ASSESSING RELATIONSHIP BETWEEN ENTERPRISE RISK MANAGEMENT AND HOSPITAL PERFORMANCE IN UAE

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ABSTRACT
Objective: This paper aims to assess the relationship between enterprise risk management and hospital performance in the UAE.
Research Method: Data collection involved a quantitative approach using a structured questionnaire survey. The gathered data was analyzed with advanced multivariate analysis of structural equation modelling with the help of the SmartPLS software package.
Findings: ERM has a strong positive relationship with Business Model Innovation while ERM does not have a direct significant impact on Hospital Financial Performance Hospital Non-financial Performance Hospital Environmental Performance. Business Model Innovation has observed a direct significant effect on Hospital Financial Performance, Hospital Non-financial Performance and hospital environmental performance.
Originality: The findings of the study will assist the practitioners in strategic planning and improving hospital performance in the UAE.
Keywords: hospital performance, enterprise risk management, SEM, UAE

1. INTRODUCTION

Enterprise risk management, or ERP, is the most popular method of addressing and identifying potential events that indicate risk scenarios for achieving strategy goals and gaining competitive advantages. ERM is a critical component of vital management that is built into a company's daily operations (Anton and Nucu 2020). A strong ERM program can differentiate between risks that the organization faces both internally and externally. The assessment of large risks and the implementation of appropriate risk reactions are central components of Enterprise Risk Management (ERM) (Etges et al., 2019).

The UAE government has begun to take hospital performance development very seriously in response to the changing landscape towards a reduction in medical errors caused by the growing role of healthcare technologies. Recognizing lead risks, focusing on them, and putting procedures in place will help prevent and reduce the risk, which could have disastrous consequences. Finally, an effective ERM program will allow the company to manage risk by creating a never-ending cycle, as the best results come from maximizing value protection through risk prevention, remediation, reporting, and learning (Elamir 2019).

The challenges that the healthcare sector faces today, in a setting characterized by an increase in service demand, lead to risk quandaries. Hospital performance in the United Arab Emirates is still in its infancy as a result of staffing shortages, requests for work plans, and elevated risk at every turn (Hussain et al., 2019). Fraser et al. (2021), discussing ERM, state that risks are often governed in conflicting ways. This is the typical outcome of a fluent approach to risk management. Sufficient degrees of success can be achieved in managing these risks within one organizational unit. This paper reports on a study that looks into the long-term effects of enterprise risk management

on the performance of UAE hospitals. It explains how hospital performance and enterprise risk management are mediated by innovative business models.

2. CONCEPTUAL MODEL DEVELOPMENT

A conceptual model is a set of techniques presented in a way that makes sense, shows how they relate to each other, or encapsulates the main idea of the model (Bashir et al., 2020). The methods and premise of a conceptual model are typically common, well-described, and indicated within terminology specific to each design; they are, however, less described than those of a paradigm, which serves as the model's source. By using the Resource-Based View (RBV) theory as the cornerstone for the HP change and gaining an understanding of ERM practices, this study isolated the RBV theory's constituent parts that demonstrated their significance (Barney, 1991; Freeman et al., 2021).

A conceptual model is a portrayal of construction that rehearses thoughts and ideas via manner picture (Hattie and Donoghue, 2016). A conceptual design offers a platform for the organization about the information of the practice, deciding the concentration about the practice and offering information for remark and analysis (Schiavi et al., 2019).

This paper adapted the conceptual model presented by Almaazmi et al. (2022) as presented in Figure 1.

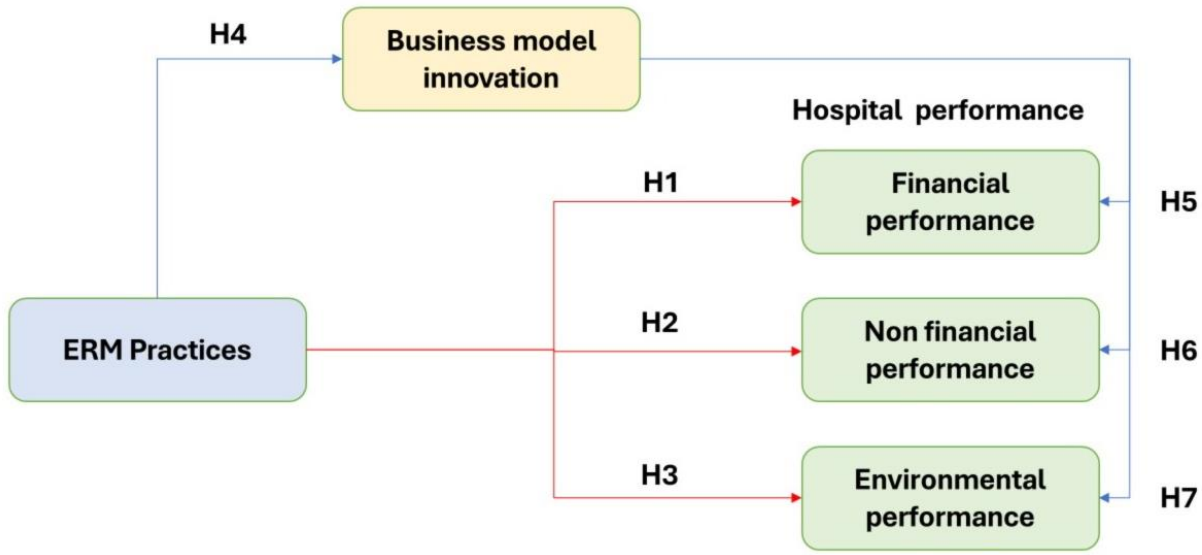

Figure 1: Conceptual Model of ERM Practices Toward the Hospital Performance
Source: (Almaazmi et al. 2022)

Based on Figure 1, the conceptual model of ERM practices will enhance hospital performance through financial performance, nonfinancial performance, and environmental performance. Based on the conceptual model, independent variables are measured by ERM practices. The independent variable is measured by the ERM practices and HP. Therefore, the hypothesis for HP is as follows:

- **H1-ERM practices significantly influence hospital financial performance:** The ERM practices establish the level of financial risk exposure and an organization's financial characteristics on financial performance (Senna et al., 2020). Singh et al. (2021) stated that the level of financial risk divulgence and an organization's financial performance emphasize the ERM practices. Therefore, ERM practices are significantly influencing hospital financial performance.
- **H2-ERM practices significantly influence hospital nonfinancial performance:** The ERM practices are imperative to influence competitive

advantage and organization's nonfinancial performance for effectiveness and intangible resources for improvements (Elamir, 2019). Cutting of risk, values and possible deprivation of an organization's nonfinancial performance emphasizes operational performance. Therefore, ERM practices are significantly influencing hospital nonfinancial performance.

- **H3-ERM practices significantly influence hospital environmental performance:** The ERM practices impact the environmental performance of listed organizations in the financial sector because they will impact the improvement of the performance of the businesses (Falkenström and Höglund, 2019). Hammoda and Durst (2022) stated that environmental performance influences an organization's benefit, which will be a helpful pointer for investors. Therefore, ERM practices are significantly influencing hospital environmental performance.
- **H4-ERM practices significantly influence BMI in hospitals:** The ERM practices influence the setting of BMI is a neglected region of profound understanding of the business model of an organization and its performance-oriented (Frankowski, 2019). Brown (2020) stated that risk management can be assimilated into an organization's BMI procedure that focuses on identifying critical business innovation issues. Therefore, ERM practices are significantly influencing BMI in hospitals.
- **H5-BMI significantly influences hospital financial performance:** The BMI gains a business risk management structure that identifies problematic scenarios and strategizes clear action plans for resolving financial performance issues (Binci et al., 2021). Tukamuhabwa et al. (2021) stated that aligning the risk behaviour option built through the business advancement procedure with the organization's corporate policy will optimize the financial performance outcome. Therefore, BMI significantly influences hospital financial performance.
- **H6-BMI significantly influences hospital nonfinancial performance:** The BMI focuses on planning into position for settling nonfinancial performance and decreasing risks that help organizations encounter risk appetite (Schiavone et al., 2020). Kulkov (2021) stated that the execution of risk management through the development interaction diminishes the risks connected to nonfinancial performance. Therefore, BMI significantly influences hospital nonfinancial performance.
- **H7-BMI significantly influences hospital environmental performance:** The BMI impact the uncertainty and density of the developing business model strategies that emphasize environmental performance (Andreassen et al., 2018). Brown (2020) stated that various kinds of BMI impact environmental performance, as assessed by various estimations of functional performance and financial activities. Therefore, BMI significantly influences hospital environmental performance.

Figure 1 reveals that there are a total of five groups of attributes that were used for data collection through questionnaire survey. The attributes are presented in Table 1.

Table 1: Attributes Measuring ERP and Hospital Performance

Item Code	Item Description
Enterprise Risk Management Practices	
ERMP1	Our hospital has a policy for dealing with severe risks that could jeopardize our capacity to achieve our strategic goals.
ERMP2	Our hospital has standard methods for identifying important risks and opportunities.
ERMP3	Our hospital analysed the risks and opportunities that were used to

	determine how they should be managed.
ERMP4	Our hospital has standard procedures for launching risk-reduction measures
ERMP5	Our hospital creates risk reports for top management and the board of directors regularly.
ERMP6	Our hospital has regular procedures in place for tracking important risk developments and risk-reduction initiatives.
ERMP7	Our hospital recognizes that failing to respond to threats or risks results in the loss of critical resources for our hospital's operation
ERMP8	Employees at the hospital have been educated to deal with the risks and threats
ERMP9	Employees in the hospitals deal with threats
ERMP10	Our hospital has processes in place that outline how to respond to external threats or risks.
Business Model Innovation	
BMI1	Our hospital business model is unique in general.
BMI2	Our hospital business model draws many new clients.
BMI3	Many new suppliers and partners are drawn to our hospital business model
BMI4	Our hospital business model creates innovative connections between participants.
BMI5	In a revolutionary approach, our hospital business model connects participants to transactions.
BMI6	Our hospital business model is constantly updated with fresh ideas and advancements.
BMI7	In our hospital business model, we often implement new operational processes, routines and standards
BMI8	Our hospital is the first to use this business model.
BMI9	Our hospital business model is unique in general.
BMI10	Our hospital improvements in the efficiency of business model operational processes.
BMI11	Our hospital customer desires and requirements are significantly more satisfied in the business model.
BMI12	Our hospital has a significant increase in the number of products or services available through the business model.
Hospital Financial Performance	
HFP1	Our hospital emphasizes the return on equity.
HFP2	Our hospital emphasizes the return on sales.
HFP3	Our hospital emphasizes the return on investment.
HFP4	Our hospital emphasizes the return on assets.
HFP5	Our hospital emphasizes sales growth.
HFP6	Our hospital emphasizes net profitability.
Hospital Non-Financial Performance	
HNFP1	Our hospital emphasizes customer satisfaction.
HNFP2	Our hospital emphasizes employee satisfaction.
HNFP3	Our hospital emphasizes product or service quality.
HNFP4	Our hospital emphasizes employee loyalty.
Hospital Environmental Performance	
HEP1	Our hospital emphasizes reusable, repairable, and recyclable items and packaging.
HEP2	Our hospital environmental regulations are exceeded voluntarily.
HEP3	Our hospital invests in energy conservation.
HEP4	Our hospital adopts measures to create environmentally friendly

	products or services.
HEP5	Our hospital conducts frequent environmental audits.

3. DATA MANAGEMENT

This research was carried out through a quantitative method of research. Almansoori et al. (2021a) cited that the quantitative mode of research enables the researcher to derive meaningful results from large amounts of data. Quantitative techniques can be used to quantify specific characteristics of a large representative sample by employing structured data collection procedures, and the results can be projected to the entire population (Bachayo et al. 2022, Creswell, 2013). For collecting data, a structured questionnaire survey was used. A total of 227 responses were received against 365 questionnaire forms distributed among the staff of various hospitals as in Table 2.

Table 2: Data Collection Statistics

Cluster	Distribution	Received	%
Private Hospital	141	88	62%
General Hospital	71	43	61%
Specialist Centre	153	96	63%
Total	365	227	62%

Data was analyzed with the advanced multivariate software SmartPLS. SmartPLS is an SEM-based software that is an iterative process that looks at the connections between the variables (Memon et al. 2023a). There are two types of variables used in the SEM model dependent and independent model. The independent variables are the variables that are used to predict or explain the dependent variables whereas, the dependent variable is the variable that is being predicted or explained (Memon et al. 2023b).

4. ASSESSMENT OF MEASUREMENT MODEL

The measurement model was tested by determining its reliability and validity. Cronbach's alpha has been extensively used to determine Internal Consistency (IC), which indicates a scale's reliability. A high IC of 0.8 or 0.9 indicates high reliability, while scores below 0.6 reflect low reliability. In this regard, higher item consistency could be reflected by higher CR (Hair et al. 2014, Memon and Rahman 2014). As shown in Table 3, the CR and Cronbach's Alpha are higher than the threshold of 0.6 and 0.7, indicating higher CR and the items in the instrument have high IC.

Table 3: Internal consistency measures

Construct	Cronbach's Alpha	Composite Reliability
Business Model Innovation	0.892	0.918
Enterprise Risk Management	0.887	0.914
Hospital Environmental Performance	0.807	0.872
Hospital Financial Performance	0.740	0.837
Hospital Non-financial Performance	0.832	0.888

Indicators reliability was assessed based on outer loading as shown in Table 4.

Table 4: Indicator outer loadings (before elimination)

Indicators	Business Model Innovation	Enterprise Risk Management	Hospital Environmental Performance	Hospital Non-Financial Performance	Hospital Financial Performance
BMI1	0.743				
BMI10	0.768				
BMI11	0.737				
BMI12	0.761				
BMI2	0.457				
BMI3	0.492				
BMI4	0.400				
BMI5	0.714				
BMI6	0.460				
BMI7	0.472				
BMI8	0.807				
BMI9	0.817				
ERMP1		0.750			
ERMP10		0.706			
ERMP2		0.795			
ERMP3		0.667			
ERMP4		0.470			
ERMP5		0.705			
ERMP6		0.678			
ERMP7		0.446			
ERMP8		0.475			
ERMP9		0.402			
HFP1					0.449
HEP1			0.793		
HEP2			0.829		
HEP3			0.402		
HEP4			0.702		
HEP5			0.645		
HFP2					0.722
HFP3					0.771
HFP4					0.772
HFP5					0.677
HNFP1				0.805	
HNFP2				0.814	
HNFP3				0.822	
HNFP4				0.819	

The factor or outer loading of the items was determined to measure the Indicator Reliability (IR). An IR of 0.70 and higher is deemed as good and acceptable. Hair et al. (2014) mentioned that any indicator less than 0.40 should be eliminated. Moreover, indicators with 0.40 and 0.70 should be considered for elimination when the elimination increases the CR and AVE. In this light, eliminating an indicator with a 0.4-0.7 value should only be done cautiously (Henseler et al., 2009; Hair et al., 2014). As highlighted in Tables 4.11 and 4.13, items with outer loading values lower than 0.50-0.60 were eliminated to assess whether the elimination could affect the CR and AVE. Therefore, the AVE values of BMI2, BMI3, BMI4, BMI6, BMI7, ERMP4, ERMP7, ERMP8, ERMP9, FP1 and HEP3, are lower than the threshold value of 0.50. The researcher eliminated these items one by one to examine how their elimination affects

the AVE. Eliminating items with the lowest indicator values (CS7, OL4, PS3 and SQ1) increased the AVE to exceed the threshold value (0.50). Table 5 shows the indicator values after the elimination of items.

. Table 5: Indicator outer loadings (after elimination)

Indicators	Business Model Innovation	Enterprise Risk Management	Hospital Environmental Performance	Hospital Non-Financial Performance	Hospital Financial Performance
BMI10	0.835				
BMI11	0.809				
BMI12	0.817				
BMI5	0.679				
BMI8	0.821				
BMI9	0.875				
ERMP1		0.801			
ERMP10		0.739			
ERMP2		0.812			
ERMP3		0.838			
ERMP5		0.796			
ERMP6		0.807			
HEP1			0.788		
HEP2			0.823		
HEP4			0.717		
HEP5			0.844		
HFP2				0.719	
HFP3				0.781	
HFP4				0.791	
HFP5				0.706	
HNFP1					0.807
HNFP2					0.809
HNFP3					0.825
HNFP4					0.820

After assessing the reliability of the model parameters, the convergent validity of the model is evaluated. Hair et al. (2014) explained that convergent validity reflects the degree of correlation between measures with the alternative measure in the same construct. In other words, it determines whether the item measures what it is supposed to measure. In the present study, the researcher evaluated the convergent validity based on the AVE (Waddock and Graves, 1997), where an AVE of 0.50 and above reflects an acceptable convergent validity (Almansoori et al. 2021b). Table 6 lists the AVE for the convergent validity of the constructs. It could be observed that all value exceeds the AVE threshold value (0.50). Hence, this study's measurement model has an acceptable convergent validity.

Table 6: Average Variance Extracted (AVE) values

Construct	**Average Variance Extracted (AVE)**
Business Model Innovation	0.653
Enterprise Risk Management	0.639
Hospital Environmental Performance	0.631
Hospital Financial Performance	0.563
Hospital Non-financial Performance	0.664

5. ASSESSMENT OF STRUCTURAL MODEL

Structural model assessment is an essential step of SEM analysis as it analyses the hypothesized relationships between variables. Conclusive evidence is crucial to prove the structural model's theoretical model (Chin, 1998). A structural model is assessed based on path coefficients and coefficient of determination to determine whether the hypotheses could be accepted. As mentioned by Hair et al. (2014), the coefficient of determination was applied to assess the structural model's goodness of structural model. In this light, higher is desirable as it reflects how much variance in the dependent variable is caused by the independent variable (s). While Hair et al. (2014) stated that the accuracy depends on a study's research framework, the general rule of thumb is 0.02-0.12 are deemed as low, 0.13-0.25 are moderate, and 0.26 or higher are significant (Cohen, 1988).

5.1 PATH COEFFICIENT

Path coefficient is a measure of the strength and significance of the relationship between two latent variables. The path coefficient was also used to evaluate the study's structural model. The bootstrapping technique in SmartPLS was used to evaluate the relationships (paths) between the independent and dependent variables. T-statistics and p-values were used to verify the significance of the paths between these variables. +Hair et al. (2014) described the coefficient as significant at the determined confidence level when the empirically obtained statistical t-value is higher than the critical value. In this case, the t-value of 0.95 was applied at the significance level of 0.05.

The bootstrapping technique in PLS-SEM (Hair et al., 2014) is a nonparametric statistical test that measures whether the estimated path coefficients are significant. Coefficients range between -1 and +1, where path coefficients close to +1 show a substantial relationship and vice-versa. Table 7 presents the empirically measured t-values, p-values and path coefficient values between variables in the present study, determining whether the hypothesis is accepted or rejected based on the path assessments. As shown, all hypotheses were supported at the 0.05 significance level.

Table 7: Path coefficients

Hypotheses	Path	Standard Deviation (SD)	T-Statistics	P-Values
Business Model Innovation -> Hospital Environmental Performance	0.736	0.047	15.735	0.000
Business Model Innovation -> Hospital Financial Performance	0.321	0.094	3.409	0.001
Business Model Innovation -> Hospital Non-financial Performance	0.435	0.094	4.630	0.000
Enterprise Risk Management -> Business Model Innovation	0.796	0.026	31.112	0.000
Enterprise Risk Management -> Hospital Environmental Performance	0.022	0.053	0.409	0.683
Enterprise Risk Management -> Hospital Financial Performance	0.150	0.089	1.693	0.091
Enterprise Risk Management -> Hospital Non-financial Performance	0.164	0.094	1.742	0.082

5.2 COEFFICIENT OF DETERMINATION

The coefficient of determination value is used to explain the amount of variance in the dependent variable caused by the independent variables. The higher values indicate the predictive ability of the structural model. However, the strength of values depend upon the complexity of the research model and type of discipline (Hair et al.,

2014). For example, values for endogenous latent variables are assessed as follows: 0.26 (substantial), 0.13 (moderate), and 0.02 (weak) (Cohen, 1988 as cited by Khahro et al. 2021). On the other hand, values should be equal to or greater than 0.10 for the variance explained by a particular endogenous construct deemed adequate (Falk and Miller, 1992). Therefore, based on Table 8, the R square values indicate a stronger relationship between the variables.

Table 8: Coefficient of determination

Variable	R Square
Business Model Innovation	0.779
Hospital Environmental Performance	0.568
Hospital Financial Performance	0.202
Hospital Non-financial Performance	0.330

6. HYPOTHESES TESTING

This study's hypotheses were tested based on the results of the PLS-SEM on the structural model. The path coefficients, t-values, and p-values at the significance level of 0.05 were evaluated to test the hypothesis. As discussed, seven (7) hypotheses were formulated on the direct and 3 indirect relationships among the variables. The result of each hypothesis is shown below

- **H1: There is a significant positive relationship between Enterprise Risk Management -> Hospital Financial Performance:** The result shows that the value of the path coefficient between ERM practices -> hospital financial performance is 0.150. As the t-value is 1.693, smaller than the critical value of 1.96 as well as the p-value of 0.091, which is higher than the threshold of 0.05, the results show that the path coefficient is not significant. Hence, there is no significant positive relationship between Enterprise Risk Management -> Hospital Financial Performance. This result provides sufficient empirical evidence to reject hypothesis H1.
- **H2: There is a significant positive relationship between Enterprise Risk Management -> Hospital Non-financial Performance**: The result shows that the path coefficient value between Enterprise Risk Management -> Hospital Non-financial Performance is 0.164. However, the t-value is 1.742, smaller than the critical value of 1.96 as well as the p-value of 0.082, which is higher than the threshold of 0.05, the results show that the path coefficient is not significant. Hence, there is a significant positive relationship between Enterprise Risk Management -> Hospital Non-Financial Performance. This result provides sufficient empirical evidence to reject hypothesis H2.
- **H3: There is a significant positive relationship between Enterprise Risk Management -> Hospital Environmental Performance**: The result shows that the value of the path coefficient between ERM practices -> hospital environmental performance is 0.022. As the t-value is 0.409, smaller than the critical value of 1.96 as well as the p-value of 0.683, which is higher than the threshold of 0.05, the results show that the path coefficient is not significant. Hence, there is no significant positive relationship between Enterprise Risk Management -> Hospital Environmental Performance. This result provides sufficient empirical evidence to reject hypothesis H3.
- **H4: There is a significant positive relationship between Enterprise Risk Management -> Business Model Innovation**: The result shows that the value of the path coefficient between ERM practices -> BMI is 0.796. As the t-value is 31.112, higher than the critical value of 1.96 as well as the p-value of 0.000, which is smaller than the threshold of 0.05, the results show that the path coefficient is significant. Hence, there is a significant positive relationship

between Enterprise Risk Management -> Business Model Innovation. This result provides sufficient empirical evidence to accept hypothesis H4.

- **H5: There is a significant positive relationship between Business Model Innovation -> Hospital Financial Performance**: This study found that the path coefficient between Business Model Innovation -> Hospital Financial Performance is 0.321, with a t-value of 3.409 and a p-value of 0.001. As the t-value is higher than the critical value (1.96) and at the significance value lower than the threshold of 0.05, the path coefficient is significant. Thus, there is a significant positive relationship between Business Model Innovation -> Hospital Financial Performance. This provides substantial empirical evidence to accept hypothesis H5.
- **H6: There is a significant positive relationship between Business Model Innovation -> Hospital Non-financial Performance**: The result shows that the value of the path coefficient between Business Model Innovation -> Hospital Non-financial Performance is 0.435. Furthermore, as the t-value is 4.630, higher than the critical value of 1.96 as well as the p-value of 0.000, which is lower than the threshold of 0.05, the results show that the path coefficient is significant. Hence, there is a significant positive relationship between Business Model Innovation -> Hospital Non-financial Performance. This result provides sufficient empirical evidence to reject hypothesis H6.
- **H7: There is a significant positive relationship between Business Model Innovation -> Hospital Environmental Performance**: The result shows that the value of the path coefficient between BMI and hospital environmental performance is 0.736. As the t-value is 15.735, higher than the critical value of 1.96 as well as the p-value of 0.000, which is smaller than the threshold of 0.05, the results show that the path coefficient is significant. Hence, there is a significant positive relationship between BMI and hospital environmental performance. This result provides sufficient empirical evidence to accept hypothesis H7.

7. CONCLUSIONS

This study assessed the relationship between ERM and hospital performance in the UAE. The aim of the study was achieved through a questionnaire survey and advanced multivariate analysis with SmartPLS. The findings showed that ERM practices indicate 0.796 path coefficient has a direct effect on BMI. In this sense, the influence of the ERM practices. Hypothesis analysis revealed that there is a strong correlation between ERM practices and BMI. Subsequently, an expansion in ERM practices will prompt an expansion in the firm exhibition of the BMI. This association has confirmed the validity of ERM practices as a factor in BMI (Songling et al., 2018; Lee et al., 2019). This conclusion also provides more support for earlier studies that ERM practices can strategize BMI (Bodolica and Spraggon, 2019; Elamir, 2019). Also, it is evident from the results that BMI has a positive, significant relationship with the hospital's financial performance. The findings showed that BMI indicates 0.321 path coefficient has a direct effect on the hospital's financial performance. In this sense, the influence of the BMI, which is the mediate variable was determined to be important. The hypothesis also revealed that there is a strong correlation between BMI and Hospital Financial Performance. Subsequently, an expansion in BMI will prompt an expansion in the firm exhibition of the Hospital's Financial Performance. This association has confirmed the validity of BMI as a factor in the performance of the hospital (Andreassen et al., 2018; Schiavone et al., 2020). This conclusion also provides more support for earlier studies that BMI can strategize HP (Sousa et al., 2019; Kulkov, 2021).

BMI indicates 0.435 path coefficient has a direct effect on the hospital's nonfinancial performance. In this sense, the influence of the BMI, which is the mediate variable was determined to be important. H6 has hypothesized that there is a strong

correlation between BMI and Hospital Nonfinancial Performance. Subsequently, an expansion in BMI will prompt an expansion in the firm exhibition of the Hospital's Nonfinancial Performance. This association has confirmed the validity of BMI as a factor in the performance of the hospital (Andreassen et al., 2018; Schmidt and Scaringella, 2020). This conclusion also provides more support for earlier studies that BMI can strategize HP (Sousa et al., 2019; Kulkov, 2021). BMI indicated a 0.736 path coefficient showing a direct effect on the hospital's environmental performance. In this sense, the influence of the BMI, which is the mediate variable was determined to be important. Subsequently, an expansion in BMI will prompt an expansion in the firm exhibition of the Hospital's Environmental Performance. This association has confirmed the validity of BMI as a factor in the performance of the hospital (Sousa et al., 2019; Kulkov, 2021). This conclusion also provides more support for earlier studies that BMI can strategize HP (Andreassen et al., 2018; Schmidt and Scaringella, 2020).

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