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The Moderating Effect of Risk Management on the Relationship between Critical Risk Factors and Project Success: A Case of Construction Projects in the Oil and Gas Industry of the UAE

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Abstract

Introduction: *This study explores the connection between critical risk factors and their impact on construction project success in the oil and gas industry in the UAE. Additionally, it examines the moderating effect of risk management practices on the relationship between these risk factors and project success in the same region.* ***Methods:*** *A survey questionnaire was developed using existing literature. A valid sample of 353 respondents, all playing a substantial role in project success, was analysed. Data was processed using measurement and structural models under Smart PLS 4.0.* ***Results:*** *The measurement model confirmed the reliability and validity of the latent constructs and their items. The structural model findings showed a significant impact of economic, environmental, local people, and contractor-related risks on construction project success in the UAE oil and gas industry. Additionally, risk management practices significantly moderated the relationships between economic risk and project success, local people risk and project success, and contractor-related risk and project success.* ***Conclusion:*** *The study provides policy recommendations to support stakeholders, including project officials, risk managers, and administrative personnel linked to construction projects in the UAE oil and gas industry. Limitations and future research directions are also discussed.*

Major Findings: *The study finds that economic, environmental, and contractor-related risks negatively affect project success in UAE oil and gas construction, while local-people risk has a positive impact. Risk management practices significantly moderate these relationships, enhancing project success, except in the case of environmental risk.*

Keywords: *Critical Risk Factors, Project Success, Risk Management, UAE*

1.0 Introduction

Although construction projects have major economic and financial significance in any region, a range of critical risk factors exists for construction projects in the oil and gas industry. These risk factors have been observed with their adverse influence on the project in terms of final cost and schedule of the projects, which ultimately halt the achievement of the strategic objectives. Moreover, various international oil and gas companies are choosing to expand their markets beyond their local business operations to enhance their profitability and earning capabilities. The construction projects at the international level entail dealing with not only the uncertainties and risk dynamics typically associated with local construction projects but also the intricate risks specific to international transactions[1-3]. For this reason, the role of critical risk factors towards the success or failure of the

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construction projects in the oil and gas industry has been under the observation of the researchers, policymakers and other stakeholders. In this regard, the critical factors have been entitled as economic risk, environmental risk, political risk, local people risk, and contractor-related risk, respectively.

The term economic risk refers to as macroeconomic situation of a region, which can further deter foreign investment into the domestic market and decrease the earning potentials due to some uneven changes in the market[4]. Moreover, the term currency fluctuations is also regarded as one of the key indicators to reflect the economic risk in any economy. In this regard, the term economic exposure, also referred to as operating exposure, arises from unanticipated currency variations affecting cash flows, foreign investments, and earnings of the companies or the entire economy[5]. Additionally, the term financial crisis has also been utilised to reflect the economic risk in a country, which is referred to as a severe disruption in the financial market resulting from the debt crisis, banking crisis or currency crisis, respectively[6]. More specifically, under a financial crisis, there is a decline in the financial value of the instruments and other assets. In this regard, the global financial crisis of 2007-08, which originated from the United States, has spread to other economies and is known as the worst economic disaster since the great depression in 1930[7].

On the other side, the term environmental risk has also been recognised as among the critical risk factors having their influence towards the construction project in the oil and gas industry. The term environmental risk refers to as probability and the consequence of an unwanted event due to the deficiency in waste management in terms of waste treatment, waste transportation, and disposal[8]. It is believed that the environmental-related risk factors specifically in the oil and gas projects may lead to suspension of the projects at different time durations, and for this reason, such risk factors adversely impact project performance and success titles based upon the schedule and cost[9,10]. Therefore, the environment-related risk factors have their substantial linkage with the construction projects in the oil and gas industry[10].

Additionally, the critical risk factors also consist of the local people's risk and political risk, which can directly affect the success of the construction projects. The concept of local people risk encompasses the responsibility towards society, different languages and cultures and the recruitment of the local people, etc[11-13]. In this regard, the cultural and language differences tend to be among the most crucial indicators to determine the local people's risk for the construction projects, and the same is the case with the oil and gas industry[10]. More specifically, the complications and uncertainties in the construction projects due to complicated relationships and conflicts among various stakeholders, leading towards higher social risk[14-16]. On the other side, the term political risk is vital in deteriorating the successful completion of the construction projects due to the presence of several channels. For instance, political instability, change in the government or regulatory framework or compliance can lead to project delays while increasing the cost. Additionally, the presence of corruption has been found as the highest in the construction industry, which is due to the presence of corruption professionals both at the demand and supply side[17]. Therefore, addressing and mitigating the local people's risk and political risk seems vital for the project's success.

Besides, among various stakeholders, the role of the contractor in the construction industry determines a substantial role towards the project's success, which can further be stem through action, capabilities, and contractor-related resources, respectively[18-20]. In any construction project, the three important resources have been regarded as the manpower, material, and machinery, where the sole obligation of the contractor is to make it sure that these resources are adequately available throughout the project when they would have been required. However, low skill and productivity of the manpower, and shortage of material and equipment reflect the failure of the construction projects, which need to be observed with significant attention[21-23].

2.0 Literature Review

2.1 Relationship between Critical Risk Factors and Project Success

In terms of relative importance and as per the perspectives of the respondents, the most pivotal success criteria regarding the project have been entitled as cost/budget, time/schedule, client/user's level of satisfaction, and the quality and technical performance, accordingly. Conversely, the most critical success factors towards the project's success encompass project financial needs and

funding, along with the capabilities and competence of the project team and team members. Meanwhile, it is also inferred that the effectiveness of the project manager or team leader, along with their relevant experience, is also substantially important towards the success criteria of the project in the construction industry. Additionally, among these factors, the first four success criteria exhibit noteworthy similarities in terms of their frequency of citation in the literature review and their relative importance, as indicated by the respondents. However, there are significant differences in the ranks of the remaining success criteria and CSF, respectively. Meanwhile, to explore potential relationships among the Success Criteria and the Critical Success Factors, the study has utilised the Spearman correlation coefficient, where it is observed that 5 out of 17 Success Criteria and 11 out of 26 Critical Success Factors exhibit relatively low to moderate correlations. Besides, the provided research serves as a foundational step towards the development of either a mathematical model or a performance index for the evaluation of construction project success.

Ogwueleka[24] claim that Success factors represent key elements within a management system that can directly or indirectly influence the achievement of project success and performance outlook. Considering the stated background of the project's success and critical factors, the primary objective of his paper is to investigate the critical success factors that impact project performance in the Nigerian economy. Moreover, the specific aims are to identify the success factors prevalent in the construction projects and to assess the significant influence of these factors on project performance in a similar region. For this purpose, a set of twenty-two success factors was chosen from the existing literature, and a sample of 188 professionals participated in the study, entitled as study's respondents during the data collection process. The data collected through questionnaires were analysed using various indices. More specifically, the empirical estimation covers the reliability test through Cronbach's alpha, revealing that 16 success factors were found to be the most essential for ensuring the successful implementation of projects within the Construction Industry of Nigeria. Based on these empirical outcomes, it is inferred that factors like objective management, design management, consideration of the technical perspectives, top-level management support, and RMP were identified as the most critical success factors in project performance. Additionally, authors claim that the research work is intended to provide practitioners with valuable insights specifically from the perspective of decision making while enabling them to prioritise and focus on key areas related to success factors in order to enhance the performance of the project in the construction industry of Nigeria and other regional economies.

Chandra[25] also explore the role of critical key risk factors as linked with the project success. The author states that there is an extensive literature that underscores the significance of comprehending the risks associated with construction projects, as these risks can profoundly impact project success. These risks are inherent in various facets of construction-related activities, encompassing natural occurrences, design-related challenges, resource limitations, financial reservations, legal and regulatory complications, and construction-specific risk dynamics. The stated paper aims to accomplish several objectives: first, to identify the causal variables that give rise to these risks; second, to pinpoint the factors having the most influential role in the project's success. Lastly, to present a model delineating the risk factors that influence project success. The study data were gathered through a questionnaire survey, garnering 180 valid responses for the purpose of empirical estimation. To analyse the relationship between these risk factors and project success, Structural Equation Modelling or the SEM approach was employed. The results obtained from the structural equation modelling analysis suggest that the linkage between risk factors and project success in Surabaya projects can be elucidated by standardised coefficients: 0.442 for natural risks, -0.499 for design risks, 0.257 for resource-related risks, 0.651 for financial risks, 0.166 for legal and regulatory risks, and -0.197 for construction-specific risks, respectively. It means that there is a significant linkage between the critical risk factors and project success, which cannot be neglected. Project success exhibits a substantial association with critical dimensions such as cost (standardised coefficient of 0.878), quality (standardised coefficient of 0.873), timeliness (standardised coefficient of 0.804), customer satisfaction (standardised coefficient of 0.884), and profit (standardised coefficient of 0.850). To attain project success, recommendations are put forth, with particular emphasis on proactive measures to address financial risks linked to inflation rates in the targeted economy.

- H1: There is a significant impact of economic risk on the construction project success in the oil and gas Industry of the UAE.
- H2: There is a significant impact of environmental risk on the construction project success in the oil and gas Industry of the UAE.
- H3: There is a significant impact of local people's risk on the construction project success in the oil and gas Industry of the UAE.
- H4: There is a significant impact of political risk on the construction project success in the oil and gas Industry of the UAE.
- H5: There is a significant impact of contractor-related risk on the construction project success in the oil and gas Industry of the UAE.

2.2 Risk Management and its Moderating Effect

The term risk management has been widely recognised in recent and past studies in several fields[26]. In its general context, the risk is referred to as unexpected events having either positive or negative outcomes that are a deviation from the plan of the project[27]. It is believed that positive outcomes are referred to as the market opportunities, while the negative outcomes have been entitled as the losses being suffered by the project. Several definitions of risk have been available in the literature covering the exposure of the loss in a given situation of a project. However, one key difference exists between risk and uncertainty, where the former is quantifiable and measurable through using computational methods and the latter is based on the subjective probability, hence not measurable[28-30].

The risk management process has been defined as a process of interconnected activities which has been done to take some proactive measures to mitigate the adverse outcomes of the risk factors or for the transfer of risk. Figure 1 indicates the risk management process as determined by the Australian Standard for Risk Management which is based upon the seven but iterative sub-process covering the context of risk, identification of risk, analysis of risk, evaluation of risk, communication and consultation across different stakeholders as linked with the risk, and finally, the monitoring and controlling the risk, respectively[31]. Meanwhile, the context establishment in the overall risk management process covers the presentation of the project units, which can be

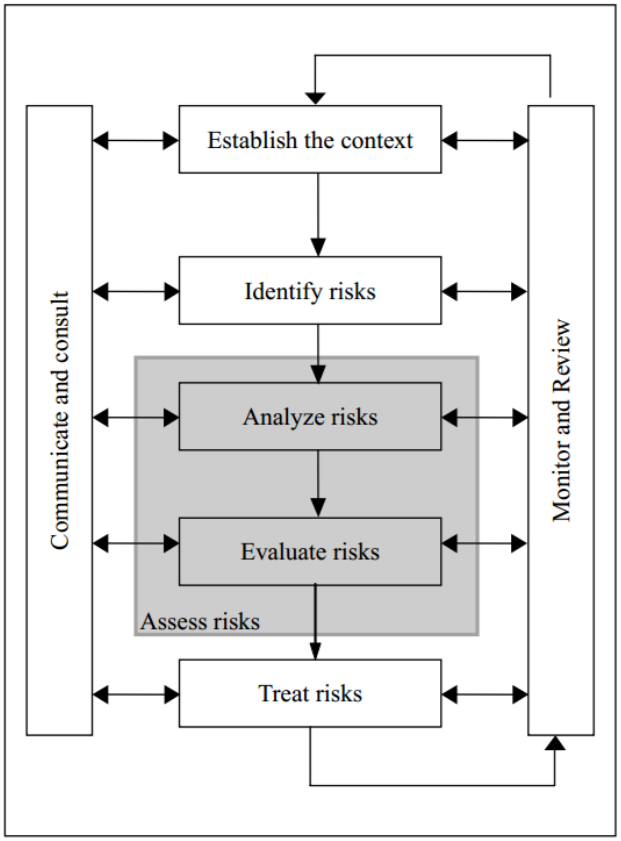


Figure 1. Risk management framework. Source: Purdy (2010)

categorised into functional, process and data perspective and their inter-linkages[31]. This permits the presentation of project status in various formats, such as usage of the available resources, equipment as needed, budget being available, participation of the stakeholders, deliverables through a contract, strategic objectives of the contract, and scheduling[32]. However, these dimensions are significantly depending on the specific aspect of the project that is relevant for a particular purpose[31].

This literature gap is of considerable consequence, as comprehending the moderating influence of RMP assumes paramount significance in the development of more efficacious project management strategies to enhance the performance and success-related dynamics. It furnishes valuable insights into the practical measures that organisations can adopt to augment the likelihood of project success, especially in the face of intricate and uncertain operational environments. Closing this deficiency within the academic domain of project management is indispensable for conducting a

comprehensive examination of the intricate interplay between risk factors, the practice of risk management, and the ultimate realisation of project success. Therefore, the following research hypotheses have been developed, exploring the moderating role of RMP on the relationship between selected critical risk factors and project success.

- H6: There is a significant moderating effect of risk management practices on the relationship between economic risk and project success in the construction projects of the oil and gas industry in the UAE.
- H7: There is a significant moderating effect of risk management practices on the relationship between environmental risk and project success in the construction projects of the oil and gas industry in the UAE.
- H8: There is a significant moderating effect of risk management practices on the relationship between local people's risk and project success in the construction projects of the oil and gas industry in the UAE.
- H9: There is a significant moderating effect of risk management practices on the relationship between political risk and project success in the construction projects of the oil and gas industry in the UAE.
- H10: There is a significant moderating effect of risk management practices on the relationship between contractor-related risk and project success in the construction projects of the oil and gas industry in the UAE.

Figure 2 provides the framework of the study covering the direct effect of critical risk factors on the project success, along with the moderating effect of risk management practices.

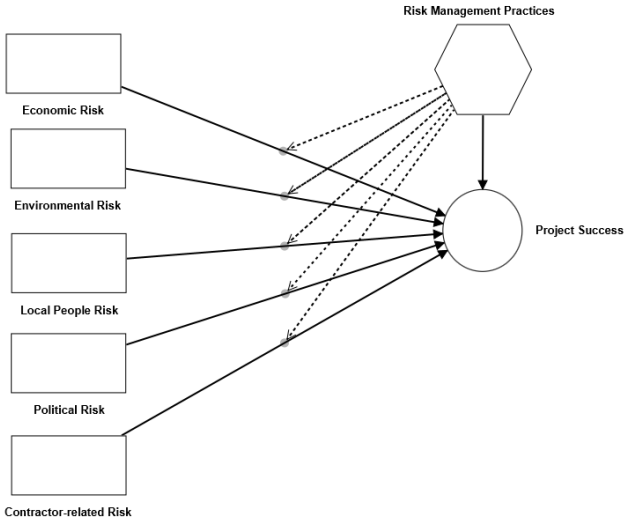


Figure 2. Framework of the study.
Source: Self-developed

3.0 Research Methodology

A research design is referred to as a structured plan or outline for the execution of a research project within a given time. Meanwhile, it outlines the steps and methods which are required to gather the required data for shaping and potentially resolving the research investigation[33]. The research design establishes the groundwork for the project's execution[33]. Moreover, the term research design is also expressed as a plan or a structure of means which are being adopted to answer the research questions. In this regard, the research design can be categorised into quantitative and qualitative approaches. The term quantitative refers to that type of research design in which the numerical data will be collected using a structured questionnaire or a similar technique. Additionally, under quantitative research design, the collected data will be in numerical format and will be analysed through applying some statistical techniques[34]. In the realm of research investigation, the fundamental techniques employed for the examination of data are referred to as statistics. These statistical methods encompass tasks related to the organisation, analysis, interpretation, and presentation of numeric information for better decision making based on statistical inference. The field of statistics encompasses a broad domain of study, finding applications across different fields of interest like information systems, human resources, project management and many others. The advent of computers, especially personal computers, has significantly facilitated the accessibility of statistical processes for data handling and analysis, which has their fundamental role in the quantitative research design[34]. Based upon the above discussion, the current study has adopted a deductive and quantitative research design for which data was collected using the questionnaire. In this regard, the items for the measurement of the critical risk factors and project success have been extracted from the research work of Kassem *et al.*[35-37]. On the other side, the risk management practices' items were extracted from the research work of Rehman and Anwar[38]. A five-point Likert scale has been used (*i.e.*, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) for the risk management practices, whereas for the rest of

the items the scale ranges like 1 = very Low, 2 = Low, 3 = Moderate, 4 = High, and = 5 Very High, have been utilised. For the purpose of data analysis, both measurement model and structural model techniques under Smart PLS have been utilised.

4.0 Results

In the initial effort, a sample of 500 (Table 1) questionnaires, with the help of team members, was distributed across different construction-related individuals of the oil and gas industry over a time span of 10 weeks. Out of this distributed sample of 500 questionnaires, the researcher, along with the team members, was able to collect 413 copies from the targeted respondents, whereas the rest of the 87 questionnaires have not been returned by the respondents due to several reasons. These reasons might include the lack of motivation or interest to fill in the questionnaires, time constraints, privacy concerns, lack of understanding of the questionnaire, forgetfulness, and other personal or organisational concerns. Consequently, the stated number of 87 questionnaires was automatically dropped from the final sample of questionnaires. Moreover, a detailed investigation of the collected questionnaires has made it evident that a few questionnaires have been observed with missing or incomplete responses from the respondents. These incomplete questionnaires with missing responses were a total of 52, hence dropped from the sample of 417. Additionally, the researcher has further found that there were 8 outliers in the data as observed during the data filtration process. For this reason, a final sample of the valid responses of 353 has been found to be good enough for applying the measurement model and structural model assessment. Table 1 provides the outlook for the sample response rate and the valid sample, respectively.

Table 1. Sample response and valid response rate

Questionnaire	Frequency	%
Total Distributed	500	100
Not returned by the respondents	87	17.4
Questionnaires with Missing Responses	52	10.4
Outliers found	8	1.6
Usable for Analysis	353	70.6
Valid Response Rate	**70.6**	

The current section mainly covers the assessment of the measurement model. In this way, the current body of literature has provided several measures to examine the measurement model. More specifically, the purpose of the measurement model is to confirm the reliability and validity of the latent constructs as measured through several items. Additionally, the assessment of the individual items/indicators involves the evaluation of the dependability of individual indicators, which represent latent constructs. This evaluation typically employs techniques such as Cronbach's alpha and Composite Reliability (CR) to ensure that the indicators are stable and dependable measures of the underlying constructs. Under measurement model assessment, the reliability of every single item has been conducted by considering their relative loadings as extracted from the Smart PLS. In this regard, it is assumed that a higher level of the loadings of the relative items of the latent construct means indicators have effectively measured the constructs and vice versa. In this regard, the existing study has only considered those items having their relative loadings above 0.70 from the entire model. This threshold has widely been recognised in the available literature[39]. The findings for the measurement model have been covered under Figure 2, showing the loadings of the items (above 0.50 have been considered) along with the Cronbach's alpha for the inner model. It is found that all the provided items under Figure 3 have their good relative loadings, whereas the relative values of the alpha for the critical risk factors, project success and risk management practices have been found to be above 0.70. The same has been reported under Table 2.

The findings for the discriminant validity have been reported under Tables 3 and 4, showing the Fornell and Larcker and the HTMT ratio, as well as the accepted ranges.

Table 2. Construct reliability and validity

Variables	CB Alpha	CR_rho_a	CR_rho_c	AVE
ECR	0.827	0.836	0.897	0.743
ENR	0.874	0.878	0.914	0.727
LPR	0.849	0.883	0.906	0.764
PLR	0.799	0.799	0.883	0.715
PRS	0.890	0.895	0.924	0.752
RMP	0.835	0.863	0.899	0.749
CRR	0.736	0.734	0.851	0.656

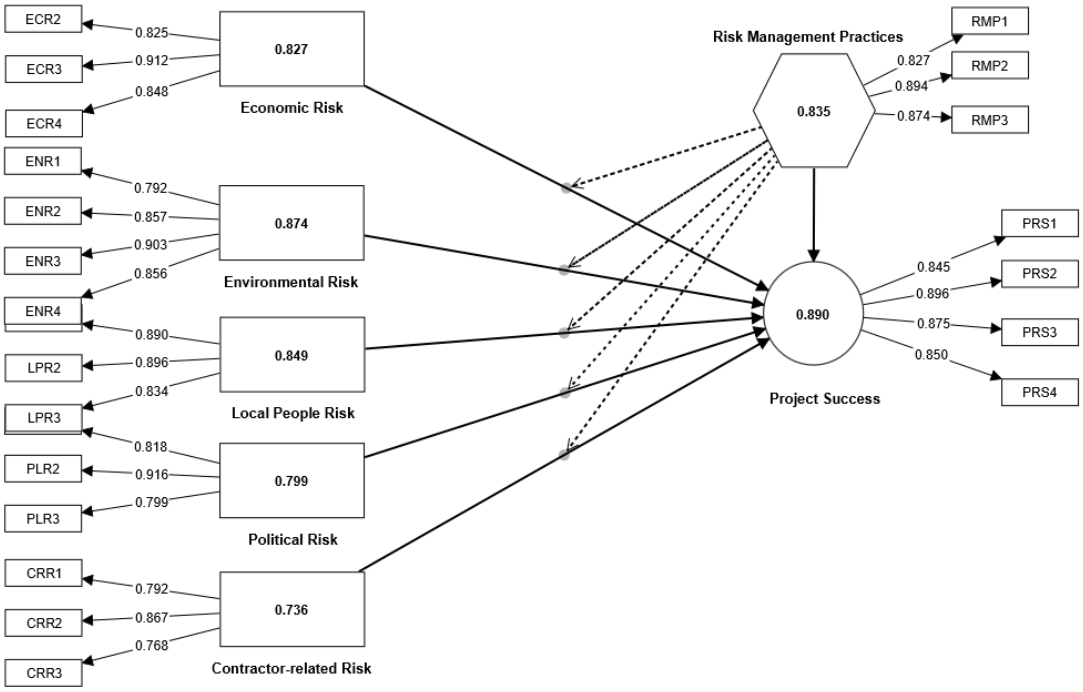


Figure 3. Measurement model output.
Source: Self-developed

Table 3. Fornell-Larcker Criteria

Variables	ECR	ENR	LPR	PLR	PRS	RMP	CRR
ECR	**0.862**						
ENR	0.277	**0.853**					
LPR	-0.125	-0.755	**0.874**				
PLR	0.325	0.112	-0.081	**0.846**			
PRS	0.532	0.333	-0.191	0.276	**0.867**		
RMP	0.279	0.051	0.008	0.046	0.345	**0.865**	
CRR	0.388	0.175	-0.185	0.294	0.464	0.090	**0.810**

Table 4. HTMT ratio

Variables	ECR	ENR	LPR	PLR	PRS	RMP	CRR
ECR	--						
ENR	0.326	--					
LPR	0.144	0.869	--				
PLR	0.393	0.133	0.101	--			
PRS	0.615	0.377	0.213	0.321	--		
RMP	0.328	0.069	0.056	0.089	0.388	--	
CRR	0.496	0.216	0.229	0.378	0.567	0.123	--

As per the findings under Table 5, the value of the coefficient for the ENR towards PRS reflects a score of -0.266 with a standard deviation of 0.057. Additionally, the value of T-statistics has been found to be -4.682 with the p-value of 0.000. Based upon the relative tvalue and pvalue, it is inferred that there is a significant and negative impact of environmental risk factors on the project success among the oil and gas construction projects in the regional context of the UAE. The stated coefficient is highly significant at 1%, claiming that keeping the rest of the factors constant, a one per cent upsurge in the value of ENR tends to cause a decline in the value of project-related success by 0.266, which is not a good indication. In this regard, the existing studies like Akanni *et al.*[40] state that the project's environmental factors have their significant linkage in determining the project performance and success-related factors.

Environmental risks present a substantial challenge to achieving success in construction projects, introducing uncertainties related to regulatory adherence, site conditions, and natural elements. Adhering to dynamic environmental regulations can lead to project delays and increased expenditures, while unforeseen site issues such as soil contamination or geological instability may necessitate costly alterations to the project design. Disruptions caused by weather-related events, natural disasters, and resource scarcities influenced by environmental factors can also impede project schedules and inflate costs[41].

Moreover, the findings sunder Table 5 explore the role of local people's risk towards the success of the construction projects in the oil and gas industry of the UAE. As per the given findings, it is found that the coefficient for the LPR towards PRS is 0.110 with a standard deviation of 0.056. Based upon the given coefficient and the stated standard deviation of the coefficient, the researcher has achieved a tvalue of 1.945 with a pvalue of 0.052, significant at 10%. It means that there is a significant and positive impact of LPR on the PRS among the construction projects of the oil and gas industry of the UAE. More specifically, it shows that keeping the rest of the factors constant, a 1% upsurge in the value of the LPR is positively impacting the PRS. The positive nexus between local people's risk and project success can be justified with the help of several channels and mechanisms, respectively. For example, comprehending and showing due regard for the indigenous culture of an area nurtures positive relations between project teams and the local communities at different levels of the projects. Additionally, the actively involving the local leaders, individuals, and community members in project endeavours promotes the establishment of trust and confidence, which results in a more seamless project execution and a decrease in potential opposition, accordingly[42].

In addition, the findings under Table 5 also indicate the relationships between the political risk and project-related success among the oil and gas industries in the UAE. The findings reveal a coefficient of 0.060 with a standard deviation of 0.037. Moreover, the given value of the T-statistics has been found to be 1.628 with the pvalue of 0.104. As the t-score is less than the threshold level of 1.96 and the p-value is also insignificant even at 10%, therefore, it is inferred that there is an insignificant relationship between the political risk and project-related success. This might be due to various reasons, where the relationship between political risk and project-related success is not statistically significant. For instance, the region of the UAE has been well recognised for its noteworthy political stability and a favourable environment for business operations and commercial and industrial activities. In this regard, the government has implemented policies to encourage foreign direct investment and accelerate economic expansion through several other financial and economic strategies. Finally, the findings under Table 5 cover the direct relationship between contractor-related risk on project-related success in the oil and gas industry. The findings reveal that there is a negative impact of contractor-related risk on project success among construction projects in the oil and gas industry. More specifically, the value of the coefficient for the CRR is -0.287 with a standard deviation of 0.050. Through the stated coefficient and standard deviation, the t-score of 5.715 has been achieved, which further

Table 5. Direct relationships between the variables

Path	Original sample (O)	SD	T statistics	P values
ECR -> PRS	-0.344***	0.049	-7.055	0.000
ENR -> PRS	-0.266***	0.057	-4.682	0.000
LPR -> PRS	0.110*	0.056	1.945	0.052
PLR -> PRS	0.060	0.037	1.628	0.104
CRR -> PRS	-0.287***	0.050	-5.715	0.000

provides the p-value of 0.000, hence a direct relationship exists.

After analysing the direct relationships between the risk factors and project-related success, the current section explores the moderating effect of risk management practices on the relationship between critical risk factors and project-related success among the construction projects of the oil and gas industry in the UAE. The findings for the moderating effect of the stated moderators have been provided in Table 6. As per the given findings, the results indicate that the moderating effect through the interaction term between RMP and ECR has been found to be 0.128. It shows that there is a positive moderating effect of RMP on the relationship between ECR and PRS. The value of the standard deviation for the stated moderating effect is 0.041, with the value of -3.098. Through the stated t-value, the researcher was able to achieve the p-value of 0.002, significant at 1%. It means that there is a significant moderating effect of RMP on the relationship between ECR and PRS among the construction projects in the oil and gas industry of the UAE. However, it is substantially important to note that the direct effect of ECR on PRS is without the presence of the RMP as a moderator. In this regard, the findings under Table 6 show that the coefficient for the direct effect of ECR on PRS was -0.344, which was also statistically significant at 1%. However, with the presence of the RMP practices as a moderator, the results reflect a substantial change in the value of the coefficient when determining the trends in the PRS. This indicates that although the direct effect of ECR on the PRS is adverse significant which claims a decline in the value of the project success due to such risk factors. However, when the management of the construction projects in the oil and gas industry puts their strong effects on risk management practices, subsequently, the negative effect of ECR on PRS tends to change into positive and significant, which indeed is a good indication.

In addition, the findings under Table 6 reveal the moderating role of risk management practices on the relationship between ENR and PRS, respectively. The findings reveal that although the direct effect of ENR on PRS is highly significant and negative at 1%; however, the effect from the RMP on the relationship between ENR and PRS is found to be statistically insignificant. In the constantly evolving world of business, projects often encounter a wide array of risk factors that can present substantial hurdles to their success. Of these challenges, environmental risk factors have become particularly notable, thanks to the growing emphasis on sustainability and environmental accountability. Successfully managing these environmental risks is not only essential for a project's ultimate results but also for an organisation's standing and its connections with stakeholders. Consistent assessments and evaluations facilitate the early identification of potential problems, creating openings for corrective measures and ongoing enhancements. This strategy serves to reduce the adverse impacts of environmental risks. In this regard, Figure 4 reflects the moderating effect of TMC on the relationship between ENR and PRS. It shows that there is a significant interaction effect of TMC between ENR and PRS. More specifically, the graph shows that firms with higher TMC are more likely to dampen the negative relationship between ENR and PRS, compared to those having a lower level of TMC[43].

Table 6. Moderating effect of TMC and RMP

Directions	Coefficients	Standard deviation	T statistics	pvalues
RMP x ECR -> PRS	0.128***	0.041	3.098	0.002
RMP x ENR -> PRS	-0.042	0.075	0.554	0.579
RMP x LPR -> PRS	0.227***	0.061	3.737	0.000
RMP x PLR -> PRS	-0.034	0.040	-0.846	0.398
RMP x CRR -> PRS	0.521***	0.095	5.477	0.000

Moreover, the results under Table 6 show the moderating effect of RMP between LPR and RPS. The findings indicate that the interaction effect of RMP*PLR is 0.227 with the t-value of 3.737. It means that there is a significant and positive interaction effect of RMP on the relationship between LPR and PRS. The results reveal that RMP strengthens the positive relationship between LPR and PRS among the selected companies of oil and gas construction in the UAE. This is because the direct effect of on PRS is also positively significant, meaning that a one per cent change in the value of LPR tends to increase the project-related success by 0.110, which is significant at 10%. However, with the involvement of the

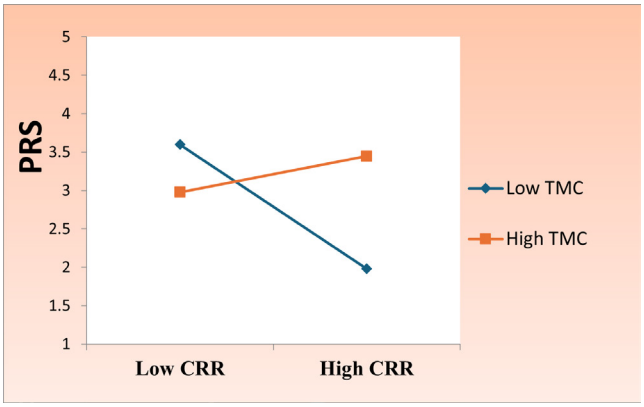


Figure 4. Moderating effect of RMP between CRR-PRS.

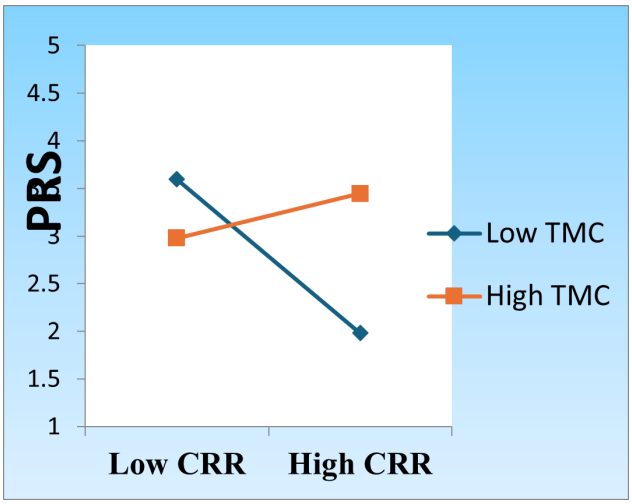


Figure 5. Moderating effect of TMC between PLR-PRS.

risk management practices as a moderator, it strengthens the positive relationship with the coefficient of 0.227, significant at 1%. For a better understanding, Figure 5 provides the graphical output for this moderating effect. It shows that RMP strengthens the positive association between LPR and PRS[44,45]. More specifically, it confirms that firms with higher RMP tend to strengthen the nexus between PLS and PRS, comparatively to those having low RMP[46]. When these effective risk management practices are put into action, they serve as a bridge or enabler that helps mediate the connection between the risks associated with local people and the successful execution of the project[47,48]. They enable the project team to foresee and manage challenges that may arise from local interactions, resulting in a more streamlined project implementation[49,50]. Consequently, the benefits of involving local people in the project are amplified, and any potential drawbacks are reduced. Ultimately, this increases the probability of achieving project success, even when faced with local people-related risks[51].

5.0 Conclusion and Policy Suggestions

This study examines the relationship between critical risk factors on project success, with the moderating role of risk management practices. The measurement model discusses the reliability of latent constructs and their respective items. Results indicate that only a few items were removed due to low factor loadings, while most items were retained as their loadings comfortably exceeded the 0.70 threshold level. The assessment of the measurement model in terms of reliability demonstrates that variables like economic risk factors, political risk factors, environmental risk, local people risk, contractor-related risk factors, project success, and risk management practices, all have Cronbach's alpha scores above 0.70, affirming the reliability of latent constructs when measured through their chosen items. Additionally, findings from composite reliability affirm the reliability of key latent constructs in the measurement model, including critical risk factors, project success, and risk management practices. Convergent validity, assessed through the average variance extracted for latent variables, also exceeds the threshold level. The results then shift their focus to discriminant validity, employing the Fornell-Larcker Criterion, Heterotrait-Monotrait (HTMT) Ratio, and Cross-Loadings to validate the presence of discriminant validity in the present study. The subsequent analysis presents findings that confirm the existence of discriminant validity. Moreover, the results further explore direct and indirect relationships between variables using the Smart PLS structural equation modelling technique. The results indicate significant and negative impacts of critical risk factors (economic, environmental, and contractor-related) on project success within the oil and gas construction projects in the UAE. Conversely, there is a positive and significant relationship between local-people risk and project success, while no significant relationship is observed between political risk and project success in the UAE.

Moreover, the findings also validate the moderating effects of risk management practices within the context of oil and gas construction projects. The findings reveal significant and positive moderating effects of risk

management practices on the relationship between critical risk factors and project success. However, the magnitude of the coefficients varies considerably compared to the direct effect. Additionally, there is an insignificant moderating effect of risk management practices on the relationship between environmental risk and project success. Significant and positive moderating effects of risk management practices have been observed in the relationship between local people's risk and project success. Ultimately, the results confirm that risk management practices play substantial moderating roles in the relationship between critical risk factors and project success.

For companies operating in the oil sector, it is vital to establish comprehensive plans that encompass the entire project lifecycle, starting from feasibility studies and design preparations, extending to the tendering and contract phases. These pre-project stages are deemed crucial components of project management because of their potential impacts during the project's execution. Effective risk management is the key to ensuring the success of a project without exceeding its budget or timeline, ultimately enabling the realisation of project objectives as initially planned. Considering the nexus between critical risk factors and project success, here are the sub-policy implications which need serious attention from the management of construction projects in the oil and gas industry:

- Creating a favourable environment for investment and providing the necessary infrastructure to support the success of oil and gas projects in the region of the UAE, which are integral to the national economy.
- Enhancing the country's infrastructure and road networks within the UAE's oil and gas sector.
- Enacting legislation that outlines policy procedures and addresses the streamlining of official transactions, with a focus on combating bribery in the tendering processes of the oil and gas sector.
- Expediting decision-making processes related to project approvals, budget allocations, and overall government oversight in the oil sector.
- Cultivating an economic and political environment that encourages long-term investment in construction projects specifically for the oil and gas industry.
- Strengthening security measures in areas associated with oil and gas operations and fostering collaboration among relevant parties responsible for the security of the oil sector. This collaboration aims to streamline procedures and material transportation while minimising security-related risks.
- Collaborating with oil and gas companies to provide training and professional development opportunities for local personnel, equipping them with the skills needed to manage the sector effectively in the future.
- Formulating contingency plans to address potential risks that could impede the progress of projects within the oil and gas sector.

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7.0 References

1. Alvand A, Mirhosseini SM, Ehsanifar M, Zeighami E, Mohammadi A. Identification and assessment of risk in construction projects using the integrated FMEA-SWARA-WASPAS model under fuzzy environment: a case study of a construction project in Iran. Int J Construct Manag. 2021; 23(3):1-23. https://doi.org/10.1080/15623599.2021.1877875
2. Loo SC, Rahman HA, Wang C. Managing external risks for international architectural, engineering, and construction (AEC) firms operating in Gulf Cooperation Council (GCC) states. Proj Manag J. 2013; 44(5):70-88. https://doi.org/10.1002/pmj.21365
3. Smith NJ, Merna T, Jobling P. Managing risk in construction projects. John Wiley and Sons; 2014.
4. Gupta A, Kaur G, Sarva M. Factors influencing international institutional investments. In: Regional trade and development strategies in the era of globalisation. 2020. p. 195-212. https://doi.org/10.4018/978-1-7998-1730-7.ch010
5. Pobrić N. Currency risk exposure and its determinants: theoretical and empirical research. Acta Econom. 2019; 17(30). https://doi.org/10.7251/ACE1730117P
6. Vargas-Hernández JG. Critical analysis of the world economy and deglobalization processes in times of pandemic. Adv Finance Account Econom. 2021: 1-22. https://doi.org/10.4018/978-1-7998-8314-2.ch001

7. Munir Q, Munir Q. Handbook of research on financial and banking crisis prediction through early warning systems. Business Science Reference; 2016. https://doi.org/10.4018/978-1-4666-9484-2
8. Nriagu JO. Encyclopedia of environmental health. Elsevier; 2019.
9. Akanni PO, Oke AE, Akpomiemie OA. Impact of environmental factors on building project performance in Delta State, Nigeria. HBRC J. 2015; 11(1):91-7. https://doi.org/10.1016/j.hbrcj.2014.02.010
10. Kassem MA, Khoiry MA, Hamzah N. Evaluation of risk factors affecting on oil and gas construction projects in Yemen. Int J Eng Technol. 2019; 8(1):6-14. https://doi.org/10.14419/ijet.v8i1.2.24864
11. Ankrah N. An investigation into the impact of culture on construction project performance. 2007.
12. Van Thuyet N, Ogunlana SO, Dey PK. Risk management in oil and gas construction projects in Vietnam. In: Risk management in engineering and construction. Routledge; 2019. p. 225-47. https://doi.org/10.4324/9780203887059-13
13. Kassem MA, Khoiry MA, Hamzah N. Evaluation of risk factors affecting on oil and gas construction projects in Yemen. Int J Eng Technol. 2019; 8(1):6-14. https://doi.org/10.14419/ijet.v8i1.2.24864
14. Boeri A, Longo D. From the redevelopment of high-density suburban areas to sustainable cities. Architectoni.ca. 2012; 2:118-30. https://doi.org/10.5618/arch.2012.v1.n2.3
15. Loosemore M, Alkilani SZ, Murphy R. The institutional drivers of social procurement implementation in Australian construction projects. Int J Proj Manag. 2021; 39(7):750-61. https://doi.org/10.1016/j.ijproman.2021.07.002
16. Yang RJ, Zou PX. Stakeholder-associated risks and their interactions in complex green building projects: a social network model. Build Environ. 2014; 73:208-22. https://doi.org/10.1016/j.buildenv.2013.12.014
17. Owusu EK, Chan AP, Shan M. Causal factors of corruption in construction project management: an overview. Sci Eng Ethics. 2019; 25:1-31. https://doi.org/10.1007/s11948-017-0002-4
18. Hlaing N, Singh D, Tiong R, Ehrlich M. Perceptions of Singapore construction contractors on construction risk identification. J Financ Manag Prop Constr. 2008; 13(2):85-95. https://doi.org/10.1108/13664380810898104
19. Kartam NA, Kartam SA. Risk and its management in the Kuwaiti construction industry: a contractors' perspective. Int J Proj Manag. 2001; 19(6):325-35. https://doi.org/10.1016/S0263-7863(00)00014-4
20. Taofeeq D, Adeleke A, Lee CK. Individual factors influencing contractors' risk attitudes among Malaysian construction industries: the moderating role of government policy. Int J Construct Manag. 2022; 22(4):612-31. https://doi.org/10.1080/15623599.2019.1641888
21. Abdel-Hamid M, Mohamed Abdelhaleem H. Impact of poor labor productivity on construction project cost. Int J Construct Manag. 2022; 22(12):2356-63. https://doi.org/10.1080/15623599.2020.1788757
22. Gamil Y, Abdul Rahman I. Assessment of critical factors contributing to construction failure in Yemen. Int J Construct Manag. 2020; 20(5):429-36. https://doi.org/10.1080/15623599.2018.1484866
23. Yap JBH, Chow IN, Shavarebi K. Criticality of construction industry problems in developing countries: analyzing Malaysian projects. J Manag Eng. 2019; 35(5):04019020. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000709
24. Ogwueleka A. The critical success factors influencing project performance in Nigeria. Int J Manag Sci Eng Manag. 2011; 6(5):343-9. https://doi.org/10.1080/17509653.2011.10671182
25. Chandra HP. Structural equation model for investigating risk factors affecting project success in Surabaya. Procedia Eng. 2015; 125:53-9. https://doi.org/10.1016/j.proeng.2015.11.009
26. Nguyen HD, Macchion L. Risk management in green building: a review of the current state of research and future directions. Environ Dev Sustain. 2023; 25(3):2136-72. https://doi.org/10.1007/s10668-022-02168-y
27. Coulon T, Paré G, Barki H. Unexpected events in IT projects: a conceptual review and research agenda. Commun Assoc Inf Syst. 2023; 52(1):41. https://doi.org/10.17705/1CAIS.05242
28. Raftery J. Risk analysis in project management. Routledge; 2003. https://doi.org/10.4324/9780203474556
29. Samson S, Reneke JA, Wiecek MM. A review of different perspectives on uncertainty and risk and an alternative modeling paradigm. Reliab Eng Syst Saf. 2009; 94(2):558-67. https://doi.org/10.1016/j.ress.2008.06.004
30. Wang W, Xu H. Preference robust state-dependent distortion risk measure on act space and its application in optimal decision making. Comput Manag Sci. 2023; 20(1):1-51. https://doi.org/10.1007/s10287-023-00475-x
31. Ahmed A, Kayis B, Amornsawadwatana S. A review of techniques for risk management in projects. Benchmarking. 2007; 14(1):22-36. https://doi.org/10.1108/14635770710730919

32. Nicholas JM, Steyn H. Project management for engineering, business and technology. Routledge; 2020. https://doi.org/10.4324/9780429297588
33. Patra NKD. Digital disruption and electronic resource management in libraries. Chandos Publishing; 2017. https://doi.org/10.1016/B978-0-08-102045-6.00007-8
34. Sheard J. Quantitative data analysis. In: Research methods: information, systems, and contexts. 2nd ed. Elsevier; 2018. p. 429-52. https://doi.org/10.1016/B978-0-08-102220-7.00018-2
35. Kassem MA, Khoiry MA, Hamzah N. Using probability impact matrix (PIM) in analyzing risk factors affecting the success of oil and gas construction projects in Yemen. Int J Energy Sect Manag. 2020; 14(3):527-46. https://doi.org/10.1108/IJESM-03-2019-0011
36. Kassem MA, Khoiry MA, Hamzah N. Evaluation of risk factors affecting on oil and gas construction projects in Yemen. Int J Eng Technol. 2019; 8(1):6-14. https://doi.org/10.14419/ijet.v8i1.2.24864
37. Kassem MA, Khoiry MA, Hamzah N. Theoretical review on critical risk factors in oil and gas construction projects in Yemen. Eng Construct Archit Manag. 2021; 28(4):934-68. https://doi.org/10.1108/ECAM-03-2019-0123
38. Rehman A, Anwar M. Mediating role of enterprise risk management practices between business strategy and SME performance. Small Enterp Res. 2019; 26(2):207-27. https://doi.org/10.1080/13215906.2019.1624385
39. Jacobs K. Driven by personal or environmental gains? Investigating consumer motives behind purchasing long-lasting products. J Clean Prod. 2023; 383:135505. https://doi.org/10.1016/j.jclepro.2022.135505
40. Akanni P, Oke A, Akpomiemie O. Impact of environmental factors on building project performance in Delta State, Nigeria. HBRC J. 2015; 11(1):91-7. https://doi.org/10.1016/j.hbrcj.2014.02.010
41. Pamidimukkala A, Kermanshachi S, Karthick S. Impact of natural disasters on construction projects: strategies to prevent cost and schedule overruns in reconstruction projects. Creative Construction e-Conference 2020.
42. Kendra K, Taplin LJ. Project success: a cultural framework. Proj Manag J. 2004; 35(1):30-45. https://doi.org/10.1177/875697280403500104
43. Kamran HW, Rafiq M, Abudaqa A, Amin A. Interconnecting sustainable development goals 7 and 13: the role of renewable energy innovations towards combating the climate change. Environ Technol. 2024; 45(17):3439-55. https://doi.org/10.1080/09593330.2023.2216903
44. Abudaqa A, Alzahmi RA, Hilmi MF, Almujaini H. Impact of job security, career advancement and employee participation on employee engagement in oil and gas industry, UAE. Univ Soc. 2023; 15(3):26-36.
45. Abudaqa A, Alzahmi R, Hilmi MF, Ahmed G. How organisational leadership and strategic management helps in business excellence: moderating role of employees' motivation in UAE. Int J Bus Excell. 2024; 33(2):191-209. https://doi.org/10.1504/IJBEX.2024.139915
46. Abudaqa A, Alzahmi RA, Hilmi MF, Almujaini H. Study of the trends in career success through leadership, innovative behavior and motivation in UAE University, UAE. Univ Soc. 2023; 15(3):130-8.
47. Ahmed G, Abudaqa A, Jayachandran C, Limbu Y, Alzahmi R. Nation branding as a strategic approach for emerging economies: the case of UAE. In: Adeola O, Hinson RE, Sakkthivel AM, editors. Marketing communications and brand development in emerging economies volume I. Cham: Palgrave Macmillan; 2022. https://doi.org/10.1007/978-3-030-88678-3_3
48. Abudaqa A, Alzahmi RA, Hilmi MF, Almujaini H. Impact of job security, career advancement and employee participation on employee engagement in oil and gas industry, UAE. Univ Soc. 2023; 15(3):26-36.
49. Abudaqa A, Alzahmi R, Hilmi MF, Ahmed G. How supply chain resilience is achieved in SMEs of Dubai, UAE? Considering the flexible supply chain practices as a mediator. Int J Logist Syst Manag. 2023; 45(2):159-74. https://doi.org/10.1504/IJLSM.2023.131420
50. Alblooshi T, Azli M, Hilmi MF, Abudaqa A, Ahmed G. Examining the trends in citizen satisfaction towards e-government services in United Arab Emirates: a structural equation modelling approach. Int J Serv Econ Manag. 2023;14:58. https://doi.org/10.1504/IJSEM.2023.129597
51. Abudaqa AM, *et al.* The effects of instant messaging services on working and communication quality. Int J Sci Technol Res. 2019;8:38-41.