The Nexus between Risk Profile and Project Performance: Evidence from the Real Estate Sector in Tanzania

Diana Kayamba
Assistant Lecturer
Department of Accounting and Finance

Tanzania Institute of Accountancy
Corresponding author email: kayambadiana@yahoo.com

Abstract

Studies on the risk and project management in real estate research largely identify various forms of risk factors; the question of how these risks ultimately affect the performance of real estate projects has remained under-researched. Thus, this study examines the inter linkages of risk profile in terms of risk likelihood of occurrence (RLO), risk severity of impact (RSI) and risk controllability (RC) on real estate project performance (REPP). Data were collected from a sample of 144 developers from 18 real estate companies in Tanzania. It was found that identified risks have different levels of RLO, RSI, and RC. While market, financial, and environmental risks have higher RLO and RSI, technical risks, design risks, and managerial risks have higher RC. Furthermore, the results show that REPP is negatively influenced by RLO and RSI but positively influenced by RC. The study contributes to, and extends scholarly literature on risk and project management in real estate and sheds light on practitioners, particularly on the need to prioritize risks remedies, considering their frequency of occurrence. The paper concludes with avenues for further research. Research has identified various forms of risk factors, but the question of how these risks ultimately affect the performance of real estate projects has remained under-researched. This study stands as the first of its kind to analyse the nexus between risk profile and REPP.

Key words: Real Estate, Risk Profile, Project Performance, Occurrence, Severity, Controllability.
DOI: *https://dx.doi.org/10.4314/ajasss.v5i1.21*

1. Introduction

Real estate investments are regarded as among the riskiest endeavours do to their huge capital requirements characterized by labour intensive operations, prolonged payback periods and high yield (Xuefang and Wei, 2010). This calls for property developers to conduct scientific and systematic risk assessment prior to embarking on real estate projects as some of risks may have destructive effects on these projects (Dauda and Ibrahim, 2014). This involves having a thorough understanding of the nature and frequency at which risks occur which helps project managers to stay on track by adhering to delivery schedules and allocated budgets (Harinarain and Othman, 2007; Pereira et al., 2019).

Project risk management is an inherently on-going activity done in all phases to enhance project performance by minimizing the probability and impact of events that may adversely impact the project (Ferreira et al., 2019; Luo and Gao, 2014). Project performance is contingent upon risk identification and prediction of their chances of occurrence and potential outcomes as well as mitigation mechanisms (Jamadar and Shahapur, 2016; Amoatey and Danquah, 2018). Dauda and Bello (2014) indicated that poor project performance may be a result of inefficient risk management perpetuated by lack of sufficient knowledge on risk measures to consider during the life of a project. This leads to escalation of poor performing real estate projects as observed in developing countries i.e. Africa (Cretu and Gabel, 2010).

Real estate developers fail to prioritize risk management in projects which require cost optimization and application of appropriate risk mitigation measures (Rezakhani, 2012). Lack of such knowledge makes it difficult to prioritize the management of these risks and for that matter identify appropriate measures for their mitigation (Dauda et al., 2014). Earlier knowledge of risk ensures that they are efficiently managed throughout the project life thus increasing probability of success (Amoatey and Danquah, 2018).
However, real estate companies face difficulties in risk management as most decisions on real estate investments rely on incomplete information with an associated level of uncertainty about the project outcome attributed to prolonged development time (Chileshe and Fianko, 2013; Pereira et al., 2019). It is thus very important for property developers to further strengthen their risk management controls to enhance performance of the projects (Augustine et al., 2013). Considering limited literature on the subject pertaining to developing countries' contexts such as Tanzania, this study evaluates the relationship between risk factors in real estate projects and their influence on performance thereof.

The risk management theory stresses the importance of applying suitable analytical techniques to understand and assess probability of occurrence and impacts of risks in projects (Thomas, 2012). Risk management involves risks identification, assessment and development of suitable methods for handling, controlling and monitoring risk (Mahendra et al., 2013). The process reduces the probability of occurrence and impact of unfavourable events while doing opposite favourable events (Shahapur and Jamadur, 2016). It also helps Project's key participants to meet their commitments and minimize negative impacts on real estate project performance in relation to cost, time and quality objectives (Banaitiene and Banaitis, 2012).

Real estate projects consist of several phases each of which is associated with an array of risks that can positively or negatively affect project performance (Gehnera et al, 2006; Pereira et al., 2019). These include technical risks, environmental risks, design risks, logistics risks, financial risks, physical risks, political risks, management risks, stakeholders' conflicts risk and market risks (Amoatey and Danquah, 2018; Aziz et al., 2018). Risk management in this case enables project managers to acquire the basic risk information of each stage for the purpose of responding to them effectively by also creating a risk management database (Augustine et al., 2013). Amoatey and Danqua (2018) posited further that the real estate project performance is linked with how each project risk is understood, in terms of occurrence and severity of impact as this is vital for project performance (Junior and Carvalho (2013).

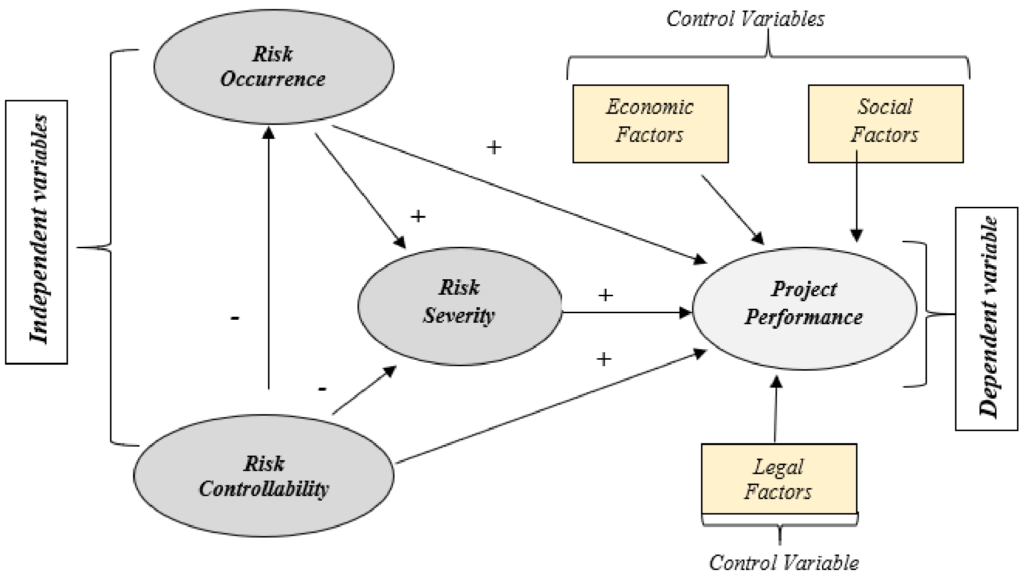
Despite the profundity of risk management in real estate projects, there is lack of a comprehensive framework that combines all project risk factors in terms of their occurrence, severity of impact and controllability (Amoatey and Danquah, 2018). As depicted by (Cretu and Gabel, 2010), project risk management is not efficiently done in developing countries especialy Africa. Furthermore, there are a very limited number of studies done in the developing countries that have comprehensively examined the phenomenon. Studies in this context (Aminu, 2013; Ekung et al., 2015; Chileshe and Fianko, 2011) have only established the relationship between risk factors namely risk occurrence, risk severity and risk controllability and project performance. The structural relationships; specifically correlations between risk occurrence, risk severity and risk controllability; have not been covered. This study has addressed not only these but also factors mediating the roles of each risk factors on the relationship between other risk factors and performance.

This study attempts to analyse risk factors affecting the performance real estate projects in terms of their likelihood of occurrence, severity of impact and controllability and correlations between them in developing countries context. We, therefore, hypothesize that:
H1: There are significant differences between real estate project risk factors in terms of their frequency of occurrence, severity of impact and controllability.
H2a: Risk occurrence has a negative association with project performance.

H2b: Risk severity has a negative association with project performance.
H2c: Risk controllability has a positive association with project performance.
H3a: Risk occurrence positively mediates the relationship between risk controllability and project performance.
H3b: Risk severity positively mediates the relationship between risk controllability and project performance.

Figure 1 presents the conceptual framework for the study.

Figure 1: Conceptual Framework



Source: Author's compilation 2022

2. Methodology

2.1 Research Context

Our study was set out to assess how risk management impacts real estate project performance in other contexts, especially in developing countries, by testing existing theoretical propositions. The Tanzanian context provides a very valuable setting for our study because firstly it helps widen coverage of limited studies in a similar context. Secondly, Tanzania is among the fastest growing economies in sub-Sahara Africa that has experienced enormous growth in the real estate sector with improvement in transparency which enables comprehensive examination of the subject due to the improved relevancy of the sector in the economy (Kusiluka, 2012; World Bank, 2020).

2.2 Sampling and Data Collection

A survey strategy was employed to allow collection of large amounts of primary data conveniently from a geographically dispersed population using a close-ended questionnaire. Prior to distributing copies of the questionnaire to the actual respondents, a pilot survey was undertaken whereby twenty (20) copies of the questionnaire were distributed to twenty (20) stakeholders in real estate projects to detect problems in the instrument before administering it to the actual respondents hence improving its efficiency. All ethical issues were taken into account, including allowing voluntary participation after explaining the details of the study to enable informed consent by respondents as well as ensuring their anonymity.

The sampling frame consisted of all project management officials from property developing firms in Dar es Salaam, the metropolitan city in Tanzania. Sampling involved selection of respondents from experienced real estate developers whose information was obtained from CRB and their official websites. A total of eighteen (18) property developers were covered with 144 project management officials including engineers, architects, quantity surveyors and site managers being sampled using convenient sampling technique since the population was indefinite.

2.3 Variables and Operationalization

This study's model comprised real estate project performance as a dependent variable which is likely to be affected by independent variables risk occurrence, risk severity and risk controllability. Also, the model included control variables that tend to affect real estate project performance which are the legal factors, economic and social factors. A summary of these variables and their operationalization is presented in Table 1.

Table 1: Summary of Variable Measurements

S/N	VARIABLES	TYPE	MEASUREMENT PARAMETERS
1.	Project performance (PM)	Dependent	• PM1 = Quality of finished project • PM2 = Clients' satisfaction • PM3 = Quality of coordination • PM4= Functionality
2.	• Risk occurrence (RO) • Risk severity (RS) • Risk controllability (RC)	Independent	• RO1-10 = Mean scores for the 10 project risk factors • RS1-10 = Mean scores for the 10project risk factors • RC1-10= Mean scores for the10 project risk factors
3.	• Legal factors (LF) • Economic factors (EF) • Social factors (SF)	Control	• LF1 = Laws, • LF2 = Regulations • LF3 = Restrictions • EF1 = Price fluctuations, • EF2 = Means of funding • EF3 = Taxation • EF4 = Cash flows of projects • SF1 = Population's attitude • SF2 = Demographics • SF3 = Cultural norms

Source: Author's compilation (2022)

2.4 Data Validity and Reliability

Exploratory Factor Analysis (EFA) was performed in R software so as, firstly, to select the appropriate factors fitting for the analysis (Hidayat et al., 2018). Out of 10 latent factors in the instrument, 7 were found to load above 0.7, implying that 70% of the measuring items (i.e. 7 factors) were fit for the analysis, and the results are presented in table 2. The average variance extract (AVE) to test for convergent validity for each factor that measured our constructs was found to be greater than 0.5,confirming that the measures of the constructs were in fact related (Thoma et al., 2018) and there was a strong correlation within different measures of the same construct (Agarwal, 2013).

Table 2: Rotated Component Matrix for Variable Validity and Reliability

	Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Cronbach's Alpha		0.75	0.72	0.75	0.64	0.7	0.75	0.55
Composite Reliability		0.86	0.83	0.78	0.97	0.76	0.88	0.86
Average Variance Extracted		0.61	0.55	0.55	0.90	0.51	0.70	0.67
Risk Severity	RS1	0.86						
	RS2	0.75						
	RS3	0.78						
	RS4	0.72						
Risk Occurrence	RO1		0.71					
	RO2		0.69					
	RO3		0.82					
	RO4		0.73					
Legal Factors	LF1			0.82				
	LF2			0.68				
	LF3			0.71				
Project Performance	PP1				0.95			
	PP2				0.92			
	PP3				0.98			
	PP4				0.94			
Social Factors	SF1					0.71		
	SF2					0.75		
	SF3					0.69		
Economic Factors	EF1						0.95	
	EF2						0.83	
	EF3						0.72	
Risk Controllability	RC1							0.77
	RC2							0.82
	RC3							0.87

Source: Author's Analysis (2022)

Comparison between the Average Variance Extracted (AVE) for each factor and the respective square rooted inter construct correlations were used to test for discriminant validity (Shaffer & De Geest, 2016). As shown in appendix1 and 2, the AVE for each of the factors was found to be greater than the squared correlations, confirming that the measures that were not supposed to be related were in fact unrelated (Matthes & Ball, 2019).

Cronbach's alpha was used to confirm data reliability in relation to this study's questionnaire design. As shown in Table 3, the Cronbach's alpha value for each factor was found to be greater than of 0.7 which confirms high reliability of this study's data set and consistency between the adopted methodology and the research objectives (Haradhan, 2017).

2.5 Data Analysis

This study adopted both descriptive and inferential techniques to analyse the studied phenomena in order to obtain conclusive results. Responses were scrutinized for straight lining problem and standard deviation of the data from all 131 respondents and were found to be lesser than 0.5, confirming that the collected data were fit for the analysis (Kabir, 2016). Mardia's test was conducted in the R software in order to test for normality; the results confirmed that the data were not normally distributed; hence we opted for non-parametric analysis techniques (Gabor, 2010).

The mean or average was used as the estimate of the centre of a distribution value for all the risk factors (Baha, 2016), then the means were ranked in order to support profiling of the risk factors in terms of their occurrence, severity and controllability to measure the extent of likelihood of occurrence, severity of impact and controllability of the risk factors (Amoatey and Danquah, 2018). Since the central value alone is not sufficient to fully describe the distribution, this study adopted standard deviation as a measure of variability in order to show the relationship between the set of scores of each of the risk factors and the mean of the sample (Loeb et al., 2017). The results were used to support profiling of the risk factors in terms of their occurrence, severity and controllability (Kabir, 2016). This study adopted Relative Importance index (RII) as part of descriptive analysis in order to identify the most important criteria, based on the respondents' replies upon the risk factors in terms of their occurrence, severity of impact and controllability (Baha, 2016). Also, RII was used since it is an appropriate tool for prioritizing indicators rated on a seven Likert type scale as adopted in this study (Rooshdia et al., 2018).

With respect to inferential analysis, the study firstly employed a post ad hoc ANOVA test in order to explore differences between risk factors group means in terms of their occurrence, severity of impact and controllability while controlling the experiment-wise error rate (Saltikov & Whittak, 2013). The relationship between risk occurrence, risk severity and risk controllability and performance of real estate projects was evaluated using Structural Equation Model (SEM) which combines path analysis and confirmatory factor analysis (CFA). Recognition of the various dimensions involved in the final model was done by transforming the theory used in this study into unobservable (latent) variables, and testable thoughts into indicators, connected by set of hypotheses (Stein et al., 2012). A summary of the research methods employed is presented in Table 3.

Table 3: Summary of research methods used

Research Methodology Item	Adopted Method/Tool
Research Approach	Quantitative Approach
Research Design	Survey design
Population of the Study	All property developer firms in Tanzania
Sampling Technique	Purposive/Judgmental Sampling
Sample Population	18 property developer companies i.e. NSSF and PSSSF, NHC, WHC, TBA, ABLA estate developers, Mohammedi Builders Ltd, Sky developers Ltd, Africa Property Ltd, Cosmos group, Highland Villas Estate developer ltd, Group Six International Ltd, Hamidu developers Ltd, Sea Rock Investment company Ltd, Estim Construction Ltd, TD property developers, Advent construction Ltd and Cotech developers
Data Collection Methods	Questionnaire method and Documentary Review
Data Collection Tools	Closed ended Questionnaires
Questionnaires Distributed	144
Questionnaires dully filled and returned	131(i.e. 90% response rate)
Type of Respondents	Project managers, functional managers, civil engineers, consultants, contractors, site manager, quantity surveyors and Architects
Data Analysis Method	Descriptive Analysis (Mean, Std Deviation and RII) and Inferential Analysis (Post Hoc ANOVA, Multiple regressions and Structural Equation Modelling)
Data Presentation Methods	Graphical Description, Statistical documentary, Tabulated description and Figures

Source: Author's compilation (2022)

3. Results

3.1 General Characteristics of Respondents

The respondents in this study were both male and female, whereby 63.4% (83 respondents) were male and 36.6% (48 respondents) were female. The most populous group was of project managers who were 22.9% of the total respondents, followed by the civil engineers who were 17.6% and quantity surveyors who were 16% of the total respondents. Furthermore, the respondents with undergraduate (47.3%) and post graduate (42.7%) level of education were more numerous than those with tertiary education level who were only 9.9% of all the respondents. Lastly, 47.3% of respondents in this study had a working experience of between 5 to 10 years, followed by those with less than 5 years' experience who were 40.5% of the total respondents. These results are presented in Table 4.

Table 4: Characteristics of respondents

Character	Frequency	Per cent (%)
Gender of the respondent		
Male	83	63.4
Female	48	36.6
Total	**131**	**100**
Type of organization		
Private	84	64.1
Public	47	35.9
Total	**131**	**100**
Position the organization		
Project Manager	30	22.9
Functional Manager	10	7.6
Site Manager	6	4.6
Consultant	16	12.2
Civil Engineer	23	17.6
Architect	19	14.5
Quantity Surveyor	21	16.0
Contractor	6	4.6
Total	**131**	**100**
Education Level		
Tertiary Education	13	9.9
Undergraduate	62	47.3
Post Graduate	56	42.7
Total	**131**	**100**
Working experience		
Less than 5 years	53	40.5
Between 5-10 years	62	47.3
Above 10years	16	12.2
Total	**131**	**100**

Source: Author's compilation (2022)

3.2 Measurement Model Development

Model Goodness of Fit

Confirmatory Factor Analysis (CFA) was performed in the R software to extract latent constructs and thereafter test for model goodness of fit i.e. how well the proposed model fitted data. The test sought to find significant results indicating goodness of fit to the data. In order to confirm whether the model was fit, the following benchmarks of assumptions of goodness of fit were considered as shown in Appendix3. For the well specified model, the ratio of degree of freedom and Chi-Squared should be less than 3 (Chen et al., 2016). Also, Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) should be close to 1 (where greater than 0.8 is also better) (Stein et al., 2012). Furthermore, for the well specified model, Root mean square error of approximation (RMSEA) and Standardized-Root mean Square (SRMR) should be less than 0.08 (Civelek, 2018). The results of the above mentioned measures of goodness-of-fit employed in this study are presented in Table 5.

Table 5: Results for the Model Goodness of Fit

	Standard	Robust	Threshold Limits	Current Model
Degrees of freedom	435.100	427.946	The ratio of DF and Chi-squared should be < 3	1.436
Chi-square	303	303		
Scaling correction factor		1.017		
p-value for the model	0.000	0.000	P value should be < 0.05	0.000
Comparative-Fit Index (CFI)	0.857	0.854	It should be close to 1 (Where greater than 0.8 is also better).	0.857
Tucker-Lewis Index (TLI)	0.835	0.830	It should be close to 1 (Where greater than 0.8 is also better).	0.835
Root mean square error of approximation (RMSEA)	0.058	0.056	It should be < 0.08	0.058
Standardized-Root mean Square (SRMR)	0.074	0.074	It should be < 0.08	0.074

Source: Author's Analysis (2022)

The results in Table 5 show that all the requirements for a model's goodness of fit were met and therefore confirming that this study's proposed model was fit. A multiple regression analysis was performed to predict the overall fit (variance explained) of the model and the extent to which the project

performance could be explained by risk occurrence, risk severity and risk controllability. The six (6) assumptions for regression analysis including heteroscedasticity, multicollinearity, normal distribution of residuals, specification problem, appropriateness of functional form and influential observations. The results of the tests for the above mentioned assumptions are shown in Appendix 3 and indicate that all the assumptions for a multiple regression model were met hence confirming the predictive capability of the model.

A common method bias check was also performed in order to identify whether there was bias in responses than the actual predisposition, and it was tested using Herman's Single Factor Model (HSFM) and Common Latent Factor Model (CLFM). The HFSM results showed that the standardized root mean square of the residuals (SRMR) was 0.11 which is greater than the threshold value 0.08. The Tucker Lewis Index (TLI) of factoring reliability was found to be 0.456, which was lesser than the threshold value (0.9). And the Root Mean Square Error of Approximation (RMSEA) index was found to be 0.098, which was greater than the threshold value (0.08). Therefore, as all the results were found to violate the assumptions of a good model it confirmed the absence of a common method bias problem (Stein et al., 2012).

The CLFM results showed that he value of equal factor loading was 0.003, which suggested that the common factor explained about 0.0009% of the variance which is below the recommended threshold of 50%, thus confirming the absence of common method bias problem i.e. the data were free from the prejudiced response and further analysis could be conducted (Tehseen et al., 2017).

3.3 Descriptive Statistics

A total of 7 variables (project performance, risk occurrence, risk severity, risk controllability, social, legal and economic factors) were included in the questionnaire. Table 6 presents a summary of how the mentioned variables were rated by the respondents in the field.

Table 6: Summary of Descriptive Statistics (studied variables)

Variable	Obs	Mean	Std. Dev.	Min.	Max.
Project Performance	131	4.498	1.219	1	7
Risk Occurrence	131	3.443	1.300	1	7
Risk Severity	131	3.502	1.256	1	7
Risk Controllability	131	4.266	1.495	1	7
Social Factors	131	4.427	1.564	1	7
Legal Factors	131	4.429	1.252	1	7
Economic Factors	131	4.118	1.178	1	7

Source: Author's Analysis (2022)

The results IN table 7 show that the performance of real estate project was moderate (4.498), meaning that it was neither good nor bad in the current situation. The effect of frequency of risk occurrence and severity of impact on project performance were moderately low (3.443 and 3.502), whereas the effect of risk controllability was moderate (4.266). On the other hand, control variables which are social, legal and economic factors posed moderate effect on the performance of real estate projects.

Relative Importance Index (RII) was used to rank ten (10) most common risk factors encountered in undertaking real estate projects, namely technical risks, environmental risks, physical risks, design risk, financial risk, market risk, stakeholders' conflict risks, logistic risk and managerial risk. The results are presented in Table 7.

Table 7: Description of risk in terms of their Occurrence

SN	Risk factors	Mean	Standard deviation	Relative importance index	% of RII	Ranking
1	Market risks	5.62	1.542	0.802617	80.26	1st
2	Financial risks	5.42	1.441	0.774264	77.43	2nd
3	Environmental risks	5.05	1.427	0.721919	72.19	3rd
4	Technical risks	5.05	1.553	0.720829	72.08	4th
5	Logistics risks	3.43	1.639	0.619411	61.94	5th
6	Political risks	4.29	1.747	0.612868	61.29	6th
7	Stakeholder's conflict risks	4.24	1.545	0.606325	60.63	7th
8	Management risks	3.98	1.756	0.568157	56.82	8th
9	Design risks	3.96	1.76	0.565976	56.60	9th
10	Physical risks	3.07	1.337	0.438386	43.84	10th

Source: Author's Analysis (2022)

The results in Table 8 reveal that identified risks contained some level of likelihood of occurrence in undertaking real estate projects. However, it clearly shows market risks (80.26%) followed by financial risks (77.43%) and environmental risks (72.19%) to be the most occurring risks in undertaking real estate projects. Meanwhile, design risks (56.60%) and physical risks (43.84%) appeared to be the least occurring risks in the real estate projects. Even so, all of the risk identified appeared to be occurring at a rate of more than 40%. The results of ranking the risk factors in terms of their severity of impact are presented in Table 8.

Table 8: Description of risk in terms of their severity of impact

SN	Risk factors	Mean	Standard deviation	Relative importance index	% of RII	Ranking
1	Financial risks	5.75	1.261	0.821156	82.12	1st
2	Market risks	5.58	1.386	0.797165	79.72	2nd
3	Technical risks	5.31	1.387	0.758997	75.90	3rd
4	Stakeholders' conflict risks	5.13	1.422	0.732824	73.28	4th
5	Environmental risks	5.02	1.444	0.717557	71.76	5th
6	Political risks	4.98	1.349	0.711014	71.10	6th
7	Design risks	4.56	1.715	0.652126	65.21	7th
8	Management risks	4.48	2.96	0.640131	64.01	8th
9	Logistics risks	4.31	1.376	0.616140	61.61	9th
10	Physical risks	2.96	1.416	0.423119	42.31	10th

Source: Author's Analysis (2022)

The results in Table 8 indicate that all the identified risks had some level of severity of impact in undertaking real estate projects. However, it clearly shows that financial risks (82.12%), followed by market risks (79.72%) and technical risks (75.90%) to have the most severe impact in undertakings the real estate projects. Meanwhile, logistic risks (61.61%) and physical risks (42.31%) appeared to have the least severity of impact in the real estate projects. The results of ranking the risk factors in terms of their controllability are presented in Table 9.

Table 9: Description of risk in terms of their Controllability

SN	Risk factors	Mean	Standard deviation	Relative importance index	% of RII	Ranking
1	Technical risks	5.85	1.068	0.836423	83.64	1st
2	Design risks	5.79	1.023	0.826609	82.66	2nd
3	Market risks	5.44	1.468	0.776445	77.64	3rd
4	Financial risks	5.24	1.164	0.749182	74.92	4th
5	Management risks	5.21	1.24	0.744820	74.48	5th
6	Physical risks	4.87	1.422	0.695747	69.57	6th
7	Logistics risks	4.67	1.321	0.667394	66.74	7th
8	Stakeholders' conflict risks	3.75	1.541	0.535442	53.54	8th

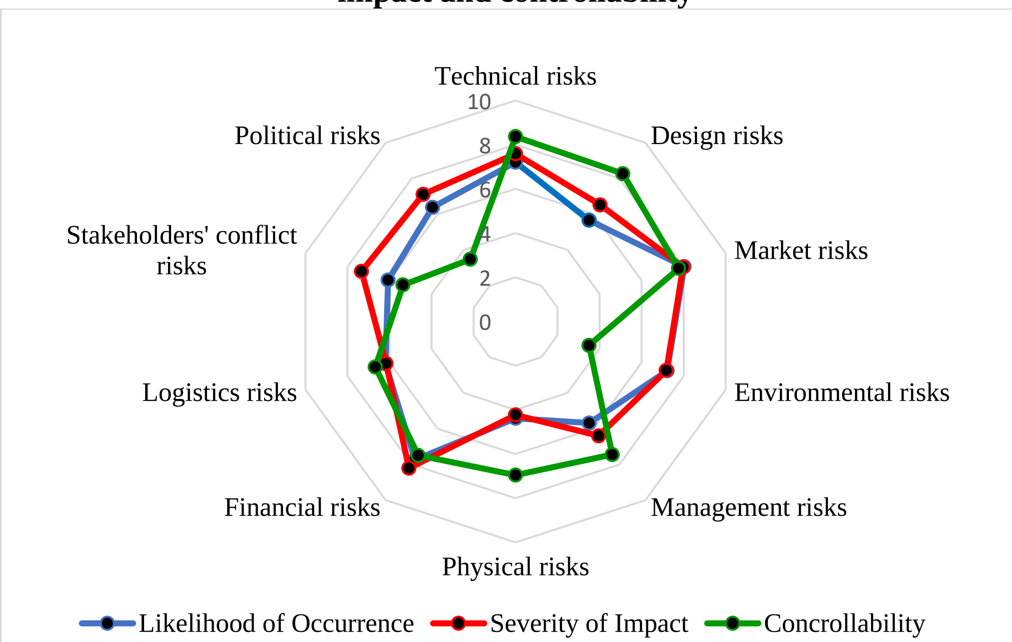
9	Environmental risks	2.45	1.343	0.350055	35.01	9th
10	Political risks	2.44	1.479	0.347874	34.79	10th

Source: Author's Analysis (2022)

The results in Table 9 show that the risks identified had a certain level of controllability in undertaking real estate projects. However, they clearly show that technical risks (86.64%), followed by design risks (82.66%) and market risks (77.46%) to be the most controllable risk factors in undertaking of the real estate projects. Meanwhile, environmental risks (35.01%) and political risks (34.79) appeared to be the least controllable factors in the real estate projects.

A radar chart was used for further profiling of the risk factors in terms of their occurrence, severity of impact and controllability of the ten risk factors identified. The scores assigned to each risk factor were relatively scaled 1-10, where higher score indicate higher level in the respective category. The results are presented in Figure 2.

Figure 2: Comparison of project risk likelihood of occurrence, severity of impact and controllability



Source: Author's compilation (2022)

The results displayed in Figure 2 indicate that market risk, financial risk and technical risk had the highest scores in all three categories of likelihood of occurrence, severity of impact and controllability. This implies that market risk, technical risk and financial risks were the most occurring risks with significant impact yet easiest to control. On the other hand, environmental risks and political risks were found to have high scores in both likelihood of occurrence and severity of impact but low scores in terms of their controllability. This implies that environmental risks and political risks are direst as they are more likely to occur with severe impacts on the project and yet they are the hardest to control.

3.4 Inferential Analysis

ANOVA and Post Hoc ANOVA Results

A Post Hoc ANOVA was conducted in order to test hypothesis H_1: There are significant differences between real estate project risk factors in terms of their occurrence, severity of impact and controllability. A one-way ANOVA between groups was conducted first to explore whether there were differences in means of the risk factors in terms of their occurrence, severity of impact and controllability, and the results are presented in Table 10.

Table 10: ANOVA results for risk occurrence, risk severity and risk controllability

	Risk Occurrence				**Risk Severity**				**Risk controllability**			
	Df	Mean Square	F	Sig.	Df	Mean Square	F	Sig.	Df	Mean Square	F	Sig.
Between Groups	9	79.313	31.728	.000	9	83.444	39.600	.000	9	209.008	121.889	.000
Within Groups	1300	2.500			1300	2.107			1300	1.715		
Total	**1309**				**1309**				**1309**			

Source: Author's Analysis (2022)

The results in Table 11 show that the significance value was 0.000 (i.e. p = .000), which is below 0.05 and, therefore, confirmed that there was a statistically significant difference in the mean likelihood of occurrence between the different risk factors.

However, in order to know the specificity of groups that differed, the Tukey post Hoc test was conducted to allow multiple comparisons. The results, as shown in Tables 11a, 11b and 11c indicate that the mean difference between the risk factors in terms of their occurrence was accurate by 0.195, while the mean difference between the risk factors in terms of their severity of impact was accurate by 0.179. The mean difference between the risk factors in terms of their controllability was accurate by 0.161.

Table 11a: Post Hoc ANOVA Multiple Comparisons

Dependent Variable: Risk Occurrence, Risk Severity and Risk Controllability
Tukey HSD

		Risk Occurrence		Risk Severity		Risk Controllability	
(I) (II) (III)	GroupO GroupS GroupC	Mean Difference	Std. Error	Mean Difference	Std. Error	Mean Difference	Std. Error
Technical risks	Environmental risks	-.00763	.19536	.29008	.17936	3.40458*	.16180
	Design risks	1.08397*	.19536	.74809*	.17936	.06870	.16180
	Logistic risks	.70992*	.19536	1.00000*	.17936	1.18321*	.16180
	Financial risks	-.37405	.19536	-.43511	.17936	.61069*	.16180
	Political risks	.75573*	.19536	.33588	.17936	3.41985*	.16180
	Management risks	1.06870*	.19536	.83206*	.17936	.64122*	.16180
	Physical risks	1.97710*	.19536	2.35115*	.17936	.98473*	.16180
	Market risks	-.57252	.19536	-.26718	.17936	.41985	.16180
	Stakeholders' conflicts risks	.80153*	.19536	.18321	.17936	.41985	.16180
Environmental risks	Technical risks	.00763	.19536	-.29008	.17936	-3.40458*	.16180
	Design risks	1.09160*	.19536	.45802	.17936	-3.33588*	.16180
	Financial risks	-.36641	.19536	-.72519*	.17936	-2.79389*	.16180
	Political risks	.76336*	.19536	.04580	.17936	.01527	.16180
	Management risks	1.07634*	.19536	.54198	.17936	-2.76336*	.16180
	Physical risks	1.98473*	.19536	2.06107*	.17936	-2.41985*	.16180
	Market risks	-.56489	.19536	-.55725	.17936	-2.98473*	.16180

	Stakeholders' conflicts risks	.80916*	.19536	-.10687	.17936	-2.98473*	.16180
Design risks	Technical risks	-1.08397*	.19536	-.74809*	.17936	-.06870	.16180
	Environmental risks	-1.09160*	.19536	-.45802	.17936	3.33588*	.16180
	Logistic risks	-.37405	.19536	.25191	.17936	1.11450*	.16180
	Financial risks	-1.45802*	.19536	-1.18321*	.17936	.54198*	.16180
	Political risks	-.32824	.19536	-.41221	.17936	3.35115*	.16180
	Management risks	-.01527	.19536	.08397	.17936	.57252*	.16180
	Physical risks	.89313*	.19536	1.60305*	.17936	.91603*	.16180
	Market risks	-1.65649*	.19536	-1.01527*	.17936	.35115	.16180
	Stakeholders' conflicts risks	-.28244	.19536	-.56489	.17936	.35115	.16180

Source: Author's Analysis (2022)

Table 11b: Post Hoc ANOVA Multiple Comparisons

Dependent Variable: Risk Occurrence, Risk Severity and Risk Controllability
Tukey HSD

		Risk Occurrence		**Risk Severity**		**Risk Controllability**	
(I) (II) (III)	GroupO GroupS GroupC	Mean Difference	Std. Error	Mean Difference	Std. Error	Mean Difference	Std. Error
Logistic risks	Technical risks	-.70992*	.19536	-1.00000*	.17936	-1.18321*	.16180
	Environmental risks	-.71756*	.19536	-.70992*	.17936	2.22137*	.16180
	Design risks	.37405	.19536	-.25191	.17936	-1.11450*	.16180
	Financial risks	-1.08397*	.19536	-1.43511*	.17936	-.57252*	.16180
	Political risks	.04580	.19536	-.66412*	.17936	2.23664*	.16180
	Management risks	.35878	.19536	-.16794	.17936	-.54198*	.16180
	Physical risks	1.26718*	.19536	1.35115*	.17936	-.19847	.16180
	Market risks	-1.28244*	.19536	-1.26718*	.17936	-.76336*	.16180
	Stakeholders' conflicts risks	.09160	.19536	-.81679*	.17936	-.76336*	.16180
Financial risks	Technical risks	.37405	.19536	.43511	.17936	-.61069*	.16180
	Environmental risks	.36641	.19536	.72519*	.17936	2.79389*	.16180

	Design risks	1.45802*	.19536	1.18321*	.17936	-.54198*	.16180
	Logistic risks	1.08397*	.19536	1.43511*	.17936	.57252*	.16180
	Political risks	1.12977*	.19536	.77099*	.17936	2.80916*	.16180
	Management risks	1.44275*	.19536	1.26718*	.17936	.03053	.16180
	Market risks	-.19847	.19536	.16794	.17936	-.19084	.16180
	Stakeholders' conflicts risks	1.17557*	.19536	.61832*	.17936	-.19084	.16180
Political risks	Technical risks	-.75573*	.19536	-.33588	.17936	-3.41985*	.16180
	Environmental risks	-.76336*	.19536	-.04580	.17936	-.01527	.16180
	Design risks	.32824	.19536	.41221	.17936	-3.35115*	.16180
	Logistic risks	-.04580	.19536	.66412*	.17936	-2.23664*	.16180
	Financial risks	-1.12977*	.19536	-.77099*	.17936	-2.80916*	.16180
	Physical risks	1.22137*	.19536	2.01527*	.17936	-2.43511*	.16180
	Market risks	-1.32824*	.19536	-.60305*	.17936	-3.00000*	.16180
	Stakeholders' conflicts risks	.04580	.19536	-.15267	.17936	-3.00000*	.16180

Source: Author's Analysis (2022)

Table 11c: Post Hoc ANOVA Multiple Comparisons

Dependent Variable: Risk Occurrence, Risk Severity and Risk controllability

Tukey HSD

		Risk Occurrence		**Risk Severity**		**Risk Controllability**	
(I) (II) (III)	GroupO GroupS GroupC	Mean Difference	Std. Error	Mean Difference	Std. Error	Mean Difference	Std. Error
Physical risks	Technical risks	-1.97710*	.19536	-2.35115*	.17936	-.98473*	.16180
	Environmental risks	-1.98473*	.19536	-2.06107*	.17936	2.41985*	.16180
	Design risks	-.89313*	.19536	-1.60305*	.17936	-.91603*	.16180
	Logistic risks	-1.26718*	.19536	-1.35115*	.17936	.19847	.16180
	Financial risks	-2.35115*	.19536	-2.78626*	.17936	-.37405	.16180
	Political risks	-1.22137*	.19536	-2.01527*	.17936	2.43511*	.16180

	Management risks	-.90840*	.19536	-1.51908*	.17936	-.34351	.16180
	Market risks	-2.54962*	.19536	-2.61832*	.17936	-.56489*	.16180
	Stakeholders' conflicts risks	-1.17557*	.19536	-2.16794*	.17936	-.56489*	.16180
Market risks	Technical risks	.57252	.19536	.26718	.17936	-.41985	.16180
	Environmental risks	.56489	.19536	.55725	.17936	2.98473*	.16180
	Design risks	1.65649*	.19536	1.01527*	.17936	-.35115	.16180
	Logistic risks	1.28244*	.19536	1.26718*	.17936	.76336*	.16180
	Financial risks	.19847	.19536	-.16794	.17936	.19084	.16180
	Political risks	1.32824*	.19536	.60305*	.17936	3.00000*	.16180
	Management risks	1.64122*	.19536	1.09924*	.17936	.22137	.16180
	Physical risks	2.54962*	.19536	2.61832*	.17936	.56489*	.16180
	Stakeholders' conflicts risks	1.37405*	.19536	.45038	.17936	0.00000	.16180
Stakeholders' conflicts risks	Technical risks	-.80153*	.19536	-.18321	.17936	-.41985	.16180
	Environmental risks	-.80916*	.19536	.10687	.17936	2.98473*	.16180
	Design risks	.28244	.19536	.56489	.17936	-.35115	.16180
	Logistic risks	-.09160	.19536	.81679*	.17936	.76336*	.16180
	Financial risks	-1.17557*	.19536	-.61832*	.17936	.19084	.16180
	Political risks	-.04580	.19536	.15267	.17936	3.00000*	.16180
	Management risks	.26718	.19536	.64885*	.17936	.22137	.16180
	Physical risks	1.17557*	.19536	2.16794*	.17936	.56489*	.16180
	Market risks	-1.37405*	.19536	-.45038	.17936	0.00000	.16180

Source: Author's Analysis (2022)

Model Estimation Results

Multiple Regression Estimations

The results for multiple regression analysis are shown in Tables 12a and 12b. From the results, all F- statistic results were found to be significant at 1% confidence interval, implying that at least some of the regression parameters were non-zero and that the regression equation was valid in fitting the data. The R-

Squared results were found to be greater than 0.5, implying that more than 50% of the total variations in the dependent variables were explained by the independent variables. The Adjusted R-Square results were also found to be greater than 0.5, thus implying that more than 50% of the data fitted the regression model.

It was further revealed, in Table 12a, that organization type dummy which represented public organizations significantly negatively affected project performance at 1% confidence interval. This implies that more involvement of public organizations in undertaking real estate projects has a negative influence on their performance. Moreover, the officials with experience of 5-10 years were found to significantly positively influence projects' performance at 5% confidence interval while those with 10 plus years of experience had a similar influence but at 10% confidence interval. This implies that officials with experience of more than 5 years were the ones who were highly contributing to the performance of real estate projects more than the officials with experience of less than 5 years.

Table 12(a): The link between Risk Occurrence, Severity and Project Performance

	Proj Perfom	Proj Perfom	Severity	Proj Perfom	Proj Perfom
	Coef	Coef	Coef	Coef	Coef
	1	2	3	4	5
Social Factors	0.123* (0.067)	0.117* (0.068)	0.211** (0.095)	0.110 (0.067)	0.098 (0.067)
Legal Factors	0.069 (0.085)	0.075 (0.068)	0.195 (0.123)	0.042 (0.086)	0.047 (0.086)
Economic Factors	-0.074 (0.120)	-0.054 (0.123)	-0.225 (0.176)	-0.061 (0.119)	-0.025 (0.122)
Org-type dummy	-0.461*** (0.125)	-0.525*** (0.151)	-0.461** (0.21)	-0.381*** (0.132)	-0.474*** (0.151)
5-10 years of Exper	0.364* (0.199)	0.377* (0.200)		0.358* (0.197)	0.380* (0.197)
10+ years of Exper	0.624** (0.214)	0.623*** (0.214)		0.618*** (0.212)	0.614*** (0.212)
Undergraduate Edu	0.092 (0.133)	0.089 (0.133)		0.108 (0.132)	0.105 (0.132)
Postgraduate Edu	0.067 (0.195)	0.040 (0.200)		0.069 (0.193)	0.024 (0.196)
Risk Occurrence	0.222 (0.189)	-0.193* (0.989)	0.687*** (0.147)		-0.158 (0.125)

Risk Severity				-0.105* (0.060)	-0.147** (0.061)
Risk Controllability					
_cons		0.210 (0.190)	-0.006 (0.082)	0.237 (0.188)	0.220 (0.189)
F-Statistic	5.23***	4.69***	9.37***	5.07***	4.74***
R-squared	0.528	0.587	0.529	0.638	0.683
Adj R-squared	0.506	0.536	0.52	0.618	0.636
Observations	131	131	131	131	131

Note: In parentheses are standard errors; ***, **, * = 1%, 5%, and 10% significance level respectively.

Source: Author's Analysis (2022)

Besides the results in Table 12a, the results in Table 13(b) show that a unit increase in risk occurrence would lead to a 0.687 increase in risk severity, and a 0.193 decrease in project performance. This implies that risk occurrence has a positive influence risk severity but a negative influence on project performance. Also, a unit increase in risk severity would lead to a 0.147 decrease in project performance. This indicates that risk severity has a negative influence on project performance. On the other hand, a unit increase in risk controllability would lead to a 0.181 decrease in risk frequency of occurrence and 0.272 decrease in risk severity of impact while a 0.197 increase in project performance. This implies that risk controllability has a negative influence on risk frequency of occurrence and risk severity but positive on project performance.

Table 12(b): The link between Risk Occurrence, Severity and Project Performance for Coefficient

	Proj Perfom	**Occurrence**	**ProjPerfom**	**Severity**	**Proj Perfom**	**Proj Perfom**
	Coef	**Coef**	**Coef.**	**Coef**	**Coef**	**Coef**
	6	**7**	**8**	**9**	**10**	**11**
Social Factors	0.091* (0.053)	0.082 (0.071)	0.071 (0.072)	0.058 (0.108)	0.077 (0.071)	0.059 (0.072)
Legal Factors	0.044 (0.063)	0.048 (0.086)	0.053 (0.085)	0.226* (0.129)	0.027 (0.086)	-0.030 (0.015)
Economic Factors	-0.219** (0.088)	-0.067 (0.119)	-0.040 (0.122)	-0.109 (0.180)	-0.057 (0.119)	-0.015 (0.122)
Org-type dummy	-0.644** (0.096)	-0.405*** (0.129)	-0.484** (0.151)	-0.700*** (0.188)	-0.342** (0.135)	-0.443*** (0.151)
5-10 years of Exper	0.417** (0.200)		0.439** (0.202)		0.405** (0.199)	0.435** (0.200)

10+ years of Exper	0.666** (0.214)		0.668** (0.214)		0.655*** (0.213)	0.654*** (0.212)
Undergraduate Edu	0.091 (0.132)		0.086 (0.132)		0.105 (0.132)	0.102 (0.131)
Postgraduate Edu	0.096 (0.194)		0.063 (0.197)		0.094 (0.193)	0.045 (0.195)
Risk Occurrence			0.123** (0.044)			0.178** (0.0.079)
Risk Severity					0.093** (0.037)	0.208*** (0.062)
Risk Controllability	0.181 (0.114)	-0.181** (0.074)	0.197* (0.115)	-0.272** (0.119)	0.156 (0.114)	0.174 (0.115)
_cons	0.282 (0.192)	0.282 (0.192)	0.271 (0.192)	-0.058 (0.289)	0.287 (0.191)	0.273 (0.190)
F-Statistic	4.99***	4.99***	4.59***	4.09***	4.78***	4.57***
R-squared	0.571	0.5705	0.576	0.5093	0.685	0.69
Adj R-squared	0.516	0.541	0.513	0.5176	0.653	0.62
Observations	131	131	131	131	131	131

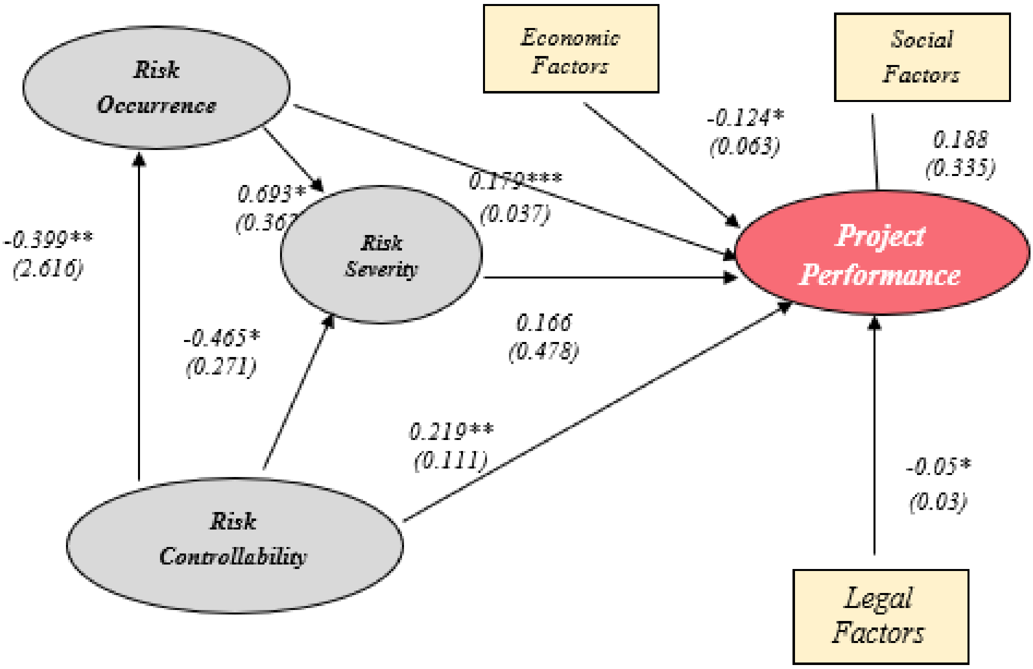
Note: In parentheses are standard errors; ***, **, * = 1%, 5%, and 10% significance level respectively.

Source: Author's Analysis (2022)

The Structural Equation Model (SEM) Estimations

To ensure results robustness, the Structural Equation Modelling (SEM) was performed to analyse the structural relationships among our variables as well as covariance between them (Chen et al, 2016). The SEM results are displayed in Figure 3.

Figure 3: Structural Equation Model estimations



RMSEA…….; RSMR: DF: Chi-Square; CFI: TLI:
Note: In parentheses are standard errors; ***, **, * = 1%, 5%, and 10% significance level respectively.

Source: Author's Analysis (2022)

The SEM results displayed in Figure 3 indicate that a unit increase in risk controllability would lead to a 0.399 decrease in the risk occurrence at 5% significant level and then lead to an increase of 0.179 in project performance at 1% significance level. Also, a unit increase in risk occurrence would lead to a 0.693 increase in risk severity at 10% significance level which would be decreased by 0.465 of a unit increase of risk controllability at a 10% significance level and then lead to an increase of 0.219 in project performance at 5% significance level. On the other hand, a unit increase in economic factor would directly lead to a 0.124 decrease in the project performance which is significant at 10%. Furthermore, a unit increase in legal factors would directly lead to a 0.05 decrease in the project performance significantly at 10%.

4.0 Findings, Implications, and Further Research

4.1 Discussion of Findings

The first objective of this study was to profile real estate project risk factors in terms of their occurrence, severity of impact and controllability. Market risk was found to be the most occurring risk, which was in line with Aminu (2013) and Chileshe and Fianko (2013) which was a result of increasing market competition and a wide variety of customers' preferences, creating more difficulties to forecast the demand accurately. Physical risks e.g. labour injuries and fires were found to have the least likelihood of occurrence, which is in line with findings by Maseko (2017) due to implementation of health, safety and environmental care measures.

On the aspect of severity of impact, financial risk was found to have the most profound severity of impact similarly to what Aminu (2013) reported as changing project requirements during implementation could lead to overspending and thus negatively affecting the timeliness of project closure. However, this is contrary to what Amoatey and Danquah (2018) found that technical risk had the highest severity of impact. On the other hand, physical risk was found to have the lowest severity of impact which resembles findings by Rezakhani (2012). Technical risk was observed to be the most controllable in line with what Amoatey and Danquah (2018) reported, as it involves presence of efficient set standards and tested methods for mitigating their effects when they occur in real estate projects.

Political risk was found to be the most challenging in controllability in line with Chileshe and Fianko (2011) as there is not much that stakeholders can do when new governmental legislations are contrary to the project's objectives**.** Above all**,** environmental risks and political risks were found to be outrageous since they had slightly higher likelihood of occurrence and severity of impact but very low level of controllability.

The second objective of this study was to examine the relationship between risk occurrence, risk severity, risk controllability and the project performance. First and foremost, risk occurrence was found to have a positive influence on risk severity but a negative influence on project performance; this is in line with what Ekung and Adenarian (2015) reported. Risk severity was found to have a negative influence on project performance similar to what Aminu (2013) found. Furthermore, risk controllability was found to have a negative influence on risk severity and risk occurrence but positive effect on project performance as supported by Amoatey and Danquah (2018).

The third objective of the study was to examine the mediation effect of risk occurrence and risk severity on the relationship between risk controllability and real estate project performance. Both risk occurrence and risk severity were found to positively mediate the relationship between risk controllability and project performance. This is similar to findings by Chileshe & Fianko (2013) that the effect of risk controllability level on project performance was shown to be transmitted through either risk occurrence or risk severity or both.

4.2. Theoretical and Practical Implications

Theoretical Implications

Our study provides empirical evidence for behaviour of different risk factors encountered in undertaking of real estate projects in terms of their occurrence severity of impact and controllability in a Tanzanian context. To date, literature is deficient with regard to studies that investigate management of the risk factors, especially with respect to their likelihood of occurrence, severity of impact and controllability (Amoatey & Danquah, 2018; Aminu, 2013; Chileshe & Fianko, 2013). Often, scholars have posited about different risk factors that are encountered in executing real estate projects (Amoatey & Danquah, 2018; Banaitiene & Banaitis, 2012; Dauda et al., 2014). This study adds to the arguments of other scholars as it identified and ranked the ten most common risk factors in all three categories i.e. likelihood of occurrence, severity of impact and controllability.

In more details, empirical evidence suggests that increase in frequency of risk occurrence and their severity impact lowers project performance. In turn, when these risks are put into control, their frequency of occurrence and severity of impact tend to decrease hence influencing project performance. In this context, the findings of this study add to those of other scholars who have argued on maximizing risk control measures as vital in risk management (El Karem et al., 2015). A number of scholars have already shown that there is a significant relationship between risk factors and the performance of real estate projects (Ekung et al., 2015; Mahendra et al., 2013; Enshassi et al., 2009). This study adds to the arguments of these researchers as it considered the relationship between risk occurrence, risk severity, risk controllability and project performance, and in addition how risk occurrence and risk severity mediate the relationship between risk controllability and project performance.

Practical Implications

This study’s findings practically imply that real estate projects are likely to be more successful if the property developers can minimize frequency of occurrence and severity of impact of the risk factors with low level of controllability. In this study, environmental and political risks were found to be the direst. Minimization of their occurrence and severity of impact could be possible if property developer companies could concentrate efforts on critically studying and forecasting possible environmental and political risks, also by designing strategies intended to prevent them before commencement of the project. This would help to minimize the likelihood of occurrence and severity of impact and enhance project performance. According to Amoatey and Danquah (2018), environmental risks, such as unfavourable weather, could become controllable when the firms work with weather information providers to get reliable weather information prior to the commencement of the project. Rhezakhani (2012) posited that environmental risks could be controlled if property developer firms could prioritize their remedy. On the other hand, Chilese and Fianko (2011) postulate that political risks could become controllable when property developer companies work closely with the government as well as development stakeholders by promoting a political-enabling environment where rule of law is applied.

4.3 Limitations and Avenues for Future Research

The study focused on analysing risk factors affecting project performance in terms of their likelihood of occurrence, severity of impact and controllability. Another study may be conducted on exploring the limitations of the application of the risk management practices in relation to the performance of real estate projects. In addition, it may be potential for a study conducted to investigate the practices on risk management focusing especially on environmental and political risks by looking at the mode of forecasting and strategic plans of mitigation versus the practice on implementation practice.

5.0 Conclusions and Recommendations

The nature of real estate projects exposes them to various risks; hence effective risk management in real estate projects is observed to be profound to improve project performance. However, there is yet a better understanding on the nature of risks in order to prioritize interventions to manage them so as to enhance project performance. With regard to this, the study analysed the risk factors encountered in real estate projects in terms of their likelihood of occurrence, severity of impact and controllability level. Ten (10) risk factors were profiled, namely financial, physical, managerial, market, logistics, political, technical, environmental, stakeholders' conflicts and design risks. All the risks identified have some level of likelihood of occurrence, extent of severity of impact and controllability level. Market risks, financial risks and environmental risks are the most occurring risks in real estate projects. Financial risks, market risk sand technical risks are those with the highest severity of impact in real estate projects. Technical risks, market risks and design risks are the most controllable risks in real estate projects.

Among all risks, environmental risks and political risks have high likelihood of occurrence and severity of impact but very low controllability level. Property developing firms are therefore urged to prioritize remedy of these risks. Project performance is seen to be negatively influenced by risk occurrence and risk severity but positively influenced by risk controllability. Either way, it was clear that risk occurrence and risk severity positively mediate the relationship between risk controllability and project performance. Thus, property developing firms should put much emphasis on controlling identified risks so as to enhance project performance.

References

Agarwal, V. (2013). Investigating the convergent validity of organizational trust. Journal of Communication Management, 17 (1), pp. 24-39. doi:10.1108/13632541311300133

Aje, O. I., Odusami, K. T., & Ogunsemi, D. R. (2009). The impact of contractors' management capability on cost and time performance of construction projects in Nigeria. Journal of Financial Management of Property and Construction, 14 (2), pp. 171 - 187. doi:http://dx.doi.org/10.1108/13664380910977619

Aminu, A. B. (2013). Risk Management In Nigerian Construction Industry. Published Master Thesis.

Amoatey, C., & Danquah, D. (2018). Analysing project risks in Ghana’s real estate industry. Journal of Facilities Management, 16(4), 413-428. doi:https://doi.org/10.1108/JFM-10-2017-0054

Augustine, I. E., Ajayi, J. R., Ade, B. A., & Agbo, A. (2013). Assessment of Risk Management Practices in Nigerian Construction Industry: Toward Establishing Risk Management Index. International Journal of Pure and Applied Sciences and Technology, 16 (2), pp. 20-31.

Aziz, H., Sufian, M., & Munir, S. (2018). Conflict Handling In Project Management: A Risk Assessment Analysis. 12th International Conference on Mathematics, Actuarial Science, Computer Science and Statistics (MACS) (pp.1-7). Pakistan: IEE. doi:10.1109/MACS.2018.8628332

Baha, H. (2016). An Introduction of Descriptive Analysis,its advantages and disadvantages. Germany: University of Leuphana.

Banaitiene, N., & Banaitis, A. (2012). Risk Management in Construction Projects. Lithuania: licensee InTech. doi:http://dx.doi.org/10.5772/51460

Chen, J., Shirkey, G., John, R., Park, H., & Shao, C. (2016). Applications of structural equation modeling (SEM) in ecological studies: an updated review. Ecological Processes, 5(19), 2-12. doi:10.1186/s13717-016-0063-3

Chileshe , N., & Fianko, A. B. (2013). An evaluation of risk factors impacting construction projects in Ghana. Journal of Engineering Design and Technology, 10 (3), pp. 306-329.

Chileshe, N., & Fianko, A. B. (2011). Perceptions of Threat Risk Frequency and Impact on Construction Projects in Ghana: Opinion Survey Findings. Journal of Construction in Developing Countries, 16 (2), pp. 115–149.

Civelek, M. E. (2018). Essentials of Structural Equation Modeling. USA: University of Nebraska. doi:10.13014/K2SJ1HR5

Dauda, Kagara, A. B., & Ibrahim. (2014, July). An Investigation into Risk Factors and Preventive Measures in Building Construction Projects in Abuja FCT. International Journal of Scientific and Research Publications, 4 (7), pp. 2250-3153.

Ekung, S., Adeniran, L., & Adu, E. (2015). Theoretical Risk Identification Within the Nigeria East- West Coastal Highway Project. International Journal of Civil Engineering and Urban Planning, 2 (1), pp. 1-11.

El Karem, M. S., El Nawawy, O. A., & Alim, A. M. (2015). Identification and Assesement of Risk Factors Affecting construction projects. Housing and Building National Research Center, 13 (2), pp. 202-216. doi:http://dx.doi.org/10.1016/j.hbrcj.2015.05.001

Enshassi, A., Mohamed, S., & Abushaban, S. (2009). Factors Affecting the Performance of Construction Projects in the Gaza Strip. Journal of Civil Engineering and Management, 15 (3), pp. 269–280. doi:10.3846/1392

Gabor, R. M. (2010). Descriptive Methods of Data Analysis For Marketing Data: Theoretical And Practical Considerations. Journal of Management & Marketing, 5 (3), pp. 119-134 .

Gehnera, E., Jonge, H. D., & Halman, J. (2006). Risk Management in the Dutch Real Estate Development Sector: A Survey. In D. Amaratunga, R. Haigh, R. Vrijhoef, & M. Hamblett, (Ed.), Proceedings of the 6th International postgraduate research conference in the built and human environment (pp. 541-552). Salford, UK: SCRI.

Haradhan, M. (2017). Two Criteria for Good Measurements in Research: Validity and Reliability. MPRA Paper No. 83458, 17 (3), pp. 58-82.

Harinarain, N., & Othman, A. A. (2007). A Framework for Identifying, Quantifying and Classifying Risks Associated with the Principal Building Agreement in South Africa. Proceedings of the 2nd Built Environment Conference (pp. 138-151). Port Elizabeth, South Africa: ASOCSA22.

Hidayat, R., Akmar, S. N., & Zamri, S. (2018). Exploratory and Confirmatory Factor Analysis of Achievement Goals for Indonesian Students in Mathematics Education Programmes. Journal of Mathematics, Science and Technology Education, 14 (12), pp. 1-12. doi:https://doi.org/10.29333/ejmste/99173

Junior, R. R., & Carvalh, M. M. (2013, February 11). Understanding the Impact of Project Risk Management on Project Performance: An Empirical Study. Journal of Technology Management & Innovation, 8(Special Issue ALTEC), 64-78. Retrieved from http://www.jotmi.org

Kabir, S. M. (2016). Methods of Data Collection. India: Curtin University. Retrieved from https://www.researchgate.net/publication/325846997

Komu, F. (2011, February). Housing Decay and Maintenance: the Case of Public Housing in Tanzania. Dar Es Salaam, Tanzania: Royal Institute of Technology (KTH).

Kongela, S. M. (2013). Framework and Value Drivers for Real Estate Development in Sub-Saharan Africa. Tanzania: Immobilien Manager Verlag. Retrieved from http://dnb.d-nb.de abrufbar

Kusiluka, M. M. (2012). Agency Conflicts in Real Estate Investment in Sub-Saharan Africa. Exploration of Selected Investors in Tanzania and the Effectiveness of Institutional Remedies, 34-62. Retrieved from http://dnb.d-nb.de abrufbar.

Loeb, S., Morris, P., Reber, S., & McFarland, D. (2017). Descriptive Analysis in Education; A Guide for Researchers. Institute of Education Sciences, Department of Education. Washington DC: National Center for Education Evaluation and Regional Assistance. Retrieved from http://ies.ed.gov/ncee/.

Luo, F. Z., & Gao, L. J. (2014). Research on Real Estate Project Risk by Life Cycle Theory. 5th International Asia Conference on Industrial Engineering and Management Innovation (IEMI) , (pp. 387-389). China.

Mahendra, P. A., Pitroda, J. R., & Bhavsar, J. J. (2013, October). A Study of Risk Management Techniques for Construction Projects in Developing Countries. International Journal of Innovative Technology and Exploring Engineering, 3 (5), pp. 2278-3075.

Maseko, C. M. (2017). Identification of Risk Factors Affecting Construction of Projects: The case of emerging economy. Risk Governance and Control:

Financial Markets & Institutions, 7 (6), pp. 246-259. doi:http://doi.org/10.22495/rgc7i4c2art7

Matthes, J. M., & Ball, D. A. (2019). Discriminant Validity Assesement in Marketing Research. Internantional Journal of Marketing Research, 61(2), 210-222. doi:https://doi.org/10.1177/1470785318793263

Pereira, L. P., Ferreira, S., & Santos, J. (2019). The main causes of risk in residential real estate projects. Journal of General Management, 15 (3), pp. 152–162. doi:10.1177/0306307019890095

Rezakhani, P. (2012). Classifying key risk factors in construction projects. Journal of Construction Architecture, 58 (2), pp. 27-38. Retrieved from https://www.researchgate.net/publication/266460882

Rooshdia, R. M., Majidb, M. Z., & Ismaila, A. A. (2018). Relative Importance Index of Sustainable Design and Construction Activities Criteria for Green Highway. Chemical Engineering Transactions, 63(1), 151-156. doi: 10.3303/CET1863026

Saltikov, J. B., & Whittak, V. J. (2013). Selecting the Most Appropriate Inferential Statistical Test for Your Quantitative Research Study. Journal of Clinical Nursing. doi:DOI: 10.1111/jocn.12343

Shaffer, J. A., & De Geest, D. (2016). Tackling the Problem of Constructs Ploriferation: Aguide to Assesing the Discriminant Validity of Conceptually Related Constructs. Organizational Research Methods, 19 (1), pp. 80-110.

Shahapur, R. N., & Jamadar, B. (2016). Risk Management Practices in Real Estate Projects. International Journal for Scientific Research & Development, 4 (6), pp. 555-558. Retrieved from https://www.researchgate.net/publication/337560686

Stein, C. M., Morris, N. J., & Nock, N. L. (2012). Structural Equation Modeling. Methods in molecular biology, 850 (4), pp. 496-512. doi:10.1007/978-1

Tehseen , S., Ramayah , T., & Sajilan, S. (2017). Testing and Controlling for Common Method Variance: A Review of Available Methods. Journal of Management Sciences, 4 (2), pp. 142-168. doi:10.20547/jms.2014.1704202.

The World Bank (2020). Tanzania Overview. Accessed from www.worldbank.org/en/country/tanzania/overview on 12th December 2020.

Thoma, R. J., Cook, J. A., McGrew, C., & Puls, D. T. (2018). Convergent and discriminant validity of the Impact with traditional neuropsychological measures. Cogent Psychology, 5(1), 1-16. doi:https://doi.org/10.1080/23311908.2018.1430199

Thomas, W. (2012, June). Risk Management in the Real Estate Development Industry. Doctoral Thesis.

Xuefang, Z., & Wei, J. (2010). Study on the Risk Assessment of Real Estate Project Based on BP Neural Network. 2nd IEEE International Conference on Information and Financial Engineering (ICIFE) (pp. 535-537). China: IEDRC.

Appendices

Appendix 1: Discriminant validity test results

	PM	RO	RS	RC	EF	SF	LF
PM	1.000						
RO	0.027	1.000					
RS	0.104	0.167	1.000				
RC	0.096	0.091	0.107	1.000			
EF	0.082	0.023	0.068	0.220	1.000		
SF	0.018	0.036	0.059	0.076	0.122	1.000	
LF	0.004	0.056	0.008	0.022	0.124	0.085	1.000
AVE	**0.90**	**0.55**	**0.61**	**0.67**	**0.70**	**0.51**	**0.55**

Source: Author's Analysis (2022)

Appendix 2: Correlations results among latent factors

	PM	RO	RS	RC	EF	SF	LF
PM	1						
RO	0.163	1					
RS	0.3219*	0.4092*	1				
RC	0.3094*	-0.3011*	-0.3270*	1			
EF	-0.2867*	0.1522	0.2599	0.4687*	1		
SF	0.1337	0.1891	0.2429	0.2764*	0.3487*	1	
LF	-0.0635	0.2356	0.0867	0.1476	0.3517*	0.2920*	1

Note: In parentheses are standard errors; ***, **, * = 1%, 5%, and 10% significance level respectively

Source: Author's Analysis (2022)

Appendix 3: Model assumptions results

Model Assumption	Test	Benchmark
No heteroscedasticity problem	Breusch-Pagan hettest Chi2(1): 2.280 p-value: 0.131	> 0.05
No multicollinearity problem	Variance inflation factor (VIF) Social Factors: 1.58 Risk Severity : 1.31 Risk Controllability : 1.31 Legal Factors : 1.75 Economic Factors : 3.28 Org. Type Dummy : 3.64 Undergraduate Edu : 1.42 Postgraduate Edu : 1.35 5-10 yrs. of Experience : 1.75 10+ yrs. of Experience : 1.38 Risk Occurrence : 1.53	< 5.00
Residuals are normally distributed	Shapiro-Wilk W normality test z: 0.840 p-value: 0.201	> 0.01
No specification problem	Linktest t: -0.315 p-value: 0.753	> 0.05
Appropriate functional form	Test for appropriate functional form F(3,116):0.276 p-value: 0.843	> 0.05
No influential observations	Cook's distance no distance is above the cut-off	< 1.00

Source: Author's Analysis (2022)