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THE CURRENT PROFILE OF MERCHANT MARINE OFFICERS' MANPOWER IN TURKEY

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ABSTRACT

This study aims to find out the profile of merchant marine officers' manpower in Turkey. In all steps of the study, data has been classified into age, gender, marital status, certificate of competency, the school where they graduated, graduation year, and their experience in existing companies. The study has been based on the descriptive statistics derived from a dataset. A total of 3894 profile data about merchant marine officers obtained from a total of 31 shipping companies operating in Turkey has been analyzed. The study provides a strong reference for getting the profile information of merchant marine officers and allows ship companies to get informed about the current profile. The findings of the study demonstrate that undergraduates from Istanbul Technical University, Maritime Faculty constitute 36% of the total sample, which is, not surprising due to the year of its establishment, the primary resource of the maritime officer manpower in Turkey. When examining the officers in terms of education level, the research findings show that the large majority of Turkish officers have level 6 degree (63%). Another significant finding is that the average age of the merchant marine officers is 32.5 and also Turkish officers have average 3.3-year experience in the same companies.

Keywords: *Manpower, profile, seafarers, merchant marine officer, Turkey.*

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TÜRKİYE'DE ZABİT İŞGÜCÜ PİYASASININ GÜNCEL PROFİLİ

ÖZET

Bu çalışma ile ticaret gemilerinde çalışan Türk zabitanlarının detaylı bir profili ortaya koyulmaya çalışılmıştır. Çalışmanın her basamağında, veriler; yaş, cinsiyet, medeni durum, yeterlilik, mezun olduğu okul, mezun olduğu yıl ve bulunduğu şirketteki tecrübesi olarak sınıflandırılmıştır. Toplamda 31 gemi işletme şirketine ulaşılmış ve bu şirketlerden 3894 zabitana ait profil bilgileri elde edilmiştir. Elde edilen veriler üzerine tanımlayıcı istatistikler uygulanmıştır. Bulgulara göre, İstanbul Teknik Üniversitesi Denizcilik Fakültesinden mezun olan zabitan sayısı toplam örneklemin % 36'sını oluşturduğu görülmektedir. Buna göre İstanbul Teknik Üniversitesi Denizcilik Fakültesi Türkiye'deki zabitan iş gücünün ana kaynağıdır denilebilir. Zabitanları eğitim düzeyi açısından incelediğimizde Türk zabitanlarının % 63'ünün 6. derece eğitim düzeyine sahip olduğu görülmüştür. Çalışmanın diğer göze çarpan bulguları ise Türk zabitanlarının ortalama yaşının 32,5 yıl olarak bulunması ve bir zabitanın aynı şirkette ortalama 3,3 yıl hizmet vermesidir.

Anahtar Kelimeler: *İşgücü, profil, gemiadamı, deniz ticaret filosu zabitleri; Türkiye.*

1. INTRODUCTION

Over 90% of world trade is carried by the international shipping industry and shipping is the most cost-effective way to transport goods, raw materials (James, 2016). It is obvious that without competent seafarers it is impossible to make safe and secure maritime transportation. Therefore, seafarers play a vital role in shipping industry and they are critical component in today's global economy. On the other hand, in contemporary shipping industry, seafarers are important asset for shipping companies to enable them to secure sustainable competitive advantage through cost-efficient, technically complex, safe, and customer-responsive maritime transportation (Sadjadi and Perkins, 2010). For this reason, seafarers who should not be only properly qualified but who should also have enough sea experience, have mental and physical wellbeing and display the professional standards and technical competence.

Considering the importance of seafarers for shipping industry, it is inevitable to take account of supply and demand of seafarers. In this sense, there is an ongoing shortage of seafarers, especially of officers, around the world according to the current study from the Baltic and

International Maritime Council (BIMCO) and the International Shipping Federation (ISF) (Galic et al. 2012). According to the influential BIMCO/ICS Manpower Update 2015 an anticipated shortage of some 92000 maritime officers worldwide is forecasted by the year 2020 (BIMCO/ICS Manpower 2010) and according to study of Japan International Transport Institute and The Nippon Foundation, there would be an additional 32153 officers to meet the demand in 2020 (JITI, 2010). In Turkey, a study entitled "Human resource planning in maritime industry: A study on Turkish seafarers" (Çelik, 2014) reveals that according to benchmark scenario, 2812 oceangoing officers would be needed in 2020. Another study from Turkey prepared by Asyalı et al. (2009) mentioned that the chronic shortage of officers especially marine engineers would become more intense. Because of this shortage of officers, increasing attention needs to be given to the problems that hinder the effective recruitment and retention of seafarers in order to stabilize the flow of skilled labor to the global shipping industry (Nguyen et al. 2014).

This study aims to provide detailed, concrete and complete profile of maritime officers who work at Turkish ship management companies. The study also provides comparable information for officers who work in tanker ships, container ships, bulk carriers and etc. For this purpose, the data was gathered from institutional Turkish ship management companies and it contains age, gender, marital status, alma mater, competency, graduation year, total sea experience and sea experience in the current company of officers.

2. LITERATURE REVIEW

Scanning the literature related to manpower and personnel profile, there appears to be several studies and reports. In this study, the related studies and reports have been utilized in the process of compiling data, the creation of categories, coding and analysis of data. The reason of making this kind of study is to examine the current picture of merchant marine manpower in the Turkish owned fleet.

The relevant literature shows that the related studies aim to reveal current profile of employees working in different industries such as dental manpower profile (Brewer et al. 1990), profile of artists and cultural workers (Hill, 2014), profile of discouraged workers (Tekeli, 2010), profile of older workers (Ministry of Manpower Singapore, 2007), profile of teachers (Siniscalco, 2002), and also profile of temporary workers (Ministry of Business, Innovation and Employment New

Zealand, 2009) as well as employees working in maritime industry. The summary of all these studies and categories they include are shown in Table 1. When analyzed the studies according to their categories, it is noticeable that all of them cover "age" category. The other important category that the authors have referred their studies is also "educational level". Authors frequently mention the category. Beside all these, "marital status" and "alma mater" are yet another important category covered by the studies in related literature.

Table 1: The Summary of the Relevant Studies and Reports Apart from Seafarers in the Literature

The Relevant Profile Studies apart from Seafarer	**Age**	**Education Level**	**Experience**	**Marital Status**	**Alma Mater**
Brewer et al. (1990)	√				√
Hill (2014)	√	√			
Tekeli (2010)	√	√		√	
Ministry of Manpower Singapore (2007)	√	√			
Siniscalco (2002)	√				
Ministry of Business, Innovation and Employment New Zealand (2009)	√	√		√	

On the other hand, seafarer profile studies in related literature have covered similar categories with studies involved employees working other industries. The summary of all these studies and categories they include can be seen in Table 2. "Age" category is yet again most commonly used category and it was found that researchers with other variables most frequently performed this category. Besides, "rank" is also significant for researchers who aim to conduct seafarer profile studies. Researchers commonly use the category, as well. Furthermore, it is found out that "education level", "experience", "marital status", "ship type" and "department" are other important categories take part in seafarer profile studies and researchers in different studies frequently use them.

Table 2: The Summary of the Relevant Studies and Reports about Seafarers in the Literature

The Relevant Profile Studies about Seafarer	**Ship Type**	**Department**	**Age**	**Rank**	**Education Level**	**Experience**	**Marital Status**	**Alma Mater**
Ellis and Sampson (2008)	√	√	√	√				
Cömert (2008)	√		√	√	√	√	√	
Calderon (2011)			√			√	√	
Pallis and Adolf (2011)	√				√			
Amante (2003)			√	√	√	√	√	
Taylor (2012)			√	√				
Nas and Çelik (2012)			√			√		

Analyzing all of these studies in the literature in terms of data used in research, it is revealed that each of them operates on a different number of data sets. The study conducted by Ellis and Sampson (2008) who reviewed the profile of crewing of the world fleet outlining age, rank, nationality and also the types of vessel they are employed on comprise of 4240 vessels and 80863 seafarers. According to study, Turkish seafarers are the most likely to be working on Turkish owned vessels (70%) and they are also the youngest seafarers in respect to mean age (34,8) among the top ten nationalities within the global seafarer labor market. Concordantly, Turkish junior officers had also the lowest average age (31). The study prepared by Cömert (2008) who aimed to propose a model on the supply and employment of the seafarers comprise of 544 seafarers. The data used in the study were collected through survey method and this study revealed that the majority of Turkish officers get undergraduate level education. Calderon (2011) aims to provide an overview of the supply and demand of seafarers. A total of 263 seafarers (52 officers and 211 ratings) comprised the sample of the study. Data collection in this study made via interviews and questionnaires. Pallis and Adolf (2011) conducted a study to reveal the profiles, motivations and expectations of students pursuing undergraduate maritime programs. The study discussed the results of a survey fulfilled by students pursuing undergraduate programs in maritime business and management at three universities in Asia and Europe and the findings also compared with database examining of postgraduate students within the same institutions. The study comprised a total of 436 profile data collecting via interviews

and questionnaires. Amante (2003) aimed to find out dependable profile of Filipino seafarers. The data collection was provided by surveys conducted to 374 seafarers and 658 maritime students. Taylor (2012) prepared a statistic that provides evaluation for the number of UK seafarers active at sea, containing demographic analysis. A total of 24100 Seafarers are included in the study. Nas and Çelik (2012) aimed to determine the profiles of academicians employed in the maritime higher education institutions in Turkey. The data collection was provided by interview conducted to 89 maritime academicians. The summary of data size and nationality of data comprised by related studies in the literature are shown in Table 3.

Table 3: The Summary of Data Size and Nationality of Data Comprised by Related Studies in the Literature

Related Studies	**Data Size**	**Nationality of Data**
Ellis and Sampson (2008)	4240 Vessel -80863 Seafarers	Multinational
Cömert (2008)	544 Seafarers	Turkey
Calderon (2011)	263 Seafarers	Ecuador
Pallis and Adolf (2011)	436 Maritime Students	China and Greece
Amante (2003)	374 Seafarers - 658 Maritime Students	Philippines
Taylor (2012)	24 100 Seafarers	UK
Nas and Çelik (2012)	89 Maritime Academicians	Turkey

3. MOTIVATION

Necessity of revealing the current profile of Turkish seafarers who are on the 6th rank within the global seafarer labor market according to SIRC report (prepared by Ellis and Sampson, 2008) constitutes the motivation of this study. In addition, having done this type of study by some other countries has brought up the need for such a study. In other respects, it is thought that research findings and results to be obtained from the study would be especially useful in terms of making comparisons with officers from other nations such as Filipino.

4. MATERIAL AND METHODS

The chapter shares information about aim, scope and limitations of the study. Besides, it also informs material and methods techniques used during the research process.

4.1. Aim of the Study

Demographics and profile studies are used by governments, corporations and non-government organizations to learn more about a population's characteristics for many purposes, including policy development and economic market research. In this sense, the aim of the study is to put forward to detailed profile of merchant marine officers who work at Turkish ship management companies and also to provide information for being able to make comparison in officers who work in different types of merchant vessel.

4.2. Scope and Limitation

Rating seafarers are excluded from scope of the study and also the largest volume within companies operating in Turkey were tried to be included in the sample in order to represent the universe.

4.3. Method

A detailed literature review was carried out before composing question form. Profiles studies both related to seafarers and not related to seafarers were scanned and variables were determined by means of this detailed literature review. The question form consists of two sections. First section contains profile information of interviewee such as age, gender, education level and position in the company and profile information of ship management companies such as, vessel type, flag register and company sizes. Company size has been defined according to the Nas (2006)'s study. In the study, company sizes have been determined with the number of ships as small (1-6 ships), medium (7-20 ships) and big (21 and up) size. Second section contains questions related to demographic information, which refers to baseline information of merchant marine officers such as age, gender, education and marital status. And also, section two contains questions about experience, rank, department and educational institution of marine officers.

In the research, the frequency analysis is conducted to reveal general profile of Turkish officers, the ANOVA test is conducted to measure variation between company size and ship type as to average sea experience, the t-test is conducted to measure variation department as to average sea experience, chi square is conducted to compare education level of deck and engine officers, education level of the officers as to ship type, education level of the officers as to company size and the officers' marital status as to ship type.

A total of 31 Turkish ship management companies were contacted via phone and e-mail throughout 2015. A total of 3894 profile data about merchant officers obtained from these companies and the data were analyzed by using SPSS 20.0 (Statistical Package for the Social Sciences) Program.

5. FINDINGS

The age profile of seafaring force reflects not only the supply of seafarers and the rate of renewal of seafaring force, but also provides estimation for seafaring experience. The average age of the officers in the sample is 32,58 (see Figure 1).

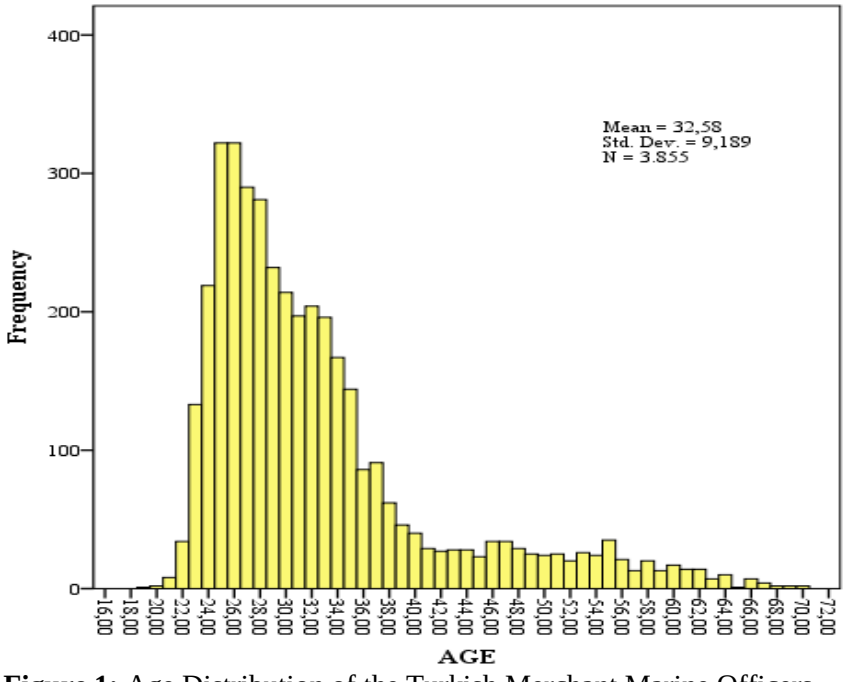

Figure 1: Age Distribution of the Turkish Merchant Marine Officers

In the study, the education level defined as in the report of International Standard Classification of Education by UNESCO (2011). According to the report, level 6 equals to bachelor's or equivalent level. Programs at this level are traditionally offered by universities and equivalent educational institutions. Level 5 equals to short-cycle tertiary education. The academic tertiary education programs below the level of a Bachelor's program are classified as level 5. Level 4 equals to Post-secondary non-tertiary education. The level provides learning experiences building on secondary education. Level 3 equals to upper secondary education. The level is typically designed to complete secondary education in preparation for tertiary education.

The majority of Turkish officers (62,6%) is also found to have level 6 education level. Across the sample there is a distribution of seafarers by rank as follows: 57,8% of the sample occupy senior officer positions; 42,2% are junior officers and there is not an immense difference between two groups. And 52,5% of seafarers is classified as working in the deck department, 37,3% is working in the engine department. In the sample, 61% of the officers preferred to work at medium size companies, 30,2% of the seafarers preferred big size companies and small size companies were preferred by only 8,8% of the officers. However, when analyzing preferred ship type; 35,8% of the officers preferred bulk carriers, 21,1% preferred chemical tankers and 17,5% choose to work at crude/oil tankers. The other main profile information about merchant marine officers is shared in detail in Table 4.

Table 4: General Profile of Turkish Merchant Marine Officers

General Profile									
Age			**Sea Experience (Year)**			**Competency**			
	(f)	**%**		**(f)**	**%**		**Age ($\bar{x}$)**	**(f)**	**%**
19-30	2058	52,9	**00-03**	610	15,7	**U. Cpt**	39,3	596	15,3
31-40	1233	31,7	**04-06**	744	19,1	**U. 1st Off**	30,7	494	12,7
41-60	495	12,7	**07-09**	470	12,1	**U. W. Off**	26,6	891	22,9
61-…	69	1,8	**10-12**	385	9,9	**U. C. Eng**	43,7	508	13,0
Miss. Value	39	1,0	**13-15**	303	7,8	**U. 2nd Eng**	32,2	329	8,4
Total	**3894**	**100,0**	**16-18**	151	3,9	**U. W. Eng**	27,6	498	12,8
			19-21	40	1,0	**Cpt**	40,7	9	0,2
Gender			**22-24**	55	1,4	**1st Off**	32,0	5	0,1
	(f)	**%**	**25-27**	60	1,5	**W. Off**	27,2	48	1,2
Male	3741	96,1	**28-30**	86	2,2	**C. Eng**	44,4	59	1,5
Female	91	2,3	**30-…**	211	5,4	**2nd Eng**	37,1	22	0,6
Miss. Value	62	1,6	**Miss. Value**	779	20,0	**W. Eng**	30,3	37	1,0
Total	**3894**	**100,0**	**Total**	**3894**	**100,0**	**Miss. Value**		398	10,2
						Total		**3894**	**100**
Marital Status			**Department**			**Sea Experience by Rank**			
	(f)	**%**		**(f)**	**%**			**(f)**	$\bar{x}$
Married	1461	37,5	**Deck**	2043	52,5	**Senior**		1738	18,5
Single	2365	60,7	**Engine**	1453	37,3	**Junior**		1201	6,3
Miss. Value	68	1,7	**Miss.Value**	398	10,2	**Miss.Value**		995	
Total	**3894**	**100,0**	**Total**	**3894**	**100,0**	**Total**		**3894**	**13,3**
Preferred Company Size			**Preferred Ship Type**			**Education Level**			
	(f)	**%**		**(f)**	**%**			**(f)**	**%**
Small Size*	343	8,8	**Bulk**	1393	35,8	**Level 6**		2438	62,6
Med. Size **	2374	61,0	**Crude/Oil**	680	17,5	**Level 5**		474	12,2
Big Size ***	1177	30,2	**Chemical**	820	21,1	**Level 4**		529	13,6
Total	**3894**	**100**	**Container**	632	16,2	**Level 3**		197	5,1
			Ro-Ro	110	2,8	**Others**		205	5,3
			Lng-Lpg	39	1,0	**Miss. Value**		51	1,3
			Miss. Value	220	5,6	**Total**		**3894**	**100**
			Total	**3894**	**100**				

*Note: *1-6 ships **7-20 ships ***20 and up*

The findings of the study demonstrated that the Istanbul Technical University, Maritime Faculty (N: 1397, P: 36%) is currently the primary resource of the maritime officer manpower in Turkey. Turkish Maritime Education Foundation (TUDEV) (N: 502, P: 13%) and Dokuz Eylül University (N: 352, P: 9%) are also the other major contributors to maritime officer manpower in Turkey. These three educational institutions nearly comprised of 60% of the sample in terms of the officers' graduation school. That's why these three educational institutions comprised of big proportion of the officers for the sample is that these institutions are old established educational institutions when compare with the rest of the educational institutions which included in this study. The contributions provided by the other institutions apart from these three institutions are shown in Figure 2.

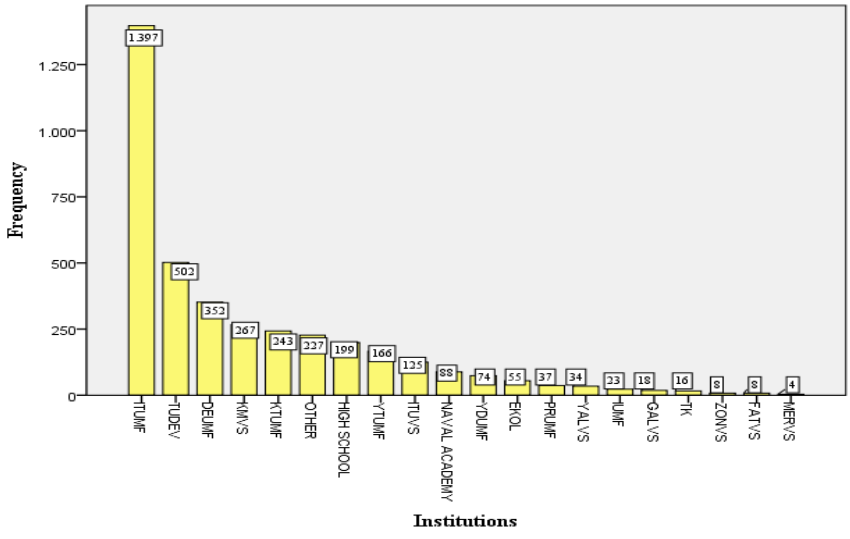

Figure 2: Institutional Contribution to Merchant Marine Officers' Manpower in Turkey

When making comparison between the officers' ship type preference and graduated educational institution, the officers who graduated from Istanbul Technical University preferred to serve on bulk carriers (25,3%), crude/oil tankers (29,4%) and chemical tankers (27,2%) while the officers graduated from Dokuz Eylül University, 44,8% and 22,1% of the them served on bulk carriers and crude /oil tankers respectively. Also, 42,2% of the officers served on bulk carriers and 20,9% of the officers preferred to work on chemical tankers who graduated from TUDEV (see Table 5).

Table 5: Comparison of the Officers' Ship Type Preference as to Graduated Educational Institution

Educational Institution	Types of Ship												Total	
	Bulk		Crude/Oil		Chemical		Container		Ro-Ro		LNG/LPG			
	(f)	%	(f)	%	(f)	%	(f)	%	(f)	%	(f)	%	(f)	%
Level 6														
İstanbul Technical Uni.	322	25,3	376	29,4	347	27,2	154	12,1	60	4,3	16	4,7	**1275**	100
Dokuz Eylül Uni	142	44,8	70	22,1	45	14,2	55	17,4	4	1,3	1	0,3	**317**	100
Karadeniz Technical Uni.	95	42,0	40	17,7	33	14,6	43	19,2	7	3,1	8	3,5	**226**	100
Yıldız Technical Uni.	87	54,0	38	23,6	6	3,7	27	16,8	2	1,2	1	0,6	**161**	100
Near East University	29	40,3	8	11,1	15	20,8	17	23,6	3	4,2	0	0,0	**72**	100
Piri Reis University	14	37,8	17	45,9	1	2,7	4	10,8	1	2,7	0	0,0	**37**	100
İstanbul University	16	69,6	3	13,0	1	4,3	2	8,7	0	0,0	1	4,3	**23**	100
T.Kıran Maritime Coll.	11	73,3	1	6,7	1	6,7	2	13,4	0	0,0	0	0,0	**15**	100
Turkish Naval Academy	44	50,6	17	19,5	5	5,7	17	19,5	3	3,4	1	1,1	**87**	100
Level 5														
Karamürsel Vocational S.	117	46,2	16	6,3	58	22,9	56	22,1	2	0,8	4	1,6	**253**	100
ITU Vocational School	69	58,0	1	0,8	25	21,0	22	18,5	0	0,0	2	1,7	**119**	100
Yalova Vocational School	7	20,6	1	2,9	12	35,3	14	41,2	0	0,0	0	0,0	**34**	100
Galatasaray Vocational S.	12	70,6	0	0,0	1	5,9	3	17,6	0	0,0	1	5,9	**17**	100
Zonguldak Vocational S.	3	37,5	1	12,5	1	12,5	3	37,5	0	0,0	0	0,0	**8**	100
Fatsa Vocational School	1	14,3	1	14,3	0	0,0	5	71,4	0	0,0	0	0,0	**7**	100
Mersin Vocational School	2	66,7	0	0,0	1	33,3	0	0,0	0	0,0	0	0,0	**3**	100
Level 4														
TUDEV	208	42,2	59	12,0	103	20,9	112	22,7	11	2,2	0	0,0	**493**	100
EKOL	28	51,9	1	1,9	12	22,2	13	24,1	0	0,0	0	0,0	**54**	100
Level 3														
High School	54	27,3	8	4,0	100	50,5	31	15,7	1	0,5	3	1,5	**197**	100
Others	98	43,4	22	9,7	40	17,7	49	21,7	16	7,1	0	0,0	**225**	100
Miss Value													**271**	
Total	**1359**	**34,9**	**680**	**17,5**	**807**	**20,7**	**629**	**16,2**	**110**	**2,8**	**38**	**1,0**	**3894**	**100**

When compare the officers' company size preference as to graduated educational institution, the officers graduated from Istanbul Technical University, preferred to work in medium size companies (61%) and big size companies (34,9%). Similarly, the officers who graduated from the earlier established educational institutions TUDEV, Dokuz Eylül University and Karadeniz Technical University mostly preferred to work in medium and big size companies. However, except TUDEV, the other educational institutions, which provided most of the officers for the study, have programs at level 6 or equivalent level. While the percentage of the officers who graduated from Karamürsel Vocational School and ITU Vocational School which have level 5 programs, or short-cycle tertiary education, preferred to work in small size companies, is relatively higher. (see Table 6).

Table 6: Comparison of the Officers' Company Size Preferences as to Graduated Educational Institution

	Company Size							
	Small		**Medium**		**Big**		**Total**	
Educational Institution	**(f)**	**%**	**(f)**	**%**	**(f)**	**%**	**(f)**	**%**
Level 6								
İstanbul Technical University	57	4,1	852	61,0	488	34,9	**1397**	100
Dokuz Eylül University	33	9,4	188	53,4	131	37,2	**352**	100
Karadeniz Technical University	20	8,2	137	56,4	86	35,4	**243**	100
Yıldız Technical University	7	4,2	111	66,9	48	28,9	**166**	100
Near East University	7	9,5	35	47,3	32	43,2	**74**	100
Piri Reis University	6	16,2	11	29,7	20	54,1	**37**	100
İstanbul University	4	17,4	15	65,2	4	17,4	**23**	100
Turgut Kıran Maritime College	0	0,0	12	75,0	4	25,0	**16**	100
Turkish Naval Academy	9	10,2	64	72,7	15	17,0	**88**	100
Level 5								
Karamürsel Vocational School	49	18,4	137	51,3	81	30,3	**267**	100
ITU Vocational School	24	19,2	84	67,2	17	13,6	**125**	100
Yalova Vocational School	6	17,6	21	61,8	7	20,6	**34**	100
Galatasaray Vocational School	6	33,3	9	50,0	3	16,7	**18**	100
Zonguldak Vocational School	2	25,0	3	37,5	3	37,5	**8**	100
Fatsa Vocational School	1	12,5	6	75,0	1	12,5	**8**	100
Mersin Vocational School	1	25,0	2	50,0	1	25,0	**4**	100

Table 6: Comparison of the Officers' Company Size Preferences as to Graduated Educational Institution (Cont.)

	Company Size							
	Small		**Medium**		**Big**		**Total**	
Educational Institution	**(f)**	**%**	**(f)**	**%**	**(f)**	**%**	**(f)**	**%**
Level 4								
TUDEV	44	8,8	332	66,1	126	25,1	**502**	100
EKOL	9	16,4	36	65,5	10	18,2	**55**	100
Level 3								
High School	25	12,6	128	64,3	46	23,1	**199**	100
Others	26	11,5	150	66,1	51	22,5	**227**	100
Miss Value		**51**						
Total	**336**	**8,7**	**2333**	**60,7**	**1174**	**30,5**	**3894**	**100**

Comparing education level of deck and engine officers shows that: 66% of the deck officers had level 6 degree of marine transport, 11% had level 5 degree and 17,6% had right to be an officer through level 4, while 57% of engine officers had level 6 degree of marine engineering, 15,8% had level 5 degree and 9,7% had completed level 4 (see Table 7). According to chi-square test results, it is revealed that the deck officers have level 6 degree more than expected count (Count: 1350, Exp. Count.: 1276), on the other hand, the engine officers have level 6 degree lower than expected count (Count: 829, Exp. Count.:903).

Table 7: Comparison of Education Level of Deck and Engine Officers

		Education Level						
		Level 6	**Level 5**	**Level 4**	**Level 3**	**Other**		**Total**
Department	Deck	1350	224	360	58	42		**2034**
	Engine	829	228	140	117	125	Miss Value	**1439**
Total		**2179**	**452**	**500**	**175**	**167**	**421**	**3894**

The percentage 56% of the officers who worked on board bulk carriers had level 6 degree, 15% of the officers had level 5 degree and 17% of them had completed level 4 degree. For crude/oil tankers, 87% of the officers had level 6 degree. 73% and 72% of the officers had level 6 degree who worked on board LNG-LPG tankers and Ro-Ro ships, respectively. However, 51,0% of the officers had level 6 degree who worked on board container ships (see Table 8). Based on these data, concluded that the officers who worked on board crude/oil tankers, LNG-LPG carriers and Ro-Ro vessels had higher levels of education than the officers worked on bulk carriers and container ships. In other words,

Turkish ship management companies which operate crude/oil tankers, LNG-LPG carriers and Ro-Ro vessels preferred the officers who had higher levels of education than companies which operate bulk carriers and container ships. According to chi-square test results, it is revealed that the officers who are employed in Tanker type ship have level 6 degree more than expected count (Count: 595, Exp. Count.: 433). On the other hand, the officers who are employed in Bulk type ship have level 6 degree lower than expected count (Count: 764, Exp. Count.:864). Similarly, the officers who are employed in Container type ship have also level 6 degree lower than expected count (Count: 320, Exp. Count.: 400).

Table 8: Comparison of Education Level of the Officers as to Ship Type

Education Level	Ship Type														Total
	Bulk		Crude/Oil		Chemical		Container		Ro-Ro		LNG/LPG				
	(f)	%	(f)	%	(f)	%	(f)	%	(f)	%	(f)	%			
Level 6	764	56,2	595	87,5	468	58,0	320	51,0	80	72,7	28	73,47			**2255**
Level 5	211	15,5	20	2,9	108	13,4	103	16,4	2	1,8	7	18,4			**451**
Level 4	232	17,1	35	5,1	115	14,3	126	20,0	11	10,0	0	0			**519**
Level 3	54	4,0	8	1,2	98	12,2	31	4,9	1	0,9	3	7,9	Miss Value		**195**
Other	98	7,2	22	3,2	18	2,2	49	7,8	16	14,5	0	0	**(f)**	**%**	**203**
Total	**1359**	**100**	**680**	**100**	**807**	**100**	**629**	**100**	**110**	**100**	**38**	**100**	**271**	**100**	**3894**

The officers who were employed by big size companies, 72% of them had level 6 degree, 9,6% of the officers had level 5 degree and 9,7% of them had level 4 degree. In medium size companies, the officers who had level 6 degree constituted of 62%, while in small size companies, this percentage declined to 43%. Also, in small size companies, the officers with level 5 degree equal to 26%, in medium size companies this percentage fell to 11% (see Table 9). Referring to this sample, one concluded that the company size and education level of the employed officers increased proportionally. According to chi-square test results, it is revealed that the officers who have level 6 education degree prefer big size, level 5 degree prefer small size and level 4 degree prefer medium size company to work (Count: 850:363:89, Exp. Count.:744:321:41, respectively).

Table 9: Comparison of Education Level of the Officers as to Company Size

Education Level	Company Size								
	Small		Medium		Big				
	(f)	%	(f)	%	(f)	%			Total
Level 6	144	42,9	1444	61,9	850	72,4			**2438**
Level 5	89	26,5	272	11,7	113	9,6			**474**
Level 4	52	15,5	363	15,6	114	9,7			**529**
Level 3	25	7,4	126	5,4	46	3,9	**Miss Value**		**197**
Other	26	7,7	128	5,5	51	4,3	(f)	%	**205**
Total	**336**	**100**	**2333**	**100**	**1174**	**100**	**51**	**100**	**3894**

According to the sample, 81% of the officers who work at medium size companies and 80% of the officers who work at big size companies have 0-15 sea experience. This percentage declined to 75% for small size companies but it is difficult to conclude that there is a significant difference. Similarly, the officers who have 16-30-year sea experience constituted between 11-17% of the total officers for each company size (see Table 10).

Table 10: Comparison of Sea Experience of the Officers as to Company Size

		Company Size			
		Small	Medium	Big	Total
Sea Experience (year)	0-15	236	1442	834	**2512**
	16-30	56	214	122	**392**
	31+	21	126	64	**211**
				Miss Value	**779**
Total		**313**	**1782**	**1020**	**3894**

The ANOVA test was performed to determine whether the average sea experience of Turkish officers indicate significant differences according to the company size. The average sea experience of Turkish officers who are employed in small size company (12,16 years) were identified a significant difference according to medium size company (10,62 years) and big size company (10,54 years). The ANOVA test was also performed to determine whether the average sea experience of Turkish officers indicate a significant difference according to the ship type. The average sea experience of Turkish officers who are employed in Container type ship (12,10 years) were identified a significant difference according to LNG/LPG (11,78 years), Bulk (11,47 years), Chemical (10,20 years) and Crude/oil (9,24 years) type ships. The T-Test was performed to determine whether the average sea experience of

Turkish officers indicate a significant difference according to department. The average sea experience of Deck officers (9,34 years) were identified a significant difference according to the average sea experience of Engine officers (13,02 years).

Table 11: ANOVA and T-Test Implementation for Company Size, Ship Type and Department as to Average Sea Experience

	Variables		
	Company Size *"Anova Test" (Post.Hoc.) Differences**	**Ship Type** *"Anova Test" (Post.Hoc.) Differences**	**Departmant** *"T Test"*
Sea Experience (year)	F: 3,919– **p: 0,020** (Scheffe) Small Size: 12,16* Medium Size: 10,62 Big Size : 10,54	F: 9,056 – **p: 0,000** (Dunnet C) Container: 12,10* LNG/LPG: 11,78 Bulk: 11,47 Chemical : 10,20 Crude/Oil: 9,24	F: -10,019 – **p: 0,000** Deck : 9,34 Engine : 13,02

When comparing sea experience of senior and junior officers as to ship type, 60% and 64% of the senior officers have 0-15-year sea experience who work on board bulk carriers and container ships, respectively. However, the senior officers have 0-15 sea experience constituted 72% of the total senior officers for crude/oil tankers and chemical tankers while this percentage declined to 52% for LNG-LPG carriers. Senior officers with 16-30-year sea experience constitute 22% of the total senior officers for bulk carriers, chemical tankers, and container ships while 16% for crude/oil tankers and 39% for LNG-LPG carriers. When examine sea experience of the junior officers as to ship type, because of the fewer sea experience of junior officers comparing to senior officers, accumulation in the 0-15-year sea experience range is more explicit as expected. Hence, the junior officers who had 0-15-year sea experience constitutes between 97-100% of the total junior officers for all ship types in the sample (see Table 12).

Table 12: Sea Experience of the Senior and Junior Officers as to Ship Type

Competency			Ship Type					Total
			Bulk	Crude/Oil	Chemical	Container	LNG/LPG	
Senior	Sea Experience (year)	0-15	302	217	295	241	12	1163
		16-30	114	49	90	84	9	361
		31+	84	34	24	49	2	198
	Total		**500**	**300**	**409**	**374**	**23**	**1722**
Junior	Sea Experience (year)	0-15	383	221	271	229	14	1175
		16-30	2	0	6	5	0	13
		31+	3	0	0	2	0	5
	Total		**388**	**221**	**277**	**236**	**14**	**1193**
Total	Sea Experience (year)	0-15	685	438	566	470	26	2338
		16-30	116	49	96	89	9	374
		31+	87	34	24	51	2	203
							Miss Value	**979**
	Total		**888**	**521**	**686**	**610**	**37**	**3894**

When making comparison between the officers' marital status and ship type, 35,3 % of the officers are married and 64,7 % of them are single who served on bulk carriers. These percentages slightly differ for the officers who served on crude/oil tankers; 22,4 percent of the officers are married; 77,6 percent is single. However, marital status of the officers who served on chemical tankers, container vessels, Ro-Ro vessels and LNG-LPG carriers is identical (see Table 13). According to chi-square test results, it is revealed that the officers who are married prefer chemical and container ship type (Count: 389:291, Exp. Count.: 310:241; respectively); the officers who are single prefer bulk and crude/oil ship type for working (Count: 865:523, Exp. Count.:826:416, respectively).

Table 13: Comparison of the Officers' Marital Status as to Ship Type

Types of Ship	Marital Status							
	Married		Single				Total	
	(f)	%	(f)	%			(f)	%
Bulk	472	35,3	865	64,7			**1337**	100
Crude/oil	151	22,4	523	77,6			**674**	100
Chemical	389	47,8	425	52,2			**814**	100
Container	291	46,0	341	54,0			**632**	100
Ro-Ro	44	40,0	66	60,0			**110**	100
LNG/LPG	18	46,2	21	53,8	**Miss Value**		**39**	100
					(f)	**%**	**288**	
Total	**1365**	**35,0**	**2241**	**57,6**	**288**	**7,40**	**3894**	**100**

6. DISCUSSION

Within the dataset, Istanbul Technical University Maritime Faculty was found to dominate the Turkish merchant marine officers' manpower. The institution is the earliest institution among others and it is the most preferred institution by those who wish to get maritime education. Therefore, it is currently the primary resource of the maritime officer manpower in Turkey. The majority of the officers (62,6%) have finished Marine Transport and Marine Engineering Level 6 degree in the sample. The officers who graduated from level 5 were 12,2% and 13,6% of the officers were qualified to be an officer by level 4. When compare education profile of the Turkish officers with Filipino officers, there found a difference. 61% of senior officers and 65% of junior officers had level 6 degree of Marine Transport or Marine Engineering in Turkey, whereas 61% of the senior officers and 33% of the junior officers had been through a level 5 degree (associate in nautical/marine engineering) in Philippine (Amante, 2003).

When the average age of officers with other countries is compared, there is a significant difference. BIMCO/ICS (2010) report in which information on age profile was found in national statistics for only five countries (Bulgaria, Lithuania, Norway, UK and Greece) shows more than 25% of officers are over 50 years old and also the total older than 40 years old is more than 50%. In the sample of our study more than 84% of officers are under 40 years old. Besides, it is noteworthy that there are more seafarers in the 19-30 category than there are in the 31-40 category. As seen from age profile of seafarers, Turkey has considerably younger seafaring workforce, which causes questions related to experience and seafarer turnover. On the other hand, younger seafaring workforce has advantages such as easily adapting to rapidly changing area of information and technology and future shortage of seafarers would not be a massive problem for Turkey when compare with other countries which have older seafarer workforce like European Countries.

As a result of the younger seafaring workforce, sea experience of seafarers in the sample was significantly low. 19,1% of seafarers had 4-6-year sea experience, 15,7% of seafarers had 0-3-year sea experience and 12,1% of seafarers had 7-9-year sea experience. As expected, senior officers had more work experience (18,5 year), while junior officers had 6,3 years work experience. There is only one study on seafarers' seagoing service entitled Philippine Global Seafarers: A Profile (Amante, 2003). According to the study, Filipino senior officers had 17 years work experience and junior officers had 15 years work experience. There is

slight difference between Turkish senior officers and Filipino senior officers in terms of sea experience. However, there is almost 9-year sea experience gap between Turkish junior officers and Filipino junior officers. This significant gap related to junior officers' sea experience most likely arises from Turkey and Philippine's education system differences.

Within the dataset 96,1% of seafarers is male and 2,3% of seafarers is female. The percentage of female seafarers is slightly higher than European Countries. According to study on EU Seafarers Employment Final Report, in which only six countries (Bulgaria, Germany, Lithuania, Norway, Sweden, UK) provide detailed information in national statistics on women employment reveals that 1,07% of deck officers and 0,3% of engine officers is constituted by female seafarers. (EU Commission, 2011). A comprehensive study on women employment in the maritime industry held by ILO survey carried on by the Seafarers International Researcher Centre, Cardiff UK in 2003 (Women seafarers: Global employment policies and practices). From this study, women in Scandinavian countries constitute more than 10% of the seafaring workforce, 8,3% in UK, 4,2% in Germany (ILO, 2003). There is a significant gap between ILO survey and the sample in terms of women seafarers. The main reason of this gap is that women seafarers were concentrated in hotel personnel on passenger ships in Scandinavian countries, UK and Germany, whereas women seafarers in Turkey are mostly employed cargo vessels (i.e., container ships, bulk carriers, etc.).

7. CONCLUSION

The one of the most important determinants of the maritime industry is seafarers' manpower. It is important to underline that the maritime sector requires high skillful and qualified seafarers who rapidly adapting to overcome many task. The strength of seafarers' manpower profile improves the safety and quality of work performed. It is crucial to employ a qualified employee in maritime industry for enhancing especially maritime safety. In this respect, it is thought that conducting such a study, which reveals seafarers' manpower profile in Turkey can contribute to the literature.

The study aims to disclose the marine merchant officers' manpower profile in Turkey. The ratings are not included in the scope of the study. The sample data has been classified into age, gender, marital status, certificate of competency, the school where they graduated, graduated year, experience in existing companies and more that shared in

a detailed manner in the study. As a result, merchant marine officers' profile in Turkey is in good state in terms of quality. But, this should not be seen sufficient and new practices should be developed for further improvement of the quantity and quality of merchant marine officers in Turkey. A more comprehensive study, which include in ratings will be conducted for further study and its results can be compared with results of the study.

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