**Survey on Risk Assessment Techniques Applied in Real Estate Development Project in Nigeria**

**(A Case Study of Federal Capital Territory, Abuja)**

**Austin C. Otegbulu**

**Mohammed I. Mohammed**

**G.K Babawale**

**Dept. of Estate Management University of Lagos**

**austinotegbulu@yahoo.com**

**Abstract**

Real estate development is fraught with risks and uncertainties spanning through all the stages of the development process. The focus of this study is to examine the application of risk assessment techniques in real estate development project in the study area. Convenience sampling technique was used in administering questionnaire to the 69 respondents who responded to the survey. The study revealed that the most prevalent risks encountered in real estate development project were economic, political and social risks. Similarly, the most frequently used risk assessment technique employed by project managers, developers, and feasibility consultantsare qualitative description and scenario/sensitivity analysis. This was influenced by the level of their familiarity with the methods as shown by the measures of association between the two variables.

**Introduction**

Real estate development is a multifaceted business, encompassing activities that range from renovation and re-lease of existing buildings to the acquisition of paw or bare land and the sale of improved process to others. These activities are coordinated by developers or their appointed agents or consultants. Developers take the greatest risk in the creation or renovation of realestate. They also receive the greatest reward depending on the circumstances (Peiser and Frey 2007, Cadmen and Topping 2006). They are responsive and respond to events as they occur and are ready for the unexpected. Developers that take a lot of risks associated with the development process and also work towards managing these risks. They try to eliminate or minimize risk by getting it down to an acceptable level. There has been repeated reference to the high degree of risk and uncertainted inherent in property process and of the need for development to minimize it in the absence of complete elimination (Millington 2009, Adair and Hutchinson 2005, Preiser and Frey 2007). Every part of the development process is fraught with the risk and uncertainties and the first step towards risk management is identification of risk and assessment with the chronological stages of property development process being broadly identified (by CadmenandThopping 2006, Bryne miles 2000), most approaches concentrate on the risk measurement I place of identification or privatization of key risk element in property developmentprocess.

Risk identification and assessment is very critical to real estate development and risk management. Thevariouscollapses in the global property market have been blamed on poor investment appraisal carried out by estate valuers.

In the Nigerian property market (with particular reference to Abuja and Lagos) a lot of developed property remain unlet or unsold due to poor or no market research which exposes the developer/investor to the risk of prolonged void and delay in cost recovery period.

Risk occurrence in real estatedevelopment projects must be considered and should not be underestimated as it affects the project management process with regard to project management delay, project cost over-run and quality of products (Khumpaisal and Chen undated).

Irrespective of thetype and size of the project, real estate development is prone to risks that are related to social, technological, environmental, economic and political factors(Khumpaisal& Chen, 2010; Khumpaisal, Ross &Abdulai, 2010; Newell &Steglick, 2005) which affect the expected income, timely delivery, use and general orientation of the conceived project.The effect of riskemanating from these factorscan be minimized to a bearable level, transferred toor shared with another party or even avoided completely (Alitheia Capital, 2010; AbouRizk, undated). However, this can only be achieved when such risks can be identified, quantified and analyzed. One way through which this can be achieved isthe use of risk assessment techniques that will enablecomputation of results quantitatively and can be used in used in decision-making.

In the international real estate investment market, investorstake into cognizance the risk profile of acountry in terms of political stability, business environment, currency fluctuation and other factors before committing their resources into any real estate investment. In addition, consideration is also given to real estate specific risk such as entitlement risk, legal risk, market risk, financial risk and many other risks associated with real estate investment (Odusote, 2008).

In line with the aforementioned background therefore, the aim of this study is to examine the application of risk assessment techniques in real estate development projects in Abuja, Nigeria.

**Literature**

**Real Estate Development Process**

As pointed by Fisher and Robison (2006)real estate development is a complex stochastic process whose featuresvary with time and place. It is also described as a multifaceted business, encompassing activities that range fromthe renovation and re-lease of existing buildings to the purchase of raw land and the sale ofimproved parcels to others(Gehner, Holmas&Jonge, 2006). This indicates that real estate development is not only restricted to the construction of new buildings only but extends to upgrading, modification, and rehabilitation of existing property. It is also described as a process that involves the coordination of series of interrelated activities which resulted into translating ideas on paper into real property (Peiser & Frej, 2003).

As a multifaceted business, real estate development involves the coordination of a wide range of stakeholders and input resources in order to realize the end product, that is, a piece of real estate. Interaction of these elements makes the whole process complex and risky as each of the elements has its unique characteristics and exerts different risk potential which can affect the overall process. The whole process is associated with risk such as schedule delay, cost overrun, change in government policy, quality ofproducts, and other factors.Thus Fisher (2005) identified long-term trends, the economy, property markets, actors,government, the site and the events-sequence as the major elements that define the complexity of real estate development project. The uncertainties associated with these factors make the real estate development process risky.

**Risk in Real Estate Development**

The British Standard Institute (1991) defined risk as *“*a combination of the probability, or frequency, of the occurrence of a defined hazardand the magnitude of the consequences of the occurrence” while in another perspective it is viewed as thecombination of the probability of an event and its consequences” (RICS 2004).Baum and Crosby (2008) define risk as the uncertainty of anexpected rate of return from an investment, while Hargitay and Yu (1993)define it as the unpredictability of the financial consequences of actionsand decisions. Similarly, according to Huffman (2002) , risk is the extentto which the actual outcome of an action ordecision may diverge fromthe expected outcome.

According to these definitionsany activity thathas elements of certainty and uncertainty or cost and benefit can said to berisky and this is feature is well suited to the real estate development.The risks involved in risk estate development are numerous.The very nature of the development process which comprises a wide scope of activities ranging from initiation to project completionmakes the whole activity a risky undertaken.

The risk associated to real estate development emanates from five factors acronymas‘STEEP’: Social, Technological, Environmental, Economic and (Morrison, 2007).Therisks resultingfrom these factorsfeatures in the various stages of project lifecycles and they have effect on the overall project (Newell &Steglick, 2006). Subjective factors such as policy change social or community objection of a project has been identified as having indirect consequences on the progress of a project which further lead to delay in completion dates, the marketing process and the non-realization of expected revenue due to decrease in rental/sale price, decrease in velocity of sales, higher vacancy rate and lower investment value(Gehner *et al,*2006).

Real estate development risksare framed by market and other forces and the decisions of other stakeholders in the process.The process surpasses the traditional ‘event sequence’ approach and nowincorporates the application of theories from other fields such as structure and agency theory, institutional analysis and institutional economics (Fisher and Robinson, 2006). Thus,the interaction of these actors coupled with the wide range of variables involve in the real estate development process requires sophisticated risk modeling which would also help developers to structure the decision-making process in any development process (Khumpaisal, Ross &Abdulai, 2010).

**Classification of Real Estate Development Risks**

There are many classifications of risk factors as real estate development is concerned. Hargitay and Yu, (1993) ;Ajayi (1998); Brown & Matysiak, (2000) and Baum &Crosby,(2008)classified risk into two broad classes: Systematic and Unsystematic. According to the authors, systematic risk (uncontrollable risk) isthe type of risk caused by external factors that affect all investments;examples include market risk, inflation or purchasing power risk, andinterest rate risk. Unsystematic or specific risk refers to risk over whichthe investor has limited control, and is specific to a particular company orinvestment decision-making process.

On the other hand, Crossland et al (1992) classified risk based on perceptions of decision-makers where risks are described as multidimensional, with aparticular meaning to different people and different things in differentcontexts. Similarly, Pidgeon *et al* (1992) classify risk into‘objective’ (statistical risk) and ‘subjective’(perceived risk). He posits thatobjective risk is unique, substantive and physicallymeasurable, and can be determined by quantitative risk assessmentmethods while as expounded by Spaulding (2008), subjective risk is what anindividual perceives to be a possible unwanted event and its degree of severity depends on people’s experience of their history and theexpectation of its occurrence. Subjective risk also involves subjectiveprobability or the perception of the decision maker of the likelihood andconsequence of the event (Khumpaisa, Ross &Abdulai, 2010).

The above mentioned classifications are applicable to risk in other fields includingthe general real estate investment. With respect toreal estate development, Tsai and Yang (2009)considernatural phenomena, economic/ finance, politics/society, industrial characteristics, contract, construction, job site, safety/ environment, client, design, and contractor as the sources of risk as shown in Table 2.Morisson (2007) narrowed down these risks into five distinct classes, which he named ‘STEEP’ factors: social, technological, environmental, economic and political factors (Table 1).

**Table 1: Classification of Real Estate Development Risks Based on STEEP Factors**

|  |  |
| --- | --- |
| **Risk Factors** | **Risk Elements** |
| **Social** | **Workforce Availability** |
| **Community Acceptability** |
| **Cultural Compatibility** |
| **Public Hygiene** |
| **Technological** | **Site Condition** |
| **Designer & Constructors** |
| **Multiple Functionality** |
| **Constructability** |
| **Duration** |
| **Amendments** |
| **Facilities Management** |
| **Accessibility & Evacuation** |
| **Durability** |
| **Environmental** | **Adverse Environmental Impact** |
| **Climate Change** |
| **Economic** | **Purchasability** |
| **Brand Visibility** |
| **Capital Exposure** |
| **Life Cycle Valuation** |
| **Area Accessibility** |
| **Buyers** |
| **Tenants** |
| **Investment Return** |
| **Political** | **Political Group/Activists** |
| **Communal Tax Policy** |
| **Local Tax Policy** |
| **Council approval** |
| **License Approval** |

**(Adapted from Khumpaisal& Chen, 2010)**

**Table 2: Classification of Real Estate Development Risk**

**A. Natural Phenomenon H. Safety / Environment**

A01.Earthquake H01.Environment damage/pollution

A02.Fire H02.Accident-related loss

A03.High gale H03.Traffic or work hour restriction

A04.Rainfall H04.Third partyfs objection

**B. Economics/Finance** **I. Client**

B01.Increased materials cost I01.Feasibility study

B02.Exchange rate fluctuation I02.Unreasonable demand

B03.Difficulty of financing I03.Reference by subcontractors

B04.Low market demand I04.Relation with the third party

B05.Strong Competitor I05.Late payment

**C. Politics/society** I06.Reliance on architect/consultant

C01.Change of laws I07.Jobsite superintendent beingincompetent

C02.War/revolution/riot I08.Financial

C03.Bribery/corruptionproblem/bankruptcy I09.Difficulty in choosing businessdealer

C04.language/cultural barrier **J. Designer**

C05.Lobby (legal/illegal) J01.Constructability

C06.Rigid bureaucracy J02.Vague drawing specifications

**D. Industrial characteristics** J03.Incomplete construction area

D01.Monopolsied bidding J04.Incompetent supervision skill**s**

D02.Labour union J05.Frequent design change

**E. Contract** J06.Lack of fair stance

E01.Unequal contractual provisions **K. Contractor**

E02.Dispute among entities K01.Stringent contractual terms

E03.Unjust arbitrator K02.Deficit contracting

E04.Inadequate insurance coverage K03.Short of manpower or experience

E05.Defect warranty K04.Higher cost than bid taking

E06. Misjudged cost estimation K05.Short of capital/equipment

**F. Construction** K06.Local jobsite particularity

F01.New technology implementation K07.Shortage in machine tools and workers

F02.Too high quality standard K08.Low safety awareness

F03.Faulty job field survey mobilization K09.Errenous allocation of human resource

due to clashes of several projects K10.Lack of trustworthy support by subcontractor

F04.Inadequate construction planning K11.Low working morale

F05.Inadequate procurement planning K12.High personnel mobility

**G. Job site**

G01.Incompetent planning

G02.Incompetent management

G03.Incompetent coordinator

**(Adapted from Tsai & Yang, 2009)**

**Risk Assessment in Real Estate Development**

Risk management is described as a three-cycled process that involves risk assessment/analysis, risk response and risk control. Risk assessment/analysis involves identification of riskboth qualitatively and quantitatively. Riskresponse is described as the willingness of people to knowingly take risk while risk control is describes as how people respond or take measures against risk which can either be through one or combination of the following: avoidance, reduction, transfer, oracceptance of the risk (Simon, Houghton & Aquino, 2000).

The purpose of risk assessment in real estate development is to explicitly identify risk in both qualitative and quantitative ways (Gehner, et. al, 2006).Risk assessment is very crucial in real estate development project because it guidethe decision maker in the overall risk management process by identifying such factors that have potential impact on the conceivedproject which may likely affect the expected income, timely completion andsuccessful execution of the project.Thus without the risk being assessed or analyzedresponding to itand controlling it will be impossible.

Several techniques have been devised for assessing the risks inherent in real estate development projects.These techniques vary from use of intuition/experience to the application of more sophisticated models. The various risk assessment techniques can be categorized into two main groups: qualitative techniques and quantitative techniques.

The qualitative technique involves the use of subjective or personal opinion in form of discussion panel, Delphi techniqueand intuitive method to qualifythe risks associated with a particular project. The rating usually is in the form of ‘low’, ‘medium’ and ‘high’ scale, colour code,or detailing and prioritizing using a probability-impact matrix(AbouRikz, undated; Fisher & Robinson, 2006).Khumpaisal&Chen (2010)which are critical of the method for its dependence on personal intuition,its failure to provide comparative result for comparison among different criteriaand the failure to provide details of data that will aid decision-maker to structure the decision-making process.

On the other hand, quantitative assessment of risk involvesassigningprobabilities orlikelihood to the variousfactors and a value forthe impact and then identifyseverity for each factor (AbouRikz, undated). It involves the application of both mathematical and statistical tools such as expected value, Real Option Analysis, financial measures, life cycle costing and computer simulation (Monte Carlo Simulation) andAnalytical Network Process(ANP)to practically assess the risk involved in real estate projects. By using these tools, objective consideration is made on the various risk factors in a project as against the subjectivity of the qualitative assessment as noted above. Thus,qualitative approach to risk assessment helps investors ordecision makers to set priorities and make the best decision when bothqualitative and quantitative aspects of a decision need to be considered (Cheng and Li, 2004; Saaty, 2005).

**Methodology**

The study was a survey on application of risk assessment techniques in real estate development projects in the Federal Capital Territory Abuja, Nigeria. The sample frame for the study was the 2010 Register of firms of the Nigerian Institution of Estate Surveyors and Valuer, F.C.T. branch. According to the register, there were 107 registered Estate Surveying and Valuation firms in the area. The sampling technique adopted was convenience sampling where 80 representing about 74.8% of the sample frame were administered with questionnaire based on Bartlett, Kotrlik and Higgins (2001). Out of the 80 sets of questionnaires administered 69 (86.25%) were retrieved and used for analysis.questionnaire was administered after enquiry of whether the firm undertake one or all of these functions with regard to real estate.

**Data Analysis and Discussion**

**Table 3: Respondent’s Characteristics**

**Variable Frequency Percentage**

***Educational Qualification***

OND 4 5.8

HND 26 37.7

B, Sc. 35 50.7

M. Sc. 1 1.4

Others 3 4.3

***Experience (Year)***

1-5years 11 15.9

6-10years 31 44.9

11-15yeras 22 31.9

15 above 5 7.2

***Role in Real Estate Development Project***

Project Manager 23 33.3

Developer 20 29.0

Feasibility Consultant 14 20.3

All of the above 12 17.4

***Nature of Clients***

Private Individuals 46 66.7

Public 4 5.8

Indigenous companies 17 24.6

Foreign Companies 2 2.9

***Project Size***

Large 20 29

Medium 32 46.4

Small 17 24.6

***Risk Consideration in Projects***

Yes 69 100

***Use of Risk Assessment Techniques***

Yes 65 94.2

No 1 1.4

Missing 3 4.3

**Source: Field Survey (2011)**

Table 3 shows the characteristics of the respondents. More than half of the respondents were B. Sc. holders (50.7%) while 37.7% were HND holders. The number of respondents that were OND, M.Sc and Others (all PGD in Construction Management) were 4 (5.8%), 1 (1.4%) and 3 (4.3%) respectively.

**Table 4: Level of Encounter with Various forms of Risk Factor**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Always | Often | Seldom | Neutral | Never | Mean |
| Social Risk | 10 | 23 | 24 | 11 | 1 | 3.43 |
| Technological Risk | 2 | 9 | 18 | 19 | 21 | 2.30 |
| Economic Risk | 29 | 32 | 5 | 3 | - | 4.26 |
| Environmental Risk | 9 | 10 | 24 | 22 | 4 | 2.97 |
| Political Risk | 26 | 33 | 7 | 2 | 1 | 4.17 |

**Source: Field Survey (2011)**

Table 4 shows the respondents’ level of encounter with the various risk factors in real estate development project. Economic risk was identified as the most prevalent form of risk encounter by the respondents with a mean score of 4.26. Political risk was identified as the next most prevalent risk factor associated with real estate development in the study area mean score of 4.17.Social risk had a mean score of 3.43. However, risks emanating from technological and environmental factors were less encountered. The mean score for these classes of risk were 2.30 and 2.97 respectively.

**Table 5: Level of Familiarity with the Variuos Risk Assessment Techniques**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Very Familiar | Familiar | Somewhat Familiar | Neutral | Not Familiar | Mean |
| Familiarity with Intuition Method | 19 | 35 | 7 | 8 | - | 3.94 |
| Familiarity with Qualitative Description | 22 | 43 | 1 | 3 | - | 4.22 |
| Familiarity with Checklist | 13 | 31 | 17 | 7 | - | 3.68 |
| Familiarity with Scenario Testing | 36 | 13 | 12 | 8 | - | 4.12 |
| Familiarity with Analytical Neural Network | - | 6 | 8 | 29 | 26 | 1.91 |

**Source: Field Survey (2011)**

As shown in Table 5 the respondents were more familiar with the quantitative description method of risk assessment where risks are labeled as “high”, “medium” and “low” (mean score = 4.22), scenario testing/sensitivity analysis (mean score = 4.12) and intuition method (mean score = 3.94) They were however less familiar with analytical neural network (mean score = 1.91).

**Table 6: Level of Application of the Variuos Risk Assessment Techniques**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Always | Often | Seldom | Neutral | Never | Mean |
| Use of Intuition/personal experience Method | 12 | 27 | 12 | 12 | 6 | 3.39 |
| Use of Qualitative Description | 21 | 43 | 1 | 2 | 2 | 4.15 |
| Use of Checklist | 2 | 20 | 23 | 23 | 1 | 2.99 |
| Use of Scenario Testing | 19 | 22 | 8 | 17 | 3 | 3.54 |
| Use of Analytical Neural Analysis | - | 2 | 4 | 15 | 48 | 1.42 |

**Source: Field Survey (2011)**

The level of application of the various risk assessment techniques is as shown in Table 6. The most often used method was qualitative description (mean = 4.15). This is followed by use of scenario testing (mean = 3.54), intuition/personal experience (3.39), checklist/risk assessment matrix (mean = 2.99) and lastly by use of analytical network process (mean = 1.42).

Majority of the respondents resort to qualitative analysis which is easy but non- robust. This exposes real estate projects to great risks and makes them vulnerable to economic and political dynamics.

**Table 7: Crosstabulation of Level of Familiarity and Use of Intuition Method**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Use of Intuition Method | | | | | Total |
|  |  | Always | Often | Seldom | Neutral | Never |  |
| Familiarity with Intuition Method | Very Familiar | 3 | 9 | 6 | 1 | - | 19 |
| Familiar | 9 | 18 | 4 | 2 | 2 | 35 |
| Somewhat Familiar | - | - | 2 | 5 | - | 7 |
| Neutral | - | - | - | 4 | 4 | 8 |
| Total | | 12 | 27 | 12 | 12 | 6 | 69 |

**Source: Field Survey (2011)**

Table 7 shows the cross-tabulation of the level of familiarity with intuition method of risk assessment and the level of application of same. Among the 19 respondents, who were very familiar with the method 3, always used the method, 9 often used it, 6 seldom used it while 1 respondent was neutral. Nine respondents who always used the method were familiar with the method, 18 often used it, 4 seldom used it,2 were neutral while 2 indicated that they never used it. Similarly, of those who indicated that they were somewhat familiar, 2 seldom used it while 5 never used it.

**Table 8: Symmetric Measures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Value | Asymp. Std. Errora | Approx. Tb | Approx. Sig. |
| Ordinal by Ordinal | Kendall's tau-b | .386 | .096 | 3.672 | .000 |
| Spearman Correlation | .461 | .107 | 4.248 | .000c |
| Interval by Interval | Pearson's R | .585 | .080 | 5.905 | .000c |
| N of Valid Cases | | 69 |  |  |  |

| a. Not assuming the null hypothesis. |
| --- |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| c. Based on normal approximation.  **Source: Field Survey (2011)** |

Table 8 displayed the symmetric measures of the cross-tabulated variables. All the three measures of association returned strong correlation between level of familiarity and the level of use of the method at 5% level of significance.

**Table 9: Cross-tabulationof Familiarity and Use of Qualitative Description**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Use of Qualitative Description | | | | | Total |
|  |  | Always | Often | Seldom | Neutral | Never |  |
| Familiarity with Qualitative Description | Very Familiar | 9 | 12 | 1 | - | - | 22 |
| Familiar | 12 | 31 | - | - | - | 43 |
| Somewhat Familiar | - | - | - | 1 | - | 1 |
| Neutral | - | - | - | 1 | 2 | 3 |
| Total | | 21 | 43 | 1 | 2 | 2 | 69 |

**Source: Field Survey (2011)**

From Table 9, among the 22 respondents who were very familiar with the qualitative description method, 9 always used the method, 12 often used it while 1 respondent was neutral. Of the 43 respondents who were familiar with the method, 12 and 13 indicated that they always and often used it respectively while 1 respondent who was neutral about use of the method indicated he was somewhat familiar with the method. 2 respondents who were neutral about the method’s familiarity never used the method.

**Table 10: Symmetric Measures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Value | Asymp. Std. Errora | Approx. Tb | Approx. Sig. |
| Ordinal by Ordinal | Kendall's tau-b | .290 | .130 | 2.082 | .037 |
| Spearman Correlation | .300 | .134 | 2.577 | .012c |
| Interval by Interval | Pearson's R | .620 | .125 | 6.466 | .000c |
| N of Valid Cases | | 69 |  |  |  |

| a. Not assuming the null hypothesis. |
| --- |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| c. Based on normal approximation. |

**Source: Field Survey (2011)**

Table 10 displayed the symmetric measures of the cross-tabulated variables. All the three measures of association returned strong correlation between level of familiarity and the level of use of the method at 5% level of significance.

**Table 11: Cross-tabulation of Familiarity and Use of Checklist Method**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Use of Checklist | | | | | Total |
|  |  | Always | Often | Seldom | Neutral | Never |  |
| Familiarity with Checklist | Very Familiar | 1 | 6 | 3 | 3 | - | 13 |
| Familiar | 1 | 14 | 12 | 3 | 1 | 31 |
| Somewhat Familiar | - | - | 7 | 10 | - | 17 |
| Neutral | - | - | 1 | 6 | - | 7 |
| Total | | 2 | 20 | 23 | 22 | 1 | 68 |

**Source: Field Survey (2011)**

Table 11 shows cross-tabulation of familiarity and use of checklist method. 13 respondents indicated that they were very familiar with the method out of which 1 always used it, 6 often, 3 seldom and 1 was neutral.Among the 34 respondents who were familiar with the method, 1always used it, 14 often, 12 seldom, 3 respondents indicated neutral and 1 respondent never used it. Of the 17 respondents who indicated that they were somewhat familiar with the method, 1 seldom used it while 10 never used it at all. 1 respondent who indicated his neutrality on the level of familiarity of the method indicated that he seldom used it while 6indicated that they never used the method.

**Table 12: Symmetric Measures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Value | Asymp. Std. Errora | Approx. Tb | Approx. Sig. |
| Ordinal by Ordinal | Kendall's tau-b | .463 | .087 | 5.183 | .000 |
| Spearman Correlation | .520 | .097 | 4.941 | .000c |
| Interval by Interval | Pearson's R | .504 | .091 | 4.735 | .000c |
| N of Valid Cases | | 68 |  |  |  |

| a. Not assuming the null hypothesis. |
| --- |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| c. Based on normal approximation. |

**Source: Field Survey (2011)**

Table 12 displayed the symmetric measures of the cross-tabulated variables. All the three measures of association returned strong correlation between level of familiarity and the level of use of the method at 5% level of significance.

**Table 13: Cross-tabulation of Familiarity and Use of Scenario Testing**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Use of Scenario Testing | | | | | Total |
|  |  | Always | Often | Seldom | Neutral | Never |  |
| Familiarity with Scenario Testing | Very Familiar | 15 | 12 | 5 | 3 | 1 | 36 |
| Familiar | 4 | 9 | - | - | - | 13 |
| Somewhat Familiar | - | 1 | 3 | 7 | 1 | 12 |
| Neutral | - | - | - | 7 | 1 | 8 |
| Total | | 19 | 22 | 8 | 17 | 3 | 69 |

**Source: Field Survey (2011)**

From Table 13, 36 respondents showed that they were very familiar with the method of scenario testing out of which 15 always used it, 12 often, 5 seldom, 3 neutral while 1 respondent never used it. 4 among the 13 respondents that were familiar with the method always used the method, while 9 often used it. 12 respondents indicated that they were somewhat familiar while 8 were neutral.

**Table 14: Symmetric Measures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Value | Asymp. Std. Errora | Approx. Tb | Approx. Sig. |
| Ordinal by Ordinal | Kendall's tau-b | .502 | .085 | 5.439 | .000 |
| Spearman Correlation | .571 | .094 | 5.693 | .000c |
| Interval by Interval | Pearson's R | .638 | .082 | 6.778 | .000c |
| N of Valid Cases | | 69 |  |  |  |

| a. Not assuming the null hypothesis. |
| --- |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| c. Based on normal approximation. |

**Source: Field Survey (2011)**

Table 14 displayed the symmetric measures of the cross-tabulated variables. All the three measures of association returned strong correlation between level of familiarity and the level of use of the method at 5% level of significance.

**Table 15: Cross-tabulation of Familiarity and Use of Analytical Neural Process**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Use of Analytical Neural Process | | | | Total |
|  |  | Often | Seldom | Neutral | Never |  |
| Familiarity with Analytical Neural Process | Familiar | 2 | 1 | - | 3 | 6 |
| Somewhat Familiar | - | 3 | 2 | 3 | 8 |
| Neutral | - | - | 8 | 21 | 29 |
| Not Familiar | - | - | 5 | 21 | 26 |
| Total | | 2 | 4 | 15 | 48 | 69 |

**Source: Field Survey (2011)**

Table 15 indicated that only 6 respondents were familiar with the method among which 2 often used it, seldom used it while 3 never used it. 8 respondents showed that they were somewhat familiar.Among which 3 seldom used it, 3 never at all while 3 were neutral. 29 respondents indicated neutral on familiarity of the method while 26 were not familiar.

**Table 16: Symmetric Measures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Value | Asymp. Std. Errora | Approx. Tb | Approx. Sig. |
| Ordinal by Ordinal | Kendall's tau-b | .307 | .114 | 2.470 | .013 |
| Spearman Correlation | .327 | .121 | 2.832 | .006c |
| Interval by Interval | Pearson's R | .468 | .126 | 4.333 | .000c |
| N of Valid Cases | | 69 |  |  |  |

| a. Not assuming the null hypothesis. |
| --- |
| b. Using the asymptotic standard error assuming the null hypothesis. |
| c. Based on normal approximation. |

**Source: Field Survey (2011)**

Table 16 displayed the symmetric measures of the cross-tabulated variables. All the three measures of association returned strong correlation between level of familiarity and the level of use of the method at 5% level of significance

**Discussion and Conclusion**

The preceding analyses showed that the STEEP factors have varying degree of impact on real estate development with economic, political and social risk factors identified as the most prevalent sources of risk in real estate development projects. Similarly, it was discovered that the level of application of the various risk assessment techniques among the respondents is dependent on the level of familiarity. This was shown by the symmetric measures between the two variables where in the case of intuition method, checklist, qualitative description and scenario testing the respondents’ familiarity with the methods resulted to their high frequency of use while in the case of analytical neural process the non-familiarity of the method was indicative of the low usage among respondents.

By implication professionals are not applying advanced and qualitative techniques in their analysis. The likely impact of this is on real estate investment decision could be disastrous and may result in property market collapse and investment loss. Sustainable mortgage industry is dependent on goods investment analysis advice.

There is therefor, an urgent need to train and retrain real estate investment advisers to adapt to the dynamics of real estate investment industry and the property market. The real estate industry can only be sustained by a knowledge driven property market.

**References**

AbouRizk, (n.d.). Risk and Uncertainty in Construction an Overview, Retrieved from

[www.investmedia.org](http://www.investmedia.org) on 23/09/2011.

Ajayi, C. A. (1998). Property Investment and Analysis, De-Ayo Publication Ltd, Ibadan.

Babalakin, A. (2004). Key Constraints to Real Estate Development in Nigeria, Retrieved

23/09/2011from [www.babalakinandco.com](http://www.babalakinandco.com).

Baum , A . and Crosby , N . (eds.) ( 2008 ) Principles of investment analysis.*Property Investment*

*Appraisal* . Oxford, UK: Blackwell Publishing.

British Standards Institute (1991) *Quality Vocabulary BS4778*, BSI, London

Brown , R . G .andMatysiak , A . G . (eds.) ( 2000 ) Risk, return and diversification . *Real*

*Estate Investment: A Capital Market Approach*. Essex, Financial Times: Prentice Hall.

Cheng , E . W .L .and Li , H .( 2004 ) Contractor selection using the analytic network process .

*Journal of Construction Management and Economics* December: 1021 – 1032.

Crossland , B . *e t al* ( 1992 ) Estimating engineering risk . *Royal Society Risk: Analysis,*

*Perception and Management*, 2nd ed. London: The Royal Society.

Fisher P. (2005) The property development process: case studies from Grainger Town. *Property*

*Management* 23 (3) 158-175.

Fisher, P. and Robinson, S. (2006). The Perception and Management of Risk in UK Office Property Development, Retrieved from [www.northumbria.ac.uk](http://www.northumbria.ac.uk) on 12/September, 2011

Gehner , E . , Halman , J . I .M .and de Jonge , H . ( 2006 ) Risk management in the Dutch Real

Estate development sector: A survey. 6th International Postgraduate Research Conference; 6 – 7 April, University of Salford, pp. 541 – 552,

Hargitay , S . and Yu , S . M . (1993).*Decision Criteria – Return and Risk, Property Investment*

*Decisions: A Quantitative Approach*. London, UK: E & FN.

Huffman , F . E ( 2002 ) Corporate real estate risk management and assessment . *Journal of*

*Corporate Real Estate* 5 (1): 31 –4 .

Bartlrlitt J. E.Kotrlik, J. W. and Higgins, C. C. (2001).Organizational Research.Determining

Appropriate Sample Size in Survey Research

Khumpaisal& Chen, (2010).Risk Assessment in Real Estate Development: An Application of

Analytic Network Process, J*ournal of Construction Engineering and Management, 131*(1), 92 101.

Khumpaisal, S. Ross, A. &Abdulai, R. (2010).An examination of Thai practitioners

Perceptions of risk assessment techniques in real estate development projects, *Journal of Retail & Leisure Property*Vol. 9, 2, 151–174

Morrison, L. J. (2007). *The STEEP Factors*, Chapel Hill: University of North Carolina. Learning

Resources Website, http://horizon.unc.edu/onramp/, accessed 20 August 2011.

Newell, G. &Steglick, M. (2005).Assessing the Importance of Property Development Risk

Factors, *Pacific Rim Property Research Journal*, Vol 12, No 1.

Odosote, O., (2008). Stimulating Nigeria’s Emerging Real Estate Markets:Investment

Opportunities Through the Public Sector, Unpublished M. Sc. Thesis submitted to the Department of Urban Studies and Planning, Massachusetts Institute o f Technology.

Royal Institution of Chartered Surveyors (2004).*The management of risk – yours, mine ours*.

A report for RICS by the University of Reading available at www.rics.org.uk accessed 27th September 2011

Spaulding , W . C .( 2008 ) Risk , http://thismatter.com/money/insurance/risk.htm , accessed 02

May 2011.

Vetiva, (2011).Construction Industry Report: A Haven of Opportunities, Retrieved from

[www.vetiva.com](http://www.vetiva.com) on 4/August/2011