



Moderating Effect of Regulations on Organizational Factors and Construction Risk Management: A Proposed Framework

A. Q. Adeleke^{1*}, A. Y. Bahaudin², A. M. Kamaruddeen³

¹School of Technology Management and Logistics, Universiti Utara Malaysia, Malaysia, Maybank Block V1, Universiti Utara Malaysia, Kedah, Malaysia, ²School of Technology Management and Logistics, Universiti Utara Malaysia, Malaysia, Maybank Block V1, Universiti Utara Malaysia, Kedah, Malaysia, ³Department of Quantity Surveying Programme, School of Built Environment, University College of Technology Sarawak, Sibu, Malaysia. *Email: aadekunle0@gmail.com

ABSTRACT

While certain organizational internal and external factors have been found to influence construction risk management among the construction companies. The influence of the organizational factors such as effective communication, team competency with skills, active leadership, political factor, organizational culture, technology factor and economic factor on construction risk management among the construction companies operating in Nigeria have not received considerable attention. This paper proposes regulations as the potential moderator on the relationship between organisational internal factors, external factors and construction risk management.

Keywords: Organizational Internal and External Factors, Construction Risk Management, Rules and Regulations

JEL Classifications: G30, D80, L70

1. INTRODUCTION

The construction industry is regarded as one of the main contributors of a country's economy (Ngai et al., 2002), often accounting for 7-10% of the gross domestic product (GDP) value (Winch, 1995; Voordijk et al., 2000). In addition to that, construction projects usually played an important role in the safety, health and environmental aspects of the society (Nawi et al., 2014; Bayliss et al., 2004).

The Malaysian construction industry contributes significantly to the economic growth of the country. Over the last 20 years, the industry has consistently contributed approximately 3-5% to the national GDP (CIDB Malaysia, 2009). Given this, under the Tenth Malaysia Plan (2011-2015), the Ministry of Works plans to inject an estimated RM138 billion (approximately US\$46 billion) to enhance the growth of the construction sector (CIDB Malaysia, 2010). The contributions by the industry are beyond economic enabler; the products of construction play an important role towards the creation of quality lifestyle among the

local population. In short, the citizens are directly or indirectly affected by construction processes and its end products which are not free from one risk or the other.

Risk management is generally known as one of the utmost important knowledge areas in project management (Tadayon et al., 2012; Arto, 1999).

The reality still persists because of the uniqueness and the dynamic nature of each construction project. Construction operation makes up of various varies techniques, divergent environments, multiple intricacies and uncertainties. However, discovering and managing the likely risk elements, which may significantly diverge from a project to some other contingent on several conditions, and performs an important role in meliorating the execution and attaining the productive outcome of a specific project (Jarkas et al., 2015).

According to Project Management Institute (2004), project risk is defined as an uncertain event that, if it occurs, will at least have

a positive or negative outcome on project objective: Scope cost, time, and quality. Barber (2005) also view risk as threats to project success which likely to occur when there is no proper management.

In this paper, risk management refers to a process of identifying, analyzing risk elements which may occur as results of management, material, design, finance, labour and equipment risk and solving them in order to attain the project aims.

Ineffective project risk management has been affirmed to have a bad effect on participants in a certain project because of improper plans towards the uncertainty and risks which a project may results to. For example, poor site management, poor communication, or environmental hazards, significant increases in costs and contractual litigation and disputes among others, lack of prevention towards the risk of stating the scope of a project and slow decision making among others, which may leads to project delay.

For example, the study of Aibinu and Jagboro (2002) has affirmed that companies which do not employ construction services on an occasional ground will never consider a risk management practices in projects, which has caused substantial negative effects on projects performance in Nigerian construction industries. Also, study conducted by Ojo (2010) on contract disputes and claims finds that the level of risks occurrence which were not properly integrated or analyzed by either the contractors or the clients as one of the actual reason behind disputes and claims on Nigerian construction projects.

Numerous studies have been conducted over the years to investigate organizational factors towards risk management in the construction industries (Kangari and Riggs, 1989; Karim et al., 2014; Abu Hassan et al., 2012; Moe and Pathranarakul, 2006; Doloi, 2009; Jabnoun and Sedrani, 2005; Gerdali et al., 2010; Lewis et al. 2003; Simpkins, 2009; Ho and Pike, 1992; Israelsson and Hansson, 2009; and Scupola, 2003). These studies have showed certain organizational internal and external factors do influence construction risks management. Additionally, previous studies have suggest the moderating effect of government regulations on construction risk management (Gibb, 2011; Niu, 2008; Alaghbari et al. 2007; Iroegbu, 2005; Ismail, 2001).

Despite the volume of studies on construction risk management, literature search has shown that little attention has been directed to research on construction risk in Nigeria, particularly Lagos and Abuja being the former and present federal capital city respectively. Consequently, this paper proposes the framework for the relationship among the organizational internal and external factors and the construction risks management. Additionally, this paper proposes government regulation as a moderator to organizational factors and construction risk management.

2. ORGANIZATIONAL INTERNAL FACTORS

2.1. Effective Communication

Effective communication has been considered as a dimension of organizational internal factor. Reliable communication is

fundamental to the success of project. Conversely, effective communication is paramount for every project team and the organization. It is necessary that clear and authentic information is passed at the appropriate time, place and to the right person during project execution. More so, flow of information which maybe downward or upward information is an essential part of project to be conceived.

Likewise, proper communication helps to improve decision making, reduces conflicts, and buffer the performance of the project team to their project manager, however, absence of all these characteristics will negatively influence construction risk management within the construction companies (Doloi, 2009). The empirical studies of (Abu Hassan et al., 2012; Gerdali et al., 2010; Moe and Pathranarakul, 2006; Karim et al., 2014) affirmed that effective communication will positively influence construction risk management.

2.2. Team Competency and Skills

According to Baron (2008), team competency and skills is perceived as an element that provides technical human resource and knowledgeable that is required by the project managers, team members and the contractors in order to attain the project objectives. The team competency with their skills can be perceived in terms of attitude and knowledge. More so, dynamic forces of the team are also associated with team competency; which present what type of features a team possesses and what are the features needed for a specific project. Gerdali et al., (2010) and Moe and Pathranarakul (2006) foregrounded a positive relationship among team competency with skills and construction risk management.

2.3. Active Leadership

Successful project involved various kinds of leadership styles to attain a project goal. Therefore, construction project needs active leaders with severe actions on time overrun in order to forefend worsen situation. Thus project leader's precedence is to execute project in pinch circumstances as it required to be executed under normal circumstances. However, any company lacking active leadership will definitely record less risk management within the projects. Simpkins (2009) and Baron (2008) empirical investigation established that active leadership will positively influenced construction risk management.

2.4. Organizational Culture

Hofstede et al., (1990) and Schein (2004) viewed organizational culture as the beliefs, elementary assumptions, models and values of symbols, behaviour, rituals, practices, artifacts and technology. More so, the study of Hartog and Verburg (2004) suggested that organizational culture is a robust tool which is related with "attitude and behaviour" of team members, project managers and the contractors at the process of project execution will importantly influenced construction risk management. Hence, the following proposition is formulated for organizational internal factors as one of the predictor variable in the on-going research.

Proposition 1: There is a positive relationship between organizational internal factors and construction risk management.

3. ORGANIZATIONAL EXTERNAL FACTORS

3.1. Political Factor

The study by Jaafari (2001) revealed the effect of environmental variables like community perception, legal acceptability, safety, social and political impacts on project is generally high. The author further explain that political elements such as, religious turmoil, civil unrest, discriminatory legislative, invasions, covering tax regimes, wars, terrorism, riots and strikes will positively influence construction risk management in construction companies. The study conducted by Abu Hassan et al. (2012) also perceived a positive influenced of political factors on construction risk management.

3.2. Technology Factor

Akanni et al. (2014) viewed technology factor as part of an environment that must be looked at in a strategic plans of any developing nation like Nigeria. Oladapo and Olotuah, (2007) further asserted that a proper and suitable construction technology may be evaluated with the following argument; the availability of plant and equipment which are produced locally, the level of utilization of the local construction resources, magnitude of local material resources with the skilled manpower resources. The studies of Walker (2000), Sommerville and Craig (2006) revealed that technology as an external factor will possess a positive relationship with construction risk management.

3.3. Economic Factor

According to Obalola (2006) which perceived that, the financial and economic feature of a company is determined by the level of available resources to carry out a project and the universal economic activity which comprises of the economic rivalry of various parties such as; the contractors, engineers, architecture and the clients which are involved in construction projects. The empirical studies of Odeh and Battaineh (2002) and Abu Hassan et al. (2012) also affirmed that economic as an external factor has a positive relationship with construction risk management. Therefore, the following propositions were formulated for organizational factors an important predictor variable in this research.

Proposition 2: There is a positive relationship between organizational external factors and construction risk management.

4. CONSTRUCTION RISK MANAGEMENT

The construction industry when comparing to other industry is more risky. Therefore, the projects are perceived to pass through some underlying risks because of the construction parties involved in any construction projects such as the clients, engineers, designers, contractors, subcontractors. Some of the parties also comprise of the unstable project team that are gathered from various countries, companies, and ties with different cultures. Table 1 show recent important studies related to the identification of risk in construction projects.

From Table 1 above, it evident that construction risk management is an important issue that requires considerable attention

Table 1: Related literatures on risk factors

Author and title	Case study	Risk factors
Risk assessment and allocation in the UAE construction industry (El-Sayegh, 2008)	UAE	42
Learning from risks: A tool for post-project risk assessment (Dikmen et al., 2008)	Turkey	73
Risk analysis in fixed-price design-build construction projects (Öztaş and Ökmen, 2004)	Turkey	14
Risks associated with trenching works in Saudi Arabia (Jannadi, 2008)	KSA	7
An evaluation of risk factors impacting construction cash flow forecast (Odeyinka et al., 2008)	UK	26
Risk management in the Chinese construction industry (Tang et al., 2007)	China	32
Understanding the key risks in construction projects in China (Zou et al., 2007)	China	85
Assessment of risks in high rise building construction in Jakarta (San Santoso et al., 2003)	Jakarta	130
The controlling influences on effective risk identification and assessment for construction design management (Chapman, 2001)	UK	85
Risk and its management in the Kuwaiti construction industry: A contractors' perspective (Kartam and Kartam, 2001)	Kuwait	26
A systematic approach to risk management for construction (Mills, 2001)	Australia	29
Risk management trends in the Hong Kong construction industry: A comparison of contractors and owners perceptions (Ahmed et al., 1999)	Hong Kong	25
Project risk management in Hong Kong (Shen, 1997)	Hong Kong	8

Source: Authors

throughout the development process. The discussion on “risk,” have been debated from various prior literatures. While (Perry and Hayes, 1985; Porter, 1981; Healy, 1982) viewed it as an avenue to economic gain or loss arising from involution through the construction process. Likewise, Mason (1973) and Kartam and Kartam (2001) perceived it to be only loss.

According to Bothroyed and Emmett (1998) and Bufaied (1987), risk is a situation where the stages of construction project turns to uncertainty through time, cost and the project quality. Hence, in this paper, risk related to construction will be defined as the probability of occurrence with specific uncertainty, that can disrupt the attainment of the project goals, which maybe from the materials, management, finance, design and labour and equipment risks. The classifications for construction risk factors can be done in several ways depending on the purpose.

For example, some risks are grouped into internal and external risks, while others are categorized as financial risk, client risk, design risk, material risk, and sub-contractor risk (Jarkas et al., 2015; Wang et al., 2004; El-Sayegh, 2008). The categorizations

of the risks factors in this study have been derived based on the previous risk relevant studies attended are presented in Table 2.

After comparing the different categories included in the reviewed literatures on identification of risk factors, the results (Table 2) shows five leading categories which are management, materials, design, financial and labour and equipment. In this paper, the main categories were chosen after extensive review of literatures from different countries. It is affirmed that these are the top five leading risk factors. Assaf and Al-Hejji (2006), identified 73 construction related risks elements that ends to delay because they lack effective construction risk management, in that case, some risk factors were misapprehension during the construction stage, inadequate finance for finished project, labour supply, lack of materials, poor communication between parties and failure and lack of equipment were figured out as the leading factors in Kingdom of Saudi Arabia.

In line with the study of Aibinu and Odeyinka (2006) conducted in Nigeria, 44 risk elements that results to delay because of ineffective construction risk management between construction companies. The study affirmed major risk factors like; design, management, finance, material, finance and labour with equipment. Sweis et al. (2008) with Frimpong et al. (2003) asserted a positive relationship among organizational internal and external factors with construction risk management. Also consistent with the study conducted by Ahmed et al. (2002) in the USA that found a positive relationship among organizational internal, external factors with construction risk management.

5. MODERATING EFFECT OF RULES AND REGULATIONS

Rules and regulations in every organization are enacted to reduce and control the occurrence of risk on construction project which might be caused by lack of materials, uncoordinated management, improper design, lack of finance with lack of labour and equipment. Consequently, construction companies are prescribed to work under the necessities of rules and regulations (Iroegbu, 2005; Flanagan and Norman, 1993; Gibb, 2011 and Ismail, 2001). Prior researcher’s findings have proved that construction companies with full obedience to rules and regulations depict a set of positive significance influence on construction projects with good output (Niu, 2008; Ismail et al., 2012; Aniekwu, 1995). So, due to immense attention of the stakeholder’s, clients, pressure with the top management allegiance, an appropriate rules and regulations have been seen to be the best method to risks occurrence reduction on construction projects. Likewise, rules and regulations were anticipated to strengthen the use of organizational internal and external factors by rendering standard necessities for organizational conformances. Hence, there is need for rules and regulations compliances to strengthen the commitment of construction companies in minimizing their risk.

In the same vein, the study of Ismail (2001) in Malaysia researched on rules and regulations with housing, revealed that, a replacement for the traditional building practices by an industrialized building system must be considered, which on the long run may save cost, labour, buffer durability and quality with duration of construction

in Malaysian construction companies as also viewed by (Alaghbari et al. 2007).

Similarly, the study of Iroegbu (2005) disclosed that rules and regulations are affecting construction projects in Nigeria, such as the taxes imposed on imported construction materials. Going by the aforementioned findings, this paper proposed the following propositions.

Proposition 3: Rules and regulations positively moderate the relationship organizational internal factors and construction risk management.

Proposition 4: Rules and regulations positively moderate the relationship organizational external factors and construction risk management.

6. PROPOSED FRAMEWORK

In line with the aforementioned empirical evidences, a proposed research framework depicts the moderating effect of rules and regulations on the influence of organizational internal factors and organizational external factors on construction risk management is presented in Figure 1.

In explaining the moderating role of rules and regulations on the relationship between organizational internal and external factors with construction risk management. the present paper proposes that the extent to which the two predictor variables influences employee to make risk management more effective and reduce risk occurrence on construction projects, depend upon the level of individual obedience to rules and regulations.

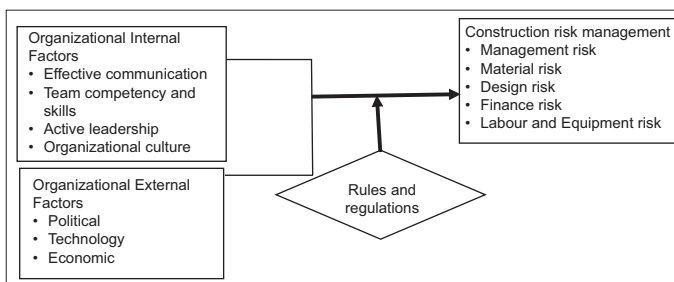
The stronger individual’s obedience to rules and regulations, the less likely risk will occur on construction project which will yield effective construction risk management.

Table 2: Categories and classifications of risk factors from previous studies

Categories	Rank
Management/administrative risk factors	1
Material risk factors	2
Design risk factors	3
Financial risk factors	4
Labor and equipment risk factors	5

Source: Authors

Figure 1: Proposed framework



Given the empirical support for the organizational control theory across various organizational setting, it is proposed that this theory would provide an empirical support for the moderating role of rules and regulations on the influence of organizational internal and external factors on construction risk management.

7. CONCLUSION

This paper has proposed the moderating role of rules and regulations on the relationship between organizational internal factors and organizational external factors on construction risk management as depicted in Figure 1. The proposed framework and the formulated propositions are to be validated in the future research.

The findings are expected to provide an important insight to contractors and construction industry stakeholders on the significant role of organizational internal factors, organizational external factors, and construction risk management with rules and regulations. Lastly, the classification of the major risk factors to the construction industries from the world perspectives has been achieved in this paper.

REFERENCES

- Abu Hassan, B.A.B., Ali, K., Onyeizu, E.N., Yusof, M.N. (2012), Evaluating risk management practices in construction company: Evidence from Oman. *International Journal of Academic Research*, 4(2), 32-37.
- Ahmed, S.M., Ahmad, R., Saram, D.E., Darshi, D. (1999), Risk management trends in the Hong Kong construction industry: A comparison of contractors and owners perceptions. *Engineering Construction and Architectural Management*, 6(3), 225-234.
- Ahmed, S.M., Azhar, S., Castillo, M., Kappagantula, P. (2002), Construction Delays in Florida: An Empirical Study. Final Report. Department of Community Affairs, Florida, US.
- Aibinu, A.A., Odeyinka, H.A. (2006), Construction delays and their causative factors in Nigeria. *Journal of Construction Engineering and Management*, 132(7), 667-677.
- Aibinu, A., Jagboro, G. (2002), The effects of construction delays on project delivery in Nigerian construction industry. *International Journal of Project Management*, 20(8), 593-599.
- Akanni, P., Oke, A., Akpomiemie, O. (2014), Impact of environmental factors on building project performance in Delta State, Nigeria. *HBRC Journal*, 11(1), 91-97.
- Alaghbari, W.E., Kadir, M.R.A., Salim, A. (2007), The significant factors causing delay of building construction projects in Malaysia. *Engineering, Construction and Architectural Management*, 14(2), 192-206.
- Aniekwu, A. (1995), The business environment of the construction industry in Nigeria. *Construction Management and Economics*, 13(6), 445-455.
- Arto, K.A. (1999), Management across the organisation. *Quest FOR Team Competence Software Project Management Organizational Change AS A Project Factors Impeding Project Management Learning*, 5(1), 4.
- Assaf, S.A., Al-Hejji, S. (2006), Causes of delay in large construction projects. *International Journal of Project Management*, 24(4), 349-357.
- Bayliss, R., Cheung, S.O., Suen, H.C.H., Wong, S.P. (2004), Effective partnering tools in construction: A case study on MTRC TKE contract 604 in Hong Kong. *International Journal of Project Management*, 22(3), 253-263.
- Baron, R.A. (2007), Behavioral and cognitive factors in entrepreneurship: Entrepreneurs as the active element in new venture creation. *Strategic Entrepreneurship Journal*, 1(1□2), 167-182.
- Bothroyd, C., Emmett, J. (1998), *Risk Management – A Practical Guide for Professionals*. London, UK: Whitherby & Co., Ltd.
- Bufaied, A. (1987), *Risks in the Construction Company: Their Causes and their Effects at the Project Level*. Manchester: University of Manchester, Institute of Science and Technology.
- Chapman, R.J. (2001), The controlling influences on effective risk identification and assessment for construction design management. *International Journal of Project Management*, 19(3), 147-160.
- CIDB Malaysia. (2009), *Construction Industry Review 1980-2009 (Q1)*. Kuala Lumpur: Construction Industry Development Board, (CIDB).
- CIDB Malaysia. (2010), *The 7th Malaysia Construction Sector Review*. Kuala Lumpur: Construction Industry Development Board, (CIDB).
- Doloi, H. (2009), Relational partnerships: The importance of communication, trust and confidence and joint risk management in achieving project success. *Construction Management and Economics*, 27(11), 1099-1109.
- Dikmen, I., Birgonul, M.T., Anac, C., Tah, J.H.M., Aouad, G. (2008), Learning from risks: A tool for post-project risk assessment. *Automation in Construction*, 18(1), 42-50.
- El-Sayegh, S.M. (2008), Risk assessment and allocation in the UAE construction company. *International Journal of Project Management*, 26(4), 431-438.
- Flanagan, R., Norman, G. (1993), *Risk Management and Construction*. Oxford: Blackwell Science Ltd.
- Frimpong, Y., Oluwoye, J., Crawford, L. (2003), Causes of delay and cost overruns in construction of groundwater projects in a developing countries; Ghana as a case study. *International Journal of Project Management*, 21(5), 321-326.
- Geraldi, J.G., Lee-Kelley, L., Kutsch, E. (2010), The Titanic sunk, so what? Project manager response to unexpected events. *International Journal of Project Management*, 28(6), 547-558.
- Gibb, K. (2011), Delivering new affordable housing in the age of austerity: Housing policy in Scotland. *International Journal of Housing Markets and Analysis*, 4(4), 357-368.
- Hartog, D.N., Verburg, R.M. (2004), High performance work systems, organisational culture and firm effectiveness. *Human Resource Management Journal*, 14(1), 55-78.
- Healy, J.R. (1982), Contingency funds evaluation. *Association for the Advancement of Cost Engineering (AACE) Transactions*.
- Ho, S.S., Pike, R.H. (1992), The use of risk analysis techniques in capital investment appraisal. *Risk Analysis Assessment and Management*. Chichester: Wiley & Sons. p71-94.
- Hofstede, G., Neuijen, B., Ohayv, D.D., Sanders, G. (1990), Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, 35, 286-316.
- Iroegbu, A.N. (2005), Housing in Nigeria: A role of the construction company. In: Kalu, A.I., Chima, G.N., editors. *Housing Development in Nigeria: Concepts, Issues and Strategies*. Abakaliki: Pauliton Press.
- Ismail, E. (2001), Industrialized building system for housing in Malaysia. Paper Presented at the 6th Asia Pacific Science and Technology Management Seminar, Tokyo.
- Ismail, Z., Doostdar, S., Harun, Z. (2012), Factors influencing the implementation of a safety management system for construction sites. *Safety Science*, 50(3), 418-423.
- Israelsson, N., Hansson, B. (2009), Factors influencing flexibility in buildings. *Structural Survey*, 27(2), 138-147.
- Jaafari, A. (2001), Management of risks, uncertainties and opportunities

- on projects: Time for a fundamental shift. *International Journal of Project Management*, 19(2), 89-101.
- Jannadi, O.A. (2008), Risks associated with trenching works in Saudi Arabia. *Building and Environment*, 43(5), 776-781.
- Jabnoun, N., Sedrani, K. (2005), TQM, culture, and performance in UAE manufacturing firms. *Quality Management Journal*, 12(4), 8.
- Jarkas, A.M., Haupt, T.C., Haupt, T. (2015), Major construction risk factors considered by general contractors in Qatar. *Journal of Engineering, Design and Technology*, 13(1), 165-194.
- Kangari, R., Riggs, L.S. (1989), Construction risk assessment by linguistics. *Engineering Management, IEEE Transactions on*, 36(2), 126-131.
- Karim, J.A., Demian, P., Baldwin, A.N., Anumba, C. (2014), An empirical study of the complexity of requirements management in construction projects. *Engineering, Construction and Architectural Management*, 21(5), 505-531.
- Kartam, N.A., Kartam, S.A. (2001), Risk and its management in the Kuwaiti construction industry: A contractors' perspective. *International Journal of Project Management*, 19(6), 325-335.
- Lewis, W., Agarwal, R., Sambamurthy, V. (2003), Sources of influence on beliefs about information technology use: An empirical study of knowledge workers. *MIS Quarterly*, 27(4), 657-678.
- Malaysia, P.M. (2012), Tenth Malaysia Plan: 2011-2015 (No. ID: 4921).
- Mason, G.E. (1973), *Quantitative Risk Management Approach to the Selection of Construction Contract Provisions*: Department of Civil Engineering. Palo Alto, CA, USA: Stanford University.
- Mills, A. (2001), A systematic approach to risk management for construction. *Structural Survey*, 19(5), 245-252.
- Moe, T.L., Pathranarakul, P. (2006), An integrated approach to natural disaster management: Public project management and its critical success factors. *Disaster Prevention and Management*, 15(3), 396-413.
- Nawi, M.N.M., Haron, A.T., Hamid, Z.A., Kamar, K.A.M., Baharuddin, Y. (2014), Improving Integrated Practice through Building Information Modeling-Integrated Project Delivery (BIM-IPD) for Malaysian Industrialised Building System (IBS) Construction Projects, *Malaysia Construction Research Journal (MCRJ)*, 15(2), 29-38.
- Ngai, S.C., Drew, D.S., Lo, H.P., Skitmore, M. (2002), A theoretical framework for determining the minimum number of bidders in construction bidding competitions. *Construction Management and Economics*, 20(6), 473-482.
- Niu, Y. (2008), The performance and problems of affordable housing policy in China: The estimations of benefits, costs and affordability. *International Journal of Housing Markets and Analysis*, 1(2), 125-146.
- Obalola, T.F. (2006), *Evaluation of the Effects of Project Environment on Project Performance in Lagos and Abuja, Nigeria* (Dissertation). Akure, Nigeria: Federal University Technology.
- Odeh, A.M., Battaineh, H.T. (2002), Causes of construction delay: Traditional contracts. *International Journal of Project Management*, 20(1), 67-73.
- Odeyinka, H.A., Lowe, J., Kaka, A. (2008), An evaluation of risk factors impacting construction cash flow forecast. *Journal of Financial Management of Property and Construction*, 13(1), 5-17.
- Ojo, G. (2010), An assessment of the construction site risk-related factors. Paper Presented at the Proceedings of the 40th Annual General Meeting/Conference of the Nigerian Institute of Building.
- Oladapo, R.A., Olotuah, A.O. (2007), Appropriate real estate laws and policies for sustainable development in Nigeria. *Structural Survey*, 25(3/4), 330-338.
- Öztaş, A., Ökmen, Ö. (2004), Risk analysis in fixed-price design-build construction projects. *Building and Environment*, 39(2), 229-237.
- Perry, J.H., Hayes, R.W. (1985), Risk and its management in construction projects. *Proceedings of the Institution of Civil Engineering*, 78(3), 499-521.
- Porter, C. (1981), *Risk Allowance in Construction Contracts*. Unpublished MSc. Project Report.
- Sambasivan, M., Soon, Y.W. (2007), Causes and effects of delays in Malaysian construction company. *International Journal of Project Management*, 25(5), 517-526.
- San Santoso, D., Ogunlana, S.O., Minato, T. (2003), Assessment of risks in high rise building construction in Jakarta. *Engineering, Construction and Architectural Management*, 10(1), 43-55.
- Schein, E.H. (2004), *Organizational Culture and Leadership*. San Francisco, CA: Jossey-Bass.
- Scupola, A. (2003), The adoption of Internet commerce by SMEs in the south of Italy: An environmental, technological and organizational perspective. *Journal of Global Information Technology Management*, 6(1), 52-71.
- Shen, L.Y. (1997), Project risk management in Hong Kong. *International Journal of Project Management*, 15(2), 101-105.
- Shenhar, A.J. (2004), Strategic project leadership® toward a strategic approach to project management. *R and D Management*, 34(5), 569-578.
- Simpkins, R.A. (2009), How great leaders avoid disaster: The value of contingency planning. *Business Strategy Series*, 10(2), 104-108.
- Sommerville, J., Craig, N. (2006), *Implementing IT in Construction*. London: Routledge.
- Sweis, G., Sweis, R., Hammad, A.A., Shboul, A. (2008), Delays in construction projects: The case of Jordan. *International Journal of Project Management*, 26(6), 665-674.
- Tadayon, M., Jaafar, M., Nasri, E. (2012), An assessment of risk identification in large construction projects in Iran. *Journal of Construction in Developing Countries*, 17(1), 57-69.
- Tang, W., Qiang, M., Duffield, C.F., Young, D.M., Lu, Y. (2007), Risk management in the Chinese construction industry. *Journal of Construction Engineering and Management*, 133(12), 944-956.
- Voordijk, H., de Haan, J., Joosten, G.J. (2000), Changing governance of supply chains in the building industry: A multiple case study. *European Journal of Purchasing and Supply Management*, 6, 217-225.
- Wang, S.Q., Dulaimi, M.F., Aguria, M.Y. (2004), Risk management framework for construction projects in developing countries. *Construction Management and Economics*, 22(3), 237-252.
- Walker, A. (2000), *Project Management in Construction*. Oxford: Blackwell Science Ltd.
- Winch, G. (1995), Contracting systems in the European construction industry: A sectoral approach to the dynamics of business systems. In: Whitley, R., Kristensen, P.H., editors. *The Changing European Firm: Limits to Convergence*. London: Routledge. p241-270.