

Research on the Countermeasures of Chinese Shipping Enterprises Facing the Loss of Seafarers

Ruowei Wang*

Adam Smith Business School, University of Glasgow, Glasgow, G12 8QQ, the United Kingdom

*Corresponding author: 2626401w@student.gla.ac.uk

Keywords: Neural Network, Prediction Model, Big Data.

Abstract: The article starts from the current situation of the losing officers in shipping enterprises and mainly adopts the literature analysis method. Using the Price-Mueller model, the reasons for seafarers' loss are discussed from four aspects, and the reasons for the loss of officers are the increase in job opportunities, the increase in the sense of responsibility of relatives, the inequality between salary and remuneration and work payment, and the tedious work and life on board. Following this, the use of relevant incentive theories and combined with organizational behavior, human resource management, and other fields of knowledge put forward four targeted countermeasures, which are shipping companies to help seafarers to solve family concerns, allocate a good team for ships, enhance the intensity of review when recruiting, enhance the attention of the crew. To completely solve the problem of the loss of senior Chinese crews, this requires the long-term joint efforts of enterprises and the state. Through the analysis and demonstration of this article, it is hoped that shipping enterprises' current urgent loss situation can be alleviated and contribute to implementing the Chinese marine power strategy.

1. Introduction

1.1. Background

As the primary method of cargo transportation in the world today, marine transport has dominated more than 80% of the global cargo transportation volume. For the total amount of Chinese import and export cargo, marine transport accounts for 90%. In 2020, shipping companies' operating costs increased by implementing the International Maritime Organization's (IMO) "Sulphur Limit Order". At the same time, the sudden COVID-19 outbreak turned into a global pandemic, and the number of confirmed cases kept increasing, which has had a profound impact on the worldwide shipping industry and the global economy since the 2008 financial crisis [1]. Instead, shipping companies seem to be paying more attention to recruiting seafarers to fill the gap and appear to be paying less attention to solving crew loss. The loss of these seafarers, especially officers, will harm Chinese economic growth, business operations and management, and personal career planning.

1.2. Related Research

Zhao, Walters, and Shan discuss why seafarers have not entered the international market through interviews with seafarers and managers of seafaring agencies. They note that the ability of seafarers to leave jobs is limited due to factors such as administrative supervision and personal environment. At the same time, due to the imperfect state supervision and support system, the reform of the Chinese maritime labor market is restricted [2]. Using the T-test, Bao et al. analyze the reasons for the loss of young Chinese seafarers with the least significant difference and the one-factor variance. They find that the main factors that cause the shipping industry to suffer from labor shortage for a long time are the lack of professional identity and the inability to bear family responsibilities [3]. Gu et al. used an online survey to sample 294 seafarers and used descriptive and correlation analysis to test hypotheses. This article examines how career commitment and interesting work environment can be used as an important mechanism to influence the relationship between job demand and separation intention. The

results show the importance of organizing appropriate group activities onboard to help seafarers reduce fatigue and stress [4]. Through biometric investigation of 323 seafarers, Oldenburg and Jensen state that in the three stages of the ship's voyage, which are port stay, river channel, and sea channel. The seafarers work the slightest pressure because of the short average working hours during the sea passage but produce tremendous pressure when docking at the port [5]. Yuen et al. analyze the high turnover rate of 116 seafarers through a survey of job satisfaction and performance, and they demonstrate that job stress and remuneration have the greatest impact on seafarers, while seafarers' personality and job characteristics have the least impact on them [6]. Liu et al. investigate seafarers working on merchant ships and use hierarchical linear regression analysis to test the adjustment effect of job satisfaction. They find that job satisfaction can alleviate the conflict between work and family. Managers need to strengthen investment and support to reduce the work pressure of crew members [7]. Through the summary of previous literature, Caesar et al. find that the management of shipping enterprises need to focus on three aspects of the seafarers' satisfaction with the work and employer, the development opportunities of the profession, and working conditions [8]. The purpose of An et al. is to empirically examine the effects of work-family conflict, job stress and job satisfaction on seafarer performance. They use layered regression analysis, and the results showed that work-family conflicts and stress at work hurt seafarers' self-reported performance. The results also show that job satisfaction plays a palliative role in the relationship between work and family conflict, job stress, and seafarer performance [9]. Jepsen et al. collect publications on fatigue risk factors, short-term and long-term health and safety implications, and marine fatigue mitigation programmes. Given the frequency of seafarer fatigue and the severity of its consequences, one should study the effectiveness of the current legislative framework and industry compliance, the staffing of international merchant fleets and the optimization of working, living, and sleeping conditions at sea [10]. After a questionnaire survey of 5,00 seafarers, Papachristou et al. report that while seafarers seem satisfied with their choice to join the industry. When asked what led them to abandon the industry, they said inadequate communication with family and friends was the most important thing. This is clear evidence of the role of communications in improving the retention rate of the maritime profession [11]. By analyzing the impact of the new crown outbreak on crew turnover, Hu describes factors affecting the departure of young senior seafarers, including unwelcome compensation systems, unreasonable promotion channels, ineffective staff training, poor human resource management, and personal factors such as related job expectations, family reasons, and psychological depression and anxiety [12].

2. Present situation

2.1. Seamen's Loss of Status

According to the Baltic and International Maritime Conference (BIMCO) and International Chamber of Shipping's (ICS) latest "Manpower Workforce Report" shows it would be an estimated global shortage of 89,510 officers by 2026 to operate the merchant fleet of the world. China Ocean Shipping Company is a shipping enterprise with the strongest comprehensive transportation capacity in Chinese. It has 1315 ships and a capacity of 104.56 million dwt in 2019, ranking first in the world, but it also faces the problem of crew loss. The enterprise lost a total of 2,614 people in 2018, accounting for about 1/20 of the total crew, of which more than 200 senior seafarers in different positions were lost. Although seafarers play a significant role in Chinese national economic development, they have not been given sufficient attention and protection by society in this situation, and the group remains vulnerable.

2.2. Covid-19's Effect

With the outbreak of Covid-19, the Chinese government notices the increasing demand rate, and the gap has grown from 2.94% to 3.1%. Additionally, half of these resigned senior seafarers are under 40 years old [13]. As for the Chinese, even though seafarers play an essential role in developing the country's economic system, this occupation does not seem to be adequately reflected, which directly leads to a substantial reduction in the number of seafarers' careers [12]. Data from the Chinese

Maritime Safety Administration shows that the number of active Chinese officers on international voyages decreases year by year, and Table 1 shows the change in the number of captains, chief officers, chief engineers, and first engineers from 2016 to 2020 [13].

Table 1. Changes in the number of active crews

Position	2017	2018	2019	2020
Captain	15781	15291	14937	13205
Chief Officer	11488	11294	11120	10323
Chief Engineer	15367	14805	14425	12686
First Engineer	10107	9999	9874	9233

Although the decline rate of the number of seafarers has slowed down in recent years, due to the outbreak of the epidemic, the company cannot protect the rights and interests of seafarers, and most countries have rigorous requirements for sailors to disembark. Some ports ban shore leave at ports or even directly refuse to disembark seafarers from other countries at their ports, leading to seafarers' growing disappointment in this industry. Considering the length of the pandemic, the impact on shipping would remain in the short term so that the seafarers have to adapt it. It is a severe mental challenge for seafarers [14].

2.3 The Model of Turnover

At present, most research has focused on job satisfaction [6] that lacks systematic and complete induction and integration. Relative research on the demission of seafarers is also still scarce in Chinese. Price-Muller model is the most widely used theory for employees' demission in enterprises. This theoretical model considers sixteen factors and divides them into four perspectives, which are environmental segments, individual segments, structural segments, and process segments [15]. Job satisfaction can effectively reduce seafarers' work stress, improve job performance, and reduce family disputes [9]. As one of the mediating segments, job satisfaction is undeniably important, but organizational commitment and search behavior cannot be ignored. Due to the different legal systems, cultural systems and economic development levels among countries, Chinese shipping enterprises need to adopt practices that suit their national conditions when facing the loss of seafarers.

3. Cause analysis

3.1. Environmental Segments

Environmental segments include opportunity and kinship responsibilities. Opportunity refers to how easy it is for an employee to find a new job. In the early days of reform and opening in the 1980s, the Chinese market economy was in the early stage of development, and job seekers had low self-choice in their work. With the complete construction of the Chinese 5G base station, seafarers can receive information on their mobile phones at any time during their land vacation, allowing them to quickly grasp job recruitment information without losing opportunities due to information congestion. Kinship responsibilities refer to the obligation to relatives living near them. When seafarers work onboard ships, they find it difficult to reunite with family and friends due to long sea voyages. Sometimes there are even obstacles to communicating with their families [11]. Another important reason is that both the seafarer family's parents and children can only rely on the wife, which puts crew families under more pressure than other professional families.

3.2. Individual Segments

Individual segments include a class of training, job participation, and emotional segments. General training refers to how other businesses can use an employee's abilities. As is often the case, shipping companies do not provide general training for seafarers but will choose to raise their wages and other means to protect their investment in special needs training. On the contrary, seafarers tend to conduct self-selecting training to enhance their abilities. Job involvement refers to an employee's enthusiasm for a job. The new seafarers are more engaged in their work and are eager for more rewards, but are

limited by the existing crew hierarchy, resulting in a lower return-to-pay ratio, leading to a decrease in the crew's job participation. Emotional segments can be divided into positive and negative emotions. When a crew member works on a ship or takes a vacation on land, there are some positive and negative emotions. During which the employer of the shipping company is unable to grasp the mental state of the crew member in a timely and accurate manner. During the vacation on land, the negative emotions generated by the crew will directly affect whether the crew member continues to engage in the profession.

3.3. Structural Segments

Structural segments consist of seven elements which are job autonomy, fairness of distribution, job stress, pay, promotion opportunities, job monotony, and social support. Work autonomy refers to the extent to which employees can exercise their rights. Under IMO practice, different levels correspond to different working hours, depriving seafarers of their working hours and the lack of working environment autonomy due to the limited space for seafarers to operate onboard ships and the relatively single environment. Distribution equity means the degree to which the management's reward for the crew corresponds to the actual performance. Managers cannot examine the crew's actual working status and therefore cannot directly assess their performance. Job stress is the extent to which an employee's work can be completed. As a particular group, the working day is fixed, and when there is extra work, the crew has to work outside of work hours. In terms of compensation, the gap between the crew's pay level and the Chinese mainland's average salary level is narrowing and the salary is linked to the crew level. The Crew Management Ordinance strictly stipulates the channels for the promotion of seafarers. The channels for the promotion are single, resulting in a steady decline in the number of new seafarers each year. Job monotony refers to the employee's repetition of a job. Ships sail away from land, and entertainment, which is standard on land, is challenging to achieve onboard, and long, monotonous working lives can lead to a gradual build-up of crew dissatisfaction with their work. Social support refers to the general recognition of the crew's work. The current situation is whether internal social support or external social support, the recognition of the profession of seafarers gradually decreased, the crew's self-esteem has also caused some harm.

3.4. Mediation Segments

Mediation segments include job satisfaction, organizational commitment, and job search behavior. Job satisfaction is influenced by many factors, including working conditions, personality, compensation, and corporate social responsibility. When the crew's job satisfaction is high, there are many positive results, i.e., job performance improvement, organization of civic behavior, but low job satisfaction will produce idle work and many other phenomena. Through organizational commitments, which impact the crew's past perceptions and behavior, these commitments will reduce staff turnover to some extent. Job-seeking behavior Job-seeking behavior refers to the degree of willingness of employees to find new jobs. China joined the World Trade Organization (WTO) in 2001 and then carried out the reform of the shipping enterprise system, which changed the original employment relationship, and the crew was able to choose the shipping enterprise more freely and autonomously. At the same time, with the development of information technology, the crew market information is more transparent and has abundant resources. These changes make it easy for the crew to find new jobs.

4. Resolution Strategies

4.1. Help The Seafarers Address Family Concerns

Due to the particularity of the seafarers' work, the seafarers cannot assume family responsibilities. Shipping enterprises can refer to the practices of other companies, i.e., Colgate. It provides employees with emergency home care and consulting services and gives them peace of mind. Through the summary of published articles, there are measures which are shown in Table 2 to reduce the contradiction between work and life.

Table 2. Measures to reduce work-life conflict

Consideration	Measure
Time	Paid vacation
	Provide holiday for new parents
Message	Consulting service
	Care service for the elderly
Fund	Additional insurance benefit
	Children’s tuition subsidy
Direct service	Nursery
	Concierge

While solving family problems, it is also necessary to provide more opportunities for the crew to contact their families. While shipping lines providing more phone communication time to seafarers increases fleet operating costs, this will make crew families more harmonious and stable and improve the company’s reputation in the industry. Overall, addressing family concerns brings more hidden wealth to the company.

4.2. Build A Rational Team

According to the Team Effectiveness Model, “Composition” is an essential component, including members’ abilities and performance, diversity, allocating roles, cultural differences, personality, and size of teams. Shipping enterprises need to analyze them one by one. For the diversity and cultural differences, communication between the crew is more cumbersome due to their different experiences and the influence of language, age, race, education level, and other factors. Easterner is a high-context culture, and Westerner is a low-context culture. When the Japanese communicate with Germany in English, misunderstandings may affect their work efficiency [16]. At the same time, the managers need a high degree of cooperation of the Drive Section and the Engine Department if a contradiction would affect the safety of the ship’s navigation. Therefore, managers should consider whether the team can cooperate effectively when equipped with seafarers and carefully review the crew’s nationality, religious beliefs, resumes and other information. Finally, they confirm no apparent problems before building a crew.

4.3. Increase Scrutiny at The Time of Recruitment

A complete selection process could be set up to reduce the losses caused by turnover. As shown in Figure 1 below, shipping enterprises could take the commonly used three-step selection steps.

The initial selection is to understand the most basic information of job seekers. Questionnaires are always used to obtain the background conditions. Substantive selection is the most important component of the whole recruitment process, and it includes a written test, interviews. These tests aim to understand the seafarers’ ability, integrity, personality, etc. Knowing the personality of the crew is an important part. By analyzing the seafarers’ personalities, the managers can understand and predict their feelings and behaviors under some special conditions [17]. Additionally, the contingent selection is the last step, i.e., drug test. This process allows shipping enterprises to know in advance who is not fit to be hired, thereby reducing the risk of employee separation at the initial moment.

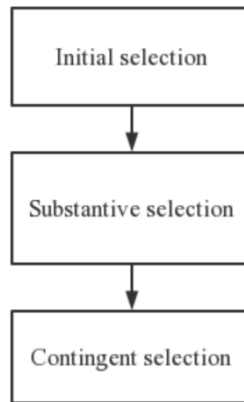


Figure. 1 The process of choosing seafarers

4.4. Increase Attention to The Crew

In general, employees want their efforts to be noticed by the business. Shipping enterprises could adjust their organizational structure to effectively control the number of seafarers and ensure that each member receives appropriate attention. Managers can classify and manage seafarers on land and on board. Seafarers on land should be regularly asked about their living conditions, and if assistance is urgently needed, advance pay may be provided to ensure that the crew can safely board the ship. For seafarers on board, due to the inconvenience of communication, enterprises may take the form of regular private mail to the crew to consult the status of each member and create more diverse forms of feedback to avoid situations where large groups isolate one or more people. In an emergency, the enterprise should immediately understand the situation and assist.

5. Conclusion

Through the integration of past research, the Price-Mueller model is used to analyze the reasons for the loss of Chinese seafarers from environmental segments, individual segments, structural segments, and intermediary segments. These reasons include subjecting to kinship responsibilities, low job satisfaction, and increased employment opportunities. In the end, there are four suggestions. Firstly, help the seafarers address family concerns. Secondly, build a rational team. Thirdly, increase scrutiny at the time of recruitment. Fourthly, increase attention to the crew. By researching how shipping enterprises face and solve the problem of senior crew loss, the losses caused by crew losses can be reduced. Furthermore, the Chinese government has proposed the “Belt and Road” initiative and the proposed maritime power strategy, providing shipping companies unprecedented opportunities. Under the good conditions of effective control of the new crown epidemic in Chinese, we should take this opportunity to enhance the influence of Chinese shipping enterprises in the world. Shipping enterprises need to earnestly safeguard the fundamental interests of seafarers and promote the development of the Chinese shipping industry.

References

- [1] Kaptan, M., & Olgun Kaptan, B. (2021). The investigation of the effects of COVID-19 restrictions on seafarers. *Australian journal of maritime and ocean affairs*, 1-13. doi:10.1080/18366503.2021.1961360
- [2] Zhao, Z., Walters, D., & Shan, D. (2020). Impediments to free movement of Chinese seafarers in the maritime labor market. *The economic and labor relations review: ELRR*, 31(3), 425-443. doi:10.1177/1035304620937881

- [3] Bao, J., Li, Y., Zheng, G., & Zhang, P. (2021). Exploring into contributing factors to young seafarer turnover: empirical evidence from China. *Journal of navigation*, 74(4), 914-930. doi:10.1017/S0373463321000230
- [4] Gu, Y., Liu, D., Zheng, G., Yang, C., Dong, Z., & Tee, E. Y. J. (2020). The Effects of Chinese Seafarers' Job Demands on Turnover Intention: The Role of Fun at Work. *International journal of environmental research and public health*, 17(14), 5247. doi:10.3390/ijerph17145247
- [5] Oldenburg, M., & Jensen, H.-J. (2019). Stress and strain among merchant seafarers differ across the three voyage episodes of port stay, river passage and sea passage. *PloS one*, 14(6), e0217904-e0217904. doi: 10.1371/journal.pone.0217904
- [6] Yuen, K. F., Loh, H. S., Zhou, Q., & Wong, Y. D. (2018). Determinants of job satisfaction and performance of seafarers. *Transportation research. Part A, Policy and practice*, 110, 1-12. doi: 10.1016/j.tra.2018.02.006
- [7] Liu, Y., An, J., Sun, Y., & Liu, C. (2021). Work-family conflict and job stress among seafarers: the moderating role of job satisfaction. *Psychology, health & medicine*, 1-7.
- [8] Caesar, L. D., Cahoon, S., & Fei, J. (2015). Exploring the range of retention issues for seafarers in global shipping: opportunities for further research. *WMU journal of maritime affairs*, 14(1), 141-157. doi:10.1007/s13437-015-0078-0
- [9] An, J., Liu, Y., Sun, Y., & Liu, C. (2020). Impact of Work-Family Conflict, Job Stress and Job Satisfaction on Seafarer Performance. *International journal of environmental research and public health*, 17(7), 2191. doi:10.3390/ijerph17072191
- [10] Jepsen, J. R., Zhao, Z., & van Leeuwen, W. M. A. (2015). Seafarer fatigue: a review of risk factors, consequences for seafarers' health and safety and options for mitigation. *International maritime health*, 66(2), 106-117. doi:10.5603/IMH.2015.0024
- [11] Papachristou, A., Stantchev, D., & Theotokas, I. (2015). The role of communication to the retention of seafarers in the profession. *WMU journal of maritime affairs*, 14(1), 159-176. doi:10.1007/s13437-015-0085-1
- [12] Hu, M. (2020). Analysis of and Countermeasure for the Continual Turnover of Young Senior Seafarers during the COVID-19 Epidemic from a HRM Perspective at a Chinese Oceangoing Shipping Enterprise. *Journal of coastal research*, 108(sp1), 317-321. doi:10.2112/JCR-SI108-064.1
- [13] Maritime Safety Administration of the People's Republic of China. (2020, June 25). Crew Size and Structure of International Sailing Ships In 2019. Retrieved November 30, 2021, from <https://www.msa.gov.cn/html/xxgk/tjsj/cysj/20200625/BCEC8F00-BD6F-40AE-9C4A-7026132E7B75.html>
- [14] Qin, W., Li, L., Zhu, D., Ju, C., Bi, P., & Li, S. (2021). Prevalence and risk factors of depression symptoms among Chinese seafarers during the COVID-19 pandemic: a cross-sectional study. *BMJ open*, 11(6), e048660-e048660. doi:10.1136/bmjopen-2021-048660
- [15] Kim, S.-W., Price, J. L., Mueller, C. W., & Watson, T. W. (1996). The Determinants of Career Intent Among Physicians at a U.S. Air Force Hospital. *Human relations (New York)*, 49(7), 947-976. doi:10.1177/001872679604900704 doi:10.1080/13548506.2021.1996617
- [16] Hall, E. T., & Hall, M. R. (1990). *Understanding Cultural Differences*, Yarmouth. In: Intercultural Press.
- [17] Oh, I.-S., Wang, G., & Mount, M. K. (2011). Validity of Observer Ratings of the Five-Factor Model of Personality Traits: A Meta-Analysis. *Journal of applied psychology*, 96(4), 762-773. doi:10.1037/a0021832