

Methodological Approach and Basic Analysis of Maritime Labour Market Needs by Case of Estonia

A. Alop & R. Leiger

Estonian Maritime Academy of Tallinn University of Technology, Tallinn, Estonia

ABSTRACT: The Estonian Government has adopted Estonian Marine Policy 2012–2020 (EMP) as a long-term planning basis for the development of maritime sector in Estonia. A number of practical tasks shall provide the achieving of goals posed by development plan. One of goals is working out the strategy for development of maritime education and training (MET) in Estonia at least for next 10 years. An enquiry among the enterprises and other actors closely re-lated to maritime sector has been conducted as first stage of this job. The main goal of it was to define the Estonian labour market needs and to adumbrate the vision for trends and developments in field until 2025.

The working out of above-mentioned strategy will be completed by Estonian Maritime Academy of TUT by the end of 2016. The results of first stage were received by the end of 2015; authors of this paper describe and explain the methodological approach using for such study work as well as the instruments used and make the short analysis of results paying special attention to problems and “bottle necks” arising in course of such enquiry.

1 INTRODUCTION

Today not only shipping companies are actually strong competitors but also maritime nations themselves compete against each other on marine transportation markets. This is one of reasons for governments and societies of maritime nations to take a number of measures to provide the better conditions for shipping companies and other maritime sector players in their countries with goal to make them being able to be more competitive on worldwide shipping market (Alop & Senčilo 2013). The main indicators showing the situation's improvement are ships' “coming back” under flag of country and the stabile positive demand on labour market of maritime sector.

The number of comparative labour market studies in maritime sector made all over Europe are relatively small. The main problem is alluded to the fact that there are no comparable data sources. Collection of Europe-wide statistics through surveys is a very large-scale work, which is not easy to carry out. Most of the recent studies is therefore limited to the evaluation of vessels' labour (seafarers), because is much easier to obtain comparative statistics for them. Some studies conducted during last twelve years are described briefly in Table 1.

Table 1. Labour market studies in European maritime sector

Author	Goal	Some results
Leggate (2004)	To analyse the extent of the deficit of seafarers around world	The employers do not believe in global seafarers deficit, rather afraid to drop in quality
Hart & Schotte (2008)	Developments in shipbuilding and repair sector in 2023	Not enough students studying in shipbuilding; demand for those with higher education will grow by 15%
ECORYS (2009)	Internal review of the EU maritime transport sector	Within the EU seafarers supply greater than demand; the demand to grow across Europe
Japan International Institute, the Nippon Foundation (2010)	The labour market needs for world merchant fleet in 2020	In 2020 the growth 7,2% comparing to 2010
Sulpice (2011)	Overview of the supply and demand of seafarers in Europe	For keeping 2010 level the number of ship officers must grow by 10% in Western Europe and by 20% in Eastern Europe annually
Bernacki (2014)	Maritime labour needs in Southern Baltic region	Largest growth in marine and coastal tourism (5 up to 10% annually)

The Estonian government adopted during last five years some important documents directed to improvements in the maritime sector. We hope that thanking to that the situation in maritime sector in Estonia will have trend for improving in current and next decades. Undoubtedly, the most important document in this field is the "Estonian Marine Policy 2012-2020" the main goal of which is to stop the negative trends in Estonian maritime sector, especially in shipping, and to achieve a positive breakthrough in the developments during going decade and later.

EMP vision includes the requirement that the maritime sector in Estonia shall be attractive and sustainable sector of Estonian economics and shall create the high quality surplus value. The 4th priority of EMP envisages that the MET and R&D in field must meet two conditions: 1) the maritime education giving in Estonia ensures up-to-day education in balanced capacity for specialists in all fields of maritime sector as necessary; 2) the quantity and quality of research works in Estonian maritime sector are growing up (Estonian Marine Policy 2012). According to EMP operational programme 2014-2016, the Conception of MET must be developed; planning of maritime education during at least next 10 years should be guided according to it. The comprehensive study of labour market needs in Estonian maritime sector was conducted in 2015. The results of that are the main source of basic data for working out of Conception.

2 THE METHODOLOGICAL APPROACH

2.1 *The basic principles*

The structure of employment of professionals with maritime education in the Estonian maritime sector by the areas, job places and education level never has been analysed before. The main goal of labour market study was to give a rough estimate how many people with which maritime education the Estonian maritime sector additionally needs for period 2016-2025.

The authors used two main principles as basis for methodology of the study work. First is the principle of objectivity that was provided by conducting of research by independent researchers involved by tender. Second is the principle of scientific methodological approach; it means that every independent researcher who would like to repeat this research work using the same methodology and the same initial input should have inevitably more or less the same results. The objectivity of initial data is necessary presuppose for that, it must be provided by extracting of them from official and widely recognised sources. Such sources were the Statistics Estonia and Business Register of Estonia.

2.2 *The methodological approach*

There are different methods for making the prognoses for the labour market's needs. In very general, we may divide them to quantitative, semi-quantitative (e.g. econometric forecasting models, surveys of employers and the skills audits) and qualitative (Delphi method, case studies, focus groups and qualification needs of the key businesses) methods. Some comprehensive combination methods are possible as well like sector or region based growth visions, scenarios and monitoring. More used the sector and alumni surveys, specific area/sector/occupation/qualification surveys and studies on a certain target group (the unemployed, the disabled and low skilled people, ethnic minorities, migrant workers, etc.). They all have their advantages and disadvantages (Cedefop 2008).

The enquiries amongst employers are usual instrument for such studies because as rule there are no the creditable statistical data about proposed or vacant job places. However, such enquiries are oft the object for critique because they not always enough representative and give the static picture of momentary situation as well. Besides, they may not reflect the situation objectively in full because the subjectivity of employers' viewpoints. The biggest value of such enquiries is the qualitative view for finding out the shortages in quality of labour forces (e.g. appraisal of skills) – the collection of such information could be quite difficult using the quantitative methods.

The second frequently using method is the statistical model. This method allows comparing the demand and supply on labour market. The strength of such model is in possibility for nationwide applying and in applicability for more long periods (5-10 years). The weaknesses are the relative imprecision and excessive generalization, and some insufficiency of model in whole as well – it is

principally impossible to find answers for some more concrete questions using this method (Cedefop 2012).

Taking into account all the above-mentioned factors, the authors of study work chosen the combined methodology. It combines the quantitative model based on statistical approach and qualitative analytical method based on appraisals of employers giving in course of so-called semi-structured interviews. Therefore, the practical work consisted of two parts: first part was the collection of statistical information about employees from enterprises using the questionnaires; second part was the receiving of qualitative appraisals about situation in sector by use the face-to-face interviews. By dint of first kind information, the structure of labour force in maritime sector by state of 2014 was determined and the possible development scenarios in next 10 years were composed and analysed. The employers had given qualitative appraisals to possible future developments in their own operating areas, i.e. they expressed their opinion about quality, sufficiency and necessary competences of employees in next 10 years as well as their expectations about quality and level of education of their employees.

The prognosis model took into account two main kind of demand affecting the developments: growth demand and replacement demand. The growth demand may be the positive one as well as the negative one and it depends on economic prognosis for the test period. Whilst developments in economics are dependent on a lot of circumstances and unpredictable events, such prognoses are relatively imprecise. Therefore, the method of different scenarios was used that means that so-named basic, conservative and optimistic scenarios was developed.

Table 2. The specialties and job places

Specialties	Job places
Navigation	Captain
	Chief Mate
	Second Mate
	Third Mate
	Deck cadet
	Boatswain
	Deck Rating (Sailor)
	Pilot
	VTS operator
	VTI operator
Ship Engineering	Chief Engineer
	Second Engineer
	Third Engineer
	Fourth Engineer
Ship Refrigeration	Refrigerating Engineer
	Electro-Technical Officer
Ship Electro Mechanics	Electrician
Shipbuilding	Ship Building and Repair
	Shipbuilding Manager
	Shipbuilding Planning and Design
Small Craft Building	Small Craft Building and Repair
Small Harbor Management	Small Harbor Specialist
Port and Shipping Management	Port and Shipping Manager
	Ship Agent
Seaways Operation and Maintenance	Cargo Forwarder
	Stevedore
	Ship Broker
	Hydrographer
Radio Electronics	Radio-Electronic Officer

The replacement demand is always positive because a number of employees in sector in the long time perspective decreases inevitably by several reasons: mortality, retirement and moving of employees to other working places out of sector. The labour market needs in maritime sector are affected by both growth and replacement demand factors.

The selection of employees' specialities and job positions for study purposes was done. The main principle of this selection was that people need maritime education for obtaining of their specialities and for working in corresponding job positions. Selection by specialities and job positions made for purposes of present study work is shown in Table 2 (Rozeik et al. 2015).

The selection of enterprises for enquiring and taking the interviews was as following: using the database of Business Register of Estonia the enterprises were chosen by main field of activity declared by them as acting in maritime sector during 2008-2013. The activities were determined according to Estonian Statistical Classification of Economic Activities EMTAK2008 that is the national version of EU classification NACE (website NACE 2016). The structure and the change of number of companies in maritime sector during the period 2008-2012 are shown in Figure 1.

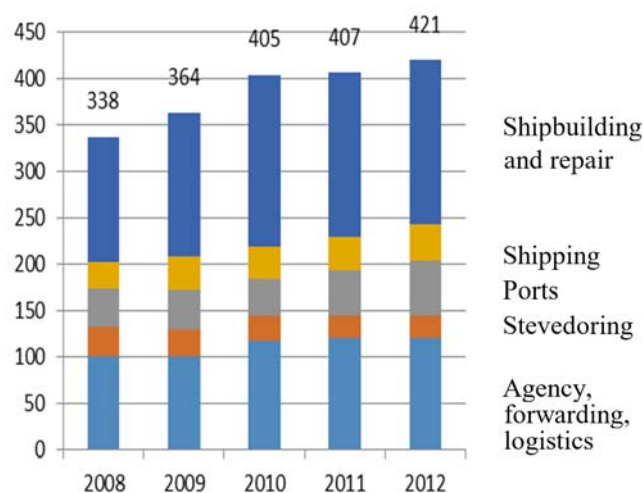


Figure 1. Number of companies in the maritime sector, 2008-2012

Source: Rozeik et al. 2015

Additionally the enterprises that have been declared maritime sector activity as ancillary one were included to selection in case if researcher had information about real acting of this enterprise in maritime sector during named period. In such way formed complete selection by year 2013 consisted of 464 maritime sector enterprises with 9 123 employees in sum.

2.3 Some results of study work

The companies that responded to the questionnaire employ in total 3543 people that is 39% of total selection for study work. For getting the expert opinions regarding to present situation and future trends the semi-structured interviews were carried out within 39 most important and biggest Estonian

enterprises as well as craft unions and governmental bodies in field; the interviewees were mainly owners or top managers of these enterprises and organisations. The received information was analysed and used for giving the appraisal to situation in maritime sector having in mind the quality and sufficiency of labour force today and in future. For better systematisation, the enterprises were divided between three fields of activity: 1) ship building and repair incl. small craft building and repair, 2) shipping together with crewing, towing and bunkering, 3) ports and port services together with stevedoring and agency.

Enterprises' survey by job places showed that the majority of the employees with maritime education constitute sailors. The other major category is the engine ratings (motorists), fairly compelling are also represented the third and fourth ship's engineer and the ship's chief engineer.

By fields of activity, the largest share of employees in the maritime sector is engaged in shipping (47% of sector employees). The following three major areas of activity are crewing, shipbuilding and repair and port activities, which provide in total 40% of the job places in maritime sector (see Figure 2).

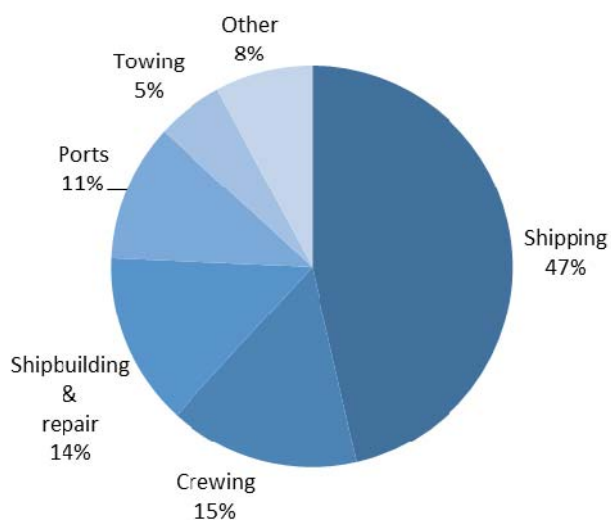


Figure 2. The distribution of employees in maritime sector by fields of activity
Source: Rozeik et al. 2015

The two most frequent specialties are navigation and ship propulsion, which together represent a range of staff with professional maritime education nearly 56% (see Table 3).

Table 3. The share of maritime sector employees by speciality

Specialty	Number of empl.	Percentage
Navigation	181	28,1%
Ship propulsion	181	28,1%
Deck Rating	46	7,1%
Engine Rating	36	5,5%
Electro-Technical Officer	34	5,3%
Other	167	25,9%
Total	645	100%

For drawing up the prognoses of labour market' needs three future developments' scenarios were

composed on the base of statistical analysis, interviews and experts' assessments. They were basic, conservative and optimistic scenarios what has been prepared in accordance with the following principles:

the basic scenario - the current situation and past trends have a simple reflection to the future, no structural changes envisaged, i.e. the continued development of the sector in accordance with the current development projection;

the conservative scenario - on the basis of the strategical and research documents compiled more modest scenario that takes into account businesses estimations;

the optimistic scenario - in contrast to the conservative scenario the most positive development opportunities are selected, i.e. the challenges facing the sector will realized in full.

According to that, the needs for additional labour forces in maritime sector until year 2025 are shown in Table 4 (Rozeik et al. 2015). Under additional labour forces we understand people who need to have maritime education for being employed in maritime sector' enterprises, governmental and supervising organisations.

Table 4. The needs for additional labor forces until 2025 in maritime sector and in governmental and supervising bodies

Job position	Scenario		
	Conservative	Basic	Optimistic
Captain	42	59	71
Chief Mate	14	18	25
Second mate	8	12	17
Third Mate	21	24	29
Boatswain	31	36	44
Pilot	10	12	15
Deck Rating (Sailor)	67	87	119
Chief Engineer	57	66	79
Second Engineer	13	15	20
Third or Fourth Engineer	64	73	89
Engine Rating (Motorist)	70	82	91
Refrigerating Engineer	8	10	13
Electro-Technical Officer	21	25	30
Radio-Electronic Officer	11	13	15
Electrician	21	28	36
Ship Electrician	20	22	26
Ship Builder	82	91	102
General Manager of Shipbuilding	20	23	27
Project Manager in Ship Building and Repair	18	22	28
Port or Shipping Manager	40	47	60
Harbor Specialist	21	23	28
Agency, Forwarding, Brokering	5	6	8
Other	4	5	6
Total	670	788	978

During interviews, the employers gave estimations to the situation with the labor force from aspects of quality and adequacy. More specifically employers described in so far they are satisfied with the existing labor force, how difficult or easy for them to find labor, which is a labor shortage or surplus, and which competences are most important to have in the future.

Employers are generally satisfied with the current workforce. In particular, they were satisfied with the

quality of training of ship officers both deck and engine personnel, but also port personnel' professional competencies and education. There is currently a shortage of qualified Chief Engineers and Second Engineers in Estonian fleet, the need for them will increase even more in the coming years due to the growing replacement demand. There is also a shortage of Electro-Technical Officers whose training has been absent in Estonia for a long time; their need for a replacement of the current workforce is becoming increasingly due to high age. For Ship's Electricians there is the labor market situation, where demand is greater than supply. Vocational curriculum for training of ship's electricians exists, but they are not trained now. In addition, there are neither in Estonia nor in the international shipping market enough unskilled workers, namely it is the lack of a sailors and a motorists.

The employers said that it is necessary to increase the competencies of employees with higher education in fields of ship automation, electronics, radio equipment and ICT. MET institutions must offer an increasingly broad-based education. ICT competences are becoming more important to the operation of the port as well, as technological developments involving the exchange of information digitalization and ports automation.

By employers' estimation, two main factors will affect the development of the Estonian maritime sector in the coming years: 1) changes in the economic situation in the world and 2) decisions and actions carried out in the national maritime policy to improve the international competitiveness of the Estonian shipping. If the global economic environment improves the growth of shipping in general as well as the passenger and freight transportation volumes will take place, the demand for vessels' services and the construction of new ships and repairs of existing will grow. Favorable tax conditions for seamen and the introduction of so-called international ship registry would result of more than 500 GT cargo ships entering under the Estonian flag. This would improve the international competitiveness of the maritime sector in Estonia and would create new jobs places for maritime professionals.

2.4 The basic principles on Conception of MET in Estonia

The results of investigation of labour market carried out are the very important input for working out and coming into force the Conception of MET in Estonia. Of course, a number of other factors and impactors should be taken into account. Actually, the study of labour market needs has made to certain extent clear the so-called *objective demand* coming from employers' side in Estonian maritime sector in next 10 years. The important task of Conception of MET is to investigate the supply as well as the *subjective demand* coming from community side.

Very significant factors that strongly affect situation on labour market of Estonian seafarers are the international character of shipping and freedom of labour forces moving within EU thanking to that a lot of graduated ship officers find their job places under foreign flags. For Estonia proportion between seafarers-residents of Estonia and Estonian seafarers

sailing under foreign flags (mainly flags of convenience) is nowhere near in the favour of Estonian residence. This may be explained by fact that number of merchant ships fly Estonian flag is close to zero now. The usual question of politicians is does the country have obligation to waste money and educational potential for preparation of well-educated seafarers who leave country and go to foreign ships? Conception has to give answer to this question among other important things.

The labour market needs investigation gives us some imagination about output of maritime education and training institutions that should enter into market every year to satisfy the demand of that. However, what is the real proportion between amount of entrances to MET institution and number of graduates after 5 years in certain speciality? In other words, if we want to have for example 10 graduates with definite qualification entering to maritime sector in 5 years, how many school youngsters have to be enrolled to MET institutions on appropriate speciality today? Giving the correct answers for this and other questions is not so easy because of a number of several impactors plus not always clear developments in future plus unstable and not very positive demographic situation in country and more other factors. All these factors and trends shall be taken into account by working out of Conception.

3 CONCLUSIONS

A number of researches and study works carrying out during last decades was dedicated to developments of MET and labour market problems in several EU countries and in EU in whole. A remarkable difference between the methodologies and source data failure making them difficult to use their findings for generalization and trends identification in whole.

Because the maritime sector, especially shipping, is very dynamic sector of economy from one side and has clear an over-border character from other side the results of these jobs need regularly revising and renewing. This is possible only by cooperation, joining of forces of MET and R&D institutions in field.

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