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FINANCIAL FACTORS INFLUENCING SUCCESSFUL COMPLETION OF CONSTRUCTION PROJECTS IN PUBLIC UNIVERSITIES: A CASE OF EGERTON UNIVERSITY, KENYA

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Abstract

Public universities in Kenya as part of their development agenda have initiated several construction projects. There are several such projects, which have taken more completion time than expected while others have remained work-on-progress for years. It is against this backdrop that this study sought to establish the financial factors that affect successful completion of construction projects in public universities. More specifically the study sought to determine the influence of access to infrastructure capital on success completion of the aforesaid projects. The study was conducted in Egerton University, which is one of the pioneer public universities in Kenya. The theories of discounted cash flow and the balanced scorecard guided the study. Descriptive survey research design was employed. The study targeted staff members attached to the management/administration, project management, accounting/finance, and auditing departments of Egerton University. Stratified random sampling method was

adopted to draw respondents from the target population. A structured questionnaire was used to collect primary data from the sampled respondents. The instrument was first pilot tested with the object of assessing its reliability and validity. Data was processed and analyzed with the aid of the Statistical Package for Social Sciences. Both descriptive and inferential analyzes were carried out. The study findings were presented in form of statistical tables. The study established that the relationship between access to infrastructure capital and successful completion of construction projects was positive and very strong (r = 0.811; p <0.05). The study recommends that the public universities' project committees should devise various sources of finance to fund construction projects.

Keywords: Construction projects, Discounted cash flow, Infrastructure capital, Public universities, Successful project completion

INTRODUCTION

Infrastructure projects fall under various categories. There are those which can be classified as large infrastructural projects that utilize massive amount of resources in terms of finances, materials, labour, machineries, and time (Salman et al., 2006). It is further argued that, infrastructural projects should not only be successfully completed, but the vast expenditures on them ought to be weighed against the expected benefits accruing from these projects to the public and the national economy (Khalied & Amr, 2009). In addition, Willard (2005) argued that, there exists a lack of consensus as to what constitute success or failure of a project.

In the same light, it is posited that, the factors that lead to success or failure of a project are restrictively defined. In other words, there is high degree of ambiguity regarding the specific factors that determine successful completion of the aforementioned projects (Shenhar et al., 2002). Murray et al. (2002) add that, projects could be technically successful in spite of being behind schedule and over-budgeted. On the other hand, they could be within budget and indeed ahead of schedule but be termed as technical failure. According to Soderholm (1995), terming a given project a success or a failure depend on the context the project is being executed. It is exemplified that, a successfully completed project is one that has successfully passed through all ideal stages; that is, conceptualization, development, implementation, and termination.

Khalied and Amr (2009) sought to determine the feasibility studies for infrastructure construction projects in Jordan. Their object was to assess the justification of investments in infrastructure projects in that country. The scholars reasoned that, their study was bound to shed light on infrastructure projects by weighing anticipated benefits against expected costs of

the project. It is averred that projects could be completed successfully yet they fail to be optimally utilized in tandem with the initial projections.

A study by Kikwasi (2012) sought to delve into causes and effects of delays and disruptions in construction projects in Tanzania. He noted that, delays and disruptions are among the challenges faced in the due course of executing construction projects in the country. The study findings further revealed that, the causes of the afore stated delays and disruptions include design changes, delays in payment to contractors, information delays, funding problems, poor project management, compensation issues, and disagreement on the valuation of work done.

It is observed that, in recent years, there has been a tremendous increase in the number of construction projects in Kenya. Yet as Gwayo et al. (2014) noted, there is a growing concern regarding the reasons why the requisite objectives are not achieved as per the projects' client's expectation. An investigation was conducted on factors that occasion delay of construction projects in Kenya (Talukhaba, 1999). He blamed poor project time management practices as one of the genesis of the widespread delay in construction projects in the country. He claimed that, project delays significantly frustrate the process of development. The scholar observed that, the client's payment and architect's instructions respectively are the most significant contributors to delays in construction projects' completion. K'Akumu (2007) underscores the importance of infrastructural construction in developing economies such as Kenya. Construction statistics of Kenya have been evaluated in order to ascertain their adequacy in terms of the scope, portrait, reliability and responsiveness in their coverage of the construction industry.

It is asserted that in Kenya studies on infrastructural construction have paid much attention to the entities (the projects, contractors, and human resources) that constitute the construction industry (Gwaya et al., 2014). By exemplifying using the case of sluggish infrastructural projects in Nairobi University, the scholars regret that, though such projects in Kenya are supervised by very qualified personnel such as professors, the people entrusted to run them end up failing on their mandate. Muchung'u (2012) lamented that, some projects takes as many as 10 years before they are completed; a scenario that is usually accompanied by huge cost overruns. Public universities in Kenya ordinarily embark on infrastructural expansion to among others, accommodated the ever increasing enrollment of students. Against this backdrop, the institutions are obliged to initiate several construction projects in tandem with the prevailing and forecasted demand. It is in light of the foregoing that this study seeks to assess specifically how the financial factors impact on success completion of the aforementioned projects.

Statement of the Problem

It is concurred that, public universities are obliged by circumstances, that is, prevailing and future demand for demand for more space due to the ever-increasing student enrollment, and also their development agenda. A visit to several public universities in Kenya brings to the fore the facts on the ground regarding the state of construction projects. As Muchung'u (2012) observed, there are several such projects which have stalled, others have been completed but not in line with minimum threshold, while others have dragged on for many years before their successful completion. The foregoing has resulted in evitable cost overruns, time overrun, idling resources, and also inconveniences to the targeted beneficiaries of such projects (Kikwasi, 2012). This is so due to the fact that, incomplete and/or unsuccessfully completed construction projects such as lecture halls, libraries, laboratories, hostels, etcetera cannot be used by, say, students and lecturers. Projects which have stalled or are unsuccessfully completed will negatively affect students, lecturers and the education fraternity at large both at the University concerned and beyond. It was, therefore, fundamental to assess the financial factors that affect successful completion of construction projects in local public universities with the view of suggesting viable recommendations which if and when implemented are bound to go a long way to overcome and/or mitigate the afore stated problem.

Research Objective

To examine the effect of access to infrastructure capital on successful completion of construction projects in Egerton University.

Research Hypothesis

H_{01}: Access to infrastructure capital does not have significant influence on successful completion of construction projects in Egerton University

THEORETICAL REVIEW

This section covers theories pertinent to financial factors and success completion of construction projects. The study reviews the theory of discounted cash flow and the balanced scorecard.

Theory of Discounted Cash flow

The theory of discounted cash flow (DCF) is employed in capital budgeting, or project valuation, or asset valuation, or securities valuation (Shrieves &Wachovicz, 2001; Myers, 2001). The theory compares the future returns of potential projects by discounting the future cash flow at a

rate that reflects the yield of similar securities in the market. Some of the techniques adopted in respect of DCF according to Brounen et al. (2004) include net present value (NPV), adjusted present value (APV) and discounted payback period (DPP). In context of construction projects, ideally, the DCF of those projects ought to be determined with the object of assessing their viability.

Myers (2001) underscores the importance of NPV but also cautions about the difficulties when defining discount rates, forecasting cash flows, estimating time series, and dealing with the stringent accounting principles (Shrieves & Wachovicz, 2001). The foregoing is anticipated to be common amongst construction projects in public universities given that, several projects fail to be completed within the budget estimates and projected timelines. The technique employed under DCF varies from one country to another; from one firm to another; and indeed from one project to another. Brounen et al. (2004) using a survey of 6,500 firms across the United Kingdom (UK), Netherlands, France, Germany, and the United States (U.S.) exemplifies that, European firms do not apply DCF techniques as much as they do payback technique. The scholars reasoned that, the limited academic and professional qualifications of the small firms' management team influenced increased use of discounted techniques.

Balanced Scorecard

The balanced scorecard was introduced in 1992. The propositions under this scorecard were based on a 1990 Nolan, Norton multi-company research project that studied the performance measurement in companies whose intangible assets played a crucial role in value creation (Atkinson et al., 1997). It is asserted that, financial reporting could be more relevant if organizations capitalized their expenditures on intangible assets or looked for other methods by which the aforementioned assets could be placed on corporate balance sheets. The foregoing enhances understanding and management (Kaplan, 2010).

The balanced scorecard also includes performance in communities as process perspective objectives when such performance contributes to the differentiation in the strategy (Kaplan & Norton, 2003). The balanced scorecard is compared to the stakeholder theory where performance measurement starts with the stakeholders. Stakeholders have expectations which they expect to be achieved through the performance of the managers. Explicably, the stakeholders pertinent to University projects expect those charged with their implementation to ensure the successful completion of the said projects. Unsuccessfully completed projects reflect poor performance on the part of project managers.

EMPIRICAL REVIEW

In this section, the study reviews studies that have hitherto been conducted in tandem with the access to infrastructure capital and successful completion of construction projects.

Access to Infrastructure Capital and Successful Completion of Construction Projects

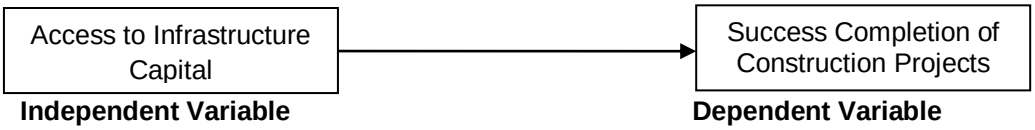
In his study, Abbas (2006) noted that, the requisite financial support to implement public projects; be it from the government sources or from donor funding, is essentially time-bound. In tandem, therefore, the author insists that, there should be critical monitoring of the implementation schedules with the object of countering any form of delay. One of the most crucial causes of delay in Malaysian construction sector according to Sambasivan and Soon (2007) is inadequate client's finance. Haseeb et al.'s (2011) study further stated that, financial problems are major delay factors in Pakistani construction industry. Khalied and Amr (2009) postulated that infrastructure projects require vast initial capital outlay and are usually developed so as to be operated over a relatively long duration. A study on construction projects in Tanzania (Kikwasi, 2012) revealed that, inadequate budgets for construction projects played a significant part in delayed completion of the aforesaid projects. The scholar inferred that the Tanzanian construction industry was negatively affected by funding problems due to delayed project completion.

When studying assessment of construction projects in Kenya, Gwaya et al. (2014) noted that, project financing was one of the key client's obligations. It is asserted that, delays and cost overruns in public sector investments can raise the capital-output ratio in the sector and elsewhere thus bringing down the efficacy of the investment. Infrastructure is further posited to include the requisite capital for economic services, and is also central to enhancing economic activity (Chandra, 2002). It is averred that, when Kenya's organizations fail to mobilize adequate funds to finance their projects, they will continue to depend on external sources in accessing funds to undertake expansion. It is further posited that some government projects such as plants require massive capital outlay. In this light, poor management of the process is bound to occasion huge financial loss in penalties and revenue to the owner.

Conceptual Framework

The conceptual framework outlines the hypothesized relationship between the two sets of variables (independent and dependent). As illustrated in Figure 1 it is presumed that, access to infrastructure capital influences successful completion of construction projects in public universities in Kenya.

Figure 1: Conceptual Framework



RESEARCH DESIGN

Study Design

The study employed a blueprint that enabled achieving of the set study objective. In that light, descriptive survey research design was employed. Needless to say, this is a mix of descriptive research and survey research designs. Kothari (2008) postulated that, descriptive studies attempt to describe the phenomenon as it is with no attempt of influencing the subjects of the study. In addition, it seeks to answer "what" kind of questions. On the other hand, a survey research is conducted at a given point in time as it will be the case with the current study which will be conducted between the months of January and March, 2015. Survey research also cut across different members of the target population which is akin to this study that sought to target individuals drawn from different departments of Egerton University.

Target Population

The target population to which the study findings will be generalized encompassed staff drawn from the management/administration, project management, accounting/finance, and auditing departments of Egerton University.

Sample Size and Sampling Technique

Nassiuma (2000) formula was adopted to calculate the sample size. This is outlined hereunder. In addition, stratified random sampling method was employed to draw the sampled respondents from the target population.

$$n = \frac{NC^2}{C^2 + (N-1)e^2}$$ Where

n = sample size

N = population size

C = coefficient of variation (50%)

e = error margin (0.05)

Substituting these values in the equation, estimated sample size (n) was:

$$n = \frac{109\ (0.5)^2}{0.5^2 + (109-1)0.05^2}$$

$$n = 52.4$$

$$n = 53 \text{ respondents}$$

Research Instrument

The study adopted a structured questionnaire to collect primary data from the sampled respondents. According to Mugenda and Mugenda (2009) questionnaires are the most appropriate tools in survey research and also when there are a relatively large number of sampled respondents. The foregoing argument is in tandem with this study. The instrument was structured in such a way that it majorly captured data pertinent to study objectives. For ease of deducing inferences from the research findings, the responses sought using the questionnaires were on a Likert scale.

Reliability of the Research Instrument

A reliable instrument is asserted (Kimberlin & Winterstein, 2008) to produce consistent and stable results. Reliability test was conducted by use of Cronbach alpha (α) whereby the reliability threshold was $\alpha \geq 0.7$ for all variables. Precisely, the two variables (access to infrastructure capital and successful completion of construction projects) returned $\alpha = 0.731$ and $\alpha = 0.726$). All the constructs captured in the questionnaire that was administered in the final study returned alpha greater than 0.7 ($\alpha > 0.7$).

Validity of the Research Instrument

Validity refers to the extent to which an instrument measures what it is intended to measure. There are various types of validity but in the context of this study, both content and construct validity were determined. Construct validity was assessed by use of principle axis factoring (PAF) method. The independent variable (access to infrastructure capital) returned Eigen value = 2.012 while the dependent variable (successful completion of construction projects) returned Eigen value = 1.673. Given that validity threshold is Eigen value > 1.0 the instrument was deemed valid. In addition, the content validity, which cannot be statistically tested, was determined by seeking expert opinion from the assigned University supervisors.

Data Processing and Analysis

The collected questionnaires were checked to ensure that they are adequately and appropriately filled. The foregoing minimized chances of non-responses and extreme outliers. The raw data was then coded and analyzed with the aid of the Statistical Package for Social Sciences (SPSS) software. Descriptive data analysis was first conducted with the object of describing the opinions of the respondents regarding the various constructs under study. This was followed by inferential analysis that will be in form of Pearson's correlation whose aim was to enable drawing of conclusions in respect of study objectives.

ANALYSIS AND FINDINGS

The study outlines the level of agreement of the respondents to propositions relative to access to infrastructure capital and successful completion of construction projects.

Descriptive Findings and Discussions for Access to Infrastructure Capital

Table 1 presents the respondents' level of agreement to propositions touching on access to infrastructure capital

Table 1: Descriptive Statistics for Access to Infrastructure Capital

		N	Min	Max	Mean	Std. Dev
i.	Financial problems are major delay factors in university construction projects	52	1	5	4.23	1.107
ii.	Infrastructure projects require vast initial capital outlay	52	1	5	4.19	1.096
iii.	Project financing one key client's obligations	52	1	5	3.92	1.055
iv.	Inadequate budgets for construction delay project completion	52	1	5	3.88	1.143
v.	Construction projects receives requisite financial support	52	1	5	3.65	1.129
vi.	Universities seek external financiers for their construction projects	52	1	5	3.15	1.223

According to the study findings, it was agreed (mean ≈ 4.00) that financial problems are major delay factors in university construction projects; infrastructure projects require vast initial capital outlay; project financing is one of the key client's obligations; inadequate budgets for construction delay project completion; and construction projects receive requisite financial support. However, the respondents were indifferent (mean = 3.15) as to whether universities seek external financiers for their construction projects or not.

Descriptive Findings and Discussions for Successful Completion of Construction Projects

The study further sought the opinions of the respondents regarding successful completion of construction projects in Egerton University. Table 2 shows the relevant findings.

Table 2: Descriptive Statistics for Successful Completion of Construction Projects

	N	Min	Max	Mean	Std. Dev
Access to infrastructure capital is key to successful completion of project	52	1	5	4.38	1.023

It was observed that access to infrastructure capital is crucial to successful completion of projects. In respect to the foregoing proposition, the findings returned mean of 4.38.

Inferential Findings and Discussions

The study examined the association between infrastructure capital and successful completion of construction projects in Egerton University. The results of the correlation analysis are as shown in Table 3.

Table 3: Relationship between Access to Infrastructure Capital and Successful Completion of Construction Projects

		Successful Project Completion
Access to Infrastructure Capital	Pearson Correlation	.811**
	Sig. (2-tailed)	.000
	N	52

**. Correlation is significant at the 0.05 level (2-tailed).

According to the findings, the relationship between access to infrastructure capital and successful completion of construction projects is positive and very strong ($r = 0.811$; $p < 0.05$). As the results indicate, the relationship is statistically significant at 0.05 level of significance. Interpretatively, the results indicate that the greater the access of the aforesaid capital, the higher the chances of successfully completing the construction projects. The findings underpin the fundamental importance of accessibility to infrastructure capital in determining how successfully construction projects are completed. Moreover, the null hypothesis that stated access to infrastructure capital does not have significant influence on successful completion of construction projects in Egerton University – was, therefore, rejected.

SUMMARY

According to the study findings, it was established that financial problems are major delay factors in university construction projects; infrastructure projects require vast initial capital outlay which was in agreement with an assessment of construction projects in Kenya where it was noted that some government projects such as plants require massive capital outlay (Gwaya et al., 2014); project financing is one of the key client's obligations; inadequate budgets for construction delay project completion; and construction projects receive requisite financial support. Yet previous studies indicated that when Kenya's organizations fail to mobilize adequate funds to finance their projects, they will continue to depend on external sources in accessing funds to undertake expansion (Chandra, 2002). However, it was ambiguous whether universities seek external financiers for their construction projects or not. The relationship between access to infrastructure capital and successful completion of construction projects was established to be positive and very strong ($r = 0.811$; $p < 0.01$). The foregoing implied that the greater the access of the aforesaid capital, the higher the chances of successfully completing the construction projects.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that construction projects require vast capital outlays. In the same note, such projects are hugely delayed by financial constraints. Hitherto, it is unclear whether public universities seek external financiers for their construction projects or not. It is further inferred that increased accessibility to capital would significantly enhance successful completion of construction projects in public universities.

It is recommended that the public universities' project committees should devise various sources of finance to fund construction projects. It is further suggested that scholars should embark on empirical studies to investigate the benefits of internal sources of funds in financing construction projects.

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