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BENEFIT COMPENSATION AND ALLOWANCE PROCEDURE ADJUSTMENT STRATEGY TO STRENGTHEN THE PERFORMANCE OF PT SAMUDERA CREW'S HUMAN RESOURCES AT JAKARTA

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Abstract:

Background: The global maritime industry operates in a highly demanding environment characterized by severe labor shortages and intense competition for skilled personnel. Optimal operational performance depends heavily on both technical proficiency and fair compensation. PT XYZ Samudera Crewing faces a critical need to adjust its current reward system because these structures directly influence crew motivation and retention. Evaluating these procedures through the lenses of equity and expectancy perspectives is essential for achieving sustainable improvement.
Purpose: This study aims to critically examine how targeted compensation and allowance adjustments improve overall crew performance at PT XYZ Samudera. It comprehensively analyzes the direct and indirect effects of these financial rewards operating through the mediating psychological channels of job satisfaction and employee engagement.
Design/methodology/approach: The researchers employed a quantitative methodology utilizing primary survey responses and official organizational performance data collected from 2019 to 2023. A stratified random sampling technique was used to ensure accurate representation across various maritime ranks. Data analysis utilized multiple linear regression and Partial Least Squares Structural Equation Modeling to rigorously test all direct and mediation effects.
Results: Analytical results indicate that specialized allowances yield a substantially stronger direct impact on crew performance than standard base-pay adjustments. Job satisfaction and employee engagement successfully and fully mediated the relationship between financial rewards and final operational outcomes. Risk-related allowances emerged as the most influential factor driving positive behavior on board.
Conclusion: This empirical study confirms that intelligently structured compensation procedures serve as vital strategic drivers of continuous behavioral improvement. Evaluated longitudinal data indicate sustained performance gains. This emphasizes that organizations must prioritize risk-based allowances to elevate crew satisfaction and overall operational performance in demanding environments.
Originality/value (State of the art): This study contributes significantly to the maritime human resource literature by providing a novel theoretical model. It integrates compensation procedures with an extensive five-year data-driven path analysis. This study offers practical and evidence-based insights for shipping companies to optimize risk-based benefits and sustain long-term market competitiveness.

Keywords: compensation system, maritime human resources performance, justice theory, expectation theory, procedure adjustment strategy

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INTRODUCTION

The global shipping industry is the backbone of international trade. It faces inherently complex challenges in managing human resources at sea. High turnover rates, severe recruitment difficulties, heavy work pressure, and inherent safety risks are critical factors that directly impact operational performance. The demanding nature of this environment severely tests the psychological and physical endurance of maritime personnel (Brooks and Greenberg, 2022). Operating within this demanding context, PT XYZ Samudera Crewing faces significant pressure to attract and retain a highly competent crew while ensuring optimal onboard performance. The strategic selection of PT XYZ Samudera Crewing as the scope of this research was not arbitrary. This organization manages specialized maritime logistics across the highly competitive Asia-Pacific corridor, making its operational efficiency a critical node in the stability of the regional supply chain. Crew retention and performance at this company transcend basic administrative metrics. They are pivotal strategic imperatives that determine logistical reliability and regulatory compliance in high-stakes markets.

Traditional compensation and benefits systems in the maritime industry largely rely on generic methods. They focus heavily on basic salaries without capturing the nuanced psychosocial needs of the workforce operating in isolated environments. This rigid framework struggles to sustain motivation across different demographic groups, particularly as younger and more dynamic generations of marine officers enter the workforce (Estimo et al. 2020). Consequently, a comprehensive adjustment of these reward structures is urgently required to prevent the continuous loss of key talents (Bao et al. 2021). To illustrate the escalating operational reality, Table 1 displays the annual crew data, average performance scores, and retention rates at PT XYZ Samudera Crewing Jakarta over five years.

Recent scholarly investigations have demonstrated that rigid compensation schemes elevate work stress and negatively impact organizational commitment among seafarers. The profound influence of compensation on behavioral outcomes is undeniable; however, the mechanism through which these rewards operate requires precise theoretical grounding. A study on seafarers' attitudes confirmed that wages and compensation directly dictate the perception of decent work and shape daily operational behaviors (Yildirim et al. 2022). Furthermore, seafarers constantly evaluate the fairness of their compensation against their expended efforts and the rewards their peers receive. Perceptions of procedural injustice during this evaluation directly elevate turnover intentions and diminish institutional trust (Colquitt et al. 2001), which is fundamentally grounded in Equity Theory, which posits that employees continuously assess the fairness of their input-output ratio relative to their peers. Contemporary extensions of this perspective demonstrate that discretionary benefits and perceived organizational support significantly influence individual performance through fairness perceptions (Balkin & Werner, 2023; Pereira & Mohiya, 2021).

To address these vulnerabilities, contemporary literature heavily advocates aligning compensation strategies directly with broader human resource management practices. Recent research has notably shifted to exploring holistic approaches that encompass direct financial compensation alongside extended health benefits and career development initiatives to secure long-term loyalty. Generational analyses of psychological motivators prove that these comprehensive reward structures specifically address the unique retention challenges of the modern maritime workforce (Tahanci, 2025).

Despite these theoretical advancements, a critical gap remains in the comparative literature. Previous maritime human resource studies have largely adopted a confirmatory style, analyzing the direct and isolated effects of specific benefits on seafarer retention. They frequently fail to capture the complex psychological transition that occurs between receiving a benefit and executing an improved onboard performance. The current literature lacks a cohesive empirical framework that maps these intermediate variables within a demanding maritime setting to reduce turnover. Researchers have noted that compensation yields a maximum effect on employee performance only when it is applied alongside specific intervening variables (Pranira, 2022). This study explicitly addresses this methodological and empirical gap. It departs from simple linear confirmations to introduce a robust structural perspective, testing how specific reward elements shape the psychological pathways that lead to enhanced productivity.

Table 1. Annual crew data, average performance scores, and retention rates at PT XYZ Samudera Crewing Jakarta from 2019 to 2023

Year	Total Crew	Average Performance (100 Scale)	Retention Rate (%)
2019	200	78.2	85.4
2020	220	75.6	82.1
2021	240	80.1	87.3
2022	230	83.5	89.0
2023	210	85.0	91.2

Addressing the complex human resource challenges at PT XYZ Samudera requires an evidence-based and performance-oriented strategy. This scientific problem-solving process requires a structural perspective and approach to accurately map the underlying behavioral mechanics. Effective resolution relies heavily on the mutual exchange relationship defined by the organizational justice. Fair treatment in compensation procedures fosters a strong psychological obligation among crew members to reciprocate with positive attitudes and elevated performance. To successfully initiate this reciprocation, procedural adjustments must prioritize absolute transparency and administrative consistency (Milkovich & Newman, 2020).

Setting specific, challenging, and achievable targets linked directly to these transparent compensation procedures serves as a core mechanism for amplifying employee motivation (Locke & Latham, 2019). Furthermore, comprehensive problem-solving integrates various elements of a total rewards inventory to build a resilient workforce capable of executing strategic objectives in the organization. A structural approach ensures that human resource decisions are firmly grounded in empirical data rather than administrative intuition (Barends & Rousseau, 2011). This structured analytical perspective is vital for establishing a comprehensive framework that systematically elevates employee well-being and operational efficiency.

The primary objective of this study is to critically evaluate the existing compensation and benefits procedures at PT XYZ Samudera Crewing using a structural analytical approach. Building upon this evaluation, this study aims to formulate strategic adjustments strictly aligned with organizational theories and the specific psychosocial realities of maritime crews. Another core objective is to comprehensively analyze the structural impact of these strategies on strengthening crew motivation and optimizing human resource performance. A key expected result of this study is the delivery of a science-based, structural model. This model will precisely identify how psychological factors mediate the relationship between adjusted compensation procedures and the final operational outcomes. Ultimately, this study provides a decisive empirical foundation for maritime companies to implement sustainable reward systems that actively prevent the loss of essential talent.

METHODS

This study employed a quantitative approach utilizing an explanatory survey method. The core objective of this study was to investigate the structural relationships between compensation procedures and overall crew performance. The target population encompasses all active crew members who have been employed at PT XYZ Samudera Crewing over a five-year retrospective period spanning 2019–2023. This population included captains, officers, and general crew staff. The researchers applied a stratified random sampling technique based on personnel rank and the specific type of ship operated to ensure adequate and proportional representation. The targeted sample size was set to a minimum of 150 respondents in total. Achieving this required distributing questionnaires to approximately 215 individuals to confidently account for an estimated 70 percent response rate. The data sources include primary data obtained directly from seafarers and secondary data consisting of historical performance reports supplied by the human resources department. Table 2 outlines the operational definitions of the research variables.

A closed-ended questionnaire featuring a standardized five-point Likert served as the primary data collection instrument. A score of one represents strong disagreement, and a score of five represents strong agreement. The questionnaire was rigorously validated before widespread distribution. Two independent

professionals reviewed the instruments to ensure structural integrity. Following this expert review, the researchers conducted a preliminary trial with 30 non-sample respondents. This step carefully assessed instrument reliability using Cronbach's alpha, strictly targeting a coefficient greater than 0.7 to confirm internal consistency. Finalized online surveys were distributed to the actual sample target using Google Forms links. The questionnaire was distributed systematically through direct emails and dedicated crew WhatsApp groups between August and October 2025. To effectively complement the primary survey responses, secondary data collection involved a thorough document analysis of performance appraisal archives and compensation policy. Explicit written permission was obtained from the company management for data access.

The researchers applied a series of systematic data analysis techniques to rigorously test the hypothesized relationships among the designated variables once the extensive data collection phase was concluded. The initial analytical procedures involved calculating descriptive statistics to accurately summarize the demographic profiles of the respondents. Frequencies, mathematical means, and standard deviations were used to summarize the data. Subsequently, classical assumption tests were performed. The Kolmogorov-Smirnov test verified data normality, and the Variance Inflation Factor evaluation guaranteed the total absence of multicollinearity issues among the independent variables. Multiple linear regression served as the foundational method for inferential statistical analysis to evaluate the direct impact of various compensation and benefits procedures on human resource performance. Additionally, Partial Least Squares Structural Equation Modeling was employed to conduct a highly comprehensive path analysis. This advanced modeling technique provides a robust methodology for measuring intricate indirect relationships and structural pathways (Hair et al. 2022). These sophisticated analytical techniques provide a scientifically sound framework for drawing accurate conclusions regarding the ultimate efficacy of the proposed compensation adjustment.

The foundational hypothesis guiding this comprehensive investigation asserts that well-structured compensation and allowance procedures exert a significant positive effect on the overall performance of maritime crew members. This core assumption is deeply rooted in the established organizational behavior paradigms. Employees become highly motivated when they perceive a fair and direct link between their efforts and the subsequent rewards (Katabalo & Mwita, 2024). The central hypothesis builds upon the premise that compensation adjustments tailored to the unique physical risks of the maritime environment directly fulfill critical psychosocial needs of seafarers. Intrinsic motivation and affective commitment naturally increase when crew members recognize that their parent company genuinely values their professional contributions. Distinctive supportive practices actively foster a climate in which individuals feel compelled to invest their energy in their assigned roles (Akour & Alwahaibi, 2021). Heightened psychological states characterized by job satisfaction and employee engagement are indispensable mediators in this relationship. This psychological engagement ultimately translates into enhanced operational productivity and sustained human resource performance (Shuck et al. 2021).

Table 2. Operational definition of variables, indicators, measurement scales, and data sources for crew performance analysis

Variable	Indicator	Measurement Scale	Data Source
Compensation Procedure (X1)	Base salary, performance bonuses, risk allowances, health insurance	Likert 1-5	Questionaire + Data HRD
Allowance Procedure (X2)	Meal allowance, annual leave, family allowance, pension plan	Likert 1-5	Questionaire + Data HRD
HR Performance (Y)	Productivity, discipline, retention rates, annual performance appraisals	Scale 1-100	Company performance archive (2019-2023)

Based on the theoretical foundation and proposed conceptual framework, the following specific hypotheses were formulated for empirical testing in this study:

H1: Standardized compensation procedures have a significant positive effect on job satisfaction.

H2: Standardized compensation procedures significantly and positively affect employee engagement.

H3: Specialized allowance procedures significantly and positively affect job satisfaction.

H4: Specialized allowance procedures significantly and positively affect employee engagement.

H5: Job satisfaction has a significantly positive effect on overall human resource performance.

H6: Employee engagement has a significantly positive effect on overall human resource performance.

Furthermore, job satisfaction and employee engagement are hypothesized to act as significant mediating variables in the relationship between compensation/ allowance procedures and final crew performance.

Figure 1 illustrates the conceptual framework of thought, explicitly mapping the vital structural relationships between exogenous, mediating, and endogenous variables. Standardized compensation and specialized allowance procedures are the primary independent variables that directly initiate crew members' motivational processes. These critical initial inputs are hypothesized to influence the intermediate psychological states of maritime workers. Job satisfaction and employee engagement were precisely targeted as fundamental mediating factors. These enhanced levels of personal satisfaction channel the highly positive effects of organizational rewards toward the ultimate dependent variable, which is the quantifiable daily performance of human resources. Mapping these sequential pathways effectively demonstrates how strategic adjustments logically culminate in vastly improved overall productivity.

RESULTS

Demographic Profile and Descriptive Statistics

The demographic profiles of the respondents provided a comprehensive overview of the seafarers participating in this study. The data reveal a diverse distribution across various hierarchical positions on the board. This distribution ensured a highly representative sample of the maritime workforce. The survey captured valuable insights from 25 skippers, 50 officers, and 75 general crew members. The professional tenure metrics indicate a highly experienced respondent base. Ninety respondents possessed between two and five years of maritime work experience. A substantial portion of 60 individuals served for more than five years. They are exceptionally capable of accurately assessing the compensation procedures. Table 3 presents the specific frequencies and percentages associated with these critical respondent characteristics.

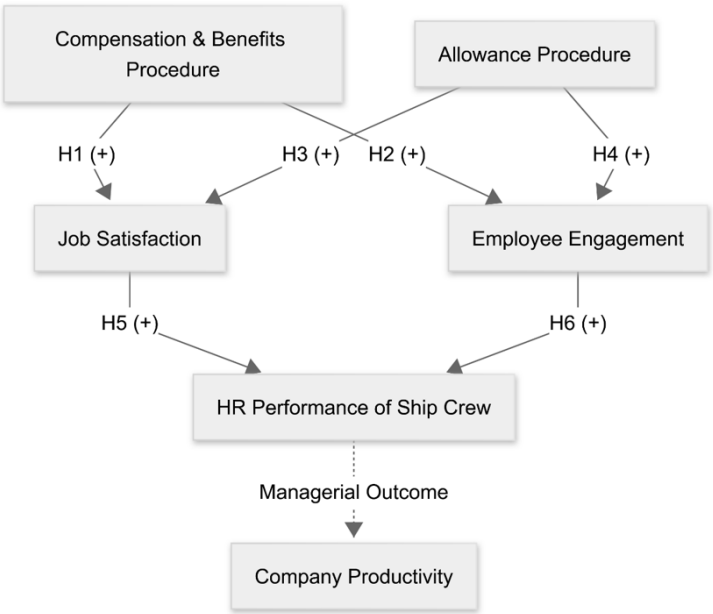


Figure 1. Conceptual framework of the relationship between compensation procedures, allowances, mediating factors, and human resource performance

The descriptive statistics offer vital insights into the average perceptions of the research variables measured on a five-point Likert scale. Respondents generally held highly positive views regarding existing human resource performance. This variable recorded the highest mean score of all constructs. Conversely, the perception of the allowance procedures received the lowest average rating. This specifically identifies a critical operational area that requires immediate organizational attention. Job satisfaction and employee engagement showed robust mean values. Table 4 systematically presents the detailed mean scores and standard deviations to illustrate these fundamental baseline metrics.

Measurement Model (Outer Model) Evaluation

Classical assumption tests confirmed the normal data distribution. The Kolmogorov–Smirnov test yielded significance values consistently above the acceptable threshold. The multicollinearity test clearly demonstrated that all Variance Inflation Factor values remained strictly below ten. This confirms the absence of severe correlations among the independent variables. Figure 2 illustrates the measurement model assessment within the Partial Least Squares analysis, revealing highly adequate outer loading values safely exceeding the recommended threshold of 0.70. To clarify the precise indicator loadings depicted in the structural visuals, the compensation indicators consistently scored above 0.811. Allowance indicators similarly demonstrated exceptionally strong convergent validity, with loadings peaking at 0.884. Internal consistency was fully supported. The Cronbach's alpha and composite reliability scores for all variables vastly surpassed the strict acceptable thresholds.

Structural Model (Inner Model) and Hypothesis Testing

Structural model analysis successfully mapped the causal relationships and direct effects among the latent variables. The initial multiple linear regression analysis established that the designated independent variables collectively explained a substantial 71 percent variation in human resource performance. The structural model comprehensively tested distinct, variable-specific hypotheses. The data clearly validates the first hypothesis. Standardized compensation procedures have a significant positive direct effect on job satisfaction. The analysis also validates the second hypothesis, proving that specialized allowance procedures strongly drive the employee engagement.

Table 3. Respondent demographic characteristics based on position and work experience

Characteristics	Category	Frequency	Percentage
Position	Skipper	25	16.7%
	Officer	50	33.3%
	Crew	75	50.0%
Work Experience	2–5 years	90	60.0%
	>5 years	60	40.0%

Table 4. Average mean scores and standard deviations of research variables on a Five-Point Scale

Variable	Mean	Hours of deviation
Compensation Procedure (X1)	3.82	0.74
Allowance Procedure (X2)	3.65	0.81
Job Satisfaction (M1)	4.10	0.68
Employee Engagement (M2)	3.95	0.72
HR Performance (Y)	4.25	0.63

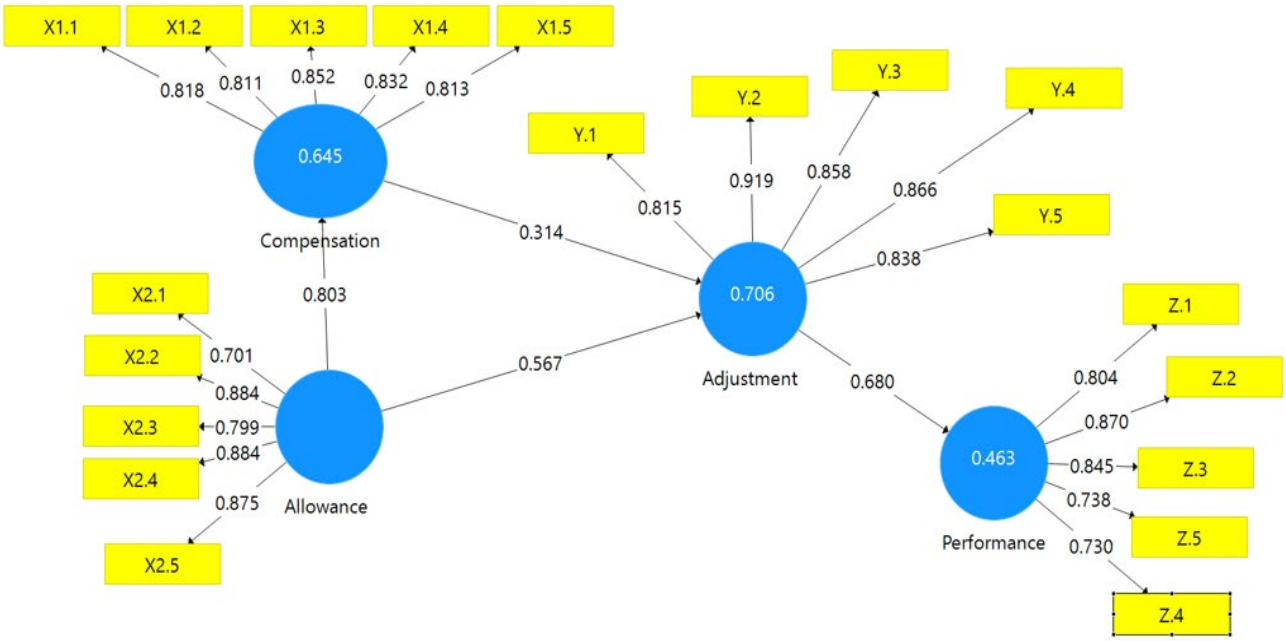


Figure 2. Measurement model displaying outer indicator loadings for compensation, allowance, adjustment, and performance variables

The path coefficient from the allowance to psychological adjustment proved to be substantially stronger than the influence of standard compensation. This demonstrates the profound impact of specialized maritime benefits. The model further validated the final mediation hypothesis. Psychological adjustment is a highly powerful determinant that ultimately yields a strong positive effect on overall crew performance. The coefficients of determination confirm that the model possesses a highly satisfactory explanatory power. Table 5 presents the comprehensive results of the structural model estimation.

The empirical findings consistently provide robust statistical evidence that strategic adjustments to compensation and allowance procedures significantly strengthen crew human resource performance. Job satisfaction and employee engagement seamlessly transmit the vital benefits of compensation directly into improved performance. This complex mediation structure strongly aligns with international findings, confirming that comprehensive talent management strategies actively produce sustained productivity gains within modern maritime organizations (Ajayi & Udeh, 2024). Our findings challenge traditional confirmatory models that view financial incentives as direct and isolated performance triggers. The data demonstrates a comparative alignment with the Conservation of Resources Theory within demanding maritime contexts. Seafarers utilize perceived compensation fairness to mitigate the severe psychological depletion inherent in isolated shipboard environments (Hobfoll, 2011). Maritime personnel interpret robust allowance structures as a clear signal of genuine organizational support. This perception directly translates into safer behavior and noticeably stronger operational resilience (Kurtessis et al. 2017).

Monetary rewards alone are fundamentally insufficient unless they are fully supported by perceived fairness and procedural transparency. These results align directly with foundational strategic human resource frameworks. The continuous alignment between daily reward systems and overarching long-term organizational strategies is vital to maintaining a competitive edge (Boxall & Purcell, 2022). Implementing comprehensive elements from a modern total rewards inventory remains particularly effective in motivating crew members to navigate operational hazards (WorldatWork, 2020). Human resource departments must proactively integrate these reward structures alongside targeted digital upskilling programs to ensure that the workforce remains agile (Theotokas et al. 2024). Our results strongly conform to recent systematic reviews emphasizing that optimal human-centered designs in highly technical maritime environments heavily depend on prioritizing operator psychological well-being (Li & Yuen, 2024).

Table 5. Structural model estimation results displaying path coefficients, t-statistics, and p-values for direct effects

Path	Coefficient	T-Statistics	P-Value
Compensation → Job Satisfaction	0.47	6.32	0.000
Compensation → Employee Engagement	0.41	5.15	0.000
Allowance → Job Satisfaction	0.39	4.87	0.000
Allowance → Employee Engagement	0.35	4.26	0.000
Job Satisfaction → HR Performance	0.33	4.01	0.000
Employee Engagement → HR Performance	0.29	3.68	0.000
Compensation → HR Performance	0.18	2.43	0.015
Allowance → HR Performance	0.15	2.11	0.035

Recognizing these human-centric compensation needs helps address future challenges related to seafarer education and training as the maritime industry approaches a more automated era (Meštrović et al. 2024). Cultivating multicultural competence and socially responsible HR practices will further solidify retention strategies across diverse crews (Progoulaki & Roe, 2011). Integrating these reward frameworks with advanced competency requirements will be essential for the next generation of ship operators as the industry continues to evolve (Ghosh & Emad, 2025). Investigating the role of strategic incentives in driving operational energy efficiency and green behavior onboard provides an innovative extension of this compensation model (Rehmatulla et al. 2026). Moreover, adapting these structured human resource practices can support broader strategic objectives, such as maintaining a competitive national fleet identity during complex reflagging processes (Czeslawa Christowa, 2024). Figure 3 precisely displays the structural path diagram, clearly visualizing the intricate direct and indirect relationships successfully bridging compensation, specialized allowances, psychological adjustment, and final performance.

Managerial Implications

Corporate executive management must rapidly revise existing operational and compensation policies. They must prioritize differentiated risk-based allowances that accurately reflect the severe physical demands of specific dangerous shipping routes. Management should implement comprehensive elements from a modern total rewards inventory to continuously reinforce sustained intrinsic motivation among the entire crew of the ship. Human resource departments must proactively integrate these reward structures alongside targeted upskilling programs to ensure that the workforce remains agile. Progressive transitions toward highly collective financial rewards will significantly foster improved interpersonal collaborations. Permanently adopting these deeply integrated reward strategies will enable organizations to sustain high retention rates.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The comprehensive empirical findings of this study directly address our primary research objective. This confirms the profound efficacy of the proposed structural model for maritime human resources. We systematically collected and transparently analyzed five years of historical performance data alongside primary survey data. This strict methodological approach ensured complete transparency throughout the evaluation process. Through this rigorous analysis, employee adjustment was confirmed as the central mediating mechanism. It effectively links various reward-related variables to overall crew performance.

Among the evaluated factors, the specialized allowance emerged as the most highly influential exogenous variable. It exerts both direct and indirect effects on seafarers. Conversely, while standard base compensation demonstrates a statistically significant impact, it has a comparatively weaker influence than targeted allowances. This crucial distinction indicates that organizational rewards influence operational performance primarily through employees' complex psychological adjustment. They do not operate merely through basic financial incentives.

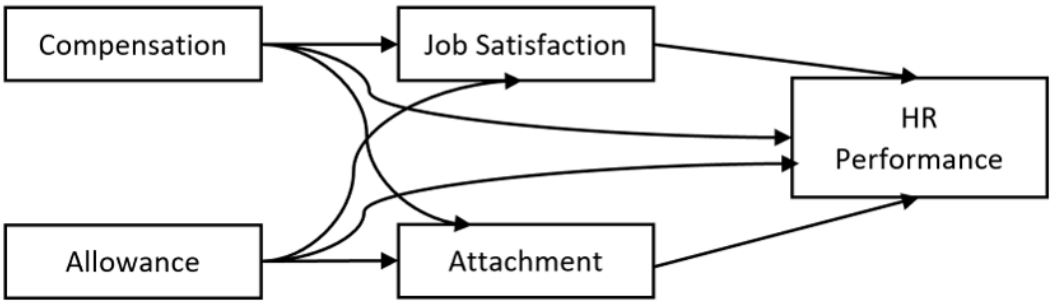


Figure 3. Path diagram visualizing the relationships between compensation, allowance, mediating variables, and performance

From a theoretical perspective, this study significantly advances maritime human resource literature. The findings confirm that perceived fairness and clear effort-to-reward linkages serve as critical drivers of sustained crew motivation. These results thoroughly support both Equity and Expectancy theories. Furthermore, these robust findings conclusively demonstrate that intelligently structured compensation and allowance procedures systematically elevate both job satisfaction and employee engagement. Addressing the unique demands of the shipping industry, the provision of risk-based allowances appears to be the strongest structural contributor to positive behavioral outcomes. This finding highlights the immense strategic importance of tailoring financial benefits to directly mitigate severe occupational hazards. The evaluated longitudinal data revealed a consistent and measurable improvement in the overall crew performance. Ultimately, this structural framework creates a vital blueprint for addressing the multifaceted complexities of modern seafaring professions.

Recommendations

Based on these conclusive findings, maritime organizations must comprehensively transition their current compensation systems. Administrative functions alone are insufficient. Companies must aggressively move toward highly integrated and performance-linked reward strategies. PT XYZ Samudera Crewing specifically needs to revise its existing compensation policy by placing a massive strategic focus on risk-based benefits and robust employee engagement programs. Management should urgently implement collective bonus structure. These structures must strictly reward entire ship teams for reaching shared productivity targets, rather than solely incentivizing isolated individual achievements.

Furthermore, companies must strongly consider developing highly differentiated risk allowances based on specific dangerous shipping routes. Cultivating multicultural competence and socially responsible HR practices will further solidify retention strategies across diverse crews. Deploying specialized stress management training and establishing creative non-financial reward systems will be highly beneficial in continuously reinforcing the vital psychological mediators identified in this study.

Subsequent research initiatives should actively conduct structured pilot projects of newly formulated compensation strategies for future strategic development. As the industry evolves, integrating these reward frameworks with advanced competency requirements will be essential for the next generation of ship operators. Investigating the role of strategic incentives in driving operational energy efficiency and green behavior onboard could provide an innovative extension to this compensation model. Moreover, adapting these structured human resource practices can support broader strategic objectives, such as maintaining a competitive national fleet identity during complex reflagging processes.

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REFERENCES

Ajayi, F. A., & Udeh, C. A. (2024). A comprehensive review of talent management strategies for seafarers: Challenges and opportunities. International Journal of Science and Research Archive, 11(2), 1116–1131. https://doi.org/10.30574/ijsra.2024.11.2.0560

Akour, M. A., & Alwahaibi, S. S. (2021). Significance of supportive HRM practices and job satisfaction towards work engagement. Annals of Contemporary Developments in Management & HR, 3(3), 20–31. https://doi.org/10.33166/ACDMHR.2021.03.003

Balkin, D. B., & Werner, S. (2023). Theorizing the relationship between discretionary employee benefits and individual performance. *Human Resource Management Review, 33*(1), 100901. https://doi.org/10.1016/j.hrmr.2022.100901

Bao, J., Li, Y., Zheng, G., & Zhang, P. (2021). Exploring contributing factors to young seafarer turnover: Empirical evidence from China. Journal of Navigation, 74(4), 914–930. https://doi.org/10.1017/S0373463321000230

Barends, E., & Rousseau, D. M. (2011). Becoming an evidence-based HR practitioner. Human Resource Management Journal, 21(2), 203–216. https://doi.org/10.1111/j.1748-8583.2011.00173.x

Boxall, P., & Purcell, J. (2022). Strategy and human resource management (5th ed.). Bloomsbury Publishing.

Brooks, S. K., & Greenberg, N. (2022). Mental health and psychological wellbeing of maritime personnel: A systematic review. BMC Psychology, 10(1), Article 850. https://doi.org/10.1186/s40359-022-00850-4

Christowa, C. (2024). Navigating national identity: A critical look at the reflagging process for Polish ships. European Research Studies Journal, 27(1), 11–27. https://doi.org/10.35808/ersj/3345

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O., & Ng, K. Y. (2001). Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. Journal of Applied Psychology, 86(3), 425–445. https://doi.org/10.1037/0021-9010.86.3.425

Estimo, E. T., Garcia, E. V., Araya, Z. B., Flores, K. M., Estrabo, S. V. P., & Lacson, J. B. (2020). Millennial seafarers as today and tomorrow's generation of marine officers: Implications and future directions. Journal of Shipping and Ocean Engineering, 10(2), 65–75. https://doi.org/10.17265/2159-5879/2020.02.002

Ghosh, S., & Emad, G. R. (2025). Identifying challenges in designing and implementing a skills and competency framework for future seafarers: A systematic literature review. Australian Journal of Maritime & Ocean Affairs, 17(3), 540–553. https://doi.org/10.1080/18366503.2024.2356365

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). Sage Publications.

Hobfoll, S. E. (2011). Conservation of resource caravans and engaged settings. Journal of Occupational and Organizational Psychology, 84(1), 116–122. https://doi.org/10.1111/j.2044-8325.2010.02016.x

Katabalo, C. V., & Mwita, K. M. (2024). The role of compensation on job satisfaction, employee performance and organisational performance. Science Mundi, 4(1), 137–148. https://doi.org/10.51867/scimundi.4.1.12

Kurtessis, J. N., Eisenberger, R., Ford, M. T., Buffardi, L. C., Stewart, K. A., & Adis, C. S. (2017). Perceived organizational support: A meta-analytic evaluation of organizational support theory. *Journal of Management, 43*(6), 1854–1884. https://doi.org/10.1177/0149206315575554

Li, X., & Yuen, K. F. (2024). A human-centred review on maritime autonomous surface ships: Impacts, responses, and future directions. Transport Reviews, 44(4), 791–810. https://doi.org/10.1080/01441647.2024.2325453

Locke, E. A., & Latham, G. P. (2019). The development of goal setting theory: A half century retrospective. Motivation Science, 5(2), 93–105.

https://doi.org/10.1037/mot0000127

Meštrović, T., Pavić, I., Maljković, M., & Androjna, A. (2024). Challenges for the education and training of seafarers in the context of autonomous shipping: Bibliometric analysis and systematic literature review. Applied Sciences, 14(8), 3173. https://doi.org/10.3390/app14083173

Milkovich, G. T., & Newman, J. M. (2020). Compensation (13th ed.). McGraw-Hill Education.

Pranira, S. (2022). Compensation, intervening variables, and their effects on employee performance. Business and Entrepreneurial Review, 22(1), 129–138. https://doi.org/10.25105/ber.v22i1.13708

Pereira, V., & Mohiya, M. (2021). Share or hide? Investigating positive and negative employee intentions and organizational support in the context of knowledge sharing and hiding. *Journal of Business Research, 129*, 368–381. https://doi.org/10.1016/j.jbusres.2021.03.011

Progoulaki, M., & Roe, M. (2011). Dealing with multicultural human resources in a socially responsible manner: A focus on the maritime industry. WMU Journal of Maritime Affairs, 10(1), 7–23. https://doi.org/10.1007/s13437-011-0003-0

Rehmatulla, N., Iyer, P., & Nameghi, F. H. (2026). Can crew onboard ships be incentivised to go green? Understanding the role of incentives in nudging behaviour for improving operational energy efficiency. Sustainability, 18(3), 1526. https://doi.org/10.3390/su18031526

Shuck, B., Kim, W., & Chai, D. S. (2021). The chicken and egg conundrum: Job satisfaction or employee engagement and implications for human resources. New Horizons in Adult Education and Human Resource Development, 33(1), 4–24. https://doi.org/10.1002/nha3.20302

Tahanci, P. (2025). A generational analysis of psychological motivators influencing seafarer retention. The Plymouth Student Scientist, 18(2), 1–12. https://doi.org/10.70156/1754-2383.1530

Theotokas, I., Lyridis, I., & Roubanis, K. (2024). The role of digitalization in maritime human resource management: A systematic literature review. Journal of Shipping and Trade, 9, Article 6. https://doi.org/10.1186/s41072-024-00165-0

WorldatWork. (2020). Total rewards inventory and compensation strategy. WorldatWork Press.

Yildirim, U., Toygar, A., & Çolakoğlu, C. (2022). Compensation effect of wages on decent work: A study on seafarers attitudes. Marine Policy, 143, 105155. https://doi.org/10.1016/j.marpol.2022.105155

OPTIMIZING SPARE PARTS INVENTORY AND WAREHOUSE LAYOUT AT PT XYZ USING ABC ANALYSIS

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Abstract:

Background: Spare parts warehouse management in the manufacturing industry often faces challenges owing to unstructured organization, where high-value and low-value items are frequently mixed. This condition is prevalent at PT XYZ, a refined sugar company, leading to operational inefficiencies and prolonged search times owing to the lack of a clear classification system.
Purpose: This study aims to analyze inventory control at PT XYZ using Activity-Based Classification (ABC Analysis) to classify spare parts and design a proposed physical warehouse layout to enhance operational efficiency.
Design/methodology/approach: This research employs a quantitative descriptive approach to analyze 94 spare part items. Annual usage data were evaluated using the ABC analysis method to categorize items into A, B, and C groups based on their cumulative value. Following this classification, a proposed warehouse layout was designed to optimize spare-part placement according to their priority levels.
Results: The inventory was categorized into three groups based on cost contribution: Group A accounted for 78.8%, Group B for 15%, and Group C for 5%. The proposed layout strategically positions Group A near the warehouse entrance for rapid access, places Group B on the middle shelf, and allocates Group C to the rear area for space optimization. This systematic arrangement significantly minimizes retrieval time and mitigates the risk of damage to high-value assets in the warehouse.
Conclusion: The application of the ABC analysis at PT XYZ has proven effective in classifying 94 spare part items to optimize inventory control based on investment value. The implementation of a new systematic warehouse layout has the potential to enhance operational efficiency and reduce item retrieval time. To ensure the sustainability of the system, companies should consistently carry out warehouse restructuring, provide inventory management training for employees, and conduct periodic evaluations to ensure that inventory management remains adaptive to operational requirements.
Originality/value: The novelty of this research lies in the integration of ABC economic value analysis with systematic physical layout design, specifically within a refined sugar industry spare parts warehouse, to reduce operational costs. These results provide a guide for warehouse managers in decision-making regarding storage allocation and monitoring priorities, ultimately reducing machine downtime caused by delays in spare part availability. This strategy enables the company to optimize its working capital through more precise inventory control of Category A items.

Keywords: ABC analysis, warehouse layout, spare parts management, operational efficiency, refined sugar industry

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