Risk Management Strategies and Performance of Construction Firms in Selected Counties in Kenya

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Abstract: The construction industry entails high levels of risk, but often this risk is not dealt with adequately, resulting in poor performance, which is reflected in frequent cost and time overruns, as well as poor quality of work. This may cause disputes which may lead to costly litigation and further time and cost overruns. Additionally, insurers traditionally avoid firms with high risk portfolios and subsequently will not offer insurance covers or may charge very high premiums to compensate for the increased risk. Previous studies have found an inconclusive relationship between adoption of risk management strategies and enhanced construction firm performance. As such, the general objective of this study was to determine how risk management strategies influenced performance of construction firms in selected counties in Kenya. The specific objectives were to determine the influence of resource risk management and litigation risk management strategies. The study also sought to assess the moderating role of government policy and regulation of the construction sector on the relationship between these risk management strategies and performance of the construction firms. Performance was measured as a function of cost variance, time variance and quality control. This study used an explanatory research design and the research philosophy was based on positivism. The population of the study was all construction firms carrying out construction and public works in selected counties in Kenya, registered by the Republic of Kenya as of July 2011 to June 2012, a total of 2,414 construction firms. The sample size was 97 respondents, and simple random sampling was used for identifying respondent firms in Nairobi County, Nakuru County and Machakos County. Data collection was done using a self-administered semi-structured questionnaire. Data analysis was done using a mixture of descriptive statistics and inferential statistics. The findings led to the conclusion that resource risk management strategy had a significant influence on firm performance, implying that any effect on firm performance was not solely due to chance. Litigation risk management strategy did not have a statistically significant effect, implying that any effect on firm performance was solely due to chance. Government policy and regulation of the construction sector had a statistically significant moderating effect on the relationship between risk management strategies and firm performance. The study recommended that, from a policy perspective, in order to further entrench risk management practices in the construction sector, construction firms in selected counties in Kenya need to increasingly engage in capacity building activities in risk management and construction project management in general. The government should also encourage activities that encourage proper risk management and risk sharing across the entire construction value chain. The beneficiaries of the findings of the research will include Government policy makers, construction firm management and business and academic research.

Keywords: Risk Management Strategies, Performance of Construction Firms, Resource Risk Management, Litigation Risk Management.

1. INTRODUCTION

The construction industry in the United Kingdom (UK), owing to the nature of its business that involves open air operations, has always been seen as vulnerable to weather extremes that impact adversely on financial performance. Wedawatta, Ingirige, Jones and Proverbs (2011) confirmed this in their findings that identified this sector as being one of the most exposed to the vagaries and extremes of climate change. Such adverse financial impacts are significant in light of the fact that construction sector firms constituted over 99 percent of Small and Medium Enterprises (SMEs) in the UK (Wedawatta et al., 2011), and dominated SME businesses.

The high risk exposure to adverse weather in the construction sector was attributed to poor risk management strategies. These included negative individual attitudes and informal organizational culture, low levels of technical expertise, poor disaster risk management procedures, poor planning activities, low levels of capital formation to manage recovery efforts and poor linkages with national agencies and technical support institutions such as the universities. These were attributed as the reason for the poor cost, time and quality performance in the sector, within the UK (Wedawatta et al., 2011).

In the developing country context, especially in Africa, risk management in the construction sector is an amorphous affair faced with higher levels of risk as compared to the developed countries. The level of adoption of formal risk management strategies is not widely studied either. In Ghana for instance, Boadua, Fianko and Chileshe (2015) observed a limited level of adoption of formal risk management strategies among construction oriented firms, with low levels of procedural documentation. One reason that was forwarded for this state of affairs was the low levels of awareness regarding appropriate tools and techniques to effectively manage construction risk. Consequently, the construction sector in Ghana faces many problems related to frequent cost and time overruns (Fugar & Agyakwah-Baah, 2010). Within the mass construction market in Ghana, Ahadzie, Proverbs and Olomolaiye (2008), observe that the most crucial project performance success criteria were overall project cost and quality.

Risk management among construction firms in Kenya has gained increased prominence owing to what Ngundo (2014) observes as an increase in infrastructure development in the country. The rise of many construction projects, most notable in real estate at the mass market level, has been faced with a lot of uncertainty, resulting in outcomes that fail to meet minimum standards benchmarked against best practice in the sector. Ngundo (2014) attributed the low levels of project success to failure to develop proper procedures, lack of sufficient training and capacity building programs, incompetence among project staff, low levels of formal quality management support and low levels of management commitment. As a result, project risk management planning was characterised by poor risk identification, assessment, prioritization, mitigation and control. The overall outcomes were weak and inappropriate risk management measures that increased the vulnerability of the construction firms to risk.

In order to enhance the management of construction risks, the Republic of Kenya (RoK) enacted legislation such as the Engineers Act (2011) and the National Construction Authority Act (2011) for purpose of ensuring that legal compliance in the industry went a long way towards reducing the various risks associated with construction projects (RoK, 2011). Karimi (2004) further observed that key reforms proposed in the Kenya Vision 2030 that would have resulted in effective risk management of construction projects included the creation of the necessary institutional framework to improve policy implementation and enforcement of industry codes and standards among others. There was also recognition of the need to institute functional and comprehensive risk management strategies in the industry, in order to achieve performance objectives.

Risk Management Strategies:

Uher (2003) noted that risk management has been described as a management tool that helps in identifying root causes of uncertainty, evaluating their impact and formulating appropriate risk management strategies. Perera, Rathnayake and Rameezdeen (2008) observed that risk management is composed of several processes including risk identification, classification, analysis, attitude and risk response. The focus of this study was risk management strategies, which concerns itself with how to manage risk either through risk retention, risk reduction, risk transfer or risk avoidance, or a combination of all these mechanisms. Construction firms adopt various methods for allocating risk, with risk transfer being one of the most preferable options.

Uher (2003) noted the difficulty in instituting cost-effective risk management systems, owing to the fluid nature of the risk dynamics that underlied effective risk management in the construction sector. In order to circumvent uncertainty, Uher

(2003) proposed the use of matured risk management systems, coupled with delegation to the agent best equipped to deal with the risk. The matured systems approach that espoused matured processes was seen as more holistic as it paid attention to process maturity along the entire construction value chain.

Risk management strategies were also specific in the sense that components that may adversely affect construction firm performance were isolated, with a view to managing them. These components constituted the unsystematic risk function, which could be minimized or eliminated through risk retention, risk reduction, risk transfer, risk avoidance or a combination of these. Such unsystematic risk components included resource risk and litigation risk. By managing these unsystematic risk components, it was then possible for construction firm management to optimize on firm performance (Ahmed et al., 2007).

Finally, policy and regulatory frameworks had the ultimate consequence of creating a balance between a firm's general operations and compliance with policies formulated and implemented by the regulator. Government was viewed both as a facilitator and an inhibitor, in its role whereby it created bureaucratic barriers aimed at maintaining or enhancing standards. Building codes, inspections, approvals and other requirements, imposed restrictions on construction project progress. Also, minimum capital requirements imposed barriers on construction firms' ability to access financial markets. On the other hand, tax holidays and relaxation of custom duties facilitated cheaper imports and prevented crippling shortages, and were viewed as facilitating the industry (Isik, Arditi, Dilmen & Birgonul, 2010).

Performance of Construction Firms:

Baker and Reid (2005) identified two major categories of construction firm performance, these being efficiency and effectiveness measures. The former referred to good quality management and ability to deliver construction projects within set standards. These included adherence to schedule, budget, technical specification, safety, profitability and absence of any legal claims and proceedings. These measures were applied to evaluate success at the construction project implementation phase, thus encouraging result oriented thinking. Effectiveness measures on the other hand, referred to user satisfaction with the end-product of the project. Construction firm performance was measured using the key metrics of cost variance (CV), time variance (TV) and quality control (Leong, Zakuan, Saman, Ariff & Tan, 2014).

Leong et al. (2014) defined cost variance as the degree to which a construction project achieved budgetary compliance or completion within the estimated budget. Time variance was the difference between the budgeted timeframe for project completion less the actual time taken. Quality control was described as conformity to consumer expectations and fitness for purpose intended. Quality was also seen holistically as the totality of features required for a construction end product to satisfy needs and deliver benefits (Kim, Kumar & Kumar, 2011). Quality ramified the entire construction value chain, and was deployed using a participatory stakeholder approach in order to holistically address quality issues at all stages. Kim et al. (2011) noted that quality performance was based on Non-Conformance Reports (NCR), which were benchmarked against best practice in the industry relating to quality certification.

The adoption of risk management practices was demonstrated to yield positive outcomes in a variety of contexts. In the building construction sector in Nigeria, Aje, Odusami and Ogunsemi (2009) evidenced a significant positive impact of contractor's management capability on construction project cost and time performance. Similarly, Ahmed et al. (2007) in a benchmarking exercise on techniques for risk management in construction projects, observed that risk management practices conferred a competitive advantage to construction firms. They observed that institutional memory, through learning and retention of knowledge, helped to smoothen out the continuous changes and interference at the construction stage that undermined firm performance.

2. RESEARCH METHODOLOGY

The research philosophy that was used in this study was based on positivism, which holds that reality is concretized and has an independent existence of its own (Ashley & Orenstein, 2005). Positivism as a philosophy adheres to the view that only factual knowledge gained through observation (the senses), including measurement, is trustworthy. In positivism studies, the role of the researcher is limited to data collection and interpretation through objective approaches and the research findings are usually observable and quantifiable. According to the principles of positivism, it depends on quantifiable observations that lend themselves to statistical analysis. This aspect of positivism was relevant to this study as the researcher only based the findings on data collected from the construction firms. Also, the researcher maintained minimal interactions with the research participants, to avoid influencing their responses.

This study used an explanatory research design, which connects ideas to understand causation, meaning the researcher wanted to explain the relationship among the study variables (Saunders, Lewis & Thornhill, 2003). This design was adopted since it involved the collection of data from the population, at one specific point in time. Explanatory research looks at how variables come together and interact (Babbie, 2007). Saunders, Lewis and Thornhill (2007) observes that the explanatory design is best suited for gathering information where the researcher wants to elucidate a cause-effect relationship between independent variables and dependent variable in a *post facto* research study. Good explanatory researches effectively answer the why questions in research (Shields & Rangarjan, 2013). Since this study had the prime goal of determining the effect of risk management strategies on performance of construction firms in selected counties in Kenya, which was also subject to micro- and macro-economic variables, the explanatory research design would best help the researcher in understanding how the chosen independent variables affect the dependent variable.

Data Analysis:

Data obtained through questionnaires were coded, keyed into Statistical Package for the Social Sciences (SPSS) software and edited. Descriptive statistics such as percentages, charts, mean scores and standard deviations were computed to explain the characteristics of the data. Nachmias and Nachmias (2008) explain that the percentage distributions examine the pattern of response to each of the independent variables and the dependent variable under investigation and allow a comparison of two or more distributions. The means and standard deviations enabled description and comparison of the data using single values for each variable. According to Sekaran and Bougie (2011), frequency distributions provided the basic information and the measures of central tendency and dispersion which helped in understanding the data better.

Inferential analysis was done using multiple linear regression, which was used to assess the degree and character of the relationship between the independent variables and the dependent variable. Multiple linear regression helped the researcher understand the direction and magnitude of the relationship between firm performance and the independent variables as well as the moderating influence of the moderating variable (Babbie, 2012). The regression coefficients (β_i's) indicated the relative importance of each of the independent variables in the prediction of the dependent variable. The regression coefficients were tested at the 5 percent level of significance. To construct variables for the regression, summation of the monadic scale items for each variable were calculated to get a composite index for each variable. To test for the overall significance of the multiple linear regression equation, the F-test was used.

3. RESULTS

Resource Risk Management Strategies:

Table 3.1 below presented the percentages, means and standard deviation statistics relating to the information measuring the respondents' level of agreement as to how the given indicators of resource risk management strategies influenced performance of constructions firms. The value that had the highest frequency scores among the respondents was the occurrence, agree (value of 4.00 on the monadic scale), as all the indicators for resource risk management under this column had high numbers of respondents. This implied that most respondents tended to agree that the indicators listed for resource risk management influenced firm performance.

Table 3.1 Resource Risk Management Strategies and Firm Performance (Percent)

Resource Risk Management Strategies	Neither agree nor disagree	Strongly disagree	Disagree	Agree	Strongly agree	Mean	Standard Deviation
Ensuring availability of relevant plant and equipment reduces the risk of time overruns	2.6	7.8	.0	70.1	19.5	3.96	.865
Ensuring an adequate supply of construction materials reduces risk of cost and time overruns	7.8	.0	3.9	66.2	22.1	3.95	.985
Ensuring good quality of construction materials through an efficient supply chain reduces the risk of quality defects	10.4	2.6	.0	67.5	19.5	3.83	1.105
Use of appropriate technology improves firm performance	13.0	.0	2.6	72.7	11.7	3.70	1.113

Ensuring high productivity of plant and equipment reduces the risk of time overruns	15.6	2.6	11.7	62.3	7.8	3.44	1.186
Reducing the risk of financial failure and delays in payments to contractors, reduces the risk of cost overruns	19.5	.0	5.2	68.8	6.5	3.43	1.251
Ensuring optimal ground and site conditions reduces the risk of defects and cost and time overruns	36.4	.0	.0	59.7	3.9	2.95	1.495
Fixing material prices using forward contracts reduces risk of cost overruns, by reducing price volatilities	40.3	3.9	2.6	45.5	7.8	2.77	1.547
Overall						**3.50**	**1.193**

Source: Survey Data (2016)

Table 3.1 also gave the mean values for individual indicators of resource risk management and the respondent's level of agreement on their influence on firm performance. These were arranged in order from the largest to the smallest mean values. The first four mean values all had values greater than 3.5 and rounded off to a mean of 4.00 (which corresponded to agree on the monadic measurement scale). Thus, the respondents generally agreed on the perceived influence of the first four resource risk management indicators on firm performance, and these had the highest ranking among all the respondents.

Mean values lower than 3.50 rounded off to a mean of 3.00, indicating that these respondents disagreed on the influence of these resource risk management indicators on firm performance. The standard deviations represented the degree to which the responses were dispersed around the mean values. The lower the standard deviation values, the closer the scores clustered together and this was easily observed by comparing the scores for each individual resource risk management indicators. Likewise, fixing material prices through use of forward contracts thus reducing risk of cost overruns, though reducing price volatilities, had the lowest perceived influence on firm performance.

In accordance with Chen et al. (2004) findings, local firms were encouraged to use forward contracts to minimize price escalation during project implementation, thus minimizing cost variance. Also, resource risk management strategies suggested by Ali (2007), involving the use of supply chain management approach, would enhance the construction value-chain. These would regularize the flow of goods and services and creating an efficient payments system. This is in agreement with the current study's findings where supply chain management strategies are ranked highly.

Litigation Risk Management Strategies

Table 3.2 Litigation Risk Management Strategies and Performance (Percent)

Litigation Risk Management Strategies	Neither agree nor disagree	Strongly disagree	Disagree	Agree	Strongly agree	Mean	Standard Deviation
Allocating fair contract risk reduced risk of litigation	15.2	.0	5.1	62.0	17.7	3.67	1.227
Binding arbitration reduced risk of litigation	14.3	3.9	.0	61.0	20.8	3.70	1.257
Drafting dispute clauses reduced risk of litigation	20.3	2.5	7.6	43.0	26.6	3.53	1.440
Provision of a neutral arbitrator provides alternative dispute resolution	18.4	.0	6.6	55.3	19.7	3.58	1.329
Team building reduced risk of litigation	27.8	6.3	.0	54.4	11.4	3.15	1.477
Use of contract wording that avoids ambiguity led to improved firm performance	20.3	.0	12.7	63.3	3.8	3.30	1.234
Overall						**3.49**	**1.327**

Source: Survey Data (2016)

Table 3.2 presented summary statistics of indicators of litigation risk management strategies. The percentages indicated a clustering around the column for 'agree'. Only two variables had mean values that clustered around a mean value of 3.00 (disagree), while the others clustered around the mean value of 4.00 (agree). Allocating fair risk contract was ranked high in this study, unlike in Jannadia et al's. (2000) study, where this attribute was poorly ranked. This was possible due to the high risk in construction projects locally and the inefficient legal systems that make it costly to resolve issues, making it important to pre-empt risk. Binding arbitration, or out of court settlements, were the most widely used, and this was normal given the fact that they were less likely to result in delays and disruptions that may have resulted in high cost and time variance. Additionally, binding arbitration had the capacity to impose a lasting solution to issues that sped up the dispute resolution process.

4. CONCLUSION

Resource risk management had a statistically significant effect on performance of construction firms in selected counties in Kenya. Also, government policy and regulation of the construction sector had a statistically significant moderating effect on the relationship between risk management strategies and performance of construction firms in selected counties in Kenya. This implied that the influence of these three risk management strategies on firm performance, was not due to chance alone, but could be explained as a having an impact that enhanced construction firm operations and subsequent performance. Further, litigation risk management had no statistically significant effect on construction firm performance, indicating that any influence of these strategies on firm performance could be due to chance and not due to any real impact on firm performance

5. RECOMMENDATIONS

Resource risk management strategies and government policy and regulation of the construction sector on firm performance had a negative influence on firm performance. Additionally, litigation had no statistically significant influence on firm performance. In relation to the study objectives, these findings point out the need to deepen the application and implementation of the given risk management strategies in the sector. This may be achieved through increased engagement in capacity building activities in risk management and construction project management in general. This would help equip project management with the requisite managerial tools and techniques to effectively run construction projects.

There should also be a higher level of involvement of construction sector professionals charged with offering expert advice and assistance on implementation of risk management strategies. Awareness creation among clients was another front that was encouraged in order to optimize the benefits of risk management practice implementation, through increased uptake and compliance. Lastly, the government should encourage activities that encourage proper risk management and risk sharing cross the entire construction value chain. This would enable firm management make informed choices when assigning resources to maximize on efficiency and effectiveness in the construction firms leading to reduced risks and increased shareholder value.

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