

Relative Occurrence of Risk Factors in Real Estate Development Phases in Lagos State, Nigeria

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Abstract: This paper assesses the relative occurrences of risk factors in real estate development phases in Lagos State, Nigeria with a view to providing information that could enhance effective management of risks in real estate development projects. Adopting random sampling, primary data were obtained from sixty-eight real estate developers in Lagos State through survey questionnaires. Principal component analysis was used to regroup the risk factors through the application of Kaiser- Meyer- Olkin (KMO) and Bartlett's test values. At KMO of 0.747 and sig. of 0.000, the study established that the most significant risk factors in each phase of real estate development include pre-construction phase risk factors: land title and approval risks (mean = 4.45); resource risks (mean = 3.61); socio-political risks (Mean = 3.69); economic risks (Mean = 3.26); physical risks (Mean = 3.99) and environmental risks (Mean = 2.41). Contract negotiation phase risk factors: contract risks (Mean = 3.44) and financial risks (mean = 3.32). Formal commitment risk factors: legal risks (Mean = 3.175); personnel risks (Mean = 2.94); Insurance risks (Mean = 2.77). Construction phase risk factors: financial risks (Mean = 4.01); technical risks (Mean = 3.36); personnel risks (Mean = 3.16) and time-delay risks (Mean = 3.14). The study also established relatively that pre-construction phase has the highest risk occurrence with RII of 3.52 while the formal commitment phase (RII = 3.13) has the least occurrence of risks. This study will enhance familiarity of real estate developers with the specific risk factors in each phase of project.

Keywords: Risk Factors, Real Estate Development, Real estate Development Phases, Risk Management Strategies, Lagos State.

I. Introduction

Real estate is an important class of assets that contributes immensely to the economic growth of every nation including Nigeria. Between 2013 and 2014, the Nigerian real estate industry experienced an increase in growth rate of 20% and an increased rate of 13.1% between 2014 and 2017 [1]. By contributing up to 6.3% to the Nation's gross domestic product (GDP), real estate sector remains one of the top drivers that made Nigeria to record its positive (0.11%) quarterly

growth in the fourth quarter of 2020, an improvement upon the three negative growth rates from the previous quarters [2]. Therefore, the role played in the economic development of the nation by real estate sector cannot be underestimated.

Despite its significant contribution to economic development, real estate development industry is highly risky and can also cripple both local and international economies if the risks are not well managed. The creation of real estate is somehow considered to be a complex task as it involves the coordination of people with different set of skills and experience to carryout interconnected and interrelated activities. An overview of the real estate development process shows that real estate projects comprise of five major phases, namely; pre-construction phase, contract negotiation

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Submitted: 16-03-2022

Accepted: 30-09-2022

phase, formal commitment phase, construction phase and post-construction phase [3 and 4]. However, the execution of activities from one phase of the development to another is not easy, but is disintegrated, risky and very complex [5]. Each phase is typically associated with specific risks and therefore, risk remains a significant component of real estate development [6, 7 and 8]. Despite the risky nature of real estate development process, previous studies have only been confined to identification of general risk factors, with little attention to providing information on the specific occurrences of risk factors in each of the real estate development phases. This study attempts to bridge the knowledge gap in this regard.

The term “real estate” encompasses land and any structure or building on it including the air above it and everything under it. It ranges from residential to commercial office, trading spaces to agricultural properties, to specialized properties such as mosques, churches and hotels and industrial buildings such as factories [9].

Real estate development is a part of a social and political process, involving the distribution and control of resources [3]. It is a multifaceted business, which process invariably include a combination of the following: coming up with an idea, refining it, testing its feasibility, negotiating contracts, making a formal commitment, constructing the project, completing and opening it, and, finally managing the new project.

The main players in real estate development market are the developers, builders, real estate agents, tenants, buyers, etc. [9]. The developer is the party that motivates co-ordinates, makes crucial decisions and bears the main financial risks of the project. The components of real estate development process listed above are ultimately the responsibilities of the developer, even though the bulk of the work may be

undertaken by professional agents [10]. The developer therefore takes risks, manage risks, and try to eliminate or minimize risks or at least, getting them down to a bearable minimal. The development process describes the series of sequential activities from the conception of a development project through to actual construction and to eventual disposal of the development. Property development therefore involves the combination of various inputs in order to achieve an output or product. There is no universally accepted model of the property development process. [11] identified eight stages in the development process including initiation, evaluation, acquisition, design and costing, permissions, commitment, and implementation, let/manage/disposal. [12] identified three phases which are: acquisition, production and disposal. [4] recognized five phases including ‘pre-construction phase’, ‘contract negotiation phase’, ‘formal commitment phase’, ‘construction phase’ and ‘post-construction phase’.

According to [4], the pre-construction phase involves the decision to undertake a real estate development project and a site being selected. It also involves site appraisal and feasibility studies including a detailed design upon which planning permission is obtained. The contract negotiation phase covers the period of discussion of the contract terms and the conditions of the contract by the concerned parties. At the formal commitment phase, the developer signs all necessary contracts and is given the permission to start the actual construction. The construction phase is the phase where actual execution of the development takes place. The post-construction phase is where the completed development is disposed through outright sale or letting. These five constitute the various links in the real estate development supply chain. The distortion or malfunctioning of any

of these phases renders the development process ineffective especially in terms of maximizing income potential and minimizing of the cost. Given the important role of the real estate development sector in any economy, it is therefore important to assess the significance of the various risks at each phase of real estate development.

Since real estate development has to do with making a product available for the future; it is a process fraught with risk and uncertainty [12]. The risks factors are related to land, labour, time, finance, environment, building materials, manpower and management risks. Extensive lists of risks can be derived from many authors such as [8, 13, 14, 15, 16, and 17]. The authors identified real estate development risks as environmental, economic, physical, social, legal, technical,

organizational, financial and political. Some other authors such as [15] categorized risks as project-related risks, while [18 and 19] classified them as macro-level and micro-level risks. Others related risks to the participants in the development process [8 and 20]. The main purpose of the classification is to cover a wide range of risk factors. Table 1 shows the summary of examples of risk categories by different authors.

II. Materials and Methods

The study area is Lagos State, it was chosen as the research area because it is the centre of commercial and economic activities in Nigeria. This thereby makes the development of real estate to be relatively higher than any other parts of the country. The study employed field survey using well-structured

Table 1: Risk Factors in the Four-Phases of Real Estate Development Process

Real Estate Development Phase	Risk Factors
Pre-construction Phase	Land Title and encumbrance, Compliance risks, Occurrence of claims and disputes, Permission and approval risks, Site condition inappropriateness, Weather condition, Natural Disaster, Contamination, Poor consideration of site investigation, Risk of land reform and existing improvement, Accessibility risks, Inadequate equipment, Poor identification of source of services, Traffic risks, Incomplete market research, Portfolio diversification risks, Poor specification of financial performance benchmark, Poor identification and analysis of risks, Ill-defined funding and finance options, Workforce availability, Lack of support from local community, Lack of support from Government, Social unrest, Unreliable consultant report.
Contract Negotiation Phase	Poor preparation of contract terms among all parties, Ill-defined acquisition terms, Poor consideration of building contract terms, Land Cost risks, Ill-prepared specification of financial terms.
Formal Commitment Phase	Lack of sign of initial commitment among project team, Unsatisfactory potential labour skill, Ill-defined scope and adequacy of insurance facilities, Poor preparation and provision for insurance premium, Ill-preparation of legal documentation, Lack of process of execution of legal documentation.
Construction Phase	Builders experience in similar properties, Unsatisfactory monitoring of quality of construction work, Incomplete design/faulty design, Accident risks, Damage to property, Lack of safety officer, Lack of enforcement of compliance. Poor site communication, Increase in construction cost Inflation risk, Failure of client to pay/ delay of payment, Unfavorable weather condition, Lack of time-phased budget for tasks, Force majeure, Prolonged Contractors' strike

Source: Author's Compilation from Literature (2021)

Table 2: Profiles of Real Estate Development Firms

Parameters	Response Frequency	Percentage of Response
Year of Experience		
1-5	1	1.47
6-10	11	16.18
11-15	14	20.59
16-20	23	33.87
21+	19	27.94
Total	68	100
Academic Qualification		
OND	9	13.24
HND/B.Sc.	36	52.94
Masters	17	25.00
Ph.D.	6	8.82
Total	68	100
Professional Background		
Architect	12	17.65
Builder	18	26.47
Engineer	22	32.35
Estate Surveyor	16	23.53
Total	68	100
Position in the Firm		
Lower Management Level	6	8.82
Middle Management Level	18	26.47
Top Management Level	44	64.71
Total	68	100
Developer Categories		
Trader Developer	32	47.06
Investor Developer	23	33.82
Service Developer	13	19.12
Total	68	100

Source: Field Survey, 2021.

questionnaires administration on real estate developers in Lagos State, Nigeria through random sampling. The respondents were asked to select their options on likelihood of occurrence of risk factors in the phases of real estate development on a five-point Likert scale. A total of 101 questionnaires were administered through random sampling of real estate development firms and 68 questionnaires were retrieved and found useful for the study and this represents a response rate of 67.3 percent. Data obtained from the survey were analyzed with the use of simple percentages, mean ratings, factor analysis and relative importance index.

III. Results and Discussion

This section is structured into two parts. The first part examined the profiles of the real estate developers. The second part contained

the relative occurrence of risk factors in real estate development phases.

From Table 2, the background characteristics of the respondents revealed that they are largely experienced in real estate development as 61.81% of them have above 15 years' experience, educated (86.76% possessed HND/B.Sc. certificate and above) certified professionals (all respondents are registered members of their respective professional bodies) and 91.18% of the respondents are key members of top management board, who make real estate development decisions in their respective firms. From Table 3, it can be observed that the first three most significant occurring risk factors are land title and encumbrances (mean = 4.72), occurrence of claims and disputes (mean = 4.69), compliance risks (mean = 4.58) and risks of land reform and existing improvements and

Table 3: Pre-Construction Phase Risk Ratings

Risk factors	SWV	Mean	Rank
Land title and encumbrances	321	4.72	1
Occurrence of claims and disputes	319	4.69	2
Change in zone risks	161	2.37	23
Social unrest	234	3.44	15
Contamination	155	2.28	24
Weather condition	170	2.50	21
National disaster	166	2.44	22
Workforce availability	250	3.68	11
Permission and approval	258	3.80	9
Unreliable and consultant reports	239	3.52	14
Poor consideration of site investigation	241	3.54	13
Risk of land reform and existing improvement	307	4.51	4
Accessibility risks	266	3.91	5
Compliance risks	311	4.58	3
Site condition inappropriateness	209	3.07	18
Lack of support from local community	263	3.87	8
Lack of support from government	256	3.76	10
Incomplete market research	248	3.65	12
Portfolio diversification	217	3.19	16
Risk of inappropriate assumption	209	3.07	18
Inadequate equipment	266	3.91	5
Poor identification of sources of service	264	3.88	7
Traffic risks	202	2.97	20
Ill-defined funding and financial options	211	3.11	17
RII		3.52	

*SWV = Sum Weighted Value **RII = Relative Importance Index

Source: Author's Data Analysis, 2021

rated first, second and third occurring risk factors respectively. Also, other important risk factors in this stage includes inadequate equipment (mean = 3.91), accessibility (mean = 3.91), poor identification and analysis of risks (mean = 3.80), lack of support from local community (mean = 3.87), permission and approval risks (mean = 3.80), lack of support from government (mean = 3.76), workforce availability (mean = 3.68) and incomplete market research (mean = 3.68) and rated as the fifth, seventh, eighth, ninth, tenth, eleventh and twelfth risks respectively. Other risks, which are likely occurring risks include poor consideration of site investigation (mean = 3.54) and unreliable consultant report (mean = 3.52). The finding of this study reveals that at the pre-construction stage of real estate development, risks of varying compositions and degrees are already in existence. The result further shows that all the

risks are very important as reflected in their respective mean scores.

This suggests that occurrence of any of the risk factors could impede the smooth process of real estate development in this phase and this could lead to extension in the time of completion and delivery.

Having inquired into the risk factors, which occur in the pre-construction phase of real estate development, further analysis was done to reduce and regroup these risk factors, using principal component analysis. The author first established the suitability of factor analysis in this regard by subjecting the identified risk factors to Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. The data were found to fulfill the condition (i.e. KMO = 0.747, sig = 0.000) and was greater than 0.5 at 0.05 significant level as indicated in Table 4. Also, communality table for variable was examined; all variables were found to have

Table 4: KMO and Bartlett's Test Analysis

Factors	Kaiser-Meyer-Olkin measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	Df	Sig.
Risk Factors in Pre-Construction Phase	0.747	437.611	276	.000

Source: Author's Data Analysis, 2021

Table 5: Variance Rotated Factor Loading with Rotated Component Matrix for Risk Factors in the Pre- Construction Phase

Risk Factors in the Pre-construction Phase	Components					
	1	2	3	4	5	6
Land title and encumbrances	.872					
Compliance risks	.738					
Occurrence of claims and discipline	.724					
Permission and approval risks	.651					
Weather condition		.612				
Natural disaster		.578				
Contamination		.566				
Poor consideration of site investigation			.795			
Land reform and existing improvement			.762			
Accessibility risks			.664			
Inadequate equipment				.809		
Poor identification of source of service				.736		
Traffic risks				.688		
Work force availability				.654		
Incomplete market research					.902	
Ill-defined funding and finance options					.813	
Site condition inappropriateness					.631	
Lack of support from local community						.712
Lack of support from government						.629
Social unrest						.567

*Extraction method, 6 components extracted

Source: Author's Data Analysis, 2021

communality values of greater than 0. This indicated that the data and the variables were suitable and adequate for factor analysis [21].

The correlated component groups of pre-construction phase risk factors are presented in Table 5. From the result of the principal component analysis, the risk factors variables were found to load into six different components that contain only factors with primary loading of value greater than 0.4. From the table, component 1 had four (4) variables loaded on it which were land title and encumbrance, compliance, occurrence of claims and disputes and permission and approval risks. These variables relate mostly to title and approval, hence the group was named

title and approval risk factors. Also, weather condition, natural disaster and contaminations were loaded in component 2. They are mostly pertaining to environmental issues; hence, they were named environmental risk factors.

In the same vein, poor consideration of site investigation, land reform and existing improvements and accessibility risks were correlated to component 3. These factors were highly related to physical issues; hence the group was named physical risk factors. Furthermore, risk factors associated with inadequate equipment, poor identification of source of services, workforce availability and traffic were all correlated to component 4. These factors were mostly concerned with

Table 6: Mean Ratings for Pre-Construction Risk Factors Groups

Component	Risk Factor Group	Mean	Rating
1	Title and Approval Factors		
	Land Title and Encumbrances	4.72	
	Compliance risk	4.58	
	Occurrence of claims and disputes	4.69	
	Permission and approval	3.80	
	Overall	4.45	1
2	Environmental Factors		
	Weather Condition	2.50	
	Natural Disaster	2.44	
	Contamination	2.28	
	Overall	2.41	6
3	Physical Factors		
	Poor consideration of site investigation	3.54	
	Land reform and existing improvements	4.51	
	Accessibility	3.91	
	Overall	3.99	2
4	Resource Factors		
	Inadequate equipment	3.91	
	Poor identification of source of services	3.88	
	Workforce availability	3.68	
	Traffic risk	2.97	
	Overall	3.61	4
5	Economic Factors		
	Incomplete Market Research	3.65	
	Portfolio Diversification	3.19	
	Ill-defined funding and finance options	3.11	
	Site condition inappropriateness	3.07	
	Overall	3.26	5
6	Socio-Political Factors		
	Lack of support from local community	3.87	
	Lack of support from Government	3.76	
	Social Unrest	3.44	
	Overall	3.69	3

Source: Field Data Analysis, 2021

issues of resources; hence the group was named resource risk factors.

Also, incomplete market research, portfolio diversification risks, ill-defined funding and finance options and site condition inappropriateness were correlated towards component 5. These factors are mostly related to economic issues; hence, their group was named economic risk factor. Finally, risk variables, which include lack of support from local communities, lack of support from government and social unrest, were correlated to component 6. These factors pertain mostly to socio-political issues; hence they were named socio-political risks. The study established that the risk factors that frequently

occur in the pre-construction phase of real estate development were title and approval risks, environmental risks, physical risks, resource risks, economic risks and socio-political risks.

Further analysis was carried out to determine the mean rating for each risk factor group in the pre-construction phase of real estate development. From Table 6, Land title and approval (mean = 4.45) was rated as the most occurring risk factor in this phase. This was followed by Physical factors with a mean of 3.99. Socio-political factors and resource factors were rated as the third and fourth occurrence risk factors with respective means of 3.69 and 3.61 in this phase. Economic

factors (mean = 3.26) and environmental factors (mean = 2.41) were rated as the fifth and sixth risk factors respectively in terms of occurrence in the pre-construction phase of real estate development.

From Table 7 in the contract negotiation phase, poor consideration of building contract terms was rated first as the likely occurring risk factor with a mean of 3.57. This was followed by poor preparation of contract terms among all parties and land cost risks with means of 3.44 and 3.36 as the second and third risks respectively, which moderately occur in the phase of development. The fourth and fifth risk factors which occur moderately at the contract negotiation phase were ill-defined acquisition terms (3.31) and ill-prepared specification of financial terms (3.28) respectively. The risk factors poor preparation of contract terms among all parties, ill-defined acquisition terms and poor consideration of building contract terms were all related to contract issues; hence they were named contract risks. In the same vein land cost and ill-prepared specification of financial

terms pertain mostly to financial issues; hence, named financial risk factors. Therefore, the risk factors in the contract negotiation phase are contract risks and financial risks.

The occurrence of contract and financial risks in this phase could be linked to the fact that most of the activities involved in the contract negotiation phase relate to contract term and financial implications. One could therefore conclude that the findings are not unexpected. Also, the findings of this study corroborate [3] with respect to the risk factors in the contract negotiation phase.

From Table 8, it can be observed that at the formal commitment phase, lack of sign of initial commitment among project team (3.52) was considered as the first likely occurring risk factor. Ill-defined scope and adequacy of insurance facilities (3.36) and ill-prepared legal documentation (3.29) were respectively considered as second and third risk factors which occur moderately in this phase of development. They were followed by poor preparation and provision for insurance

Table 7: Contract Negotiation Phase Mean Risk Rating

Risk Factors	SWV	Mean	Rank
Poor preparation of contract terms among all parties	234	3.44	2
Ill- defined acquisition terms	225	3.31	4
Poor consideration terms	243	3.57	1
Land cost risks	228	3.36	3
Ill- prepared specification of formulation	223	3.28	5
RII		3.39	

Note: SWV = Sum of Weighted value, RII = Relative Importance Index

Source: Author's Field Data Analysis, 2021

Table 8: Formal Commitment Phase Risk Rating

Risk Factors	SWV	Mean	Rank
Lack of sign of initial commitment	239	3.52	1
Ill-defined scope and adequacy of insurance facilities	228	3.36	2
Poor preparation and provision for insurance premium	211	3.11	4
Ill-prepared legal documents	224	3.29	3
Lack of process of execution of legal documentation	208	3.96	5
Unsatisfactory potential labour skill	165	2.43	6
RII		3.13	

***SWV = Sum of Weighted Value, **RII = Relative Importance Index**

Source: Author's Data Analysis, 2021

Table 9: Construction Phase Risk Rating

Risk factor	SWV	Mean	Rank
Builders experience in similar properties	208	3.06	12
Unsatisfactory monitoring of quality work	222	3.26	10
Incomplete design/faulty design	239	3.51	8
Accident risk	260	3.82	5
Damage to property	262	3.86	4
Absence of safety officer	245	3.63	6
Lack of enforcement of compliance	244	3.59	7
Increase in construction cost	316	4.64	1
Inflation	213	3.13	11
Poor site communication	228	3.35	9
Failure of client to pay/ delay in payment	290	4.27	3
Weather condition	154	2.56	14
Lack of time- phased budget for tasks	204	3.00	13
Force majeure	164	2.41	15
Prolonged contractor's strike	311	4.58	2
RII		3.51	

*SWV = Sum of Weighted Value, **RII = Relative Importance index

Source: Author's Data Analysis, 2021

premium (mean=3.11) and lack of process of execution of legal documentation (3.06) as the fourth and fifth moderately occurring risk in this phase. The least occurring risk factor in this phase was unsatisfactory potential labour skill with 2.43 mean rating.

Table 9 shows the construction phase risk rating, from the table, it is shown that increase in cost of construction was considered as the very likely occurring risk with a mean of (4.64). This is followed by prolonged contractor's strike (mean = 4.58) and failure of client to pay or delay in payment risks (mean = 4.27), which were respectively rated as the second and third very likely occurring risk factors in the construction phase. Also, damage to property and accident risks were considered as the fourth and the fifth risk factors with means of 3.86 and 3.82 respectively.

Furthermore, absence of safety officer (3.63), lack of enforcement of compliance (3.59), incomplete/faulty design (mean = 3.51) were considered as the sixth, seventh and eighth risk factors respectively in terms of likelihood of occurrence. They were followed by poor site communication (3.35), unsatisfactory monitoring of quality of work (3.26) and

inflation (3.13) which were rated ninth, tenth and eleventh risk factors that moderately occur in the construction phase respectively. Other risk factors, which were considered as moderately occurring risks in the construction phase, were Builders' experience in similar properties (3.06) and lack of time phase budget for tasks (3.00). The least rated risk factors in this phase were risk connected with weather condition (2.56) and force majeure (2.41) as they have been reported to be unlikely occurring risk factors in this phase.

When comparing the occurrence of risk factors in the four phases of real estate development considered by this study, the pre-construction phase had the greatest likelihood of occurrence of risk factors with RII = 3.52. This is followed by the construction phase with relative importance index of 3.51. The third rated phase of development in terms of likelihood of occurrence of risk factor is the contract negotiation phase (RII = 3.39). The formal commitment phase (RII = 3.13) was considered as the phase with the least occurrence of risks.

IV. Conclusion

The study examined the relative occurrence risk factors in real estate development phases with a view to providing information that will enhance risk management practice in real estate development industry. Previous studies have only been confined to identification of risk factors in real estate development process as a whole with no information on the specific phase of development that the risk factors occur as well as the relative occurrence of the particular risk factors in each phase. This study therefore bridge knowledge in these areas. The study established that the preconstruction phase is relatively most prone to occurrences of risk factors such as land title and approval risks, resource risks, economic risk, physical risks and environmental risks. This is followed by the construction phase with relatively high level of occurrence of risk factors that include financial risks, technical risks, personnel risks and time-delay risks. The Formal commitment phase is next in terms of occurrence of risk factors, which include legal risks, personnel risks and insurance risks. The phase with the least occurrence of risk factor is contract negotiation phase with inherent contract risks and financial risks. It is recommended that real estate developers should make necessary efforts to prevent the occurrence of risk factors in each phase of real estate development. Effort should also be made towards adoption of appropriate risk management strategies in each phase should any risk occurs.

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