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## Determinants of job satisfaction and performance of seafarers

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### ABSTRACT

The ability to motivate and retain seafarers is a critical manpower issue in view of global labour shortage and high turnover rate among seafarers. The objective of this paper is to analyse the core determinants of job satisfaction and performance of seafarers. A survey was administered on 116 seafaring officers and the obtained data were analysed using structural equation modelling. The results show that job satisfaction is considerably correlated with job performance of seafarers. In addition, the amount of stress associated with working onboard a ship and attractiveness of rewards are key determinants of job satisfaction. The dispositions of seafarers and appeal of the job design also have considerable impacts on job satisfaction. Based on literature review and post-survey interviews, a management model consisting of policies and strategies to motivate and retain seafarers is proposed.

### 1. Introduction

The shortage of skilled seafarers, in particular officers and engineers, has been a growing concern for the shipping industry (McLaughlin, 2015). With more than 90% of world trade volumes transported by sea (International Chamber of Shipping, 2015), this problem is a global challenge to overcome. According to the scenario estimates by Baltic International Maritime Council and International Shipping Federation (2015), a global shortfall of approximately 92,000 seafaring officers is expected by the year of 2020.

This alarming finding has initiated a series of international campaigns such as ‘Go to Sea’ and ‘Day of the Seafarer’ which encourage governments to promote seafaring and address issues related to the work and living conditions on-board ships (International Maritime Organization, 2008, 2017). In line with these campaigns, the recent literature has proposed strategies for firms to attract seafarers. For instance, Thai et al. (2013) proposed several branding strategies to position a shipping firm as the employer of choice in the seafaring market. Some of the proposed strategies include improving the image of the shipping industry, and the use of attractive rewards in the form of high salaries and more employment benefits.

In addition to attracting seafarers, Fei and Lu (2015) argued that it is more important for shipping firms to retain their in-service seafarers. It was estimated that the annual turnover rate is between 25% and 35% in some shipping sectors such as cruise shipping (Bhattacharya, 2015). In general, attrition of seafarers is high, by virtue of reasons such as boredom at sea, single-task work environment, emotional and work-related stresses, and lack of family time (Singh, 2017; Thai and Latta, 2010). This is exacerbated by changes in the socioeconomic landscape where the younger generation favours shore-based jobs due to greater freedom and increasingly comparable salaries (Kantharia, 2017; Sulpice, 2011). According to a survey conducted by Ruggunan and Kanengoni

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(2017), approximately 55% of junior cadets do not intend to pursue a career at sea for more than 10 years, which further emphasises the importance of retaining in-service seafarers.

From the shipping firms' perspective, the ability to retain seafarers offers numerous organisational benefits. First, due to the shortage and rarity of qualified seafarers in the market, retaining seafarers can contribute to the competitive advantage of shipping firms. By possessing a competent and motivated pool of seafarers, the cost advantage of a shipping firm can be strengthened from improved productivity, and reduced absenteeism and attrition (Nguyen et al., 2014). Next, the ability to retain seafarers shall also render the accumulation of valuable knowledge and experience within the organisation. This valuable knowledge pool which is acquired through learning can be subsequently transferred to new seafarers and to the management of shipping activities ashore.

In recent year, much research has been conducted with the focus of formulating strategies to retain seafarers (Caesar et al., 2015; Papachristou et al., 2015; Pauksztat, 2017). The general conclusion from these research highlights the importance of job satisfaction (or motivation), which plays a key role in retaining seafarers. However, very little is known with regards to the factors influencing job satisfaction. There is presently a dearth of studies that adopt a theoretical lens to analysing the determinants of job satisfaction or dissatisfaction of seafarers. Furthermore, very few studies have investigated the relationship between job satisfaction and performance of seafarers. The performance of seafarers is measured by productivity and quality (i.e. making fewer mistakes). Performance improvements in seafarers have the potential of enhancing ships' turnaround time, meeting the efficiency demands of shipowners, and safety performance of ship operations (Fenstad et al., 2016). This could potentially translate to sizeable cost-savings and service improvements for a shipping company. Therefore, to bridge the gap in the literature, this study aims to introduce a research model that considers key theoretical approaches to explain job satisfaction, and examines its effect on the job performance of seafarers. Based on the results, policies and strategies to improve job satisfaction as well as job performance of seafarers are proposed.

This rest of the paper is presented as follows. A review of existing theories on job satisfaction, and the current situation in the job satisfaction level of seafarers are first presented; the hypotheses are then formulated accordingly. Following which, the methodology for the administration of an online survey and post-survey interviews are described. Thereafter, the collected data are analysed using structural equation modelling. The paper then presents and discusses the results obtained from the analysis and concludes with recommendations for future research directions.

## 2. Literature review and hypotheses formulation

### 2.1. Job satisfaction

Job satisfaction, a concept which is widely studied in organisational behaviour research, is 'commonly conceptualised as an affective variable that results from an assessment of an individual's job experience' (Fritzsche and Parrish, 2005). In a simpler term, job satisfaction is 'the extent to which people like their jobs' (Spector, 2008).

Job satisfaction can be explained using equity theory. According to Adams and Freedman (1976), equity theory refers to balancing or calibrating the inputs and outputs of an employee. The inputs are a composite of time, effort, ability, and loyalty which an employee commits to his (both genders) work. In exchange, the employee receives intrinsic and extrinsic rewards in the form of pay, bonuses, benefits, security, and enjoyment. Adams and Freedman (1976) posited that individuals become demotivated or unsatisfied when their inputs are not fairly compensated as compared to someone who is performing a comparable job.

Pursuing a seafaring career can be unsatisfying, despite the obvious attractions and benefits such as high wages and opportunities to sail internationally (Fei and Lu, 2015). The prospects and joy of visiting faraway lands have been reduced considerably due to faster turnaround in ports as a result of efficient cargo-handling operations and increasing demands from shipping companies to maximise profits (Fenstad et al., 2016). In addition, there are nowadays fewer incentives to pursue a seafaring career since salaries and perks offered by shore-based jobs are as competitive (Sulpice, 2011). A recent study by Sánchez-Beaskoetxea and Coca García (2015) found that the public generally portray seafarers rather negatively as seafarers' negligence or errors are often perceived to be the main cause of maritime accidents and pollutions (Uğurlu et al., 2013). The aforementioned factors have collectively reduced the overall attractiveness of seafaring while contributing to dissatisfaction among in-service seafarers.

Work-wise, there is a lot of stress associated with working on board a ship. This stress is mainly attributed to poor working and living conditions. According to Thai and Latta (2010), the shortage of seafarers and prevailing minimalist manning level on merchant ships have dramatically increased the work load of seafarers who face tighter and longer work schedules. It was reported that time on board a ship is either spent on working or resting. Ellis and Sampson (2013) found that only 23 percent of the seafarers have adequate rest, and this is worsened by noise and vibration in their cabins (Håvold, 2015).

Working on board a ship also affects the regular social life of seafarers. Seafaring has been described as a career which is isolated from human interactions due to restricted direct contact with home, infrequent and limited amount of shore leaves, low manning scales, and single-person tasking (Liang, 2011). Prolonged absence from families has been reported to be another major cause of dissatisfaction (Papachristou et al., 2015). The absence issue is magnified with the growing supply of Asian seafarers who are from collectivistic cultures that prioritise family bonding over individual needs (Abdullah, 2017). According to Ulven et al. (2007), the long-term absence of a parent or spouse has negative impact on the psychological well-being of the both the seafarer and his kin. In particular, heightened anxiety and depression are typically experienced prior to a seafarer's departure or return. As a result, conflicts may arise from the lack of support from the seafarers' families.

## 2.2. Determinants of job satisfaction

As indicated earlier, there are many factors that can lead to satisfaction or dissatisfaction of seafarers. Studying the antecedents of job satisfaction allows the identification of key determinants of job satisfaction in seafaring. Accordingly, appropriate and concrete human resources management strategies can be employed to motivate and retain seafarers, and improve their job performance. Although there have been many studies being conducted on other professions such as healthcare officers and customer service officers (Boamah et al., 2017; Lo et al., 2016; Strömngren et al., 2016; Zablah et al., 2016), most findings are not applicable to the seafaring context given that the seafarers work and live in the same small environment (i.e. a ship) over prolonged periods.

At present, very little attention has been paid to studying and organising the antecedents of seafarers' job satisfaction. Herein, this study examines these antecedents based on four theoretical lenses. They are the reward system approach, job stressor approach, job characteristic approach, and dispositional approach. A brief review of these approaches with reference to seafaring is presented in the following paragraphs.

The rewards system approach utilises both tangible and intangible benefits to satisfy an employee. According to Thai et al. (2013), such benefits can be in the form of pay, bonuses, promotions, training and development, and welfare on board ships. This carrot and stick approach was suggested to be the most effective strategy to motivate and attract seafarers (Pauksztat, 2017). This view was also supported by Li et al. (2014) who found that promotions and pay are the leading indicators of job satisfaction among Chinese seafarers. Based on rewards system precept, the following hypothesis is proposed.

**Hypothesis 1.** Reward system has a positive influence on job satisfaction of seafarers.

While this study acknowledges the importance of rewards in seafarers' job satisfaction, there are other approaches that could be equally important but have not been adequately discussed in the existing literature. One of which is the job stressor approach. This approach posits that the level of stress experienced by an employee is negatively correlated with job satisfaction (Fairbrother and Warn, 2003).

Job stress can be manifested in the environment (i.e. the workplace) as well as when performing the job itself. For instance, a job can be stressful because of the physical environment such as high noise level and a lack of privacy. Similarly, stress can be generated from performing a job due to role ambiguity, overwhelming workload, role conflict, and under-utilisation of skills. In the context of seafaring, the correlation between psychological health, job stress and job satisfaction in maritime officers have been amply demonstrated (Kim and Jang, 2016). Rengamani and Venkatraman (2015) studied physical stressors, psychosocial stressors, social stressors and high work demand, and found that the most important stressors on board are job-related, for example, heat at workplace and long working hours. The common stresses are chiefly caused by occupational stress, sleepiness (Chung et al., 2017), poor working and living conditions, lack of organisational support (Silva et al., 2011), and work-family conflicts (Thomas et al., 2003). These job stressors can potentially cause job dissatisfaction. Therefore, the following hypothesis is proposed.

**Hypothesis 2.** High amount of work stress has a negative influence on job satisfaction of seafarers.

Another approach that determines job satisfaction is job characteristics. Job characteristics refer to the content and nature of a job (Sengupta, 2007). The most prominent theory that subsumes under this category is the model of Hackman and Oldham (1976). According to the authors, the basis of job characteristic theory is that people can be motivated by the intrinsic satisfaction they get from performing their work.

Based on the model, there are five job characteristics that motivate or satisfy an employee. They are: skill variety, task identity, task significance, autonomy, and job feedback. Skill variety refers to the number of skills involved to complete a job, and task identity refers to the completeness of a piece of work. Task significance refers to the impact that a job has on other people, and autonomy refers to the amount of freedom that is given to an employee to perform his job. Finally, job feedback refers to the extent to which an employee receives feedback about his performance.

In general, the five job characteristics lead to three psychological states. Skill variety, task significance, and task identity reflect the meaningfulness of work. Autonomy creates the feeling of responsibility, and feedback leads to knowledge of work outcomes. Nielsen et al. (2013) have shown that job demands, and team cohesion are among the important factors related to job satisfaction and intention to leave seafaring. Accordingly, these three psychological states contribute to job satisfaction and motivation of employees. Therefore, the following hypothesis is proposed.

**Hypothesis 3.** Job characteristics such as skill variety, task identity, task significance, autonomy and feedback have a positive influence on job satisfaction of seafarers.

In addition to examining the impact of work environment and job characteristics on job satisfaction of seafarers, this study also considers the disposition of seafarers. According to personality-job fit theory, an employee with the right personality for the job would outperform his counterpart who is less fit for the job (Inceoglu and Warr, 2011). There are a number of universal traits that were reported to influence job satisfaction. The widely-discussed traits are positive or negative affectivity, internal or external locus of control, and burnout tendencies.

Affectivity is the tendency to experience positive mood states such as being happy and confident, or negative mood states such as anxiety and depression (Fetznier et al., 2012). Locus of control is another disposition variable that represents an individual's tendency to attribute the cause of his behaviour to external (i.e. environment) or internal forces (i.e. himself) (Lefcourt, 2014). In general, a person who exhibits positive affectivity or internal locus of control is more satisfied at work. Finally, burnout tendency refers to the tendency of an individual to feel emotional and physical exhaustion from performing his job (Kalbers and Fogarty, 2005). In general,

an individual with low burnout tendency is found to be more satisfied at work.

Since seafarers are often out at sea for an extended period time and are isolated from social interactions with their friends and families, it is paramount that they possess positive dispositional traits. Negative concerns of seafarers such as monotonous job scope, single-person task, and work-family stress shall be less pronounced in seafarers who possess these positive traits. Therefore, the following hypothesis is proposed.

**Hypothesis 4.** Dispositional affect such as positive affectivity, internal locus of control, and low burnout tendencies has a positive influence on job satisfaction of seafarers.

These hypotheses give rise to four constructs i.e. rewards, job stress, job characteristics, and dispositional affect which act as determinants of job satisfaction.

### 2.3. Job satisfaction and job performance

The importance of studying job satisfaction in organisational behaviour research is attributed to its positive correlation with job performance, which ultimately drives organisational performance (Hancock et al., 2013; Lannoo and Verhofstadt, 2016). An employee who is highly satisfied with his job shall outperform his counterpart who is dissatisfied. Scholars suggested that a satisfied employee tends to be present at work more often (i.e. low absenteeism), makes fewer mistakes (i.e. quality), be more productive, and has stronger intention to stay in the organisation (Sánchez-Beaskoetxea and Coca García, 2015).

Based on a meta-analysis, it has been reported that the effect of job satisfaction on job performance is generally positive (Christen et al., 2006). However, the strength of the correlation varies across studies from low ( $r = 0.1$ ) to moderate ( $r = 0.3$ ). Some scholars have also suggested a reverse causality i.e. good performance is translated to desirable intrinsic and extrinsic rewards which in turn boost job satisfaction (Locke, 1976). This inconsistency in the magnitude and direction suggests that the relationship varies across professions. The relationship has not been formally tested for seafaring careers. However, anecdotal evidence based on the general literature suggests the following hypothesis.

**Hypothesis 5.** Job satisfaction has a positive influence on job performance of seafarers.

## 3. Methodology

### 3.1. Measurement items

To test the hypotheses, measurement items were developed to operationalise each latent construct. These indicators were obtained from reviewing the extant literature on job outcomes and seafaring. As shown in Table 1, 22 measurement items were used to

**Table 1**  
Latent and observed variables.

Construct	Variable	Measurement Items	Literature Source
Rewards	x1	The salary offered by my company is reasonable	Li et al. (2014)
	x2	The family benefits offered by my company are reasonable	
	x3	The promotion opportunities offered by my company are reasonable	
	x4	The training opportunities offered by my company are reasonable	
Job stress	x5	There is insufficient work-life balance	Fairbrother and Warn (2003)
	x6	There is insufficient co-workers' support at work	
	x7	There is insufficient shore-staff support at work	
	x8	My working hours and work schedules are not well-planned	
	x9	The working and living conditions in ships are not acceptable	
Job characteristics	x10	My job requires me to apply a variety of skills	Hackman and Oldham (1976)
	x11	My job involves doing a whole and identifiable piece of work	
	x12	My job has significant effect on the lives of other people	
	x13	My job permits me to decide on how to go about completing the work	
	x14	I receive sufficient information and feedback concerning my work performance	
Dispositional affect	x15	I feel positive at work	Alarcon et al. (2009) Clark et al. (2010)
	x16	I feel in control of my work	
	x17	I tend to feel exhausted at work	
Overall job satisfaction	y1	I am satisfied with my job	Wanous et al. (1997)
	y2	I am satisfied with my company	
Job performance	*y3	I am often absent from work	Sánchez-Beaskoetxea and Coca García (2015)
	y4	I make few mistakes at work	
	y5	I complete my tasks efficiently	

\* Note: x17 and y3 are negatively worded to ensure that the questionnaire has been carefully read and answered by the respondents.

operationalise the six latent constructs relating to rewards, job stress, job characteristics, dispositional affect, overall job satisfaction, and job performance.

As shown in Table 1, reward system was measured using both tangible and intangible benefits associated with the job which can be comprehensively measured based on salary, family benefits, promotion prospects, and training opportunities (Li et al., 2014). Job stress was operationalised by five items which were negatively-worded. Accordingly, each measurement item represents various stress that can manifest from (1) insufficient work-life balance, (2) insufficient co-workers' support, (3) insufficient shore-staff support, (4) disruption of routines which represent poor planning of working hours and work schedules, and (5) deplorable physical environment i.e. poor working and living conditions on the ship (Fairbrother and Warn, 2003). Job characteristics were measured based on five well-established dimensions which consist of skill variety, task identity, task significance, autonomy, and feedback (Hackman and Oldham, 1976). Dispositional affect was evaluated based on various personality traits or tendencies such as affectivity, locus of control, and burnout tendency (Alarcon et al., 2009; Clark et al., 2010). For all the aforementioned measurement items, a seven-point Likert scale based on the degree of agreement with '1 – strongly disagree', '4 – neither agree nor disagree', to '7 – strongly agree' was employed.

Global measures were used to operationalise job satisfaction (Wanous et al., 1997). They include overall satisfaction with the job as well as the company. A seven-point Likert scale which ranges from '1 – very dissatisfied' to '7 – very satisfied' was used. Job performance was operationalised by three measurement items relating to absenteeism, quality (i.e. number of mistakes), and productivity. A seven-point Likert scale based on the degree of agreement with '1 – strongly disagree', '4 – neither agree nor disagree', to '7 strongly agree' was employed (Sánchez-Beaskoetxea and Coca García, 2015).

### 3.2. Survey design and administration

Recognising that seafaring is a career with high mobility, a web-based survey was designed. The survey comprises three sections. Section one describes the background and objectives of the study. Section two lists and elaborates the 22 observed variables as shown in Table 1. The respondents were requested to rate each variable with the provided item scale. Finally, Section 3 consists of demographic questions relating to the respondent's position, nationality, length of service, and age. Mainly categorical or interval scales were used in this section.

The invitation to participate in the survey was electronically mailed to 75 ship management companies located in Singapore. Their contact information was obtained from the online directory published by Marshall Cavendish Business Information Private Limited. Six ship management companies expressed interest to participate in the study. The survey was first sent to the human resource managers, preferably someone with sailing experience, to ascertain the readability and content validity of the measurement items. Subsequently, instructions to complete the online survey were forwarded to the liaison officer of each company. Thereafter, the survey was disseminated by the liaison officers to their seafaring officers.

Attributing to the perceptual nature of self-administered surveys, which are subjected to common method bias, a procedural remedy involving temporal separation of measurement was performed (Podsakoff et al., 2003). This technique involves introducing a time lag between the measurement of the exogenous (phase 1) and endogenous variables (phase 2). In this study, a time lag of at least one month was introduced between phase 1 and phase 2 of the survey administration. In total, 536 invitations were sent during phase 1 of the survey administration and 149 usable responses were received. A month later, the 149 respondents were invited to complete phase 2 of the survey administration. However, only 116 completed the survey and a response rate of approximately 22 percent was achieved. Table 2 shows the demographics of the respondents.

**Table 2**  
Demographics of respondents.

Demographics	Frequency (n = 116)	Percentage (%)
<i>Nationality</i>		
Filipino	52	44.8
Indian	33	28.4
Chinese	13	11.2
Others (Indonesia, OECD, etc.)	18	15.5
<i>Designation</i>		
Deck officer	75	64.7
Engine officer	41	35.3
<i>Operating vessels</i>		
Containers	48	41.4
Dry bulk	27	23.3
Liquid bulk	41	35.3
<i>Years in company</i>		
0–5	46	39.7
5–10	43	37.1
10–15	25	21.6
Above 15	2	1.7

### 3.3. Post-survey interviews

Based on analysing the survey results and reviewing the current literature, a preliminary management model which recommends policies and strategies for ship management companies to improve the satisfaction and performance of seafarers was designed. Thereafter, two ship management companies which participated in the survey were contacted for an interview. Face-to-face, in-depth interviews were conducted with their human resource managers to elicit their opinion and feedback on the survey results as well as the management model. Their inputs are incorporated in the discussion section of this paper.

## 4. Results

### 4.1. Preliminary data preparation

Prior to running the structural equation modelling, the following negatively-worded observed variables which include burnout tendency (x17) and absenteeism (y3) were reversed-scored by subtracting the value of each observation from a value of seven, which is the upper limit of the scale. The purpose of using negative questions is to ensure that the questionnaire has been carefully read and answered by the respondents. Reverse-scoring is necessary for conducting structural equation modelling to ensure consistency in the factor loadings of each latent construct (Woods, 2006). Subsequently, the covariance of the observed variables, which serves as the data input for performing structural equation modelling, were computed using PRELIS, a statistical analysis software.

### 4.2. Measurement model

This study adopts the methodology proposed by Anderson and Gerbing (1988) in performing structural equation modelling. They recommended analysing the measurement model followed by the structural model. In this study, all analyses were conducted using LISREL 8.8. The results of the confirmatory analysis of the measurement model are shown in Table 3. It shows the factor loadings of the measurement items ( $\lambda$ ), their associated t-values as well as the average variance extracted (AVE) and composite reliability (CR) of the constructs.

As shown at the bottom of Table 3, a chi-square fit index of 262.97 with 194 degrees of freedom was found. Its associated p-value is lesser than 0.05 which indicates absolute, significant difference between the implied and observed data. Nevertheless, the root mean square error of approximation (RMSEA), standardised root mean square residual (SRMR), Tucker-Lewis index (TLI), and comparative fit index (CFI) are 0.03 (90% confidence interval = 0.00–0.018), 0.040, 0.95, and 0.96, respectively. All fit indices are within the acceptable limits specified by Hu and Bentler (1999), suggesting that the six-factor model fits the data adequately.

Construct validity is the extent to which a set of measurement items accurately reflects a latent construct or factor (Hair et al., 2010). In this study, construct validity was evaluated based on two components; convergent validity (or reliability), and discriminant

**Table 3**  
Confirmatory factor analysis.

Construct	Item	$\lambda$	t-value	AVE	CR
Rewards	x1	0.71	–	0.57	0.84
	x2	0.79	7.51		
	x3	0.79	7.54		
	x4	0.72	6.91		
Job stress	x5	0.76	–	0.51	0.84
	x6	0.72	7.42		
	x7	0.71	7.29		
	x8	0.70	7.22		
	x9	0.66	6.75		
Job characteristics	x10	0.71	–	0.59	0.88
	x11	0.80	7.86		
	x12	0.84	8.18		
	x13	0.75	7.43		
	x14	0.72	7.14		
Dispositional affect	x15	0.70	–	0.52	0.77
	x16	0.76	6.16		
	x17	0.71	6.04		
Overall job satisfaction	y1	0.77	–	0.57	0.72
	y2	0.74	8.58		
Job performance	y3	0.76	–	0.55	0.79
	y4	0.73	6.96		
	y5	0.74	7.03		

Note: Model fit statistics:  $\chi^2 = 262.97$ ,  $df = 194$ ,  $\chi^2/df = 1.36$ ,  $p < 0.01$ ; CFI = 0.96, TLI = 0.95, SRMR = 0.04, RMSEA = 0.03,  $0.00 < RMSEA < 0.018$  at 90% confidence interval.

**Table 4**  
Convergent and discriminant validity analysis.

Construct	1	2	3	4	5	6
Rewards (1)	<b>0.57</b>					
Job stress (2)	0.02	<b>0.51</b>				
Job characteristics (3)	0.14	0.05	<b>0.59</b>			
Dispositional affect (4)	0.08	0.04	0.11	<b>0.52</b>		
Overall job satisfaction (5)	0.42	0.49	0.27	0.29	<b>0.57</b>	
Job performance (6)	0.07	0.06	0.08	0.03	0.28	<b>0.55</b>

Note: The bolded diagonal values represent average variance extracted; the off-diagonal values are the square of the correlations

validity. Table 4 presents all the necessary statistics for the evaluation of construct validity.

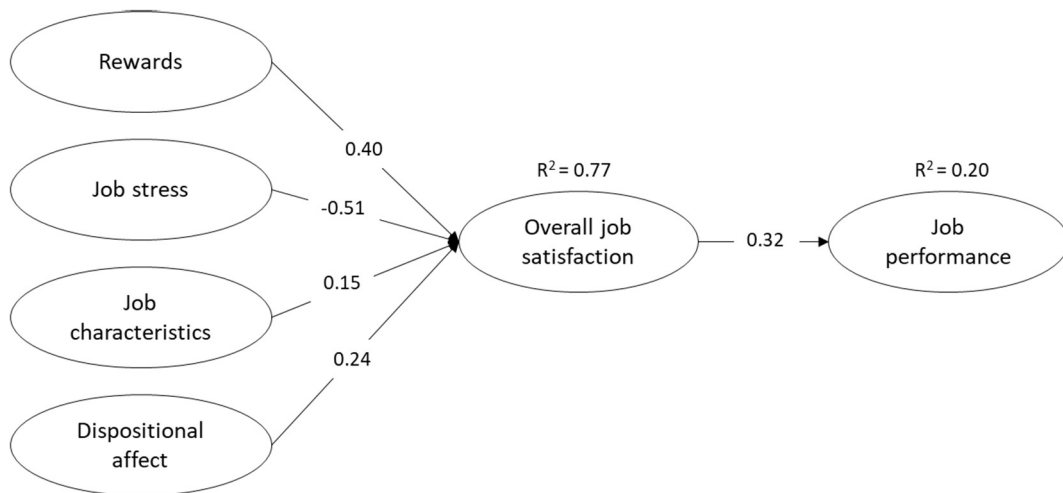
As shown in Table 4, there is convergent validity since average variance extracted (AVE) of the constructs are above the general guideline of 0.5 (Hair et al., 2010). This is further supported by high construct reliabilities (CR > 0.7) which are 0.84, 0.84, 0.88, 0.77, 0.72, and 0.79, respectively (see Table 3). Second, there is discriminant validity since AVE of each construct is greater than its squared correlation estimates (Fornell and Larcker, 1981), which suggests distinctiveness of constructs. Based on the above analysis, there is evidence of construct reliability and validity in the proposed six-factor model. Therefore, the research can proceed with the formal testing and discussion of the structural model.

### 4.3. Structural model

The measurement model was subsequently converted into a structural model by fixing (i.e. deleting) the bidirectional structural paths between the various approaches and job performance. The remaining bidirectional structural paths were specified into uni-directional paths to indicate causality. Based on the hypotheses of this study, Fig. 1 presents the structural model which specifies the relationships between the determinants of job satisfaction, job satisfaction, and job performance. All parameter estimates including factor loadings and structural estimates were standardised to aid interpretation.

As shown in Fig. 1, the chi-square fit index of the model is 307.61 with 198 degrees of freedom. Although the model fails to achieve global fit since the p-value of the chi-square fit is significant (p < 0.05), other fit indices such as RMSEA, SRMR, TLI, and CFI suggest adequate absolute and comparative fit between the implied and observed data. According to the modification indices, no further addition of structural paths is necessary to improve the model. The presented model is noted to be parsimonious and optimum in terms of chi-square fit.

In general, all hypotheses are supported since the structural paths presented in Fig. 1 are statistically significant (p < 0.05). The multiple squared correlations (R<sup>2</sup>) for job satisfaction and job performance are 0.77 and 0.20. The considerably low R<sup>2</sup> for job performance is considered sufficient for modelling human behaviour and performance which is complex. Nevertheless, job satisfaction is well-determined by the four factors. In descending order of their influence of job satisfaction, these four factors are job



Chi-Square=307.61, df=198, P-value<0.05, RMSEA=0.02, SRMR=0.060, TLI=0.95, CFI=0.95

Fig. 1. Determinants of job outcomes in seafaring.

stress ( $\beta = -0.51$ ,  $p < 0.05$ ), rewards ( $\beta = 0.40$ ,  $p < 0.05$ ), dispositional affect ( $\beta = 0.24$ ,  $p < 0.05$ ), and job characteristics ( $\beta = 0.15$ ,  $p < 0.05$ ). Collectively, they accounted for 77 percent of the variances in job satisfaction of seafarers. Lastly, job satisfaction has a positive effect on job performance ( $\beta = 0.32$ ,  $p < 0.05$ ).

Sobel's test was conducted to examine the significance of the indirect effects emanating from the determinants of job satisfaction to job performance. The results are significant ( $p < 0.05$ ) suggesting a full-mediation model i.e. job satisfaction fully-mediates the effects of rewards, job stress, dispositional affect, and job characteristics on job performance.

## 5. Discussion

The discussion is divided into two sections. The first section discusses the research model (Fig. 1) comprising the network of hypotheses. The second section presents and discusses a management model consisting of policies and strategies to improve the satisfaction and performance of seafarers.

### 5.1. Research model and hypotheses

In this study, a research model has been proposed to (1) identify the determinants of job satisfaction which are anchored on various theoretical perspectives, and (2) examine their effects on seafarers' job satisfaction and performance.

The determinants that were studied include rewards, job stress, dispositional affect and job characteristics. They were found to have direct effects on job satisfaction and indirect effects on their performance, which was measured by seafarers' absenteeism, quality of work, productivity, and intention to stay with their companies. This finding highlights the importance of job satisfaction, which fully-mediates the effects of these determinants on job performance. This implies that crew managers should focus on enhancing seafarers' job satisfaction if they wish to improve their performance at work and retain them.

Job stress, which arises from working and living on board a ship, was the leading cause for job dissatisfaction. This finding is aligned with a number of studies which suggested that seafaring is an inherently stressful career (Ellis and Sampson, 2013; Thomas et al., 2003). The results reveal that environmental and work-related factors such as insufficient work-life balance, lack of co-workers' support, insufficient shore-staff support, improper working hours and work schedules, and poor physical working and living conditions are correlated with work-stress and can lead to dissatisfaction. Our finding hence reiterates the imperative need to review occupational and work-related circumstances that seafarers are subjected to at work.

The amount of benefits or rewards that seafarers receive is also highly correlated with satisfaction. These benefits can encompass both tangible and intangible compensations such as salary, family benefits, promotion and training opportunities. This finding corroborates numerous literature that emphasises the use of rewards to attract and retain seafarers (Fei and Lu, 2015; Li et al., 2014; Silva et al., 2011). It also aligns with equity theory which suggests that employees must be duly compensated for their time, effort, and sacrifice dedicated to the work. In addition, the amount of benefits that they receive should be perceived to be comparable with their significant references i.e. co-workers performing similar duties with equal skills and experience. The results suggest a delicate balance between compensation and seafarers' contributions, and should be constantly monitored and reviewed by human resource managers.

To a small extent, seafarers' dispositions also have a positive effect on satisfaction. Disposition refers to the prevailing tendency of an individual's mood or attitude. The results suggest that seafarers who possess desirable dispositions such as positive affectivity, internal locus of control, and low burnout tendencies are more satisfied at work. As discussed earlier, seafarers are subjected to a large amount of stress working and living on a ship and are often isolated from social interactions with their family and community for an extended period. Possessing positive dispositions or emotional state can psychologically prepare seafarers to better cope with negative influences.

Finally, job characteristics have the least influence on seafarers' satisfaction. Positive job characteristics such as skill variety, task identity, task significance, autonomy, and job feedback engage seafarers and contribute to the meaningfulness of work. Consequently, these have positive influence on seafarers' job satisfaction. The weak relationship between job characteristics and seafarers' job satisfaction may be due to the nature of the job. Task identity is limited since shipping is only a segment of the total transportation chain. In addition, most tasks performed on board ships are divided among specialists (e.g. deck officers versus engineer officers) or ranks (e.g. captain versus first mate). These segmented tasks prevent seafarers from seeing through the entire transportation process. Another possible explanation for the weak relationship is that most tasks performed on board ships e.g. navigation or watch-keeping are controlled by safety management systems of a company or regulations such as The International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (STCW). This would restrict seafarers from exercising autonomy when performing their duties or tasks.

### 5.2. Management model

Based on the review of the literature, analysis of the survey results, and interviews with human resource managers from ship management companies, a management model is developed to recommend policies and strategies for shipping companies or ship management companies to improve job satisfaction and performance of seafarers (see Fig. 2). The management model is depicted using a hierarchical structure to highlight the priorities and significance of each theme.

As shown in Fig. 2, the bottom level of the hierarchy seeks to reduce or help seafarers cope with stress by building a supportive working and living environment. As seafarers are separated from their family and friends, who are usually their pillar of support, for



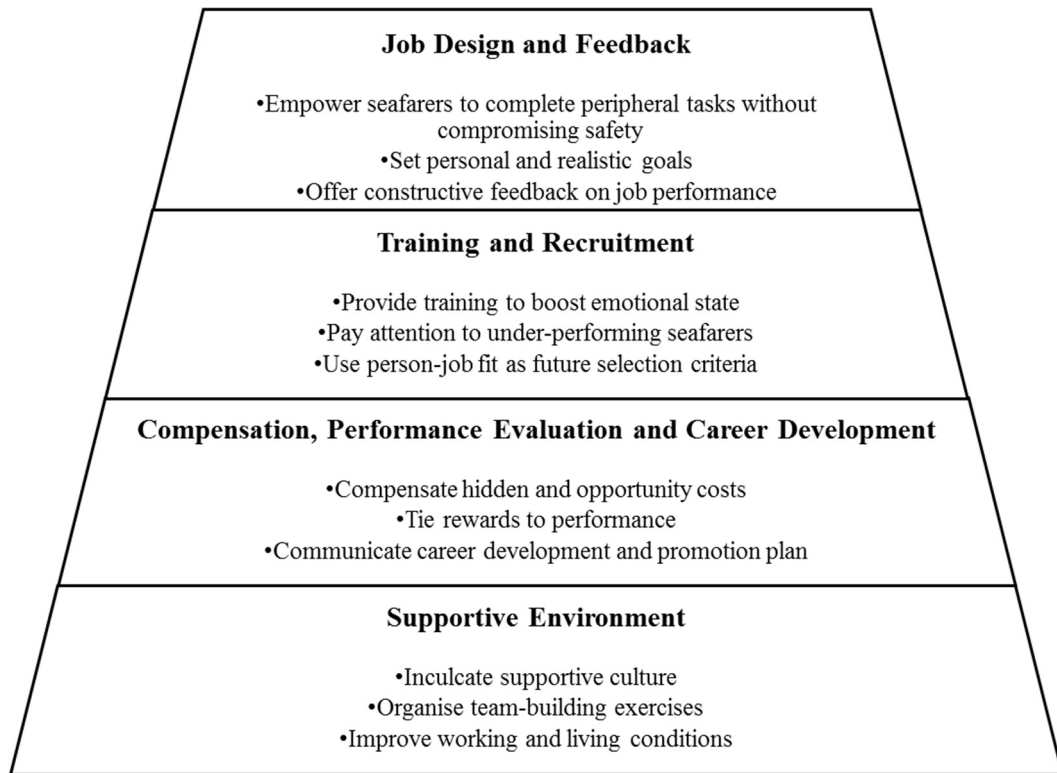


Fig. 2. Hierarchy of priorities to managing job satisfaction and performance of seafarers.

an extended period, the company should inculcate a supportive organisational culture for seafarers. This form of support can help improve work spirit among the crew and can be extended to seafarers from both ashore and on board a ship. The latter should be emphasised since seafarers spend most of their time on board a ship and such support is immediate and direct in addressing their work or emotional stress. In particular, a mentoring programme should be implemented where a more experienced seafarer or co-worker will periodically supervise and evaluate the concerns of a younger or junior seafarer. Accordingly, their concerns should be raised to the management ashore so that they can be addressed promptly. Since seafarers are away from home for a long period of time, support should also be extended to their family members. Communication services such as internet access should also be provided to improve communications between seafarers and their social support network. According to [Papachristou et al. \(2015\)](#), social isolation and separation from families are two leading factors for attrition in the seafaring industry.

Second, the camaraderie among seafarers can be enhanced from minimising personnel changes in the seafaring team, and organising team-building exercises and training. As there exists different types of employment contract between seafarers and their employers in terms of length, the extent of sense of identification with their employers hence varies. This is exacerbated by the trend of employing seafarers from many different countries and having seafarers handle the cultural differences in the same working and living environment while relying on each other for a safe and secure voyage. Since ships today are operated by a diversity of nationalities in which conflict and stress are unavoidably created due to cultural differences and conflicts, stress management can be improved through training and education, particularly in conflict management skills and cultural tolerance among the crew.

Lastly, due to the different needs of each seafarer and their families, if required, the management should be flexible in tailoring a fair and reasonable employee benefits package for the seafarers. The working and living conditions of seafarers remain of paramount importance to ensure the psychological and physical health of seafarers. In addition, flexibility can be introduced in other aspects of welfare schemes such as the length of working hours and duration of shore leaves to suit individual needs.

After addressing the job stressors in seafaring, the second level of the hierarchy uses rewards as motivators to induce job satisfaction. First, with salaries of shore-based jobs being almost equivalent to seafaring careers, it is paramount that shipping companies recognise the hidden costs involved for working on board a ship. These costs such as emotional cost, communication cost, and opportunity cost of spouse should be fairly compensated. Second, it is also important to note that seafarers perceive equity in the amount of compensation they receive. This can be achieved by tying rewards to their performances. A 360-degree appraisal by superiors, subordinates, and co-workers can be used as a more objective basis to evaluate seafarers' performance at work. Lastly, a clear career development and promotion plan should also be communicated to the seafarers. The employment of seafarers tends to be contractual in nature ([Bhattacharya, 2015](#)), creating a sense of insecurity. With a well-charted career plan for the seafarers, it shall drive employee engagement through increased job security. The plan should also incorporate the transition of their seafaring career to a related shore-based job within the same company since their expertise and experience at sea could be valuable to the

management of shipping activities ashore.

As can be seen, the first two levels are associated with the nature of seafaring. The hierarchy then moves on to be more focused on the psychosocial factors of the seafarer at the third level. Although personality is not easily altered, the company is encouraged to involve seafarers in training that are not only related to their professional skills, but also to help them increase self-awareness and self-evaluation. These attributes can be taught and developed and ship managers and crewing agencies are encouraged to invest in training beyond complying minimally with conventions such as STCW and International Safety Management (ISM) Code. More support and attention can be paid to existing seafarers who are under-performing or exhibiting negative tendencies. This finding also has implications for future recruitment of seafarers. The human resource department should consider the person-job fit of potential candidates as part of the selection criteria.

The top level of the hierarchy concerns job design and feedback. While many core activities on board ships are fixed by designations or controlled by regulations and safety management systems, managers can still empower seafarers to perform tasks that are peripheral and do not jeopardise the safety and operations of the ship. Managers or ship captains can also engage seafarers by setting personal and realistic goals. In addition, they should also provide feedbacks on their performance on a regular basis.

## 6. Conclusion

This study extends the current literature on seafaring by assessing the antecedents of job satisfaction and performance. The antecedents were analysed with reference to four theoretical lenses consisting of rewards system approach, job stressor approach, job characteristic approach, and dispositional approach. A survey was subsequently administered to 116 seafaring officers who are employees of six ship management companies. The results show that job satisfaction fully-mediate the relationship between the aforementioned approaches and job performance. It is also found that work stress and rewards are the key determinants of job satisfaction and job performance of seafarers. Comparatively, the dispositions of seafarers and the characteristics of their jobs have smaller influence on both job outcomes. Based on the findings and interviews, policies and strategies to improve job satisfaction and performance of seafarers are discussed. The findings also imply that greater emphasis should be on improving the hygiene factors (i.e. improving work and living conditions and intrinsic and extrinsic rewards) as compared to motivating factors (i.e. improving job characteristics) to improve job satisfaction.

Most notably, this is one of the few studies that comprehensively assess the determinants of job outcomes in the context of seafaring. From examining the effects of each determinant, management efforts can be prioritised to motivate and retain seafarers. This study also contributes to the literature on human resource management by integrating various theoretical lenses to improve job satisfaction. It also provides a better nomological understanding of the relationships among the determinants of job satisfaction, job satisfaction, and job performance.

This research offers a scientific basis for maritime education and training as well as policy-making in crew management to attract and increase the retention rate of seafarers. As seafarers are essential to the shipping industry, the implications and benefits are multi-folds. Unlike other industries, the nature of seafaring does not allow the employers of the seafarers to be in the same working environment as them. The results of this research help the hiring managers understand what affects job satisfaction from seafarers' perspectives. The findings highlight the need to address seafarers' intrinsic work stressors and this calls for more support among themselves and from management who are usually shore-based. Seafaring remains a demanding job that requires one to face the challenges of harsh weather and working conditions on top of keeping up with the advancement in technologies onboard. As compared to rewards and benefits, addressing these stressors faced by seafarers can increase their job satisfaction to a larger extent. For the more experienced seafarers who have learnt how to handle such stresses and manage their emotions away from home, their employers can instead focus on their personality development, empowering them and setting performance objectives and career paths. When these matured and experienced seafarers are retained, their skills can be transferred to the inexperienced. With a well-defined career path for seafarers and more recognition from the management, the image of seafaring will improve and as a result, the sense of attachment and pride within the seafaring community will be increased.

There are several limitations to this study. Firstly, the current study has only applied four theoretical lenses to explain job satisfaction of seafarers. They include the reward system approach, job stressor approach, job characteristic approach, and dispositional approach. Although these approaches collectively explained approximately 77 percent of the variance of job satisfaction, future research can consider applying additional theoretical lenses to explain job satisfaction of seafarers. One potential theory would be expectancy theory which analyses the motivation (or satisfaction) and performance of employees based on a multiplicative function of valence, instrumentality and expectancy (Bauer et al., 2016). Next, the study has not examined the responses from ratings which may differ significantly with officers. In addition, due to insufficient sample size, the analysis is aggregated and has not considered the effects of sub-group differences such as between deck officers and engineer officers, and between first-mate and second-mate. Therefore, future research could probe into these nuances. Secondly, attributing to the perceptual nature of self-administered survey, the data may be subject to common method bias. However, a procedural remedy which involves the temporal separation of the exogenous and endogenous variables in the survey administration has been performed. Lastly, the model suggests that job satisfaction is the sole mediator to job performance of seafarers. However, it is noted that job satisfaction only explains for a modest amount of variance in job performance. There could be other important variables which have been omitted by the model that are also related with job performance. As ships are vulnerable to rough seas and natural calamities, the experience of seafarers might greatly affect performance in their routine duties as they are likely to be exposed to harsh and dangerous working conditions. In addition, the development of ship technologies and maritime autonomous systems requires seafarers to regularly upgrade their professional skills and training. These are factors which would also affect performance in seafaring besides job satisfaction.

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