totally different. This could cause job satisfaction to decrease, if these high levels of training end up in doing a totally different type of work (Cahoon 2008). If MET institutions do not take this into account, negative consequences will follow up such as; a reduction in job retention as consequence of resignations from the job and making companies to incur in higher costs, as they will have to recruit experienced seafarers, which are qualified in those new technologies, in a market where the scarcity of these qualifications is high (Devanadera 2009, pp.37–50).

The reduction in the relative number of crew members affected in addition, the working environment on a vessel. This is due to the fact that working on a vessel involves living in a micro-isolated community, were interaction between members is essential to maintain a minimum social life. As personal interaction decreased on one hand, on the other, thanks to the introduction of wireless internet on most of the modern fleet, contact with the seafarer's families can be done more often. This has been a response of shipping companies especially to younger people, the so called 'generation Y' which demand and live in an advanced IT environment making an extensive use of social networking applications (Cross 2011). Anyway, big complains still arise as seafarers are now working in high levels of isolation in demanding physical and social environments with longer working hours and little time for socializing or sleeping.

5.3. Future trends

Shipping has historically been a very conservative market, but is currently facing a revolutionary modernization on many aspects (SmartCompt 2013). Companies are acknowledging that a longer-term view is necessary in order to secure the future of shipping and the crew's satisfaction. Today, we can observe how efficiency improvements, technological innovations or economic friendly improvements are being implemented in order to meet with international regulations and gain competitive advantage (Maragats 2003).

Some maritime expertise call it the 'e-volution' or 'e-nautics' and they refer to the transition towards new, technological-based, and digital standards of monitoring and operating vessels. These trends are driven by regulations, commercial necessity and global change (Bhattacharya 2014). Many subjects can be mentioned as for instance, nano-technology coating for waterproofing, long-last anti-fouling, special additives for fuel and oil etc. The design of the vessels have also seen many changes along the years, especially in terms of shape but also in materials used. There are studies being made, for instance, with carbon nanotubes (more known as Buckypaper), which is one tenth the weight of steel but 500 times stronger. It also needs less maintenance and it increases security with an un-slippery surface (MaritimeInsight 2013). This means that ships could save vast

amounts of fuel and improves its structural integrity, allowing even for wireless data to be transferred through its hull (Rockwell 2014).

The question that arises is what will this mean for the future crew? Will the potential of High Throughput Satellite (HTS) data links, innovations in bridge operations, hull design, and complicated algorithms allow ships to learn and sail by themselves? (MaritimeInsight 2013). These new HTS allows for software-defined beam-steering and run all applications via the cloud (big data) from any distance over the globe. There will be no necessity for software disks, desktop computers, neither on-board knowledge to constantly troubleshoot communication equipment (Adamson 2013). Recently, many articles in magazines and newspaper columns write about the possibility of crewless ships. It is mentioned that even it is not a present reality, the possibilities of seeing this happen are greater than the ones of an aircraft or a car. This can be explained due to safety reasons as a ship in case of collision could be set still and automatically anchored without causing damage, whereas this is not the case for a plane or a car.

Furthermore, the reasons behind these improvements, besides safety and security, are the obvious cost savings, along with the increasingly difficulty to sign up competent crew, prepared to spend months away at sea. Some voyages are likely to get even longer for ships carrying non-urgent cargo (slow steaming) which, even though it provides big savings in fuel costs, it would be at the expense of increased expenditure on crew for these longer voyages, both, in wages, and for the hospitality facilities required on-board. On the other hand, if we think about the possibility of removing the on-board crew, it could provide more space for cargo as the accommodation facilities and equipment (i.e. rooms, heating and plumbing) could be removed. However, essential to this, will be the employees with the skill-sets to analyse this big data which streams from the vessel to shore based offices and monitor real-time decisions. Nevertheless, business experts are already warning of a next worldwide shortage of people qualified to undertake this role (MaritimeInsight 2013). As a consequence, also many questions arise such as; who will be responsible if two ships collide? The ship operator? Technological provider? As we see, other aspects such as Maritime Law will also need to be adapted.

Moreover, this will be a gradual trend, and big changes such as ‘crewless-ships’ are not likely to be seen in the coming years. This means that the available crew today needs to upgrade its technological and IT skills and knowledge in order to be prepared and qualified for the future but, aside from this, also shipping companies and educational and training centres need to take these trends into consideration while recruiting and retaining the new generation of seafarers. What possibly can be seen is instead of seafaring backgrounds there could rather be an increase in IT or technological backgrounds.

The next paragraph will focus on the importance of recruiting and especially retaining qualified seafarers as the cost of finding and educating additional seafarers which meet the standards and qualifications requires, can be off-set by improved retention practices (*Thomas et al, 2003*).

5.4. Recruitment and retention

The shipping industry has been facing retention difficulties for two decades and it has become a big problem, especially among qualified officers (Leggate 2004). It is now clear that the intake of high quality candidates to the junior ranks by nautical collages, especially in Asia and Eastern Europe needs to increase. But most importantly, we need to ensure that there are enough bright candidates who are attracted to a career at sea and ensure that once they are trained, these cadets remain seafarers and work their way up to the top of their profession (Leggate *2004, p.10*)

During the last decade, unprecedented changes in the way the maritime industry approaches the recruitment and retention of qualified employees has changed. The dramatic globalization of economic activity has exacerbated the need to attract and keep high-performing employees, 'given this new reality, people may be the only remaining source of competitive advantage' (Whittington & Galpin 2010). It is only the quality of an organization's talent, its passion and commitment that is nearly impossible to replicate (Bhattacharya 2014). The retention of an employee is therefore essential and it is the task of employers to systematically make efforts to create and foster an environment that encourages current employees to remain employed by having policies and practices in place that address their driver's needs (Leong 2012). The opposite of retention is turnover, which is more likely to be seen within the maritime industry, especially on sea-based jobs and in which switching between firms, jobs and occupations is often the case.

One of the aspects of this turnover is that the mobility of seafarers between different shipping companies is rather high. As shown by the Rochdale Committee of Inquiry into shipping survey, 66% of all seafarers switches between companies while 32% remains within the same company for a period, at least longer than 5 years (J Fei, S Chen 2009). A second aspect is the high cross-sectorial movement of personnel, which has also been termed as "wastage". This is referred to the movement of employees in a one-way direction and thus a loss for the shipping industry (ECSA 2013). These employees will normally switch to land-based jobs as seafaring did not fulfil their personal and basic needs making them unhappy. As a consequence, they normally end up in a different market sector. A third issue, which can be seen widely through literature, is the perceived negative image that is associated with the industry. This makes it very difficult to attract younger people and recruit and train new talent, in order to build a qualified future workforce of seafarers. This last aspect includes also that, those who do decide to step into the industry, will only do so as a "stepping stone" to a different job and do not have it in-mind as a long lasting employment profession (Bhattacharya 2014).

The recruitment of officers and especially their retention is also a wide problem recognized by the OECD nations and some of which are adopting many measures in order to address this issue. The government of Denmark, for instance (home country of Maersk), has taken positive steps to encourage recruitment into the industry. They have implemented a "dual officer" training (engine and deck) system which is believed to be more attractive in terms of transferable skills (McLaughlin 2012; Leggate 2004). Also the UK, with the implementation of the tonnage tax, is making big efforts to maintain their officer level. However, a different approach has been taken by Hong Kong. In this city, a full support of the Government together with the Maritime Industry Council has set up a

sea-going Training Incentive Scheme since 2004. This training scheme provides financial incentives for younger ones to take up sea-going trainings as cadets, which paves the way to become qualified officers in the future (Lewarn 2009). At the end of their training period, the cadets will qualify to sit for the “Class 3” Deck/Engineer Officer Examination (Hong Kong Maritime Industry Council, 2007). This initiative also addresses future trends such as technological and IT knowledge, and ensures the flow-through of appropriate skills to the shore-based maritime industry, crucial for the future retention of the officers.

All three measures are having very positive impacts in terms of recruitment positions. As seen through literature, each country, depending on its own characteristics, will approach the shortage with a different strategy. This will be depending on the demand of officers needed and the availability in supply of that determinate country.

A positive relation exists between engagement on one hand, and productivity, safety and performance on the other (Whittington & Galpin 2010). But, the principles of employee engagement in the maritime industry cannot be compared to those of a shore-based job. This industry, by virtue of its truly international nature, has some unique features which makes drivers of the application, of the conventional application difficult (Albayrak, T., Ziarati, R., Ziarati, M., & Acar 2012). With, such a big amount of vessels sailing on foreign flags, 71% of the international shipping tonnage (UNCTAD 2013), the ship’s owner could be based in a different country than the ship itself (registered in a second country), as its operates in a third, and even the crew coming from a fourth. This sets forward the need to introduce greater flexibility on national requirements for the crew’s composition with the goal of achieving a ‘transnational crew that operates independently and cohesively of their nationalities (Deloitte 2011). Corporate identity and culture should take precedence over nationalities so that the crew acts as “one team” (Baylon 2011).

Another big deviation between shore-based jobs and a sea-based ones is the essence of the contract. These are always issued for a determinate period of time, normally between 5 to 9 months, with the possibility for extension up to 12 months, upon mutual agreement. In the event that a seafarers works normally on a contractual basis, the possibility that they return to the same employee is minimal. Even if they did return to the same principal, they may well be addressed to a different ship with different crew and even a different owner. These continuous changes of co-workers, owner’s management styles, recognition and appreciation of employee’s contributions or immediate manager or supervisor, discourages employees to improve their skills and gain recognition within the company (*Sadjadi 2010, p.18*).

As we observe, it has a different significance than if we compared this loyalty with a long-term shore-based organization. A study made by Bhattacharya (*2014, pp.8-9*) for the WMU (2014) declares these differences, and has detected that the strongest drivers predictive of engagement were the following; a first factor was referred to the support perceived by officers in terms of recognition at work, guidance and feedback, and seafarers being valued themselves. Secondly, was the work itself and the relation with co-workers, which has been one of the essential antecedents seen through the history of job engagement. A third factor is the working environment, with both, the work itself, as the interpersonal relationships on-board. Career advancement, could be considered as a fourth factor were officers can see their growth within the organization based on their performance and merits. In a global perspective, this factor has been found to be the

second most important driver of engagement worldwide (Watson 2012). Finally, the top drivers of engagement found in a global sense and across all age groups, are “the payment and benefits” (Bhattacharya 2014). However, as in the shipping industry manning levels are brought to the minimum, it may not be surprising if work pressures also becomes a driver.

Companies will need to adopt the latest human resources management techniques if they want to address and better understand these needs for seafarers. Enhancing compensations and social benefits for the seafarers and securing that those packages are consistent with international norms could be a first step (*Gekara 2009, pp. 13-15*).

A nice example can be seen in the Greek company Tsakos Columbia S.A, were Captain and owner P.N.Tsakos has already been a fervent advocate of defending that the ultimate and basic driving force of the Group’s success, is its people and the officers and crew on-board vessels. He devotes most of his time in his own people, attracting and maximizing human (male and female) potential and enhancing advancement of talent and committed associates both on-board and ashore. With future uncertainness ahead, he created the Maria Tsakos Foundation (International Centre of Maritime Research and Tradition), aiming to promote social acknowledgment of the maritime profession and further enhance its growth potential in the generations to come.

5.5. Attractiveness of the industry; factors influencing shore-based jobs and the small presence of woman in the seafaring industry

5.5.1. Preferred shore-based jobs

The introduction of new entrants into the seafaring industry has not increased proportionally to the attrition of experienced seafarers (Eler et al. 2012). This is a fact that concerns, not only European traditional nations, but also other OECD countries such as Japan, Austria, Singapore as well as Hong Kong. A wide range of alternative job options are better socially recognized and more lucrative and comfortable than seafaring and which has pushed it down as a career option (Barnett, et at, 2001). The youth in the 21st century looks for honourable careers with social status, five-day week work perks and clear upwards career paths. G. Eler and Barnett et al., (2010; 2001) both agree upon the fact that the incentives that are offered to officers are limited compared to professions on land-based jobs (Barnett et al. 2001). Especially in developed nations it has been seen that seafaring is not the preferred profession for youngsters as there are much more alternative career options than in Eastern and less developed countries (Glen 2008).

There is a need of creating a pattern of professional education, integrating a sea-based and land-based employment into a lifelong progressive path, this would offer age-appropriate career choices with higher post-experienced university degrees and senior management positions (Lewarn 2009). Additionally, J.Sadjadi (*2010, pp. 4-7*) stresses

out the need for companies to invest in identifying and developing more defined career paths for their employees.

Seafarers have traditionally covered land-based maritime industry positions as they are believed to have unique and superior skills to cover them (Goulielmos et al. 2014). This is still needed nowadays especially in the education sector, as these ex-seafarers have an extensive knowledge of the industry and are believed to provide the best quality education to the younger generations. As most of the positions that have been covered traditionally have been related to the operation departments, this will gradually experience a change as other types of backgrounds such as IT, network experts, etc., will be required in the near future in order to fulfil shore-based positions such as monitoring, cargo handling or data management.

It is globally recognized that employment ashore is generally preferred to employment at sea. However, as a consequence of the land based job market failure the propensity of young adults to seek employment at sea is growing (Haralambides 1991). This trend needs a fundamental renewal as attracting the new generation of seafarers to shipping is necessary in order to overcome the large existing quality shortage. Another issue studied by Cahoon (2008) is that, besides the existing shortage, an additional pool of qualified senior seafarers will be exiting the market due to the large upcoming retirement from the so called 'baby boomers' (born between 1946 and 1964). This large demographic workforce holds many of the senior positions on vessels and in organizations and with their retirement, vital corporate knowledge will be lost (Cahoon 2008).

Additional to this issue, which cannot be influenced, the focus should be on those that seafarers leave the job early in their career and transfer to a shore-based jobs, which many times are not even related to the industry (Leggate 2004). The main reasons behind it are the lack of appropriate qualifications due to their previous education (which has already been mentioned). They normally lack in management qualifications which becomes a problem for officers as at their 50's, when they decide to shift to a shore-based job, they will require minimum responsibilities in the company and a minimum salary which cannot be offered with their current qualification.

Furthermore, in a shore-based position, mobility and career progression can be done in an upward progression within the hierarchy (with the necessary education and ability), but it can also be seen a vertical movement in order for the young talented to gain experience before moving to higher responsibilities. In addition in shore-based occupations some accelerated promotions are offered to promising employees and which enables them to enter senior positions at early ages (ECSA 2013). In contrast, this sideway flexibility cannot be seen in the shipping industry which presents various limitations on this career progression. Some of these are;

- Separation between officers and ratings in terms of education, length of training, remuneration and number of steps in their career paths
- Distinction between the deck department and the engine department
- Lack of appropriate qualifications (i.e. general management qualifications for officers searching shore management positions (Barnett et al. 2001))

- Time needed to progress from one level to the next is fixed by the STCW (95, as amended) Convention

One of the best certification systems that approach this issue is perhaps the Dutch system, which offers dual engine/deck qualifications allowing this sideway movements within the career development to be made (Sadjadi 2010). Furthermore, there are many other factors affecting the desire of seafarers to turn back to shore. This is important to consider for the implementation of future measures to address the issue. A study made by the European Community of ship-owner's Association in combination with the European Transport Workers (2013) among 150 MET institutions worldwide, showed that the main concern of seafarers was the poor social life at sea, this would include being away from family and friends for too long. Internet communications was not mentioned but is assumed to be included. It is interesting to mention that non-European seafarers ranked this factor much lower than Asian countries, which can be attributed to the extended and strong family relations Eastern countries have. The same could be seen with other factors such as low payments and poor working conditions at sea, as those were also ranked much higher on the list by Asian countries rather than Western ones. Small importance was given to it by EU employees. Time and cost of obtaining higher qualifications was ranked high by all participants together with better long term career prospects.

Many international and forward-thinking companies are already trying to address this issue. They are taking in consideration that it is inevitable that a seafarer's career is not long-lasting and eventually he/she will be looking for a land-based job. If they improve their retention techniques and provide the employee with a long-lasting career path, these seafarers will not get lost in the transition but can become a skilled and qualified future employee in their own companies (ECSA 2013).

This will definitely foster career mobility and encourage younger people to enter the market with more promising future career perspectives.

Furthermore, approaching the need to encourage a greater number of people into the industry, a study about the reasons why there is such a small amount of woman entering maritime training schools and embarking vessels, will be done in the next section.

5.5.2. Woman in the maritime industry

While woman constitute around 50% of the world's talented pool, the industry is clearly not 'tapping' this human resource (Deloitte 2011). It can be seen through literature that the role of woman in the industry remains in low percentages, with only around 1-2% of the world's 1.5 million seafarers worldwide and being found most of them in developed countries and deployed especially in ferries, the cruise industry and on land-based jobs (Belcher 2003).

Despite the fact that seafaring has been treated as a solely male domain, woman have now begun to appear in maritime schools and are more frequently seen on vessels (IMO 2014b). It was since 1945 when they started to appear on-board as cooks, stewardesses

and radio officers, as the first woman cades has not been seen since the late 60's. There has been a growing interest in recruiting and training women seafarers since the late 90's (Magramo & Eler 2012), and which is most probably connected to the increased woman entering the global labour market.

Recent BIMCO reports are increasingly studying the advantages of woman on-board and focus on the possibility of recruiting and attracting more women into the maritime industry. This must be done at the early stages of their education by approaching them in college and by eliminating current challenges such as cultural, social or ignorance of the industry.

Moreover, there is evidence that gendered stereotypes continue to persist in the industry, mostly expressed by employers who had limited experience with employing woman as engineering or navigation officers (Thomas 2004). Cultural difference also seem to be an issue as for instance, Japanese culture does not accept woman on-board of their vessels (said in an interview to Virginia Linesis, President of K-Line). This view is shared with other ship manning managers that do not hire woman by their Japanese principals. In contrast, in an interview conducted by the Cardiff University it was stated that; employers that had worked alongside women seafarers, frequently gave positive accounts of their skills. They even have been rated as equal to, and indeed often superior to, men's performances. Erik Pedrosa or Captain Dias (owner of Wallem Maritime Services and former president of Crossworld Marine Services respectively), both share the meaning that the company is giving fair treatment to man and woman and that the entry of woman in the profession will help to combat the shortage.

Nevertheless, there has been a global change in the mind-set and they are gradually fighting their way into the industry (IMO 2014b). Where they especially can be seen is in higher management, policy making, finance, and regulation in shipping positions. For sea-based jobs the ILO conducted a study in 2012, which showed that the major ship types in which female seafarer's worked were Ferries (68%) followed by Cruise ships (26%), accounting both ship types for the 94% of the total women employed in sea-based jobs. This means that woman in charge of maritime cargo transportation was only 6% not being seen at all on tankers or dry bulk carriers (ESCA 2013). In terms of rating versus officers positions, only a 7% of female reach officers positions in contrast with male, with account for 42% (ILOc 2014). This shows how working places on-board for woman are still very rare, especially in officer's position.

However, if we want a greater participations on female in the maritime industry some supportive systems should be set up, an improvement of the working situation such as shortening of terms on-board or support them to be able to man different types of ships rather than ferries and cruise ships. Additionally, addressing the issue of loneliness on-board due to the low number of females is also an important fact which needs special attention (JITI 2010). Through literature it can be seen that the separation from home and family is one of the most significant sources of stress to seafarers but this is regardless their gender. In addition, women also seem to experience problems by gaining access to vessels for their initial qualifications and training and moreover, after this period, they encounter themselves with the rejection by companies, based solely on their gender (Thomas 2004).

All these measures should be addressed by all counterparties in the maritime industry such as the shipping companies which seem to have the biggest influence among the final decision of hiring them or not, crewing agencies, which have the power of supplying crew to an extended fleet, as well as international institutions, which are already making strong efforts and making big steps towards a more equalized industry. As said by Mary Landry (Rear Admiral, US coast Guard, 2012) in a speech for the IMO's 'Women at The Helm';

'Shipping is vital to our global economy and IMO, as a leader, should be preparing that next generation and that generations should be women and men'.

5.6. Conclusion

Concluding this chapter, several important factors have been approached that clearly have an influence among the present and future aspects in the shortage of qualified officers. First of all, it has been seen how the existence of a capital-labour substitution exists in the maritime industry, in which the relative rate of increase of employment at sea has been growing in a lower rate than the increase of tonnage. This means that technological developments are allowing to build bigger vessels with less crew needed to sail and maintain them. However, the education is not being properly adapted to this matter, creating frustration among seafarers which still need to learn star navigation and obsolete techniques despite the fact that the skills needed to sail the vessel are more directed by monitored and computerized software. This fact could shift the demand for common seafarers towards employees with IT or computerized backgrounds and skills. Despite the fact that not much literature has been found embracing this issue, some already fear that there will be a future shortage in seafarers with these qualifications.

Leaving aside technological factors and focusing on the importance of recruiting and especially on the retention of qualified seafarers, there are three factors that were considered; a first one is related to the nature of the contracts; as these are on average 6 to 10 months, seafarer's are likely to switch between different companies if they are not content with their principal, meaning that there is an existence of high mobility between companies. A second factor was the cross-sectional character of the industry were employment transfers from seafaring towards other market sectors. This movement of personnel has been considered as "wastage" and is a definite loss of knowledge in the industry. Thirdly, the seafaring career is considered only as a 'stepping stone' by many seafarers, before finding a different job, with better future career opportunities.

Furthermore, generally shore-based jobs are preferred among land based jobs. The main factors that influence this fact are the poor social life seafarers have on the vessel, the extended time needed to obtain higher qualifications or the short term career prospects that seafarers believe to have on sea-based employment. However, these reasons seem to vary among countries due to differences in cultures and countries development. The last factor approached has been the influence of women in the industry which has been found to be quite low. Several reasons are behind this matter such as the historical background, constant social harassment or unacceptance of determinant countries or

principals to employ woman on their vessels. This matter is however, being strongly supported and addressed by international organizations such as IMO and which promote the woman seafarer as they have proven to be as capable as men to carry out on-board jobs.

6. Survey among manning agencies and PMMA managers to address their experience among the shortage of qualified officers.

6.1. Methodology and justification of the process

Despite the emphasis on the general literature among previous authors, the need for a comparison between literature and managerial staff working for crewing agencies and the PMMA academy in the Philippines has been considered. This is to get a better appreciation on how they are manning and providing their crewing needs and how the deal on a daily basis with this shortage of qualified officers. Questions were asked to ascertain the following: measures taken by the educational institution and crewing agencies to address this problem, main difficulties they encounter on a daily basis, main factors influencing this shortage, measures taken to increase the attractiveness of the industry, with special attention on the younger generation and what ideas are behind the short participation of woman within the industry.

Unstructured or semi-structured interviews haves been chosen to approach management level employers/employees on one hand and, on the other, additional structured interviews (questionnaires) have been carried out. This will allow a statistical study of the issue, by finding out which are the main variables concerning employees today, and which are the ones considered in a future scenario (2025). The questionnaire will consist of a mixture of ten closed and open-ended questions, providing the work with additional primary data.

Due to the qualitative character of this study, questionnaires and interviews has been found the most appropriate way to proceed. This will allow to gather emerging practices among the sample of management interviewees, together with pre-coded questions from the questionnaires and get the possibility of additional insights.

Interviews are an exploratory and explanatory study type that allows to learn from the respondents and have a broader viewpoint regarding the research problem (Seidman 2006). The positive fact of this type of method, is that is has certain flexibility which, depending on the course of the conversation, will enable to possibility address new or different issues not covered previously in this paper.

A guiding tool has been elaborated (see *appendix 10.3*) of rather more specific questions in order to maintain the interview in-line with the topic of interest but at the same time, full flexibility and space has been given to the respondent to deviate towards their own concerns or fields of interest regarding the problem. Different points of view were provided by them and will allow to make an interesting comparison between their experience and the one obtained through the extended literature review.

6.2. Profile of respondents; sample

The population sample for the interviews has been carefully selected and completely consists of manager level employees. After a background study of these employees together with some recommended people, a sample of 10 people were selected to be interviewed. They have been considered significant for this study as they all work in relevant sectors of the industry and face the shortage problem on a daily basis. All respondents have extensive backgrounds in the field of interest and currently work in a critical sector for the supply of qualified officers; the current positions of all interviewees together with their contact details are attached in the appendix (see *appendix10.4)*.

The background of the interviewees is related to crewing operations, training and educational systems (including simulation mechanisms), but also sea-based experience. With an average amount of 20 to 35 years within the maritime industry, it is assumed that all respondents have the adequate knowledge to answer the questions on the topic of interest. In addition, most of them are experienced ex-captains or chief officers that ended their careers on-board and decided to continue working in a maritime, shore-based company. This has the added value that they do not only understand the current situation but, they have also faced many drawbacks themselves, in terms of standardization of documents, training specifications, satisfaction or dissatisfaction on-board…and will be able to provide valuable reasons towards possible future solutions for the shortage of qualified officers.

The snowball sampling method has been used to select the relevant sample of interviewees. With this method the sample emerges through a process of references from one person to the next (Denscombe & Martyn 2010). At the beginning of the research it involved just a few people, and they have been asked to nominate some other people who were relevant for the purposes of this research. These nominations were then contacted and, if possible, included in the sample. Snowball sampling is often used for small-scale research projects. The advantage of it was that the accumulation of the sample was quick, due to the multiplier effect, additionally to the fact that each person can be approached, in a sense, sponsored by the person who had named him/her. It is useful when there is no sampling frame and this way it is possible to identify and contact with appropriate participants. It is a sampling method commonly used with qualitative research based on small-scale explanatory samples and is compatible with theoretical sampling (Denscombe & Martyn 2010).

In order to conduct this study, an internship has been offered by Crossworld Marine Services (CWM) in Manila (Philippines). The relevance of this fact, is that this city has a massive conglomeration of crewing agencies which supplies the greatest number of seafarers worldwide (Amante 2003).This became a top location for them to establish, due to the proximity of the harbour (the Manila International Container Terminal (MICT)) as well as the airport, allowing Philippine crew to be dispatched once prepared to embark, in the most efficient way possible.

A big sample of interviewees has been selected within this company together with recommended people that are affected by the same issue of the shortage. These came from outside the company in order to avoid the biased character of responses and

included; two PMMA employees and one person interviewed from the Maritime Institute "Willem Barentz (in The Netherlands) which has with strong relations with the WMU. These three people have been interviewed as they have considered to be relevant for this study in terms of training and educational experience and their broad knowledge among the problem of the shortage in officers.

The total sample size of interviewees consists of 10 people which work for the following companies;

- Crossworld Marine Services, INC (7)
- The Philippine Merchant Maritime Academy (PMMA) (2)
- World Maritime University (1)

The nationality of all respondents, by exception of one (Stephen J Cross from the WMU), was Philippine.

Furthermore, for the questionnaires, the same procedure of snowball sampling has been used. They were brought personally to different manning agencies and distributed randomly on the 5th, 6th and 8th floor of the Sage House Building (Ruffino Street 140, Makati, Philippines) and on the 14th, 17th and 18th floor of the Corporate Plaza Building (Legazpi Street, Makati, Philippines). On these floors the managerial staff and operational employees work from the crewing agencies and has been randomly distributed among their employees.

On one hand, employees of CWM, have been included and on the other hand, employees from Bourbon Marine Services (BMS). With both companies located in the respective buildings mentioned above.

Four different departments of both companies participated within the sample of respondents, including;

a) Managers in the recruitment department (consistent of 5 different teams, each of them responsible for crewing the fleet of various Principals)

b) Managers in the placement and dispatch department (final procedures before embarking)

c) Managers in the operational department

d) Managers in the educational and training department

The sample size consists out of 35 responses (from a total of 50 questionnaires sent), thus with a 70% response rate. 15 of them were from Bourbon Marine Services and the other 20 where by Crossworld Marine Services.

The questioner sample can be found attached in the appendix (see *appendix 10.5*).

One may argue that the survey results might have been biased due to their geographic distribution of participating companies. However, the companies work on an international level, providing their services to a broad range of different companies worldwide (*see list of principals in appendix 10.6).* Therefore, despite that the responses came from the same region, and a limited number of companies, the survey results can represent values and practices of local, regional, national and international companies.

6.3.Research procedures including method of analysis

The aim of the interviews was to obtain information from people with practical experience in the industry and find examples that prove and show the gravity of the situation. They have also been asked to provide current and future measures, which are considered important to address the shortage of the qualified labour pool. Furthermore, they were asked to give their opinion on the impact that technological developments will have (or is having) on students and crew in the maritime industry.

As form of introduction some were mentioned such as; more automation, better communication facilities for the crew, or the impact of minimum manning levels on vessels. This was thought to be useful, because not much authors have previously written about it, and to gain some interesting points of view among the different interviewees. In addition, factors such as women's participation, the influence of international organizations, or the necessity of attracting a greater number of youngsters into the industry, was mentioned and consequently discussed during the interviews.

Examples and facts have been given by the interviewees that showed specific strategies used to tackle the problem and how these might guide to overcome the shortage within their institution or company. Additional valuable information has been provided and will be helpful to compliment the final discussion.

Depending on the type of company for which the respondents were working for, the interview would be guided towards their fields of experience, for example; the respondents pertaining to the PMMA Academy where conducted towards educational issues, harmonization and standardization of courses, licenses, or concerns related to the attraction of new generations in their nautical studies.

All interviews took place in the conference room of CWM by exception of one which was held in The Netherlands on the 7th of June 2014. However the rest of the interviews were performed between the 15th of July and the 15th of August. A previous background study of the interviewees has been done, and was asked to be confirmed at the beginning of the interview. Consequently, permission would be asked to make use of a recorder during the meeting and which all respondents agreed upon. The records would be used complementarily to notes taken during the interview. The average time of the interviews was 45 minutes and the tempo was appropriate with a relaxed atmosphere. Furthermore, there has been full collaboration among the respondents and they all took time and patience to contribute valuable information answering the questions.

The questionnaires have been designed to facilitate respondents answer in about 10 minutes, therefore most of the data retrieved from the respondents was in numeric, yes/no types, ranking questions and multiple choice. The software used to consequently analyse the answers has been an Excel spreadsheet and results were depicted in tables and graphs. The software was used to arrange data into tables, calculate, sum, average and other functions and consequently, create charts in the form of column-bar and line-charts. Graphical illustration were mostly used to portray data from numeric to picture as that helps the reader to see trends and the distribution in an easier way.

First of all, a pilot study has been made with a random sample group of three employees to test the questionnaire, this was in order to ensure that all questions were coherent and perfectly understandable. Thereafter, a printed Word format version has been used and distributed personally among the different floors and buildings mentioned previously. The questionnaires were handed in on the 15Th of August, and picked up in the same way between the 18Th and 20Th of the same month. Despite the short period given to the respondents to answer, the fact that they were personally handed in, allowed to collect a greater number of questionnaires, in a shorter period of time and, had the added value to personally thank them for their collaboration.

After all questionnaires were collected they have been, jointly analysed in an Excel spreadsheet. In order to classify the sample, their gender, company and department for which they work for, was asked. Out of the 35 respondents, 27 were male and 8 were female, from these, 21 work for CWM and 14 for BMS. Furthermore, 6 were managers in the recruitment department, 15 in the placement and dispatch department, 12 in the operational department and 2 from the educational and training department. The first question gives an indication of what the main reasons were of entering in contact with the maritime industry. The aim of this question is to see if the respondent's answers correspond to the reasons found among previous authors and which have been covered in chapters 1 to 5. The second question was to study the average age at which they want to shift to a shore-based job. This allows to compare the time needed to become an officer (*see appendix 10.7 for a complete list of ages and their respective ranks*) with the average age that respondents decided to quit seafaring and opt for a shore-based job. The aim is to find out how big the spill over of knowledge is in the industry and how this could be addressed.

The next assumption, in cooperation with managers in the operational department of CWM, has been used:

- If they decided to search for a shore-based job at an age before 41, it will be considered a large spill over of knowledge as the period of time they used their skills within the industry does not compensate the time and money invested in the education.
- If they decided to search for a shore-based job at an age between 42 and 50, it will be considered a medium spill over of knowledge as the period of time they used their skills within the industry does not compensate the investment but is considered to be reasonable.

- The third group is for those who decided to search for a shore-based job after their 51 until their retirement (on average 62), and is considered to have a small spill over of knowledge as the period of time they use their skills and educational training is similar to a shore-based job.

Question three was used to find out if seafarers had career opportunities when looking for a shore-based job and if so, which career options were the most available for them. This can help define the necessities of broadening their nautical education and training courses and expand their shore-based career options in a future. Avoiding the fast track education, which is very common in the Philippines, allowing for better future prospects for seafarers (Amante 2003).

Furthermore, the next open-ended question allowed ex-seafarers to mention the reasons which have made them chose for a shore-based job and will support the background reading of the thesis. The following questions was used to get an idea of the overall acceptance of youngsters entering the maritime industry. On one hand, from a non-seafarer perspective and on the other hand, from people with seafaring experience, showing their satisfaction or dissatisfaction of their previous sea-based career. This again, together with the previous answer, serves to support the background reading.

Additionally, a question was elaborated to focuses on the shortage of the 'top four' officers, and allows to compare which variables are considered to have the strongest effect on the future supply of officers in a current scenario (2014), and compare this with a future scenario (2025). It can give us an idea of which variables are not taken in consideration today but will be a burden in the future and vice versa.

There are different variables that authors such as; Magramo et al., (2010), Lane (2000), Sadjadi (2010) or Cross (2011) considered to be supportive to address the qualified labour shortage. A ranking has been made by the sample of respondents, in order to cross-check them with the previous stated ones in chapter 5.

To finalize, a question has been elaborated to rank the main variables which could influence a young student to choose a seafaring lifestyle. In order to prevent future shortages, the variables with high scores, can be used to promote the profession and the ones with low scores, will require special attention to increase the attractiveness of the industry.

Finally, findings have then been described and reviewed to draw tentative conclusions which can be compared and contrasted with the previous literature discussed in this paper.

6.4. Limitations of the research

The main limitation of this research is the small amount of questionnaires collected and perhaps the small variation of the sample because it consists of informants who belong to the network of CWM and BMS. However, the information provided by the interviewees

came from four different departments which manage 26 different principals. The interview respondents, in combination with the questionnaires has been considered a good data base which compliments the previous literature review. On one hand, the methodology itself has some drawbacks in comparison to more quantitative methods, such as the difficulty to maintain the rigor and asses and demonstrate, that the information provided is totally objective and not subject to personal experiences. On the other hand, it has important strengths as issues can be examined in depth by asking direct questions, research framework and direction can be revised as new information emerges and, data based on human experience is powerful and sometimes more compelling than quantitative data.

6.5. Ethical considerations

At the beginning of each interview the respondent will be highlighted with the ethics held behind the interview. Each respondent has been asked for consent to use the information strictly in this paper, His/her name will at any time, be kept anonymous if so desired.

The following information has been read out;

a) Confidentiality; because the respondent is sharing personal information, the future usage and treatment of the data was explained to him. The level of confidentiality will be provided, if disagree, the decision of the respondent will be respected and information will be kept anonymous.

b) Informed consent; by agreeing to the interview, the respondent is giving consent to obtain data from him/her. Obtaining consent is crucial considering the use of the data in the paper, i.e. to state a quote or testimonial or to agree or disagree on his responses.

c) Risk assessment; all potential risks of the interview have been considered. Although the interviews are held in an “informal way” of conversation (two people just talking about a specific topic), it is important to consider the consequence of using the data collected, especially if its use can incur negative ramifications to the respondent.

d) Promises/Reciprocity; what is the benefit of the respondent? The promise of receiving a copy once the thesis is finished and, a previous draft with the inclusion of their statements will be provided. At this point, the possibility of any changes was still possible.

e) Special issues regarding minors; not relevant for this study as no minors have been involved.

(Information adapted from the text; Interviewing as Qualitative Research Guide (Seidman 2006)).

7. Research results and discussion

7.1. Analysis of data and discussion. Interviews

Many respondents started with a laugh as the global shortage of officers was mentioned. Most agreed upon the fact that, as it is a global concern and a big problem that has been going on for so long, they seek for a solution concerning their own business interests and the one that affects them in their working environment. This has become a reality in many institutions, which make it difficult to move towards a combined solution. Nevertheless, Benedicto, vice-president from PMMA stated;

"The shortage is a global problem thus, the solution will have to be approached in the same way". Our institution is one of the top 5, high qualified and skilled seafarers supplying academies of the country, and works in collaboration with high schools and several organizations and departments (IMO, Maritime Training Council, Department of Transportation and Communications or the Technical Education and Skills Development Authority) in order to offer the country with a steady supply of qualified seafarers".

This led to the implications and the role that international institutions (such as the ILO or the MLC) have among the issue. Generally, the collaboration of these institutions have been seen as a positive factor for Crossworld Marine and the PMMA managers, however, criticised by some, as it imposes strong guidelines to be followed. On one hand, in terms of documentation (CoC's, seaman's book etc, discussed in chapter 3) and, on the other hand, on the imposition of mandatory courses that seafarers constantly have to validate by the MLC (*Chapter 3*). This is a burden for seafarers as they need to invest their free time in upgrading their curriculum. An example of this was given by Mr. Pelaez;

"*All CoC titles will lose their validity if they are not upgraded before December 2016. The problem with this now is the need to take MLC courses, which average 4 months. What will happen with all those Philippine officers that are embarked on a vessel during the expiring period? Will they all be sent home?"*

The convention affecting this issue is the STCW Convention 1978 amended by the 2010 manila Amendments and which contains new training requirements. Seafarers revalidating their Certificates of Competency (CoC) will be required to submit additional evidence to ensure the Certificate is valid for service on certain types of vessels after 31 December 2016 (MCA 2014). These additional elements include; courses in personal survival techniques, fire prevention, proficiency in survival craft and rescue boats, among others. Further details and implementation dates of these upgrading trainings are recently published in a Maritime Information Notice (Department of transport 2014), (*see appendix 10.8*). Nevertheless, it has to be mentioned that this ban would only affect Philippine officers on-board of EU-flagged vessels and will not cover ratings, making the gravity of the situation smaller, in terms of numbers, even though the problem remains if we consider the shortage in the highly demanded 'top four' officers (SeaShipNews 2013).

Crossworld Marine Services is already preparing for this future drawback and strongly encourages their rotating crew to take this matter into account, and start taking the necessary courses in their free time.

The factor 'wages', is addressed by the crewing company, were the respondents had a clear inclination towards the existence of an imbalance in supply and demand for senior officers. As prices are set where supply and demand are equal (in equilibrium), in the case of labour, the price is the wage and other employment costs, such as the employer-paid taxes and benefits. This is a case of labour shortage where there is more demand than supply of officers and which will tend to increase the wages and costs. The greater the degree of shortage, the greater the movement in change of wage cost will be. Despite this fact, there does not seem to be a problem in the supply of ratings (Glen 2008). The shortage of officers can clearly be seen through some illustrations; the HR manager Rochelle P. Reyes (CMS), gave a good example to understand the gravity of the problem and the high necessity of the "top four" rankings;

"In the Philippines there is a place called Luneta, located close to the disembarking area by the harbour. It consists of 30 to 40 stands, each of them pertaining to different crewing agencies. The aim is to capture all levels of qualified seafarers and create a seafarers pool in our data base for our future supply. However, if during the day a "top four" signs up in our stands looking for employment, the recruiters have the obligation to send the details to our office straight away! We will then immediately call them and invite them for an interview. If we don't do that, in a couple of hours he will receive a job offer from another agency and we will lose him".

In order to understand the necessity of this seafarer's pool within the company, we consider the following example; Crossworld works with a software which contains all vessels they have in management. This software will combine the different vessels with the crew needed to sail the vessel. The software will also allow to oversee the future vacant positions and will enable to prepare the necessary supply. For instance, the company will need the availability of more than 5 masters to cover the respective 5 position on the different vessels. The logical reason behind this, is the need for additional master's to create a rotation plan. When a master finishes his contract, he will have to be replaced by an additional master which will be provided form this "pool" created in the data base.

"*As master positions are very hard to find, creating a good pool, of employees in which you can trust, provides security to the company in these days of short supply"* Rochelle P. Reyes.

This seems to be a common strategy among crewing agencies in the Philippines, and which creates a sort of "fight" for those qualified seafarers. Another strategy used by the crewing agency and which many employees agreed upon, was the focus on the retention of their employees.

"*The treatment they get in the whole placement process is very important"* (P. Reyes). This includes giving them additional medical insurance (not only for them, but for their whole family), taking care of their wives, which many times demand housing or school allowances for their kids... However, it is often seen that the bargaining power of the

master/chief officer is much stronger than the one from the crewing agencies or shipping companies (Mr. Pelaez). Mr Pelaez states;

"*If a master comes to me with too high demands, I will not hire him! Some even ask me to place 4 or 5 relatives which is impossible to achieve nowadays. It also caused me many problems in the past towards our principals. This is because these masters have the same demands towards their crews, creating constant conflicts on-board. A personal strategy has been to offer the principal a master, together with one cadet instead of an ordinary seaman (OS), this way we both win, me placing the master and the shipping company by spearing money as a cadet costs less than the OS. It seems however, that other crewing agencies which are more desperate are willing to hire a Master at any cost"*.

The focus on retention and additional treatments, allows crewing agencies to gain competitive advantage among others and maintain their fleet fully crewed. The organisations that acquire or develop these combination of attributes will allow them to outperform its competitors.

Secondly, in terms of nationality differences, the respondents made a clear remark about the importance of Philippine seafarers, in general the respondents agreed upon the fact that; as they have a long traditional background in seafaring, they are known as hard workers, loyal to their co-workers, good in English and, being honest, they are a cheaper source of labour. What captain Diaz specified was;

"*Filipinos are the preferred crew by international owners among all nationalities because 1.) Filipinos speak English 2.) Wages are relatively lower 3.) Filipinos easily adjust to cultures of foreign owners, and work peacefully with other nationalities".*

Through literature (Amante 2003; Baylon, Angelica M. 2011; Magramo et al. 2010; McLaughlin 2012; Wu 2008; Eler et al. 2012; Glen 2008), it has been seen that most authors agree upon Philippines being a favourite nationality, however, some disagree on the quality of their English which could considerably be improved, especially among those who did not graduate from a prestigious Academy or University (Shicheng 2009; Ćorović 2013).

Furthermore, many respondents mentioned China as a new world potential seafarer supplier. Currently they are not the preferred crew, but what Captain Diaz predicts is;

"*In the same way as with European countries which, as they became richer, the demand for seafarers shifted towards less developed countries such as the Philippines, in a near future, this may also become a possible effect here. The rapid growth of the Philippines (an average of 5% a year), will shift demand towards even cheaper countries such as Chine, and India. This immense labour force could contribute to the actual shortage".*

In contrast, the Captain M. Benedictos from PMMA stated that;

"The Philippines will remain the main country supplier for a long time, as Chinese seafarers do not have the skills and seafaring knowledge we have".

Both points of view are understandable. On one hand, with a strong and stable GDP annual growth in China of 7.7% (BBC News 2014), and the immense amount of new builds entering the market (Drewry 2012), the Chinese seafarers supply has been

growing in a rapid tempo. Among the top country suppliers, China holds the lowest wages, even slightly lower than the Philippines (*see table 7 (chapter 2) for wage comparison and figures 5 and 9 for countries seafarer's respective growths*) thus a future shift, as Captain Diaz predicts, might seem a reasonable thought.

One the other hand, and taking in consideration Captain M. Benedictos point of view, the long seafarer's background the Philippines has, together with their desired skills, made them become the preferred nationality among international companies. It will take strong efforts by the Chinese to gain the skills, knowledge and English language necessary to become the first country supplier. However, the Chinese government, in strong collaboration with MET institutions, are aware of the need of improvement in the fundamental education of their large population, and are building a plan with favourable policies towards an international shipping community (Shicheng 2009). What can be concluded from this, is that eventually, Philippine seafarers are still the preferred nationality but the Chinese's conjunct efforts made different institutions, will enable them to become more attractive to serve the international fleet. This will considerably increase the worldwide supply in seafarers contributing positively to the shortage.

Additionally, as the economy grows in the Philippines, more shore-based jobs are becoming available, this means that seafaring will become even more unattractive, and people will prefer to search for a normal employment ashore (Baylon, Angelica M. 2011). All respondents with a seafaring background gave similar answers towards this reality; For instance, ex- Chief Engineer Marañon stated;

"*When my son grows up I will not encourage him to become a seafarer, but I will make sure that if he wants to become one, he receives the proper education to continue his career ashore when he establishes a family" I personally still consider there is a lack in streamlining the sea to shore employment. Most maritime institutes promise adequate on-shore opportunities but, when it comes to the point, those who want to shift to shore find it difficult to get a worthy job. Most of the companies ask for a good amount of experience at sea and even require an MBA or equivalent courses if applying for managerial positions. From my own experience, I found it very difficult to get back to my studies after so long and I also had family responsibilities…I think seafarers are able to foresee this and change their course early in their career".*

In contrast, when approaching this factor by PMMA respondents, with a more academic background, they totally disagreed upon this idea; R. Magsino stated;

"Our institution is aware of the future of our seafarers, and you are right! They will not stay at sea for very long so our students are fully educated and trained to become very qualified seafarers providing them, at the same time with an extensive number of courses which will allow them with no problems, to find a job ashore whenever they decide to".

Perhaps by these responses it should be borne in mind that, the PMMA is one of the most prestigious educational programmes (if not the most) of the Philippines and, shipping companies (which are hiring seafarers for a land-based job) know that. However, this means at the same time, that they continuously generate a solid, reliable and qualified pool of seafarers to supply the world fleet. Perhaps this educational strategy should be taken over by other institutions within the country, decreasing this way the future uncertainness of the students making their seafaring career more attractive.

However, some main reasons were given by the respondents in terms of unattractiveness of seafaring. *"I have seen many colleagues quit the job or even the industry as a whole as they were fed up of being on-board and far away from home" R.Reyes*.

All respondents mentioned or spoke about the unsettled lifestyle that comes along with this job;

"At the start of the career a seafarer would not mind having a "nomadic" kind of lifestyle, but after certain years, especially post marriage, he longs for a more stability". This is not a new reason behind seafarers quitting sea jobs, but it is still one of the prime reasons for professional dissatisfaction", Captain Diaz.

Others factors mentioned were: personal and family problems, health issues, rise in maritime piracy, poor social life, on-board politics, reducing crew members, stringent maritime laws, or reducing shore leaves. An interesting example of this last was given by training manager and ex-chief engineer, J. Marañon;

"One of the main reasons people join merchant navy is to see the world but now, with shorter turnaround times of ships at ports and the increased maintenance, crew members have to carry out, they are not allowed to go of the ship when it is moored. Even worse, many of my colleagues working on VLCCs don't even come to port for discharging or loading so they have no change to refresh themselves and get away from the ship's environment. This is in my perception, a frustrating factor which made many seafarers quit sailing".

Furthermore, an additional factor that has not previously been taken deeply in consideration in this study, was the lack of advertisement of seafaring as a career option. The HR department as well as the training department from Crossworld, both agreed upon the fact that younger generations should be properly informed of the benefits of becoming a seafarer.

"*Shipping companies should make yearly school visits to explain students the benefits of the career, what are the implications and options they will have in the future and additionally, invest in scholarships, covering expenses for trainings and additional courses once graduated". Most of the Philippine families do not have the money to send their kids to private academies, and getting in a public one such a PMMA is very difficult" J. Marañon*. (PMMA covers all expenses including meals and hospitality costs (PMMA 2014)).

The additional courses Marañon referred to, are the ones international organizations require to obtain the necessary documentation (such as the MLC courses explained previously) and proper certifications in order to be recognized worldwide.

In addressing the role of female participation, the proper advertisement of the industry could also help increase the number of female seafarers in the industry.

"*They are since college negatively influenced by their parents, friends at school or their boyfriends in a way as it is 'too tuff for them'. They should better find a job in for instance, nursing or teaching". This mentality can be changed by putting effort in reaching school by school and student by student and which I consider should be done by organizations such as the IMO".* A. Mendoza.

Other respondents were quite more positive with the role of the woman in seafaring.

"*Crossworld is taking in women cadets some of whom are now full-pledge merchant marine officers. I personally believe that women make better officers!" Captain Diaz.*

However, the HR department was not so enthusiastic about woman seafarers in the sense that; "*many principals, especially the Japanese ones, do not accept any woman on their vessels, this discourages us to hire woman as they are more difficult to place".*

This statement is partially true as most of Japanese Companies, if not all, do not accept women on their fleet (Magramo & Eler 2012). However, if all companies had this mentality, of not hiring women due to Japanese requirements, the chances for women would stay small. Thus, crewing companies should promote the positive values of this gender and show their different principals that they are as capable as male officers.

Finally, a common concern among the crewing agency's interviewees was the role that shipping companies and especially ship owners, had in the supply of qualified and seafarers for their fleet.

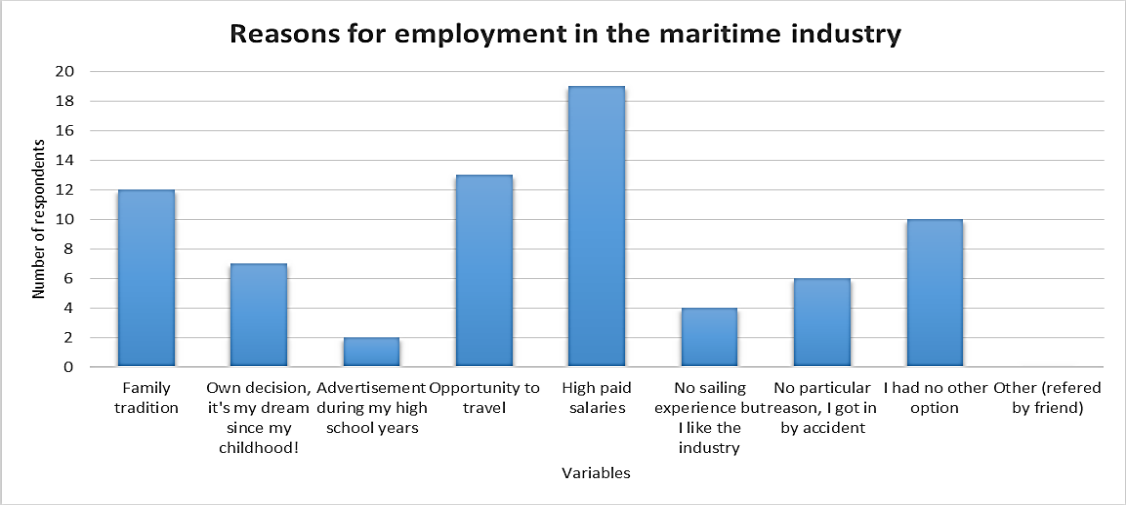
"*The basic factor causing a shortage of officers is the lack of attention and commitment given to the problem, by ship owners. This is the main reason!" In a near future, there is no other way than having each shipping company or ship owner investing in officer's development programs. Ship owners must invest not only in ships, but also in the people who will have the task to operate these ships!" Captain Diaz.*

What can be understood, is that most shipping companies simply rely on their manning agent, without realizing that manning agents cannot do much without the support of those shipping companies. Not much attention is given by ship owners to the worldwide problem of officer shortage (Burilkov & Geise 2013). What can be done as manning agency, is try to identify all potential candidates for promotion, and try to find a slot to promote them to a higher ranking, if qualified. The owner, principal and the manning agent has to come up with a certain program where each and every one is committed to produce qualified and certified seafarers for their fleet.

7.2. Questionnaire findings and discussion

The aim of this survey was to find the different variables that are affecting the shortage of qualified officers and which are considered to be the most important to address in order to approach a possible solution. From the previous literature review (Asyali 2009; Amante 2003; Baylon, Angelica M. 2011) eight variables have been selected and considered to be most relevant reasons which could influence a seafarer's decision to enter the maritime industry.

Figure 17. Reasons for employment in the maritime industry



Source: author's creation

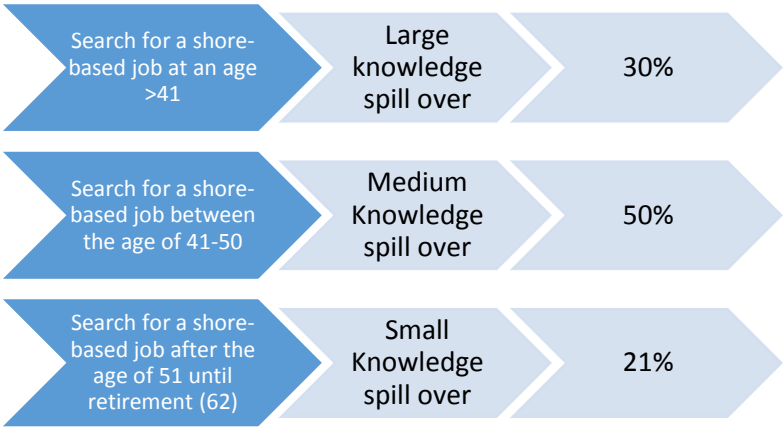
According to the surveys (*see figure 17 above*), high paid salaries (26%), opportunities to travel (18%) and family tradition (16%) seem to be the main reasons among the sample of respondents for entering the industry in the first place. However, a big group answered that they had no other option (13%). The reason for this last group to be so dominant is probably the lack of alternative career options which a country such as the Philippines offers to their young students. Nevertheless, high paid salaries have seem to be and still are the main reason for the attractiveness of this industry. In the Philippines, salaries can be up to 7 times higher (see chapter 2) than other jobs offered ashore in addition, earning in US dollars provides them with a greater security than earning their wages in Philippine currencies (pesos). As overall wages in the Philippines are considerably lower than in western countries, they do not often (if not never) get the opportunity to travel, fact why this is still such an important factor. In contrast, is we consider more western countries, this factor has considerable lost importance as low cost airlines recently offer flights that are affordable for almost everyone.

Advertisement at schools done by shipping companies, agencies or maritime academies was not experienced by the respondents. This is a very important factor that needs to be addressed and seems to lack of attention. There is a need to build a greater awareness of the profession among young people but also to invest in public awareness through campaigns (as the 'Go to Sea' Campaigns, from the IMO) in order to improve the image of the industry in general. At a company level, advertisements should also be done, organizations should make bigger efforts in strengthening their image or "brand" by communicating core values and corporate culture (Deloitte 2011). This absence was also mentioned in the interviews by Rochelle P. Reyes and Marañon.

From 68% of the respondents which were seafarers, the vast majority (79%) would however, decide to transfer to a shore-based job in the future. This is a common decision among seafarers (*see chapter 5.5*) but the early age at which they decide to do so,

generates a large knowledge spill over within the market (Cahoon 2008). The main reasons found in previous surveys (*see chapter 5.5.2*) were; the time and cost of obtaining higher maritime qualifications, a poor social life at sea and, the need for searching better long-term career prospects in a shore-based job. Additionally, in the interviews it was mentioned that the later you quit seafaring, the more difficult it becomes to find a job ashore (R. Reyes). As a consequence, the ages at which respondents decided to do so, were quit shocking when comparing to the time needed to achieve the top of their careers as master or chief engineer (*see appendix 10.7, with the seafarers ranks and respective ages at which they reach those positions*). From the sample of respondents, with their respective ages (2nd officers/engineers (28), chief engineer (30) and master (32)), an average age has been taken of (30) to achieve the 'top' of their careers, and has served as base scenario for the following classification (*see figure 18 beneath*);

Figure 18. Knowledge spill over classification



Source: author's creation

Furthermore, the respondents (which belonged to the group of ex-seafarers) were asked to provide the average age at which they shifted to a shore-based job in order to study the period of time they have used their training and educational knowledge. The results demonstrate that 30% of the sample left seafaring before the age of 41, considering this a large spill over of knowledge within the industry. Half of the respondents shifted to a shore-based job at an age between 41 and 50, considered as a medium knowledge spill over and only 21% after the age of 51. Within this last group, only two respondents worked until their retirement at the ages of 61 and 62 (averaged retirement age is 62 for working on a vessel (McKay 2007) and is not considered to have a knowledge spill over. The obvious reason behind this is that the length of their career path would then be similar to other professions such as doctor, professor or lawyer. Hence, the conclusions that can be drawn from this early seafaring retirement is that it clearly indicates the existence of a 'bottleneck' in the seafarer's career, together with the uncertainness of adapting to the new environment in a shore-based job (*see chapter 5.5*).

Seafarer's educational programs should be prepared and adapted to fulfil these necessities, including additional courses such as; administrative, maritime law, finance and especially the English language as a mandatory course along their entire education. A different approach could be to implement a transitory period (i.e. 3 months) in which seafarers are trained with additional skills or courses, required to have an appropriate shift from a sea-based to land-based career.

The career opportunities that seafarers mainly encountered, when looking for a land-based job, where at an operational level (30%) or managerial positions (17%). These where however obtained by respondents pertaining to the large knowledge spill-over group, which implies that they stopped their seafaring career before their 40's. The positive news behind this outcome is that, despite the fact that they stopped sailing, their skills are not considered to be a 'waste' (*see chapter 5*), as their knowledge stays within the maritime industry and does not get lost in the transition.

However, no career opportunities were found by a large group of respondents, when looking for a job in their first year after retiring from their sea-based job. This confirms the need to create an appropriate and broad educational programme during their years of schooling in addition to guiding and help facilities, such as on-line career platforms, for these seafarers that decide to make the transition.

Careers related to information and technology, finance or administration, where not considered by the respondents to be an option. It is understandable that after several amount of years working on a vessel, the skills that seafarers have obtained are limited to their ranking and position and little of it can be used thereafter, on a shore-based job. This supports the need discussed in the previous question of broadening the educational path and creating a program that not only is focused on seafaring, but includes also the preparation of the seafarer for its future shore-based job.

Almost 80% of the respondents already knew at the start of their careers they would not retire at sea, the main reasons included especially; being closer to their family and friends, to finally enjoy a 'normal' life, because they got bored and did not face any new challenges or simply because they did not want to be a seafarer for ever. The need to start to look for future development ashore where also reasons mentioned repeatedly.

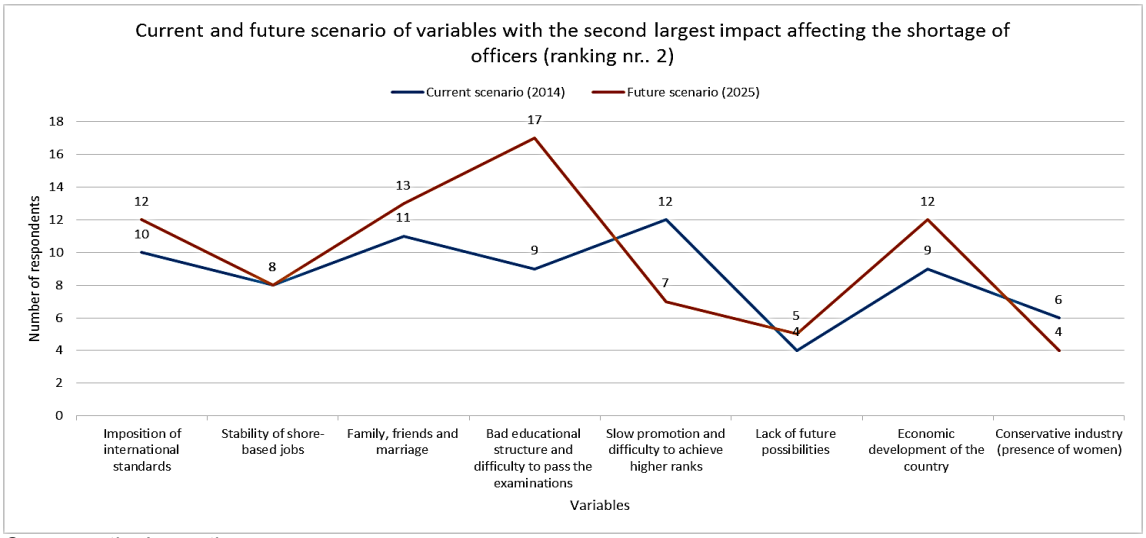
Seafarers, especially in the Philippines are very close to their families and are willing to give up their high salaries, in exchange for being closer to their families, seeing their kids grow up and have a regular lifestyle.

The labour shortage of qualified and highly skilled officers has been present during decades and does not seem to be a problem which can be solved in a matter of days (Asyali 2009). However, the economic circumstances of a country, fast technological developments or different actions that are taken by international organizations, can influence the need of addressing the problem. For instance, two decades ago, the possibilities of travelling from one continent to the other were privileges reserved to the

rich and 'high class' population, this meant that the only opportunity for middle class citizens to cross borders, was through a seafaring's career or working in the aviation sector. Nowadays, this situation has totally changed. Flight tickets fell about 50% in the last three decades and became affordable for the middle class and even for the low class population (Thompson 2013). These external influences, stress the need to make continuous adaptations in the measures and policies to address the shortage problem as, what can be relevant today, might not be in the near future and vice versa.

Besides the variables mentioned in the previous questions, a group of 8 different ones have been asked to rank from 1 (large impact among the shortage) up to 5 (small impact). In addition, and in order to create a trend between present and future scenario, the respondents were asked to rank the same variables in the hypothetic future (2025) scenario (*see figure 19 below*). The biggest gap between the two scenarios, can be seen in the need to address the bad educational structure and the difficulty of passing the examinations; see below the level 2 (moderate/large impact) comparison;

Figure 19. Current and future scenario of variables affecting the shortage of officers



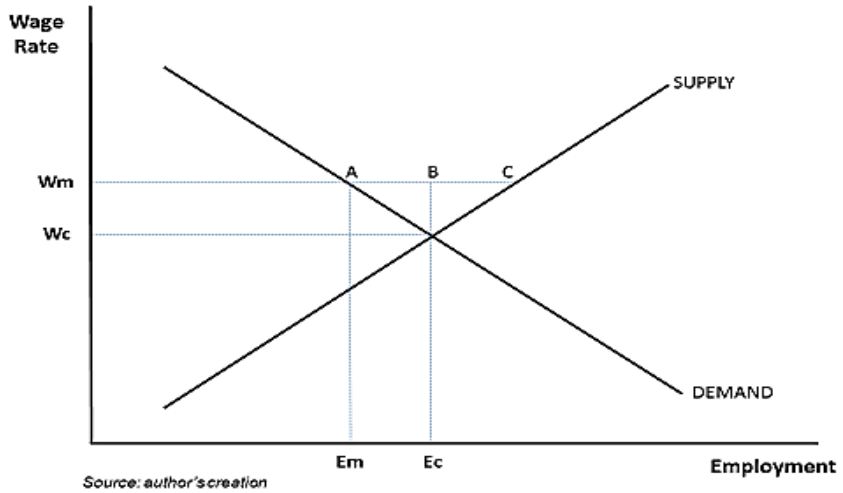
Source: author's creation

This means that the respondents do not consider that this variable is sufficiently addressed today but could have a big effect on the shortage of this skilled labour in the future if addressed in the correct way. The need for academies and educational centres to harmonize on a national and international level would improve educational programmes (see chapter 4.3 for different educational structures among countries) and seafarer's uncertainness for the future would decrease.

The imposition of international standards from the STCW (95, as amended) Convention, the MLC 2006, IMO or ILO, all seem to have a very strong effect for the respondents on

the shortage of quality of the 'top four' officers today, but also in the future. These regulatory impositions on one hand, do have very positive effects on the safety, security and protection of seafarers which increases the attractiveness of the industry but, by way of contrast, these market regulations can harm the job opportunities for lower skilled workers (difficulties for fresh graduates to start their career on-board) as minimum wages make shipping companies and ship-owners postpone their decision to hire an extra crew member and compensate this extra cost by cutting employees. If businesses are forced to pay higher minimum wages, it also induces ship-owners to keep the minimum manning levels, increasing employees working hours and as a consequence decreasing the overall satisfaction of the profession. In order to solve this problem (which could be criticized by many people), the minimum wage should lay below the equilibrium point (*see figure 20 bellow*);

Figure 20. Labour market effect of a minimum wage

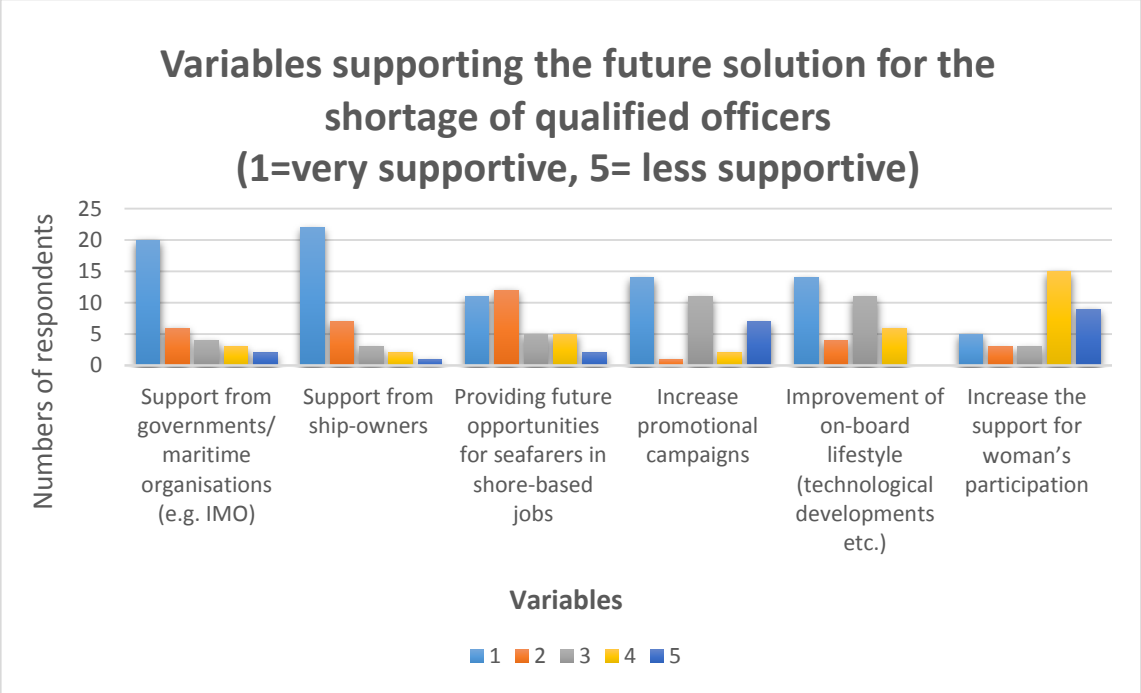


This figure shows a hypothetical competitive labour market with a demand and a supply curve. Their intersection determines the competitive wage, Wc, with employment Ec. If the minimum wage is set at Wm, (for instance by the International Labour Organization), employment is reduced to Em. The reduction of employment is smaller than the excess supply of labour (distance AC). The excess supply of labour includes both, a reduction in employment (fewer job opportunities) together with workers who are drawn into the labour market by the prospect of earning higher minimum wage (BC). Although these last (normally with higher skills) come at the expense of lower skilled workers who are shut out.

The minimum wage would have a direct effect on ratings and cadets rather than of the 'top four' officers, but we do have to bear in mind that in a future prospect, if the younger generations encounter difficulties to start their trainings on-board, they will not obtain the practical experience needed to qualify for higher positions, affecting on an indirect way the qualified workforce to replace the next generations of officers, engineers and masters.

As this is the case, ship-owners should be more involved and committed to providing these initial vacancies in addition to having a greater commitment with the industry in general. Working in strong collaboration with academies and international organizations and taking joint actions in order to secure the quality and standards of seafarers is of crucial importance and which will in the end, affect the safety and operations of their own vessels. This fact has been supported by the survey in which the respondents ranked this variable as 'very supportive' (=1) and which was the most frequently mentioned with a 65% respondent rate. This variable was followed up by the support which needs to be provided from governments and maritime organisations (e.g. financially support such as subsidies, sponsorship or campaigns by the IMO to help and support seafarers) and which had a 58% respondent rate (*see 21 figure below*);

Figure 21. Variables supporting the future solution for the shortage of qualified officers



Source: author's creation

The rest of the variables which were ranked high by the respondents, included providing opportunities for seafarers on their future jobs, or an increase in promotional campaigns. However, an increased participation of women in a sea-based career still seems to be a big challenge for the industry and was also ranked low in the survey, considered to have a small support in providing qualified labour for the future demand of 'top four officers.

8. Conclusion and possible solutions

The main goal of the interviews and questionnaires has been achieved. The focus was to answer the main research question as; which are the main factors and variables affecting the qualified labour shortage and to learn and understand how each respondent deals with his/her daily work load and which strategic approaches were taken to face this issue. In addition, the main factors and variables that affect seafarer's decision to enter and quit the market, shifting to a shore based job, were detected and correspond to the ones found by the previous authors studied. The effect it has on them today, together with a future view of the problem, was given by each respondent.

The research confirms that the principles of employee engagement exist within the maritime industry. However, there are some drivers behind this engagement such as; hiring additional relatives (which the officers bring along with them), offering medical insurances to their family or special treatment for their child's, which are similar to those found in academic and practitioner literature (*see chapter 5.4*). The engagement levels are however lower than those reported in shore-based jobs, this is due to the essence of their contracts and to the high number of intermediates between the officer and the owner or shipping company for which they work for.

There is a clear need to enhance the image of the maritime industry as a whole and mostly build a greater awareness of the maritime profession among young people in order to sustain the future growth of a qualified labour pool. It can be seen how shipping companies, schools and especially crewing agencies are becoming more inventive and innovative in addressing the labour shortage. In the case of crewing agencies, working as intermediaries between seafarers and ship owners, they are developing individual strategies in attracting, recruiting and retaining their future talented pool of seafarers, gaining this way a competitive advantage among other agencies. Similarly, some shipping companies are starting to develop close relationships with schools and universities by providing them with help in the form of academic prizes, conducting guest lectures to show the advantages of working for their organization, or offering scholarships. Despite this fact there are still significant investments to be made in establishing and supporting MET programmes.

In the case study (*see K-line case study, chapter 4.4*), it can be seen how K-Line inbounds the education and trainings of all their seafarers, gaining direct access to potential high qualified crew as they have prepared them to man their own fleet and will help to overcome a possible lack of qualifications or skills in the future. This strategy allows on one hand, to spot those students that can aim to higher qualifications and on the other hand, promotes loyalty in both ways, from the company towards the employee and vice versa, resulting in an outstanding officer's retention rate of 96% (K-Line Academy 2014). Additionally, the knowledge spill over will here be reduced as, once seafarers decide to shift to a shore based job, many career options will be offered by the company such as trainer, instructor, teacher, among others. This will provide the company with loyal and experienced employees and will retain the educational investment previously made.

From the point of view of an educational institution (PMMA), the importance of advertisements and working in collaboration with other segments of the industry and

together with a strong marketing, allows them to supply every year a big pool of high skilled and qualified seafarers. Their broad number of courses, with English as basic language, supplies seafarers that are very wanted by shipping companies all over the world. This eliminates the 'bottleneck' existing between the end of their theoretical courses, and the 12 months of on-board practice, needed to finalize their educational programme, as they will have no problem in finding a cadet vacancy on-board. However, there are still many schools and academies in the Philippines which offer programmes that do not have this prestigious image and which raises the need to standardize their courses on an international level and ensure that the certificates they issue are recognized across borders.

Concerning the importance of advertising, not every educational institution has the possibility to invest in this matter, normally due to financial reasons. Here the role of an international organization such as IMO is crucial in presenting the industry in an attractive way, promoting those factors that distinguish seafaring from every other profession and providing support and information to all new entrants and existent seafarers. These factors include, high paid salaries (mainly to support their families back home), the opportunities to travel and family tradition. However, the strong seafaring tradition present in the Philippines, forces a big population of young students to enter the industry having no alternative option. This is a factor that is probably linked to the strong seafaring culture within the Philippines or to the family tradition, however it has not been studied in depth and is recommended for future study.

In addition to the ability of pursuing maritime education, an important concern in preparing qualified seafarers is to rapidly be able to adapt to technological developments that the industry experiences and hence, requires from their crews. As it is transforming the ways that the ships are being sailed, it requires educational institutions and universities to make continuous investments and ensure that their programmes are updated.

The creation of a national and international pattern of a seafarer's professional education is strongly recommended. This could be done by the integration of a university first degree, a standardized and professional registration which is valid on an international level, standardized working experience, professional trainings and especially, the identification of barriers to carrier mobility and progression to higher degrees. This is considered to enhance the image perceived by society among the career and will align the profession with others such as architecture, medicine or i.e. law. It is also important to standardize MET programmes and degrees so that graduates are accepted across borders and ensuring that STCW (95, as amended) Certificates issued in the Philippines are recognized in other countries.

Future job opportunities must be strongly emphasized, as the aim of the vast majority of seafarers, is to look for a shore-based job at early ages. On one hand, it has to be done by expanding the maritime curricula, integrating managerial, financial or operational courses which would maximize their future career mobility, not only in a horizontal way but also vertically, from ship to shore. On the other hand, it would be recommended to aid the retention of seafarers within the maritime industry when looking for a sea-based job. This could be done for instance, by assisting with the additional qualifications needed for their shore-based job and which would help decrease the knowledge spill over by retaining a greater number of seafarers in the sector. Other recommendations could also

be in the form of an “on-line maritime career assistance data-base”, providing seafarers with access to shore-based positions or vacancies offered by MET institutions, shipping companies or any industry of interest for seafarers. Governments and international organizations should be more actively involved in this matter. In the same way, employers should be encouraged to provide more support, especially during this transition from sea to shore-based positions.

It has been seen that many variables affect the actual and future shortage of qualified officers, however this study aimed to provide a deeper insight of the problem and help understand the paths that need to be followed to enhance the satisfaction of seafarers within the industry, to provide a steady supply of qualified seafarers in the near future and the broad and joint participation by stakeholders this.

Further research recommendations could be to study more in depth the reasons behind the small participation of female in sea-based jobs or the effect that an increased supply of Chinese qualified officers could have among this shortage in the future.

Finally, the limitation of this research is the extended number of variables and conditions that affect this issue and there is no simple and quick fix or solution to this problem. The shipping industry will need to take a planned and coordinated action, involving all different stakeholders from the sector if it wants to provide its customers with the quality service to which they have become accustomed.

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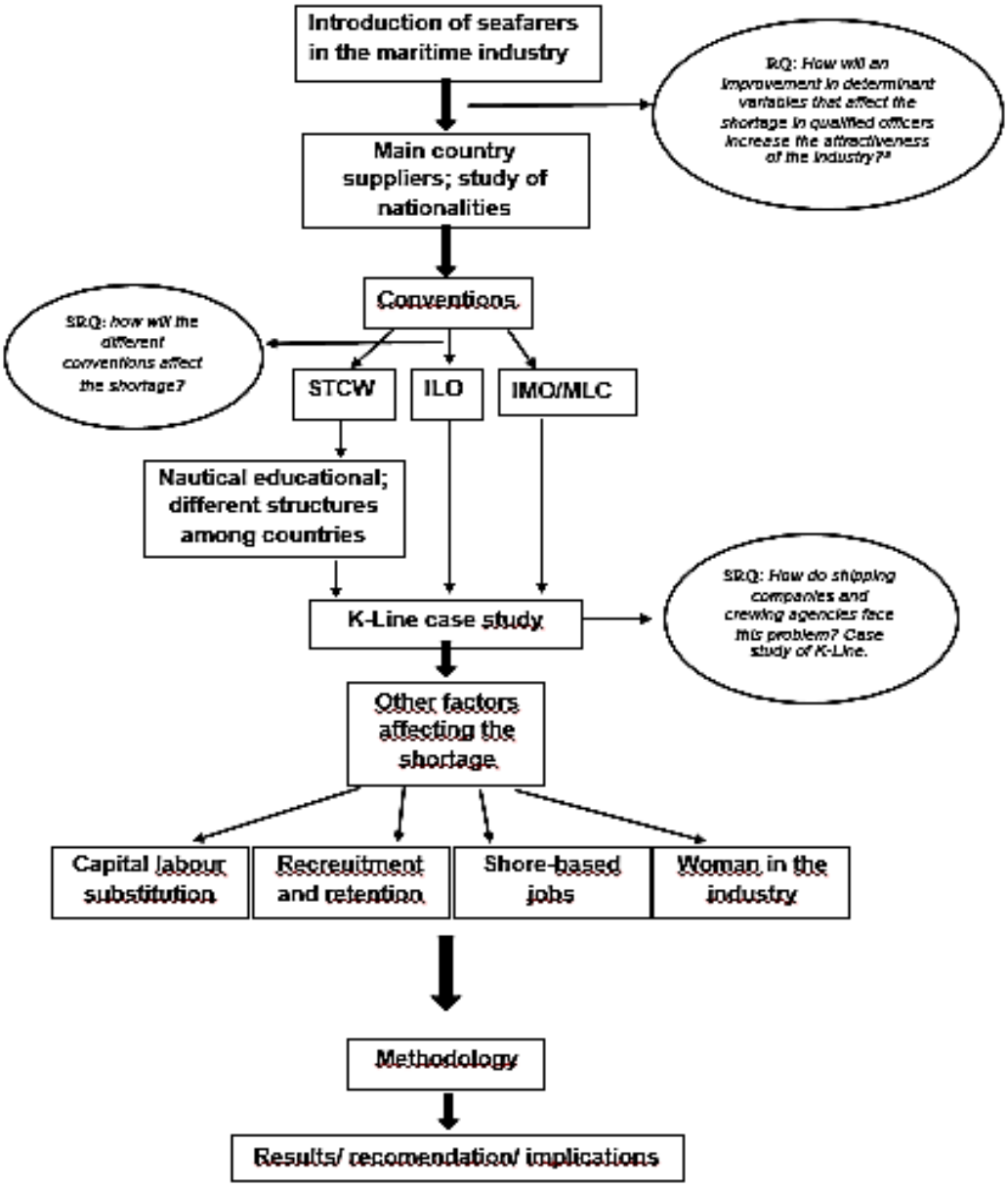
10. Appendices

10.1. Figure 1. Structure of the research



Source: own creation

10.2. List of certificates for training required for seafarers serving on board of seagoing vessels;

1 GENERAL QUALIFICATIONS

	Rank / Certificate	DECK DEPARTMENT						ENGINE DEPARTMENT						
		MA	C/O	OFF	R/O	AB	OS	C/E	2/E	ENG	MM	OS	OTH.	1. Certificate (or equivalent) required 2. Issuing institution 3. STCW requirement 4. Revalidation period
1.1	Certificate of Competency for • Masters • Officers • Engineers	●	●	●	●			●	●	●				**Applicable to STCW95 Certificates.** 1. Certificate of Competency 2. Holder's training state administration 3. Regulation II/1-3 + Regulation III/1-3 4. 5 years
	Endorsement of Certificate of Competency	●	●	●	●			●	●	●				1. Certificate of Competency 2. Administration of Vessel's Flag State 3. Regulation I/2
1.2	Watchkeeping Certificate					●					●			**Applicable to Ratings forming part of an Engine room watch / Navigational watch.** 1. Certificate of Competency 2. Holder's training state administration 3. Regulation II/4 + Regulation III/4 4. Unlimited
	Medical Fitness	●	●	●	●	●	●	●	●	●	●	●	●	1. Certificate of Medical Fitness 2. National Health Authority 3. Reg. I/9 Medical Examination Convention (73), Art. 3, Flag State requirements 4. Certificates should have a validity of 1 to 2 years. Catering personnel generally needs a renewal of medical fitness once a year and a proof of salmonella test.

▼ Passenger ships ■ Cargo Ships ● All Ships
◆ Ro-Ro-Passenger Ship ∗ Tanker ( ) Conditionally

10.3. Chapter 6. Interview guide

GUIDE (questions for an interview with managerial staff in charge of education, recruitment and retention of maritime employment).

Dear Mr/Ms:

Please shortly provide here your background experience:

- Company or list of previous companies worked for:
- Background education:
- Years of seafaring experience (if you have):
- Collaborative events, institutional connections etc. (if you have):

Any comments might be included in the thesis paper "A shortage of officers" for the Erasmus University of Rotterdam. If you prefer your name to be kept anonymous, please indicate so:

Guideline introduction.

Since decades there has been a considerable shortage in the worldwide supply of the "top four" maritime officers (Master, Chief Officer, Chief Engineer and Second Engineer). It has reached serious proportions, threatening the future of the international shipping industry, which is the life hood of world trade (IMO 2014a). Nevertheless, this problem affects especially, shipping companies, crewing agencies and manning companies or educational institutions, which struggle with this issue on a daily basis. Therefore, a deeper insight provided by experienced people in the industry will add quality to the work and will allow to contrast different opinions among this issue.

How will an improvement in determinant variables that affect the shortage of qualified officers, increase the attractiveness of the industry?"

1. From your point of view and depending on the current type of institution you are working for, what measures are being taken to address the apparent shortage in qualified officers?
2. What are the most relevant factors/elements influencing this shortage? How will these guide to a possible solution?
3. What measures are in your opinion being taken to increase the attractiveness for youngsters in the industry?

4. How do you think the new technological developments will affect the attractiveness of seafaring in the future?
5. Give your opinion on the increased interest in shore-based jobs.
6. What are the ideas/measures taken for attracting the younger generation?
7. What are the ideas/measures for securing female participation?
8. What are the positive/negative implications of International organizations (IMO, MLC...) among your institution or employment positions?

10.4. Chapter 6. List of respondents backgrounds;

List of Respondents	
Managerial staff	
Captain Eleazar Diaz/ CEO - Background education: PMMA 1977 -Seafaring career; Captain from 1978-1996 -NYK operations manager 1997-1999 -CEO Crossworld Marine Services Inc 1999-2014.	e.Diaz@crossworldmarine.com
Arnold U. Mendoza/ Sr Crew Mgr -Background education: PMMA 1989 - Seafaring career; Chief Officer (1989-2000) -Master and Mate association of the Philippines -Philippine Navy, reservist with the rank of Ensign -PMMA Alumni Association- Board of Director.	a.mendoza@crossworld.com
Dante Pelaez/ Crewing Mgr. -Background education: PMMA 1987 - Ex. 2nd Engineer. (1985-2010) -Ship management Inc., Marlow Navigation 2010-2012 -Crossworld Marine Services Inc, 2010-2014	d.pelaez@crossworldmarine.com
Jasan Marañon/ Instructor. - Background education: PMMA 1988 - Seafaring career; Chief Engineer (1988-2004) - Crossworld Marine Services Inc. (2004-2014) -Actual position. Instructor: PDOS courses, antipiracy courses, compulsory MLC courses and mandatory pre-embark courses for each principal.	jasanmharanski@yahoo.com

Global HR Manager Jill Reyes. - Background education: job placement coordinator; La Salle University (1998-2000) -Recruitment Conveys Corporation (Manila, 2001-2005) - Sourcing officer (Makati/Cebu, 2006-2007) -Pipeline Manager, Magsaysay maritime Corporation, Philippines (2008-2009) -General Manager PT Meranti Magsaysay (Jakarta, 2009-2011) -Human Resource director, Crossworld Marine Services Inc, 20012-2014	r.reyes@crossworldmarine.com
Danreb Galvez/ QAR -Batchelor in Business management 1998 -NYK operation management, Manila (1999-2005) - Operation manager Tsakos Shipping; for Crossworld Marine Services Inc, 2005-2014	d.galvez@crossworldmarine.com
Randal Reyes /Crewing Mgr - Background education: PMMA 2002. -Seafaring career; 2nd Officer (2003-2011) - Crossworld Marine Services Inc, 2011-2014	Lucky_me.rr23@yahoo.com
Captain Stephen J. Cross/ WMU -Professor Maritime Institute Willem Barentsz (director of projects) -Adjunct professor World maritime University	sjc@wmu.se, cross@nhl.nl
Capt. John Leslie Romeo Benedictos PMMA /Vice -Background education: PMMA graduate 1984 -Seafaring career; Captain (1992-2002) -Actual president for academics, training, research & extension 2014	Vp.atre@pmma.edu.ph
Ronald G. Magsino, MSc/ - Background education: PMMA graduate 1982, -Master in Maritime Education and Training -Master in Ship Management -Marlow Navigation (crew instructor) -Professor PMMA	pmma.gs@pmma.edu.ph rgmagsino92@yahoo.com

10.5. Chapter 6. Questionnaire

Questionnaire 'top four' officer shortage

By Lonneke Yntema

Introduction

Since decades there has been a considerable shortage in the worldwide supply of the "top four" maritime officers (Master, Chief Officer, Chief Engineer and Second Engineer). It has reached serious proportions, threatening the future of the international shipping industry, which is the life hood of world trade (Leggate 2004; JITI 2010; Asyali 2009; Lane 2000). This problem affects especially shipping companies, crewing agencies, manning companies and educational institutions. The aim of this study is to gain a deeper understanding on the different variables affecting the shortage of crew by making a comparison between the current and the future situation (2025).

Please fill in the following information below;

Company

Employment position

Age

Gender

Question 1. Please select the main reason(s) for your employment in the maritime industry. (Multiple answers possible). *If you have no seafaring experience, please continue to question 3.

a. Family tradition
b. Own decision, it's my dream since my childhood!
c. Through my education
d. Opportunity to travel
e. High paid salaries
f. Aiming for a shore-based job
g. No sailing experience but I like the industry
h. No particular reason, I got in by accident
i. I had no other option

j. Others, please specify below…

Question 2. Have you considered since the start of your career, to transfer your sea-going profession to a shore-based job in the future? If yes, at what age were you pretending to stop?

Yes ( ) No ( )

Age:

Question3. Of the following career options, which opportunities did you have when looking for a maritime related shore-based job in your first year?

a. Fishing industry
b. Administrative position
c. Operational position
d. Managerial position
e. Information technology
f. Ship building or machinery industry
g. Education/ training
h. Maritime finance or insurance company
i. Maritime organisations/governmental position
j. Other, please specify below…

Question 4. What has been the main reason(s) for you to choose a shore-based job?

Question 5. Would you recommend youngsters to enter the maritime industry and become a seafarer?

Yes ( ) No ( )

In case of 'No', please specify below…

Question 6. The following question will present two scenarios; a current scenario (2014) and a future scenario (2025).

Please grade from 1 to 5 the importance of the main variables (that have been found by authors in previous literature), which you consider are effecting the shortage in supply of 'top four' officers.

(1= large impact, 2= moderate/large, 3=moderate, 4= moderate/small, 5= small impact)

Current scenario (2014)	1	2	3	4	5
Imposition of international standards					
Stability of shore-based jobs					
Family, friends and marriage					

Bad educational structure and difficulty to pass the examinations					
Slow promotion and difficulty to achieve higher ranks					
Lack of future possibilities					
Economic development of the country					
Conservative industry (presence of women)					

Future scenario (2025)	1	2	3	4	5
Imposition of international standards					
Stability of shore-based jobs					
Family, friends and marriage					
Bad educational structure and difficulty to pass the examinations					
Slow promotion and difficulty to achieve higher ranks					
Lack of future possibilities					
Economic development of the country					
Conservative industry (presence of women)					

Question 7. It is known that there is a current need in the shipping industry to address the problem of the shortage and to create a secure and stable supply of qualified officers in a medium and long term perspective (Drewry 2012)**. How do you think the maritime industry can increase this number?**

Please grade from 1 to 5 each of the variables in the list below. How important is for you the role of each variable in supporting and solving the shortage challenge?

(1= very supportive, 2= moderate/high, 3= moderate, 4 =moderate/small, 5= not supportive)

Grade	**Variables**
	Support from governments/ maritime organisations (e.g. financially support such as subsidies, sponsorship by the IMO to help and support seafarers)

	Support from ship-owners in the form of educational programmes or cadet positions on-board enabling seafarers to grow in their careers.
	Providing future opportunities for seafarers in shore-based jobs
	Increase promotional campaigns
	Improvement of on-board lifestyle (technological developments etc.)
	Increase the support for woman's participation
	Other, please specify…

Question 8. Please select three countries and grade them from 1 to 3 in the box below, which you consider the main nationalities are of the "top four" officers (Master, Chief Officer, Chief Engineer and Second Engineer) and ratings on-board of the international fleet. Consider the current and a future scenario.

Current scenario (2014);

'Top Four' officers	**Ratings**
1. Philippines 2. Croatia 3. Latvia 4. India 5. Poland 6. Romania 7. Greece 8. Russia 9. China 10. United Kingdom 11. Ukraine 12. United States 13. Japan	1. Philippines 2. Croatia 3. Latvia 4. India 5. Poland 6. Romania 7. Greece 8. Russia 9. China 10. United Kingdom 11. Ukraine 12. United States 13. Japan
1.	1.
2.	2.
3.	3.

Future scenario (2025);

'Top four' officers	**Ratings**
1. Philippine 2. Croatia 3. Latvia 4. India 5. Poland 6. Romania 7. Greek 8. Russia 9. China 10. United Kingdom 11. Ukraine 12. United States 13. Japan	1. Philippine 2. Croatia 3. Latvia 4. India 5. Poland 6. Romania 7. Greek 8. Russia 9. China 10. United Kingdom 11. Ukraine 12. United States 13. Japan
1.	1.
2.	2.
3.	3.

Question 9. From the following career options, which do you consider more prestigious? Please grade each career option from 1 to 5.

(1= very prestigious, 2=moderate/prestigious, 3=moderate, 4= moderate/small prestigious, 5= small prestigious)

Grade	**Careers**
	Doctor
	Lawyer
	Professor
	Chief officer
	Chef cook
	Chief engineer

*These professions have been selected due to the similar amount of years needed to achieve the top of the career and for their continuous need to upgrade knowledge while carrying out the job.

Question 10. Relative to the image of seafaring as a career option within your country, grade from 1 to 5 the importance of each factor.

(1= very important, 2= moderate/large, 3= moderate, 4= moderate/small importance, 5= not important)

Variables	**1**	**2**	**3**	**4**	**5**
High possibilities for self-development					
Attractive conditions (travel around the world, long rest periods…)					
Lifestyle attractiveness (close and small community on-board, hands-on job…)					
Contribution to the country (family remittances…)					
High status (compared to other employment options)					

Thank you for your time and effort in answering the questioner. Your collaboration is very much appreciated. To show my gratitude a copy of the finalised thesis will be sent to you at the end of September.

If you wish to receive a soft copy of the thesis, please add your e-mail address here:

----------@----------

10.6. Chapter 6. List of principals

CROSSWORLD MARINE SERVICES, INC.	
No. of Vessels per Principal	**Name of Company/ Principal**
30	***1. GOLDEN UNION SHIPPING***
3	**2. GOLDEN UNION ENTERPRISE**
3	***3. WORLD MANAGEMENT***
38	***4. DIANA***
8	***5. UOT (UNITED OCEAN TRANSPORT)***
4	***6. ALPHA SIGMA***
4	***7. IONIAN***
6	***8. MYKONOS***
3	***9. SEALESTIAL***
3	***10. VARSHIP***
14	**11. TSAKOS**
2	**12. SINGA SHIPMANAGEMENT PTE. LTD**
3	**13. NAVIERA ULISIS LTD.**
13	**14. EFNAV**
4	***15. IASON HELLENIC SHIPPING CO. LTD***
4	***16. MEADWAY SHIPPING and TRADING INC***
1	***17. TECHNICAL MARINE PLANNING (OVERSEAS) LTD. INC.***
1	***18. W MARINE INC***
1	***19. RAINBOW SHIP MGT.***
27	***20. KOSAN***
26	***21. KAPAL (GRIMALDI)***
4	**22. AHRENKIEL / KAPAL**
16	**23. MARCREW / MARLOW**
4	***24. ECONAV S.A***
18	***25. CASSIOPEIA***
150	***26. BOURBON OFFSHORE***

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150 BOURBON
240 CROSSWORLD

Source: own creation

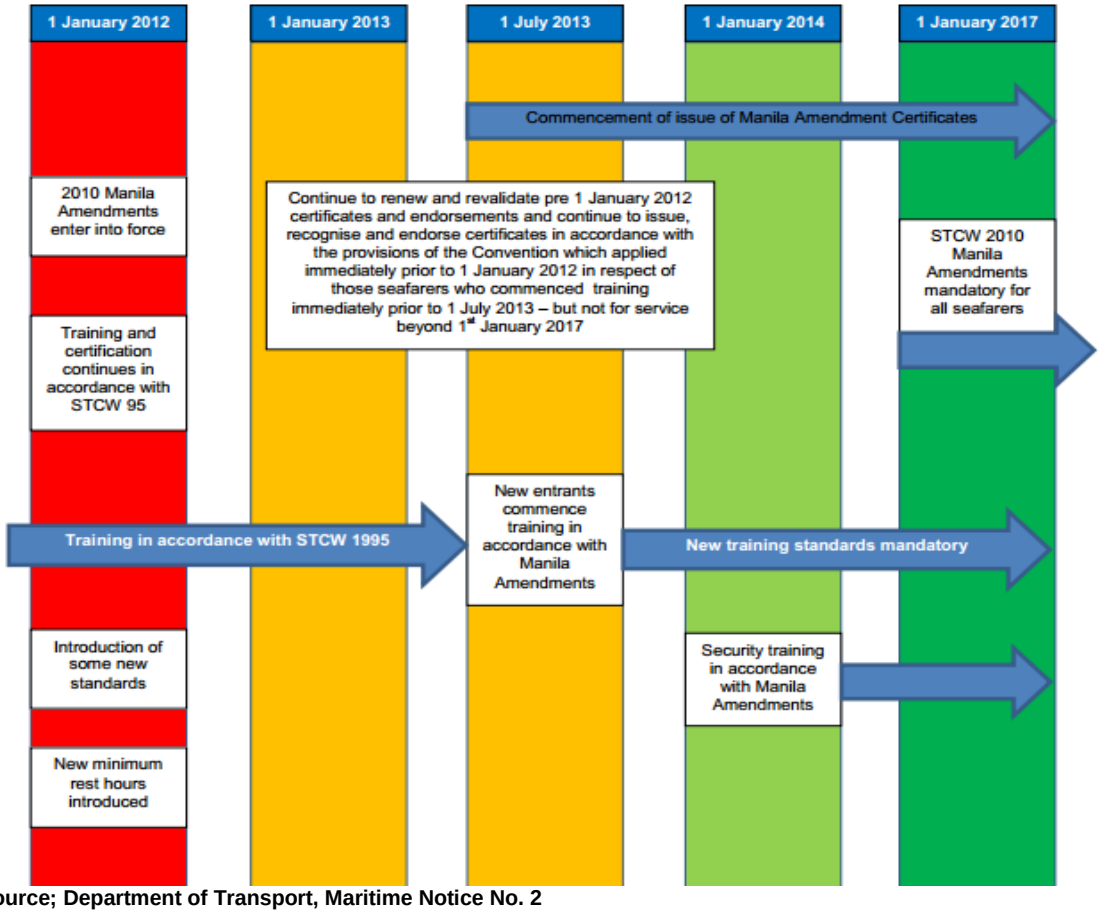
10.7. Chapter 6. List of ages, ranks, monthly salaries and contract duration

AGE	RANK	MONTHLY SALARY	CONTRACT DURATION / MONTHS
18 to 21	CADET	$400,00	12
22	OS	$1.200,00	9
23	AB	$1.600,00	9
24	Trainee 3M	$800,00	6
25	3rd Officer	$3.300,00	6
26	3rd Officer	$3.300,00	6
27	2nd Officer	$3.700,00	6
28	2nd Officer	$3.700,00	6
29	Trainee CM	$3.700,00	6
30	CHIEF OFFICEI	$6.200,00	6
31	CHIEF OFFICEI	$6.200,00	6
32	MASTER	$8.500,00	6

Source: Crossworld Marine Services, edited by author.

10.8. Chapter 7. Implementation dates of 2010 Amendments

Implementation dates of 2010 Amendments



Source; Department of Transport, Maritime Notice No. 2