

IMPACTS OF SEAFARING DIVERSITY : TAIWANESE SHIP-OFFICERS' PERCEPTION

Jiunn-Liang GUO
Instructor
Department of Navigation
China College of Marine Technology
and Commerce
212, Sec 9, Yen-Ping N. Rd., Taipei,
Taiwan, R.O.C.
Fax: +886-2-2810-8866
E-mail: fl151@mail.ccmtc.edu.tw

Gin-Shuh LIANG
Professor
Department of Shipping & Transportation
Management
National Taiwan Ocean University
2, Pei-Ning Rd., Keelung, Taiwan, R.O.C.
Fax: +886-2-2463-1903
E-mail: gsliang@mail.ntou.edu.tw

Kung-Don YE
Professor
Department of Shipping & Transportation
Management
National Taiwan Ocean University
2, Pei-Ning Rd., Keelung, Taiwan, R.O.C.
Fax: +886-2-2463-1903
E-mail: b0228@mail.ntou.edu.tw

Abstract: The sole employment pattern of national vessels has been broken in Taiwan, and seafaring diversity, called mixed seafarers, has also emerged, following the pattern of traditional maritime nations. The authors hypothesized that there would be a negative impact on Taiwanese seafarers' psychological and behavioral attachment to working of a team. This study was carried out from the perception of Taiwanese seafaring officers. Data was collected through questionnaires from seafaring officers who participated in the shore-based promotional training in Taiwan on April 26-31, 2004. An empirical analysis based on a hierarchical regression model was conducted. Results revealed that seafaring diversity has a significant negative effect on Taiwanese seafaring officers' job satisfaction. The study, however, reveals no significant impact to officers' organizational commitment or intent to turnover. The authors consider that the industry-specific nature of seafaring officers is the possible explanation.

Key Words: Seafaring diversity, Job satisfaction, Industry-specific human resource

1. INTRODUCTION

In the early 1970s severe shortages of seafarers emerged in traditional maritime nations leading owners to begin recruiting seafarers from the Far East (Moreby, 2004). Since then employment conditions for seafarers have gradually become multi-national, multi-cultural, and multi-lingual in traditional maritime nations. According to the SIRC (Seafarers' International Research Centre at Cardiff University) global seafarers' database, over 60% of world seafarers do not work in a single-national environment (Wu, 2004). Reasonably, Thomas *et al.* (2003) considered that the world seafarers can be seen as one of the first truly international and global workforces, comprising individuals from regions as geographically and culturally disparate as Western Europe, India, South America, and the Philippines. In general, graduates from Taiwan marine colleges prefer not to enter into seafaring. That phenomenon directly affects the supply of ship officers and indirectly affects the supply of

masters and chief officers (Lin *et al.*, 2001). According to the survey of Fong *et al.* (2001), the operating cost per Taiwan national merchant ship could be cut 48.91% by hiring mixed seafarers. Therefore, to reduce cost and to respond to ship-owners' requests for a sufficient supply of seafarers, the Taiwan government has allowed national ship-owners to recruit foreign seafarers since 1994. As a result, the sole employment pattern of national vessels has been broken, and seafaring diversity, called mixed seafarers, has also emerged. As Ding *et al.* (2004) found, ship owners operating international liners prefer to hire foreign officers and domestic rating in Taiwan. Guo *et al.* (2004) also found that more than 80% of Taiwanese merchant ship officers worked with foreign seafarers on their last assignment. That is, to date seafaring diversity has already become the norm in Taiwan following the pattern of traditional maritime nations.

Might there be other impacts of seafaring diversity on vessels other than cost reduction? Is the job security of Taiwanese seafarers influenced by the trend toward seafaring diversity? Furthermore, is there a negative impact on Taiwanese seafarers' psychological and behavioral attachment to working of a team? According to organizational behavior theory, the diversity of seafarers could negatively affect job attitudes because increasing work-unit diversity is associated with lower levels of psychological attachment within groups (Tsui *et al.*, 1992). Although there is evidence that diverse seafaring groups contribute toward cost-reduction and help to confront global competition (Fong *et al.*, 2001), according to the study of Tajfel and Turner (1986), there could be substantial consequences as seafarers classify themselves and others according to social categories such as race and nationality and evince strong preferences for groups based on these social categories. Explicitly, work-unit diversity occurring on merchant ships is inevitable, so an understanding of impacts resulting from seafaring diversity should help in managing and predicting behavior of seafarers from different countries. Hence, there are many implications of seafaring diversity which management should be concerned with, such as the impact on seafarers' job-related attitudes including job satisfaction, organizational commitment, and intent to turnover. The author carries out this study from the perception of Taiwanese merchant ship officers.

2. CONCEPTUAL BACKGROUND AND HYPOTHESES

2.1 Self-Categorization Theory and Job-Related Attitudes

Self-categorization theory (Turner, 1985; Turner *et al.*, 1987) postulates that similarities among a set of people cause the boundary around the similar people to be used as the basis for social categorization. Similarities among a set of people do not exist in isolation, but are often judged relative to differences between members of the particular set and others outside the set (Oakes, 1996; Turner, 1985). Moreover, research has shown that individuals choose to interact more often with members of their own social group than with members of other groups (Stephan, 1978). Watson and Kumar (1992) therefore inferred that diversity might increase the potential for "process losses" due to intragroup conflict, miscommunication, and lack of trust. Similarly, Tsui *et al.* (1992) found that increasing work-unit diversity was associated with lower levels of psychological attachment among groups. That is, homogeneous groups are more likely than heterogeneous groups to be socially integrated and, therefore, more likely to experience greater job satisfaction with lower turnover (O'Reilly *et al.*, 1989).

Seafarers' work, in contrast with land-based work, necessitates prolonged separation from

home and family. Inevitably, such separations have negative effects on seafarers and their families, and may go so far as to become problematic for seafarers and their families (Thomas *et al.*, 2003). For instance, Agterberg and Passchier (1998) found that seafarers' psychological problems were primarily caused by long periods away from home, reduced number of seafarers per ship, and increased automation. In addition, the 'closed-type' human relationship of seafaring is also very different from those experienced in land-based jobs. Taken together, we posited that the above-mentioned unique features of seafaring could elicit the impacts of diverse seafarers employed on merchant ships operated by Taiwanese owners. That is to say, seafaring diversity could affect Taiwanese seafarers' job-related attitudes including job satisfaction, organizational commitment, and the intent to turnover. Thus, the following hypotheses are proposed:

Hypothesis 1a: Seafaring diversity will be likely have an effect on Taiwanese ship officers' job satisfaction.

Hypothesis 1b: Seafaring diversity will be likely have an effect on Taiwanese ship officers' organizational commitment.

Hypothesis 1c: Seafaring diversity will be likely have an effect on Taiwanese ship officers' intent to turnover.

2.2 Individual Characteristics and Job-Related Attitudes

Rambo (1982) asserted that "one of the more consistent findings [in Organizational Behavior research] has been that there is a positive relationship between age and satisfaction". This relationship is believed to develop because older workers establish better rapport with authority figures in the organization (Mathieu *et al.*, 1993). With regard to the relationship between education level and job satisfaction, education level was usually considered to have a negative impact on job satisfaction. The reason is that highly educated employees expect more career options and tend to be less satisfied than lower educated employees working in the same job (James and Jones, 1980; Oldham and Hackman, 1981). In addition, evidence indicates that tenure and satisfaction are positively related (e.g., Bedeian *et al.*, 1992).

Furthermore, organizational commitment and job satisfaction are both considered as employee attitudes or "orientations", whereas turnover refers to employee behavior (Douglas, 1999). Organizational commitment is the degree to which an employee feels loyalty to a particular organization, while job satisfaction denotes positive emotions toward a particular job (Mueller *et al.*, 1992). Moreover, individuals develop attitudes consistent with situations to which they are already committed (Staw, 1980). Thus, we hypothesize:

Hypothesis 2a: Under the condition of seafaring diversity, differences in age, education, and tenure will likely affect a Taiwanese ship officers' job satisfaction.

Hypothesis 2b: Under the condition of seafaring diversity, differences in age, education, and tenure will likely affect a Taiwanese ship officers' organizational commitment.

Many studies conclude that the older one gets, the less likely one is to quit his/her job (e.g., Rhodes, 1983; Cotton *et al.*, 1986; Davies *et al.*, 1991). There are several factors, one of which being that as workers age, fewer alternative employment opportunities remain. Also, longer tenure tends to provide older workers with higher wages, longer paid vacations, and more-attractive pension benefits (Robbins, 2003). Concerning the relationship between tenure and turnover, Griffeth *et al.* (2000) found that tenure is also a potent variable in explaining turnover; thus, the longer a person is employed, the less likely he or she is to quit. In contrast, education was usually considered to have a positive impact on turnover (e.g., Griffeth *et al.*,

2000). Moreover, the intent to turnover in the withdrawal process was shown to be among the best predictors of turnover (Griffeth *et al.*, 2000). Thus, the following hypothesis is proposed:

Hypothesis 2c: Under the condition of seafaring diversity, differences in age, education, and tenure will likely affect a Taiwanese ship officers' intent to turnover.

2.3 Working Circumstances and Job-Related Attitudes

As mentioned above, workplaces on merchant vessels have become multi-national, multi-cultural, multi-lingual in Taiwan. Such diverse circumstances are very different from what Taiwanese ship officers have experienced in the past. However, expectancy theory assumes employees enter work organizations with expectations and values about the organization of their workplaces. Expectations are beliefs about what conditions will characterize the workplace, while values refer to employee conceptions of desired outcomes in the workplace (Kim *et al.*, 1996). To the extent that employee expectations and values are met, positive emotions toward the work role (satisfaction) and feeling of loyalty to the organization (commitment) result (Douglas, 1999).

In the shipping industry there are a several types of ships (container, bulk carrier, oil tanker, general cargo, etc.). On each type of ship seafarers experience distinct working patterns. Similarly, two distinct ship sections, the deck department and the engine department, could be further identified on merchant ships by different working patterns. There are also two distinct levels, i.e. management and operation, among merchant-ship officers. Taken together, we infer that seafarers of different ranks experiencing different ship-types and sections could result in different levels of job stress. Moreover, seafarers with higher job stress are more likely to have negative emotional states. We can assume higher negative emotional states, in turn, lead to lower job satisfaction and organizational commitment, resulting in the seafarers' increased intent to turnover. Thus, this logic suggests the following hypothesis:

Hypothesis 3: Under the condition of seafaring diversity, differences in rank, section and ship type will likely affect a Taiwanese ship officers' job satisfaction, organizational commitment and intent to turnover.

2.4 Perceived Opportunity for Employment and Intent to Turnover

According to the result of Guo's survey (2004), over 80% of all Taiwanese merchant ship officers worked with foreign seafarers on their last assignment. That is, to date the condition of mixed seafarers has already become very popular in the Taiwan seafaring market. Conceivably, Taiwanese ship officers' opportunity for employment could be reduced by the employment of foreign seafarers. But what is the Taiwanese ship officers' perceptions regarding opportunity for employment in the seafaring market? As previous studies have revealed, intent to stay/turnover is influenced by perceived opportunity for employment outside the current job (e.g., Cavanagh and Coffin, 1992; Price and Mueller, 1981). That is, a positive relationship was found between employment opportunity and intent to turnover. Thus we hypothesize:

Hypothesis 4: Under the condition of seafaring diversity, differences in perceived opportunity for employment will likely affect Taiwanese ship officers' intent to turnover.

2.5 Interactions of Job-Related Attitudes under Seafaring Diversity

Job satisfaction and organizational commitment are usually considered as two key

determinants of employee turnover (Douglas, 1999). Although there is some association between job-related attitudes (like job satisfaction, organizational commitment, and turnover), the strength of the relationship between the variables varies between studies. For instance, in Michaels and Spector (1982) turnover modestly correlated to organizational commitment and job satisfaction, whilst in Weisman *et al.* (1981) they were strongly related. Similarly, Parasuraman (1989) also found that job satisfaction and organizational commitment negatively associated with intention to leave. In addition, according to many studies, turnover strongly correlated to intent to leave (e.g., Michaels and Spector, 1982). Thus, the following hypothesis is proposed:

Hypothesis 5: Under the condition of seafaring diversity, differences in job satisfaction and organizational commitment will likely affect Taiwanese ship officers' intent to turnover.

3. METHODOLOGY

3.1 Sample

The Ministry of Transportation and Communications (MTC), Republic of China, commenced on April 26, 2004 to conduct "The shore-based promotion training for seafarers" in accordance with the demands of the STCW Convention (i.e. International Convention on Standards of Training, Certification and Watch-keeping for seafarers). The nominated governmental agencies and institutes included National Taiwan Ocean University (NTOU), National Kaohsiung Marine University (NKMU), China College of Marine Technology and Commerce (CCMTC), Evergreen Seafarers Training Center (ESTC), and others as well. This study collected data through questionnaires administered to ship officers who joined the above-mentioned shore-based promotion training during the period April 26-31, 2004. The 146 ship officers that replied to the questionnaire consisted of four subgroups: 35 deck officers being promoted to chief officers, 31 engineers being promoted to first engineers, 26 chief officers being promoted to masters, and 22 first engineers being promoted to chief engineers. 114 valid questionnaires were submitted and used for this study; that is, the effective rate of the questionnaires was 78%. Moreover, the sample excludes ship officers from government ships (coast guard ships, customs ships, etc.) so that all sample members were ship officers whose last work was on a commercial cargo ship.

3.2 Independent Variables

This study applied three variables, i.e. 'relational nationality', 'number of nationalities' and 'core seafarers', as the proxy of seafaring diversity on merchant ships. This method is different from similar studies (e.g., Tsui *et al.*, 1992). The author argues that as there is generally more than one nationality of seafarers onboard any one ship, the single 'relational nationality' cannot express thoroughly the workplace of seafaring diversity. In addition, all officers on some ships are Taiwanese, while some officers of other ships are non-Taiwanese. Therefore, the author considers the number of nationalities of seafarers per ship an important factor in the analysis of seafaring diversity. Moreover, the author uses the dummy value '1' to indicate that there are non-Taiwanese ship officers onboard. In contrast, the dummy value '0' indicates that all ship officers are Taiwanese.

The 'relational nationality' is the difference between an individual and all other individuals onboard a ship on nationality. This study measured the 'relational nationality' by imitating the

method used by O'Reilly *et al.* (1989) and by Tsui *et al.* (1992). It is the square root of the summed differences between an individual S_i 's value on a specific demographic variable and the value on the same variable for every other individual S_j in the sample for the work unit, divided by the total number of respondents in the unit (n). The following formula was used for this calculation:

$$\left[\frac{1}{n} \sum_{j=1}^n (S_i - S_j)^2 \right]^{1/2} \quad (1)$$

However, the 'relational nationality' is the difference on the simple demographic variable 'nationality' in the current study. For simplicity, we therefore modified the above formula as follows:

$$\left[\frac{N_f}{N_d + N_f} \right]^{1/2} \quad (2)$$

where N_d is the number of Taiwanese seafarers and N_f is the number of non-Taiwanese seafarers. The denominator is the total number of all seafarers on a ship. The actual scores ranged from zero to .99 for the permutations of seafarers on a ship. For example, a Taiwanese chief officer on a ship of four Taiwanese and twelve Filipinos would have a relational nationality score of .87; 0 for being the same as the other Taiwanese and 12 for being different from each of the twelve Filipinos. We would then divide the score of 12 by 16 and take the square root of the result.

3.3 Control Variables

Three sets of control variables were used. The first set included three individual characteristics, i.e. age, education, and tenure. These variables were necessary to ensure that seafaring diversity effect was obtained even when the effect of the demographic attribute was considered. Age, tenure, and education were measured in years. In order to increase the sensitivity of the analysis, we used the entire education period minus 9 years of compulsory education as the education variable.

The second set included rank, ship type, and section. As discussed above, different ship-types (container, bulk carrier, oil tanker, general cargo, etc.) are used in the shipping industry, whereas seafarers experience distinct working patterns. In general, working on a container vessel is more difficult and stressful than on other types of vessels. Similarly, two distinct sections, the deck department and the engine department, can be characterized by different working patterns. Furthermore, there are two distinct levels, i.e. management and operation, among merchant-ship officers. Taken together, these three variables present the work environment of seafaring diversity. Those factors were measured by a dichotomous variable, with 1 designating container vessel or deck department and 0 designating non-container vessel or engine department. Similarly, rank was also measured by a dichotomous variable, with 1 designating chief officers advancing to masters or first engineers advancing to chief engineers and 0 designating deck officers advancing to chief officers or engineers advancing to first engineers. Again, these variables were included as controls to ensure that the hypothesized effect of seafaring diversity remained after inclusion of work environment factors.

The final control variable is perceived opportunity for employment. As previous studies

showed and as was discussed above, intent to turnover is influenced by perceived opportunity for employment beyond the current job. It was measured by a three-item index (Hsieh, 1996) with a Cronbach's alpha of 0.864. The mean of the three items was used as an index of perceived opportunity for employment.

3.4 Dependent Variables

Three dependent variables were measured. These were job satisfaction, organizational commitment and intent to turnover. Job satisfaction was measured by a six-item index (Tsui *et al.*, 1992) with a Cronbach's alpha of 0.749. Organizational commitment was assessed on a scale of one to five using the 10-item value commitment index (Tsui *et al.*, 1992; Angle and Perry, 1981) of the 15-item organizational commitment scale (Porter *et al.*, 1974). This index includes all the items (Cronbach's alpha = 0.871) measuring an individual's psychological attachment to the organization. Intent to turnover was measured by a five-item index (Hsieh, 1996) with a Cronbach's alpha of 0.720. The above three scale scores were, respectively, the averages of items.

4. RESULTS

4.1 The Analysis of Job-Related Attitudes Affected by Seafaring Diversity

Table 1 provides the means, standard deviations, and correlations of the study variables. Results show that all correlation coefficients between seafaring diversity variables (i.e. relational nationality, number of nationalities, and core seafarers) and job-related attitudes (i.e. job satisfaction, organizational commitment, and intent to turnover) are negative. Although the directions of the relationships between seafaring diversity variables and intent to turnover are contrary to those results of previous studies (e.g. O'Reilly *et al.*, 1989). However, these coefficients have no empirical meanings while their correlations do not reach significant levels yet. In addition, scores indicate the presence of significant relationships between job satisfaction, relational nationality, and number of nationalities. Other job-related attitude scores (i.e. organizational commitment and intent to turnover) are not significantly influenced by seafaring diversity variables. Therefore, hypothesis 1a is seemingly supported by the above-mentioned results, while hypothesis 1b and 1c are not supported by the same results.

This study uses hierarchical regression analysis to test aforementioned hypotheses comprehensively. This regression procedure is different from other approaches in which the control variables were entered before the independent variables. In this study, the author entered the independent variables first, then added each set of control variables. The author was interested in the stability of the regression coefficients on the seafaring diversity measures as each set of controls was added to the regression model. Additionally, for the sake of avoiding multicollinearity problem, independent variables were added separately to the regression model. The analysis results are shown in Tables 2, 3, and 4.

Hypothesis 1a was tested directly by examining the coefficients for the seafaring diversity variables in Table 2. Though the three sets of control variables were added to the regression model, the coefficients for the relational nationality variable and the number of nationalities variable both reveal negatives and reach significant levels ($p < 0.01$). The results imply that increasing the number of foreign seafarers and nationalities that Taiwanese ship officers must

deal with reduces officers' job satisfaction. Moreover, introduction of the three sets of common correlations of job-related attitudes does not change the effect of seafaring diversity on Taiwanese ship officers' job satisfaction, though the overall model F value decreased gradually from 3.804, $p < 0.05$ (model 1) to 1.793, $p < 0.1$ (model 4). In short, this finding supports Hypothesis 1a.

Hypothesis 1b & 1c were tested respectively by examining the coefficients for the seafaring diversity variables in Table 3 & 4. In Table 3 the number of crewmember nationalities that Taiwanese ship officers must confront is associated with their organizational commitment, while the other two seafaring diversity variables do not reveal any significant relationship with organizational commitment. The signs of the above coefficients indicate that the greater the number of crewmember nationalities onboard a ship, the lower the level of Taiwanese ship officers' organizational commitment. In addition, the overall model F-value 2.193 (model 3) reached a significant level ($p < 0.05$) and the coefficients for the numbers of nationalities revealed greater significance ($p < 0.01$) after the second set of control variables (i.e., rank, ship type, and section) were introduced to the regression model. These results support the proposed effects for the number of crewmembers' nationalities on a ship but not for the two other seafaring diversity variables. However, according to the results of Table 4, no single seafaring diversity variable accounted for changes in Taiwanese ship officers' intent to turnover even though all three sets of control variables were considered. That is, Taiwanese ship officers' intents to turnover were not influenced by seafaring diversity on a ship. In conclusion, the overall results of Table 3 & 4 partly support Hypothesis 1b, however, but not Hypothesis 1c.

4.2 The Analysis of Job-related Attitudes Affected by The Individual's Characteristics

Table 1 shows that correlations among job-related attitudes and individual characteristics (i.e. age, education, and tenure) are consistent with previous studies, though their significances do not support the hypotheses. That is, age and tenure are associated with job-related attitudes variables in the same directions: the greater the age and tenure, the lower the individual's intent to turnover and the higher the level of job satisfaction and organizational commitment. However, the relationship between education and job-related attitudes is contrary to the above direction. Higher education results in greater intent to turnover and lower job satisfaction and organizational commitment.

Furthermore, this study uses regression analysis to comprehensively test Hypotheses 2a, 2b, and 2c. According to the results of Table 2, 3, and 4, individuals' characteristics are not consistently and significantly associated with job-related attitudes. That is, under conditions of seafaring diversity differences in age, education and tenure do not likely affect Taiwanese ship officers' job satisfaction, organizational commitment, and intent to turnover. These results do not support Hypotheses 2a, 2b, or 2c.

Table 1. Means, Standard Deviations, Correlations and Reliabilities^a

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Intent to turnover	2.53	0.73	(.720)												
2.Job satisfaction	3.57	0.58	-.354 ^{**}	(.746)											
3.Organizational commitment	3.46	0.60	-.532 ^{**}	.664 ^{**}	(.871)										
4.Seafaring diversity	0.48	0.30	-.032	-.245 ^{**}	-.059	---									
5.Number of nationalities	1.97	0.70	-.010	-.304 ^{**}	-.175	.744 ^{**}	---								
6.Core seafarers (dummy)	---	---	-.084	-.149	-.032	.748 ^{**}	.491 ^{**}	---							
7.Age	39.90	8.28	-.218 [*]	.116	.142	.174	-.069	.303 ^{**}	---						
8.Education	5.16	1.55	.175	-.107	-.099	-.022	.134	-.209 [*]	-.619 ^{**}	---					
9.Tenure	9.65	6.91	-.201 [*]	.185 [*]	.156	.197 [*]	-.076	.325 ^{**}	.720 ^{**}	-.618 ^{**}	---				
10.Rank (dummy)	---	---	-.118	.086	.213 [*]	.269 ^{**}	.058	.309 ^{**}	.396 ^{**}	-.179	.442 ^{**}	---			
11.Ship type (dummy)	---	---	-.137	-.062	.085	.131	.388 ^{**}	-.073	-.450 ^{**}	.500 ^{**}	-.363 ^{**}	-.069	---		
12.Section (dummy)	---	---	.121	-.077	-.135	.089	.116	.004	-.086	.369 ^{**}	-.227 ^{**}	-.009	.132	---	
13.Job opportunity	2.54	0.76	.403 ^{**}	.040	.025	-.135	-.101	-.136	-.136	.167	-.188 [*]	.037	-.159	.133	(.846)

^a The numbers in parentheses on the diagonal are Conbach's alphas. * $P < 0.05$. ** $P < 0.01$.

Table 2. Effects of Seafaring Diversity on Job Satisfaction

Variable	Model			
	1	2	3	4
Independent variables				
Relational nationality	-.245 ^{***}	-.300 ^{***}	-.322 ^{***}	-.317 ^{***}
Number of nationalities	-.304 ^{***}	-.296 ^{***}	-.348 ^{***}	-.345 ^{***}
Core seafarers	-.149	-.233 ^{**}	-.242 ^{**}	-.236 ^{**}
Control variables				
Age		-.008	.015	.023
Education		.059	.009	-.002
Tenure		.250 [*]	.218	.230
Rank			.048	.034
Ship type			.132	.158
Section			-.007	-.012
Job opportunity				.070
Overall model <i>F</i>	3.804 ^{**}	2.693 ^{**}	1.947 [*]	1.793 [*]
Adjusted <i>R</i> ²	.069	.082	.070	.066
ΔR^2		.013	-.012	-.004
Standard error	.561	.557	.561	.562

p* < 0.1; *p* < 0.05; ****p* < 0.01.

Table 3. Effects of Seafaring Diversity on Organizational Commitment

Variable	Model				
	1	2	3	4	5
Independent variables					
Relational nationality	-.059	-.100	-.163	-.155	.057
Number of nationalities	-.175 [*]	-.166 [*]	-.276 ^{***}	-.273 ^{***}	-.054
Core seafarers	-.032	-.098	-.137	-.128	.027
Job satisfaction					.646 ^{***}
Control variables					
Age		.065	.143	.155	.140
Education		.025	-.064	-.082	-.080
Tenure		.102	-.011	.007	-.141
Rank			.166	.144	.122
Ship type			.324 ^{***}	.364 ^{***}	.262 ^{***}
Section			-.113	-.121	-.113
Job opportunity				.108	.063
Overall model <i>F</i>	1.599	1.083	2.193 ^{**}	2.098 ^{**}	10.256 ^{***}
Adjusted <i>R</i> ²	.016	.004	.087	.089	.474
ΔR^2		-.012	.083 ^{***}	.002	.385 ^{***}
Standard error	.593	.597	.571	.571	.434

p* < 0.1; *p* < 0.05; ****p* < 0.01.

Table 4. Effects of Seafaring Diversity on Intent to Turnover

Variable	Model					
	1	2	3	4	5	6
Independent variables						
Relative nationality	-.032	.008	.070	.100	-.015	.013
Number of nationalities	-.010	-.032	.090	.099	-.027	-.054
Core seafarers	-.084	-.010	.010	.042	-.045	-.032
Job satisfaction					-.365 ^{***}	-.030
Organizational commitment						-.517 ^{***}
Control variables						
Age		-.144	-.262 [*]	-.225	-.216 [*]	-.144
Education		.037	.130	.077	.077	.035
Tenure		-.091	-.035	.018	.101	.028
Rank			.002	-.064	-.052	.011
Ship type			-.392 ^{***}	-.270 ^{**}	-.212 ^{**}	-.076
Section			.079	.053	.049	-.010
Job opportunity				.327 ^{***}	.352 ^{***}	.384 ^{***}
Overall model <i>F</i>	.346	1.081	2.112 ^{**}	3.317 ^{***}	5.145 ^{***}	7.895 ^{***}
Adjusted <i>R</i> ²	-.018	.004	.081	.170	.287	.423
ΔR^2		.022	.077 ^{**}	.089 ^{***}	.117 ^{***}	.136 ^{***}
Standard error	.733	.725	.696	.662	.613	.552

p* < 0.1; *p* < 0.05; ****p* < 0.01.

4.3 The Analysis of Working Circumstances of Seafaring Diversity

According to Table 1, correlation exists between rank and organizational commitment only at significant levels ($p < 0.05$). Other correlations between job-related attitudes and working circumstances (i.e. rank, ship type and section) do not reveal any significance. However, in considering the effects of seafaring diversity on Taiwanese ship officers' job-related attitudes, the study added the above mentioned working circumstance variables into the regression analysis model. The model 3 of Table 2 shows that none of the three working circumstance variables are associated with job satisfaction under seafaring diversity situations. However, in Table 3 the overall model *F*-value 2.193 (model 3) reaches significant level ($p < 0.05$) and the coefficient for ship type becomes significant ($p < 0.01$) after the second set of control variables (i.e. rank, ship type and section) were added to the regression model. Similarly, in Table 4 the overall model *F*-value 2.112 (model 3) also reaches significant level ($p < 0.05$) and the coefficient for ship type also becomes significant ($p < 0.01$) after the same variables were added to the regression model.

From the above results, we find that Taiwanese ship officers' job satisfaction was not affected by the working circumstances of seafaring diversity. But their organizational commitment and intent to turnover were affected significantly, especially with regard to the type of ship they worked aboard. Furthermore, signs of the coefficient for ship type in Table 3 & 4 show that

the Taiwanese ship officers who worked on container ships have higher levels of organizational commitment and lower levels of intent to turnover than those who worked on non-container ships. In addition, the negative signs of the coefficients for section variables in Tables 2 & 3 imply that Taiwanese ship officers who worked in deck departments have lower levels of job satisfaction and organizational commitment, though the coefficients did not reach a significant level. This may indicate a higher intent to turnover. Similarly, the positive signs of the coefficients for rank variables manifest that Taiwanese management ship officers (herein, chief officers and first engineers) have higher levels of job satisfaction and organizational commitment than those whose ranks were at an operational level (herein, deck officers and engineers). However, the significance of the coefficient for the effect of rank variable on the intent to turnover in Table 4 is relatively small. That is, Taiwanese ship officers' intents to turnover were not affected significantly by the ranks possessed by them. In short, these results regarding the effects of working circumstances of seafaring diversity partly support Hypothesis 3.

4.4 The Effects of Perceived Opportunity for Employment under Seafaring Diversity

Table 1 reveals significant correlation ($p < 0.01$) between job opportunity (i.e. the perceived opportunity for employment outside the current job) and intent to turnover while no obvious relationships exist between job opportunity, job satisfaction, and organizational commitment. In order to understand the effects of perceived opportunity for employment on job-related attitudes for Taiwanese ship officers under conditions of seafaring diversity, this study added the job opportunity variable to the regression model. According to the results of Table 2 & 3, we confirm that Taiwanese ship officers' job satisfaction and organizational commitment under conditions of seafaring diversity were not affected by their perceived opportunity for employment. However, model 4 of Table 4 shows that Taiwanese ship officers' intents to turnover were significantly affected ($p < 0.01$) by their perceived opportunities for employment outside the current job, while the addition of the explainable variances of the overall model reach a significant level ($p < 0.01$). Additionally, the positive sign of the coefficient for the job opportunity variable indicate that more perceived opportunities resulted in higher levels of intent to turnover for Taiwanese ship officers. Overall, the above-mentioned findings support Hypothesis 4.

4.5 The Interactions of Job-related attitudes under Seafaring Diversity

Consistent with previous studies, Table 1 shows that all correlations among job-related attitudes are significant ($p < 0.01$). Through the analysis of the regression model, these correlations continue to be significant. Model 5 of Table 3 confirms that organizational commitment was associated with job satisfaction while the coefficient for the job satisfaction variable was positive and significant ($p < 0.01$). Model 5 of Table 4 also manifests that the intent to turnover was associated with job satisfaction, while the coefficient for the job satisfaction variable was negative and significant ($p < 0.01$). Furthermore, in comparing models 5 and 6, we find that the effects of the job satisfaction variable on the intents to turnover were mediated by the organizational commitment variable.

The above-mentioned results imply that Taiwanese ship officers' organizational commitment and intents to turnover were affected by their job satisfaction. Higher levels of job satisfaction

resulted in higher levels of organizational commitment. Conversely, higher levels of job satisfaction resulted in lower levels of intents to turnover. Moreover, the effect of Taiwanese ship officers' job satisfaction on the intent to turnover, in fact, was mediated by their organizational commitment. That is, higher levels of organizational commitment, the proxy of job satisfaction, resulted in lower levels of intent to turnover. In conclusion, these findings support Hypothesis 5.

5. CONCLUSIONS

Concerning the inevitable trend toward seafaring diversity, this study aimed to investigate the effects of mixed seafarers (on merchant vessels) on Taiwanese ship officers' job-related attitudes. The author first applied three seafaring diversity variables (i.e., relational nationality, number of nationalities and core seafarers) as independent variables in the analysis of the regression model and its intercorrelations. The results of this study show that Taiwanese ship officers' job satisfaction was significantly affected by all three seafaring diversity variables even though three sets of control variables were considered. However, Taiwanese ship officers' organizational commitment was affected only by the variable of the number of nationalities with which they worked on a ship. In especial, their intents to turnover were not affected by the three seafaring diversity variables whether control variables were considered or not. Such a finding differs from those in previous studies (e.g., O'Reilly *et al.*, 1989) in organizational behavior. The authors consider that the industry-specific nature of the human resources—the seafaring officers—is the possible explanation. That is, though Taiwanese ship officers may not be content with seafaring diversity, they would not act arbitrarily to affect their organizational commitment and intents to turnover. They are aware of the difficulty in transferring their industry-specific skills to other land-based jobs.

In addition, this study finds that Taiwanese ship officers who worked on container ships have higher levels of organizational commitment and lower levels of intent to turnover than those who worked on non-container ships. Moreover, the perceived opportunities for employment outside the current job significantly affected Taiwanese ship officers' intent to turnover. That is, under conditions of seafaring diversity, more perceived opportunities for employment outside the current job resulted in higher levels of intent to turnover. Furthermore, this study also confirms that Taiwanese ship officers' intent to turnover was affected by their job satisfaction and organizational commitment. The effect of Taiwanese ship officers' job satisfaction on the intent to turnover, in fact, was mediated by their organizational commitment.

Finally, although the overall results show that seafaring diversity affects Taiwanese ship officers' job satisfaction and partial organizational commitment to a limited extent, their intent to turnover was not at all influenced. Nevertheless, the author argues emphatically that ship owners should deal with the negative effects of seafaring diversity toward officers, especially with regard to job satisfaction, as ship safety could ultimately be affected.

Some limitations of the current study need to be addressed. Strictly speaking, the R^2 values seem to be quite low in this study. Due to the hierarchical regression used in this study basing on the assumption of linear relationship between variables, hence the authors submit the idea of assuming non-linear relationships between variables for future studies. Additionally,

because 'income' as well as 'opportunity cost' are important variables to explain job-related attitudes (i.e. job satisfaction, organizational commitment, and intent to turnover), we suggest that future studies should include the two above-mentioned variables in proposed models to capture more real scenes, though the two variable seem to be reflected partly in 'rank' and 'job opportunity' included in this study.

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