

# Determinants of work performance of seafarers

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## Abstract

**Purpose** – The purpose of this paper is to focus on the aims of discovering the problems existing in the seafarer recruitment management system and of finding out an efficiency recruitment system for shipping companies to retain skillful seafarers continue serving in their companies.

**Design/methodology/approach** – This study interviewed with the senior managers of shipping companies to clarify the seafarers' problems they have encountered and conducted questionnaire survey to collect the seafarers' perceptions for further analysis. Exploratory factor analysis and multi-regression analysis were applied for the data analysis.

**Findings** – There were four primary dimensions relating to seafarers' management, namely, work attitude, loyalty, payment and welfare and opportunity. The results revealed that dimensions of payment and welfare and opportunity were significantly positive effect on seafarers' loyalty; only the dimension of payment and welfare was found to significantly effect on the work attitude. However, these four dimensions were all found a positive effect on the work performance as well.

**Research limitations/implications** – The results of cross-section research cannot fit all economic fluctuation conditions.

**Practical implications** – The ship owners and the operators should consider both the environmental motivation and the hygiene factor to establish a proper seafarers' recruitment management system to retain seafarers and lead to better performance of the seafarers. The study findings also suggest the shipping company should pay attention to hire local seafarers, i.e. seafarers from the place where the company is based, as those local seafarers might have more work commitment than seafarers from other countries.

**Originality/value** – The findings of the study show that welfare and opportunity is the most important factor on loyalty, while it also exerts significant effect on work attitude and work performance. The results suggest that the motivation and performance are not merely dependent upon environmental needs (payment). The findings provide evidences of the importance of non-monetary remuneration within the seafarers' recruitment management system.

**Keywords** Work performance, Determinant, Recruitment management, Seafarer

**Paper type** Research paper

## 1. Introduction

The sea-borne transportation shoulders over 90 per cent of global trade and is booming in recent decades (UNCTAD, 2016). In Southeast Asia, the seafarers' labor market of countries/regions such as Hong Kong, Korea and Taiwan developed rapidly in the 1970s and thus had supported a quick development of their shipping industry in these countries. When the economies of these countries regions improved, young people did not join the seafaring



career just same as what happened in the developed countries such as UK, Japan, France, etc. However, seafarers are always important to the shipping industry but are in serious shortage in the developed countries. In recent years, the increasing number of fleets around the world has made it difficult for shipping companies to find capable seafarers and. As a consequence, the major source of seafarers has shifted from developed countries to less developed countries, and then to underdeveloped countries (BIMCO/ISF, 2005; Glen, 2007; Lane, 2000).

In the recent decades, the shipping industries of Taiwan have been developing and expanding very fast. This has led to the shortage of seafarers become reality which in turn has pushed up the salary level of seafarers and forced the market players to hire seafarers from the “third world” countries. Most shipping companies have resorted to countries abroad to find enough seafarers to operate their ships. One may say that it is not hard to find seafarers but to find well-trained (skillful and experienced) seafarers and to keep them loyal to the company is the real challenges. Because the shipping companies of Taiwan have started hiring seafarers from the third-world countries 20 years ago, a lot of problems have arisen, recently?

As seafarers leave their home to work onboard ships for transnational voyages on contracts of long duration and live in confined spaces, crises concerning the confined spaces might arise (Wu and Morris, 2006; Wu and Winchester, 2006). Taiwanese seafarers are competing for jobs with seafarers of other nationalities and going away from their families to work onboard. Shipping companies in the world can hire seafarers from almost anywhere of the world, take them to their vessels to work and repatriate them home at the end of their employment contract. The main sources of seafarers are also shifting.

At present, it is common for shipping companies operating modern international vessels to recruit seafarers of different regions over the world through networks of crewing agents, and so it is common to find crews comprising those from different countries (Sampson and Zhao, 2003). According to the interviews with experienced managers of shipping companies, combining seafarers of different nationalities has resulted in a higher turnover rate and some management problems, such as low loyalty, low productivity and high accident rate.

O’Neil (2002) pointed out that the causes of 100 per cent of marine accidents are related to human factor, whereas the human beings included the seafarers themselves and other parties. Rothblum’s (2000) study showed that human error contributed to 84-88 per cent of tanker accidents, 79 per cent of towing vessel groundings, 89-96 per cent of collisions and 75 per cent of fires and explosions. Recently, an analysis (Berg, 2013) of the instances of groundings and collisions indicates that human element accounted for 80 per cent of these accidents. It seemed to be a common knowledge that a majority of accidents were actually caused by human factors or human errors. Moreover, Koldemir (2005) pointed out that no matter how sophisticated the navigational aids and safety devices are onboard ships, and how far mathematically planned, computerized and automated the voyages are, human fallibility always exists and remains as the prime cause of accidents in navigable waters (IMO, 2008).

The seafarers, according to the Seafarers’ Training, Certification and Watchkeeping (STCW) code and its amendments, are required to receive standard training to be a qualified crew. However, competency of seafarers refers to not only the possession of knowledge and certificates but also the skills and experience which can only be accumulated year by year. Accordingly, management ashore and on board should not only ensure that the formal skills are in place but also ensure, encourage and inspire the necessary attitudes to achieve the safety objectives (Berg, 2013). The employment contracts between seafarers and ship owners or ship operators include the terms relevant to the service of seafarers onboard the ships and how and when to leave the ship after completing the contract. When we take a look at the developing pattern of the shipping industry and the existing problems, we find that most of the line managers of

seafarers' recruitment and even the ship owners and operators still think of costs of crew management as administrative overhead and place high priority to the reduction of this kind of cost. While the shipping companies are focusing on the administrative efficiency and compliance activities, how to justify seafarers into as an asset of a shipping company and retain seafarers longer in their companies is a critical issue to enhance the operation performance and navigation safety.

The global trend of shipping industry development provides significant evidence that the ship owners and ship operators are only concerned with their encountered problems and recruited seafarers with certain knowledge associated with certificates. Even worse is that the management of shipping companies all considered employment costs as the costs which can immediately be reduced. The seafarer will leave the ship, but in most of the cases, they will remain in the same company as well to find more favorable contract terms, i.e. higher salary and better working environment. In consequence, the skills and experience accumulated by the seafarers are displaced with that, if any, of new and junior seafarers. High turnover rate of seafarers is common in shipping industry, and this resulted in the global shortage of experienced and well-trained senior seafarers.

Efficiency of seafarers has two basic dimensions: technical competency which is acquired through training, education and experience, and effort and commitment which is primarily determined by the social and economic conditions of employment. At first, there may be a consensus in the industry about an imminent shortage of people suitably trained and experienced for senior officer ranks, but it is also becoming apparent that many ratings are also poorly trained and that fraudulent certification, especially at junior officer and ratings levels, is widespread. As ship owners are turning to regions of low development and low salary for recruitment of seafarers, there seems now a serious problem of shortage of competent seafarers within the companies (Ceyhun, 2010).

An awareness of the standards required of the skills of other specialist technical areas and the adoption of a broader and longer term view of the skill requirements of modern maritime industry is required. These kind of manpower problems arise from the requirement of technical competences of seafarers. An optimally efficient labor force can be sensibly defined as one where technical competency is universally consistent with best practice, up-to-date knowledge and maximum commitment to pay effort. Thus, the seafarers' experience, talent, commitment and flexibility can be the desirable characteristics of the human capital of a shipping company. From the view point of crew managers, finding sufficient qualified seafarers and keeping their continuous loyalty to the company. To achieve this objective, shipping companies should regard the seafarers as their asset. Equally important is motivation of the seafarers to optimize their productivity and efficiency. Organizational assets will rise to the level of a strategic asset when they become a source of competitive advantage. Strategic assets of a company are the set of assets which other companies find difficult to trade and imitate, and they are scarce, appropriable and specialized resources and capabilities which are the company's competitive advantages.

To bridge the gaps within human resource management and to explore both where and who to hire the qualified seafarers to better fit for the shipping companies, this study focuses on the aims of discovering the problems existing in the seafarer recruitment management system and of finding out an efficiency recruitment system for shipping companies. The results will provide evidences to guide the seafarer recruitment in the shipping companies, and it may further improve the overall welfare of seafarers and enhance the navigation safety as well.

This paper is organized in five sections. First, the literature review is presented in Section 2 and then Section 3 introduces the methodology employed in current paper. The results of

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the analysis are displayed in Section 4. In the final section, the conclusions and suggestions for both practical implementation and future research are presented.

## 2. Literature review

The manpower crisis of shipping company has several dimensions. Previous work on employees' performance has focused on either organization climate (Chow *et al.*, 1999; Hetherington *et al.*, 2006; Lu and Tsai, 2008, 2010) or organization civic behavior (Hui *et al.*, 2008; Lee and Allen, 2002; Podsakoff *et al.*, 2009; Wright and Bonett, 2002). There are still relatively few studies addressed the relationship between determinants of seafarer's work performance. Moreover, some research recommended to strengthen human including organizational aspects and to improve the synergy between technology and human factors (Rusconi, 2013; Ryser, 2013). Marcy and Demetrio (2004) pointed that the cost of a high employee turnover rate can be high due to the loss of productivity, the expense of finding a replacement and the time to be spent on training up the replacement. Even worst is that the high turnover rate of seafarers might lead to safety problems of navigation and operation. Thus, a good seafarer payment and welfare is a strategic asset because it plays a critical role in both the strategy implementation and management systems within a shipping company.

For shipping companies which employ seafarers of less developed countries, their costs of employment of seafarers will be lower. While salary is certainly a key consideration for potential employees, pay alone would not keep them in a job (Angott, 2007). According to the school of thought of Right Management, employees are more likely to stay engaged in their jobs and committed to an organization which is willing to invest in training and developing its employee. Benefits other than merely monetary compensation, i.e. salary, can also attract and retain good employees. Branham (2005) found that 88 per cent of employees leave their jobs for reasons other than pay (Yazinski, 2009). However, 70 per cent of managers think employees leave mainly for pay-related reasons. Accordingly, ship owners and operators need to listen to seafarers' needs and implement retention strategies to make seafarers feel valued and engaged to keep seafarers staying.

Jenkins *et al.* (1998) indicated that financial remuneration is not the only incentive for a staff to have higher working performance. The meaning of work is not only to earn money for living but also to enhance individual values (Porvaznik, 2007). Monetary motivation is only a short-term factor which influences the performance of employees (Ellis and Pennington, 2004; Gabcanova, 2011). Generally, most of seafarers are looking for a career package which includes a comfortable company culture, career path, diversity of responsibilities and work/life balance (Griffiths, 2006). Apart from monetary rewards, non-monetary forms of motivation are getting an important place which includes good internal communication, employees' personal development and their education opportunities (Ellis and Pennington, 2004; Gabcanova, 2011).

Svecova (2009) indicated that the growth of satisfaction is to be reflected in the increase in productivity, improvement of product quality and increased number of innovations. Thus, if employers desire their employees to be loyal to the company, they must improve employees' work satisfaction. The main factors of satisfaction are salary, job diversity, personal development opportunity of employees, desirable supervisor-subordinate relationship and work environment and fringe benefits. As mentioned previously, recruiting new staff is costly, stressful and time-consuming. Main (2008) suggested that turnover costs nearly three times of an employee's monthly salary to replace someone, which includes recruitment, severance, lost productivity and lost opportunities. Seafarers work at the shipping company during a contract term, and they have chance to change the company upon completion of the contract. While monetary compensation can attract good employees; benefits other than this will retain the employees. In regard to

shipping industry, although, salary is certainly a key consideration for potential seafarers, pay alone would not keep them in the job (Angott, 2007).

Bettencourt (1997) and Garbarino and Johnson (1999) indicated that trust, commitment and satisfaction are important constructs influencing employee performance behavior which includes loyalty, cooperation and participation (Morgan and Hunt, 1994; Podsakoff and MacKenzie, 1994; Singh and Sirdeshmukh, 2000). These three types of performance behavior are known as the voluntary performance of employees (Bettencourt, 1997; Moorman *et al.*, 1993). Bettencourt (1997) contended that commitment describes an attitude toward an organization that should produce various beneficial behaviors including loyal behavior. Employees who feel that they are supported by the organization may reciprocate and reduce the imbalance in the relationship by engaging in citizenship behaviors. The feelings of obligation, rather than emotional attachment, may be the basis for citizenship behaviors (Shore and Wayne, 1993). Therefore, employers must take up the responsibility of retaining the employees' loyalty and commitment to the companies.

Talley (2002) pointed out that human factor was the most significant reason responsible for maritime accident. Actually, international organizations and associations all remain dependent to some degree or other on people trained in and with experience of advanced regulatory systems. Thus, how to make skillful and experienced seafarers stay longer in the shipping company are very important issues. According to Squire (2006), the personal output of seafarers depends on seven needs, e.g. competence, attitude, motivation, happy and healthy life style, safe and secure working environment, self-actualization and moral values. It is the role of maritime administrations to ensure that many of the above-mentioned needs are satisfied, such as the establishment of a good maritime education and training system, good living conditions and working environment onboard, good balance of working and rest hours and, most of all, a management system to verify that the ship is complying with all the national and international regulations related to safety, environmental protection and seafarer's rights.

On the other hand, ship owners are responsible for providing safe and secure working conditions, decent working and living conditions and reasonable employment terms for the satisfaction of other needs of seafarers. Offering things like competitive salaries, profit sharing, bonus programs, pension and health plans, paid leave and tuition reimbursement sends a powerful message to employees about their importance at the organization. Saks's (2006) indicated that employees perceived organizational support predicts both job and organization engagement. Subsequently, it is the duty of seafarers themselves to use all the available tools to satisfy their needs. Employee's engagement like organizational commitment and organizational citizenship behavior will lead to the discretionary effort exhibited by employees in their jobs (Frank *et al.*, 2004; Robinson *et al.*, 2004). The research concepts and hypotheses were postulated as follows:

- H1.* Payment and welfare of shipping company have a positive effect on the seafarers' loyalty.
- H2.* Payment and welfare of shipping company have a positive effect on the seafarers' work attitude.
- H3.* Payment and welfare of shipping company have a positive effect on the seafarers' work performance.
- H4.* Seafarers' loyalty has a positive effect on their work attitude.
- H5.* Seafarers' loyalty has a positive effect on their work performance.
- H6.* Seafarers' work attitude has a positive effect on their work performance.

### 3. Methodology

#### 3.1 Questionnaire design

The study aims to find out the problems of seafarer recruitment management system in the shipping industry. A questionnaire survey was used to collect data to examine the seafarer recruitment management effect on the work performance. The research steps used in this study included instrument, an exploratory factor analysis, variance analysis and hierarchical regression analysis. Thus, the questionnaire was designed according to the literature and interviews to collect data of seafarers' perceptions based on the recommendation of Churchill and Iacobucci (2004). The measures were designed with reference to the dimensions such as recruitment management system which includes monetary and non-monetary issues, the loyalty, work attitude and work performance. Regarding work performance of seafarers, two ship's equipment operation results and three individual behavioral attributes were used. They were "The machine on this ship is safety and reliability", "The machine on the ship has low failure rate", "I always respond quickly when the ship in an emergency situation", "I always cooperate with others on the ship" and "I always do my best to have better performance on the ship". By the end of 2013, the author conducted a pilot test to verify and modify the wording and question for suit for this study. The questionnaire contained three sections including greeting, questions and demography information. The questions were measured on a five-point Likert scale ranging from (1) "strongly disagree" to (5) "strongly agree".

#### 3.2 Sampling

The study focused on exploring the problems existing in the seafarer recruitment management system within the shipping industry. Therefore, the questionnaire was distributed to the seafarers working on board the vessels when the vessels called at the port of Kaohsiung and when the seafarers attended the retraining course in the seafarer training center in Taiwan. The survey was conducted during the period from February to April 2014. In total, 473 questionnaires were distributed to the seafarers and 242 were returned. There were 28 incomplete questionnaires which were then discarded and 214 were considered valid, thus giving a return rate of 42.5 per cent.

#### 3.3 Research methods

This study aims to evaluate the determinants of work performance of seafarers. An exploratory factor analysis was used to identify the payment and welfare of shipping companies, seafarer loyalty, work attitude and work performance. A reliability test with Cronbach's alpha value was conducted. A multiple regression analysis was subsequently used to examine the effects of payment and welfare of shipping companies, loyalty and work attitude on work performance of seafarers. The analysis was carried out using the SPSS 24 for Windows statistical packages.

### 4. Results of analysis

#### 4.1 Respondents' profiles

Of the total 214 valid questionnaires, most respondents, 147 (68.7 per cent), are from Taiwan, 20 from China, 20 from Philippines, 7 from Myanmar, 2 from Indian and the remaining 18 from other countries (Table I). Over two-thirds of respondents (71.5 per cent) indicated that they completed collage/university education; around a quarter (25.7 per cent), i.e. 55 respondents completed high school or under level education; and the other 6 (2.8 per cent) are at master level. As regards the work experience, 74 (34.6 per cent) respondents possess less than 5 years' seafaring experience and only 37 (17.3 per cent) have been seafarers for more than 20 years and the other 48 per cent possess

Characteristics	Frequency	(%)
<i>Nationality</i>		
China	20	9.3
India	2	0.9
Myanmar	7	3.3
Philippines	20	9.3
Taiwan	147	68.7
Others*	18	8.4
<i>Types of ship</i>		
Bulk carrier	35	16.4
Containership	83	38.8
General cargo	37	17.3
Chemical and tanker	51	23.8
Others*	8	3.7
<i>Education level</i>		
High school or under	55	25.7
College/University	152	71.5
Master	6	2.8
<i>Work experience (Years)</i>		
<5	74	34.6
6-10	39	18.2
11-15	42	19.6
16-20	22	10.3
>20	37	17.3
<i>Tenure (Years)</i>		
<5	122	57.0
6-10	43	20.1
11-15	29	13.6
16-20	11	5.1
>20	9	4.2

**Table I.**  
The profile of  
respondents

**Note:** \*“Others” indicates the selection was not showed in the questionnaire

seafaring experience of 6 to 20 years. With respect to the tenure, more than 50 per cent (122) respondents indicate that they have worked in their company for less than 5 years, 20.1 per cent between 6 and 10 years, 13.6 per cent between 11 and 15 years and 5.1 per cent between 16 and 20 years. Notably, only 4.2 per cent (9) respondents report they have worked in the same company for over than 20 years. Regarding the ship type, 16.4 per cent are working for bulk carriers, 38.8 per cent for containerships, 17.3 per cent for general cargo ships, 23.8 per cent for chemical tankers, while 3.7 per cent (8) respondents report that they serve on other types of ship.

#### 4.2 Exploratory factor analysis

The original responses resulted in too many variables to proceed with an analysis. An exploratory factor analysis can help a researcher reduce a large set of variables to a smaller, manageable set of underlying dimensions which helps detect the presence of meaningful patterns among the original variables (Lu and Tsai, 2008). To ensure the data are suitable for carrying out a factor analysis, the Bartlett Test of Sphericity must be significant and the Kaiser–Meyer–Olkin

value of above 0.8 (Hair *et al.*, 2006). A rule of thumb indicated that a minimum of five subjects per variable or a sample of 100 is required for factor analysis (Coakes and Steed, 1999). The criteria include eigenvalues over 1; a minimum of 5 per cent variance per factor and examination of the scree plot are popular used to extract factors. The factors with loadings of 0.40 or more are retained (Lauder *et al.*, 2000; Nunnally, 1978).

Litwin (1995) suggested that reliability could be assessed in three forms, namely test-retest, alternate-form and internal consistency, which are the ratio of true score variances to observe score variance (Segar, 1997). The internal consistency is applied to groups of items. Generally, Cronbach's alpha is used to measure internal consistency reliability among a group of items combined to form a single scale; levels of 0.7 or more are considered reliable in basic research (Churchill and Peter, 1984; Litwin, 1995; Nunnally, 1978).

The primary factor analysis with Varimax rotation method is used to identify the key dimensions of seafarer recruitment management in shipping industry because it has advantages including that after the rotation, each original variable tends to be associated with one (or a small number) of factors, each representing only a small number of variables and the factors can often be interpreted from the opposition of a small number of variables with positive loadings to a small number of variables with negative loadings and the original factors, to maximize the variance of the loadings (Abdi, 2003; Kaiser, 1958). The Kaiser–Meyer–Olkin value of 0.907 indicates that the data are suitable for conducting a factor analysis, and the Bartlett Test of Sphericity [ $\chi^2 = 2,697.52, p < 0.001$ ] suggests that correlations exist between some of the response categories. Eigenvalues greater than one are used to determine the number of factors in each data set (Churchill and Iacobucci, 2004). The results presented in Table II reveal that four factors account for approximately 71.59 per cent of the total variance. To enable an easy interpretation, only the factors with a loading of 0.50 or higher are extracted (Hair *et al.*, 2006). After deleting four attributes, V1 (*The company has clear seafarer's wage regulation*), V6 (*The company provides an integrated insurance to seafarer*), V9 (*The company cares about seafarers' health*) and V21 (*I would like to work in the same company after my contract expiring*), whose factor loading are smaller than 0.5, four dimensions are found to underlie the perceptions of seafarer recruitment management of shipping context base on the responses. These dimensions are labeled and are described below.

Factor 1, the work attitude dimension, comprises seven items including V16, V17, V18, V19, V20 and V22 (Table II). These are related to perceptions of work attitude. Therefore, this factor is labeled “work attitude”, accounting for 24.78 per cent of the total variance. The scale reliability of Component 1 has a Cronbach's alpha measurement of 0.92, greater than the recommended level of 0.7.

Factor 2 was a dimension of welfare and opportunity, including six measures of V7, V8, V10, V11, V13 and V15. These attributes are related to welfare and career development opportunities. Therefore, this component is named “welfare & opportunity” which accounts for 19.92 per cent of the total variance. The Cronbach's alpha measurement for Component 2 is 0.87.

Factor 3, the payment dimension, contains four items, V2, V3, V4 and V5, which are referring to seafarers' salary and compensations of work. Therefore, Component 3 is labeled as “payment” and accounts for 16.14 per cent of the total variance. Its Cronbach's alpha measurement is 0.83.

Factor 4, the loyalty dimension, comprises of two measures, V24 and V25, which are referring to the seafarers' loyalty on their employment. This factor accounts for 10.76 per cent of the total variance. The value of Cronbach's alpha is 0.84.



Measures	Factor 1	Factor 2	Factor 3	Factor 4
V16 I solve the problem immediately when I encounter it on board ship	0.69	0.16	0.18	0.19
V17 I fix the machine immediately when it was out of work	0.86	0.17	0.06	0.09
V18 I always do my best to accomplish the order	0.84	0.15	0.11	0.12
V19 I always do my best to improve my professional capability to demonstrate better job performance	0.86	0.14	0.09	0.23
V20 I have a sense of accomplishment after I completed a task or voyage	0.80	0.12	0.22	0.10
V22 I am proud of completing the assignment of the company	0.68	0.16	0.21	0.44
V7 The company offers pick-up service when the ship is berthing at the port	0.13	0.80	0.19	0.05
V8 The company offers free post mail delivery and internet service	0.11	0.79	0.05	0.26
V10 The company cares the health of seafarers' family members	0.32	0.67	0.34	0.32
V11 The company considers the seafarers' professional capability to make promotion decisions	0.30	0.59	0.24	0.28
V13 The seafarers can transfer to office in this company	0.17	0.79	0.27	-0.20
V15 My job is stable in the company	0.33	0.56	0.37	0.21
V2 Payment of stand-by wage is calculated when crew is ashore	0.01	0.41	0.68	0.04
V3 The bonus of performance is better than other companies	0.22	0.09	0.81	0.18
V4 I satisfy the overtime pay in this company	0.33	0.19	0.78	0.15
V5 The bonus complied with the performance in this company	0.10	0.38	0.73	0.13
V24 I feel satisfaction to work in this company	0.34	0.32	0.21	0.74
V25 I will recommend my friends or relatives to work in this company	0.36	0.10	0.19	0.82
Eigenvalue	8.15	2.48	1.25	1.01
Percentage of variance	24.78	19.92	16.14	10.76
Acuminated percentage	24.78	44.69	60.83	71.59
Cronbach's alpha	0.92	0.87	0.83	0.84

**Table II.**  
Results of exploratory  
factor analysis

**Note:** V1, V6, V9 and V21 were discarded due to their factor loadings were less than 0.5

#### 4.3 Analysis of variance test

The views of seafarers might be different with reference to their characteristics. One-way analysis of variance (ANOVA) is used to identify whether perceived differences in the dimensions of seafarers' recruitment management exists among the different groups based on demographic variables, such as nationality, (experience as seafarer for a number of years), tenure (years of experience in current company), various departments and various ranks. With respect to the aims of current study, ANOVA tests are used to ascertain whether differences exist among the groups of different nationalities, seniority as seafarers and tenure.

The results indicate that for the dimensions of payment and work attitude, significant differences existing amongst the different nationality groups. On the contrary, for the other two dimensions, namely, welfare and opportunity and loyalty, there are no significant differences (5 per cent significance level; Table III) among the different nationality groups. As regards the significant dimensions of payment and work attitude, Table III shows that the Taiwanese seafarers have the lowest mean score on payment (mean = 2.97), but they have the highest mean score on the dimension of work attitude (mean = 3.99).

Table IV shows the results of ANOVA tests conducted according to the seafarers' seniority groups. The results reveal that for the dimension of work attitude only, significant difference exist among the different seafarers seniority groups. Seafarers' seniority between 16 and 20 years has the highest mean score of work attitude (mean = 4.23) and the group of seniority as seafarers between 6 and 10 years has the lowest mean score (mean = 3.89) on this dimension. The other dimensions are not found to significant difference at 0.05 level according to the seafarers' seniority groups.

The ANOVA tests are carried out to identify whether difference exist among the different tenure groups. The results are displayed in Table V, which shows that for the dimensions of welfare and opportunity and work attitude and significant difference (at 0.05 level) exist among the different tenure groups. For the dimension of welfare and opportunity, the tenure group between 11 and 15 years has the highest mean score (mean = 3.82), the tenure group between 6 and 10 years has the lowest mean score (mean = 3.26). The tenure group between 11 and 15 years also has the highest mean score (mean = 4.22) on the dimension of work attitude, while the tenure group between 6 and 10 years also has the lowest mean score (mean = 3.70) on this dimension.

#### 4.4 Multiple regression analysis

The current study focuses on exploring the problems of the recruitment management system of the shipping industry. A multi-regression analysis associates with the

Dimensions	China (N = 20)	Philippines (N = 20)	Taiwan (N = 147)	Others (N = 27)	F-value
Payment	3.65	3.76	2.97	3.91	16.91***
Welfare and opportunity	3.27	3.75	3.36	3.35	1.48
Loyalty	3.70	3.95	3.71	4.07	2.26
Work attitude	3.76	3.98	3.99	4.29	3.03**
Performance	3.67	3.85	3.75	4.09	2.35*

**Table III.**  
Results of the comparisons according to the respondents' nationality

Notes: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Dimensions	<5 (N = 74)	6-10 (N = 39)	11-15 (N = 42)	16-20 (N = 22)	>20 (N = 37)	F-value
Payment	3.04	3.19	3.40	3.38	3.36	1.70
Welfare and opportunity	3.40	3.19	3.45	3.48	3.44	0.72
Loyalty	3.71	3.64	3.80	3.86	3.97	1.17
Work attitude	3.97	3.89	3.92	4.23	4.17	3.04**
Performance	3.73	3.65	3.80	3.98	3.80	1.75

**Table IV.**  
Results of the comparisons according to the different groups of seafarers' working experience

Note: \*\* $p < 0.05$

step-forward method conducted to examine the effects of independent variables. The author examines the effects of all the independent variables, seafarers' recruitment system (payment and welfare and opportunity), loyalty and work attitude, respectively, on the dependent variables of work performance via the paths of loyalty and work attitude. The results are displayed in Table VI. All the models have a significant  $F$ -value at a significance level of 0.01.  $R^2$  and adjusted  $R^2$  represent the proportion of variation in the criterion variable that is accounted for by the predictor variables. The  $R^2$  values are 0.29, 0.42 and 0.73 and significance at 0.001 level for Models 1, 2 and 3, respectively. Exception of those, the variance inflation factor ( $VIF$ ) quantifies how much the variance is inflated and is used as an indicator of multicollinearity. The  $VIF$  in these models are all smaller than 2 which are less than the recommended value of 4 (Hair *et al.*, 2006; Pan and Jackson, 2008). The Durbin–Watson values close to 2 and indicate that these independent variables are absent of autocorrelation. Accordingly, these models are all considered acceptable. Model 1 in Table VI shows that two dimensions of seafarer recruitment system, payment and welfare and opportunity, have a significant effect on the seafarers' loyalty. We are concerned about the effect of the loyalty and seafarers' recruitment system on the work attitude and the results in Model 2 reveal that only the two dimensions of welfare and opportunity and loyalty are found to have significant effect on the work attitude. The dimension of loyalty is the strongest influencing factor with the coefficient value of 0.49 on the seafarers' work attitude, followed by the dimension of welfare and opportunity ( $\beta = 0.18$ ). However, the payment dimension is not found to have significant effect on the seafarers' work attitude. Regarding work performance, the results are displayed in Model 3. The results suggest that all the

**Table V.**  
Results of the  
comparisons  
according to the  
respondents' tenure

Dimensions	<5 ( $N = 122$ )	6-10 ( $N = 43$ )	11-15 ( $N = 29$ )	16-20 ( $N = 11$ )	>20 ( $N = 9$ )	$F$ -value
Payment	3.16	3.23	3.57	2.93	3.44	1.80
Welfare and opportunity	3.30	3.26	3.82	3.39	3.80	3.19**
Loyalty	3.76	3.55	4.03	4.00	4.00	2.35
Work attitude	4.03	3.70	4.22	4.15	4.19	3.98***
Performance	3.80	3.56	4.10	3.82	4.00	3.35**

**Notes:** \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

**Table VI.**  
The results of  
multi-regressions

Dependent Independent	Loyalty (Model 1)	Work attitude (Model 2)	Work performance (Model 3)
Payment	0.22***	0.09	0.11**
Welfare and opportunity	0.37***	0.18**	0.32***
Loyalty	–	0.49***	0.14***
Work attitude	–	–	0.47***
$R^2$	0.29	0.42	0.73
Adjusted $R^2$	0.28	0.42	0.73
$F$ test	42.08	51.41	142.66
$p$ -value	0.00	0.00	0.00
Durbin–Watson	1.81	1.46	1.91
$VIF$	1.69	1.40-1.87	1.73-1.93

**Notes:** <sup>a</sup> = standard coefficient value; \*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$

independent variables have positive effect on the seafarers' work performance. Work attitude is the strongest influencing factor on the work performance with coefficient value of 0.47, followed by welfare and opportunity ( $\beta = 0.32$ ), loyalty ( $\beta = 0.14$ ) and payment ( $\beta = 0.11$ ) and all at the significance level of 0.05 or less.

## 5. Conclusions and suggestions

### 5.1 Conclusions

The author made reference to the field observation and interviews with senior managers of the shipping companies and found out many drawbacks of and received some complains of the seafarers' recruitment management system from the interviewees. Therefore, the author conducted a research focused on discovering the influence of seafarers' recruitment system on the work performance and aimed to establish a proper seafarer recruitment management system in the shipping context.

The study findings indicated that the Taiwanese seafarers have the lowest degree of satisfaction on their payment, but they have the best work attitude, however. These results implicated when the nationality of seafarers and the shipping company are based in same country, the seafarers might to have higher commitment and reflect a better loyalty. The results also provide evidences that if the seafarers come from higher developed countries which has better economy, they tend to have higher expectation and demand about their benefits and compensations. The tenure group between 11 and 15 years is the most satisfied group with reference to the dimension of welfare and opportunity and they have the best work attitude. On the contrary, the tenure group between 6 and 10 years has the lowest mean score on these two dimensions. These results suggest that the seafarer would have better work attitude while they are satisfying their work and might to perform better. This result is line with *Svecova's (2009)* that the well satisfaction reflects a good performance.

According to the results of multiple regression which pointed out that the effect of welfare and opportunity on seafarers' loyalty is stronger than the effect of payment. The results of multi-regression on seafarers' work attitude, indicated that loyalty is the strongest influence factor, followed by welfare and opportunity, whereas payment is not found to have a significant effect on seafarers' work attitude. These findings provide evidences that monetary return fulfills only the basic requirement of seafarers, whereas non-monetary return and loyalty are the determinants of work attitude. These results are in line with previous researches (*Angott, 2007; Jenkins et al., 1998; Gabcanova, 2011*). With regarding to work performance, the results reveal that work attitude is the strongest influence factor, followed by welfare and opportunity, loyalty and payment. These findings suggest that work attitude is the strongest influence factor on work performance and verify that welfare and opportunity is the most important component of the seafarers' recruitment management system because welfare and opportunity exerts the strongest effect on the loyalty and has significant effect on the work attitude, and it is the strongest influence factor on work performance as well.

### 5.2 Managerial implications

Base on the author's best knowledge, this is a pioneer study focusing on seafarers' recruitment management system. The findings of the study show that welfare and opportunity is the most important factor on loyalty, while it also exerts significant effect on work attitude and work performance. The results suggest that the motivation and performance are not merely dependent upon environmental needs (payment). The findings provide evidences of the importance of non-monetary remuneration within the seafarers' recruitment management system. According to *Frederick (1959)*, the people have two sets of needs. One is the needs for basic life, e.g. food, warmth, shelter and safety, etc. The other is the

needs for capable and achieving great things through self-development. Exception of fulfilling the needs of basic life, the people strive to achieve “hygiene” needs because they are unhappy without them. The work environment generated discontent. Instead, satisfaction came most often from factors intrinsic to work: achievements, job recognition and work that was challenging, interesting and responsible. The satisfaction of seafarers not just comes from payment only, but for the welfare and the opportunity of seeking for growing within the job as well. Therefore, the ship owners and the operators should consider both the environmental motivation and the hygiene factor to establish a proper seafarers’ recruitment management system to retain seafarers and lead to better performance of the seafarers. Apart from these, the study findings also suggested the shipping company should pay attention to hire local seafarers, i.e. seafarers from the place where the company is based, as those local seafarers might have more work commitment than seafarers from other countries.

### 5.3 Suggestions for future research

Although this study has yielded some important findings which contribute to recognizing and setting up a better system of seafarers’ recruitment management in the shipping industry, it still has some limitations which needed to be overcome in the future. First, this study focuses on the merchant marine seafarers who are quite different from the seafarers of the fishery industry. Thus, it is suggested that future research should apply the approach to the seafarers of the fishery industry to verify whether there are differences in the results of seafarers of different marine industry. Second, most of the respondents in current study were from Taiwan, and it is suggested that future research should pay effort to collect information from samples of other countries to yield normal distribution effect. Third, this is a cross-section study which displays the phenomenon of spot time. It is suggested that future research should proceed on a long-term basis to detect the changes over time of the effects of the different dimensions in the seafarers’ recruitment management system.

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