EFFECT OF FINANCING OPTIONS ON THE COMPLETION RATES OF CAPITAL PROJECTS IN KENYAN PUBLIC UNIVERSITIES; THE CASE OF JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY (JKUAT)

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Abstract

A project cannot proceed without adequate financing, and the cost of providing adequate financing can be quite large. Unless an owner immediately and completely covers the costs incurred by each participant, these organizations face financing problems of their own. At a more general level, project finance is only one aspect of the general problem of corporate finance. Whether project finance is performed at the project or at the corporate level does not alter the basic financing problem. In JKUAT, many capital projects have remained uncompleted for over five years .These projects are either fully financed by the government, or jointly financed by the government and the university. The general objective of the study was to establish the effects of financing on the completion rate of capital projects in universities in Kenya the case of JKUAT. The study found out that there is a significant relationship between project financing options and the completion rates of capital projects in JKUAT. Specifically, it was found that Government financing has a positive significant effect (β= 0.571, p = 0.000) on completion rates of capital projects in JKUAT. It was also found that Commercial banks' financing has a significant effect (β= 0.194, p = 0.023) on completion rate of capital projects in JKUAT. Moreover, it was found that AIA has a negative but significant effect (β= -0.37, p = 0.000) on completion rates of projects. Lastly, the study found that using foreign donor funds to finance capital projects has a positive significant effect (β= 0.516, p = 0.000) on completion rates of capital projects in JKUAT.

Keywords: *capital projects, capital structure, completion rate, financing options*

Significance of the Study

The findings will be important to regulators of capital projects in universities in Kenya by ensuring that all capital projects in universities institutions are governed by the appropriate rules, laws and regulations and further ensure that the laws remain relevant by continuous reviewing it based on current capital projects undertaken by universities in development trends.

The study is of great significance to university council and stakeholders in universities since it will obtain findings that help them understand the relationship between commercial loans and projects undertaken. This will help them to clearly understand how effective commercial loans can contribute towards realizations of increased the completions of projects undertaken by universities in development trends.

Introduction

In the past twenty years there has been a new wave of global interest in project finance as a tool for economic investment. The financing of project helps finance new investment by structuring the financing around the project's own operating cash flow and assets, without additional sponsor guarantees. Thus the technique is able to alleviate investment risk and raise finance at a relatively low cost, to the benefit of sponsor and investor alike. Though the financing of project has been in use for hundreds of years, primarily in mining and natural resource projects, its other possible applications especially for financing large Greenfield projects (new projects without any prior track record or operating history have only recently received serious attention. This is particularly so in developing infrastructure (Waxman-Lenz, 1995).

Project finance has been a financing mechanism, particularly for the private sector. In the recent past, the private sector has begun to finance infrastructure projects through PF arrangements in Asia and the trend seems likely to continue in the foreseeable future in Asia as well as in Europe (Esty, 2000). The term "Project Finance" has been used to explain many types of financing for projects (Lang, 1998; Nevitt*et al*., 1998). However, A financing of a particular economic unit in which a lender is satisfied to look initially to the cash flows and earnings of that economic unit as the sources of funds from which a loan will be repaid and to the assets of the economic units as collateral (Ndiwa, 2014).

Project finance is asset-based financing, meaning that the project sponsors have recourse only to the underlying assets of a project. It involves both debt and equity, where the debt-to-equity ratio is typically large (e.g., 70% debt to 30% equity). According to Lemma and Negash, (2013). Debt is used when available and when it is the least. Financing projects have an expensive form of financing with equity still needed for financial worthiness. Most important, revenue from the project must be able to generate a return to the equity investors, and pay for interest and principal on the debt, transaction costs associated with developing and structuring the project, and operations and maintenance costs.

Statement of the Problem

In JKUAT, many capital projects have remained uncompleted for over five years. These projects are either fully financed by the Government, or jointly financed by the government and the university. Kivuva (2004) in his study "Financing SMEs in Machakos Township" found out that external financing (debt) will worsen the financial crises when a business has built in operating uncertainties such as; under-capitalization, poor management practices, poorly performing portfolios. The study held that efficient capacity building is crucial, since the success of external financing is largely dependent on the quality of governance and management. In addition, Andrew and Euclid (2009) in their study 'internal vs. external financing of acquisition in British companies' investigated the proposition that, the "source of financing of new investment has a bearing on its returns". They found that, there is a negative impact on investments financed by external sources on long run outcome. This effect is attributed to the high cost and the increased costs and expenses of additional management needs associated with the external funds. There is an assumption therefore, that there is exists a direct relationship between financer and performance of the projects funded (Cheboi, 2014).The success completion of any construction process therefore, Karanja (2014) says is influenced by the manner in which the project team members work together. The study highlighted the effect of financing on the performance of capital projects in universities in Kenya the case of JKUAT.

Specific Objectives of the study

i. To find out the effect of Government financing on the completion rate of capital projects in JKUAT;

ii. To find out the effect of Commercial banks financing on the completion rate of capital projects in JKUAT;

iii. To find out the effect of Appropriation in Aid financing on the completion rate of capital projects in JKUAT; and,

iv. To find out the effect of foreign donor financing the completion rate of capital projects in JKUAT.

Theoretical Framework

This section discusses the relevant theories that support the study. The study based on the three main theories as explained.

Modern Portfolio Theory; According to Modern portfolio theory (MPT) in the 1950s considers an important advance in the mathematical modelling of finance explains that investment which attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets.

Working Capital Management Theory; According to Working Capital Management Theory (Walker (1964) pioneered an effort to develop a theory of working capital management through empirical testing of the risk-return trade-off of working capital management and formulated three propositions.

Modigliani - Miller Capital Relevance; According to Modigliani–Miller Capital Relevance (Franco Modigliani, Merton Miller 1958) forms the basis for modern thinking on capital structure. The basic principal of theory states that, under a certain market price process, in the absence of taxes, agency costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed.

Research Methodology

This study adopted descriptive research design. The design was suitable because it required an accurate examination of the information that affects the completion rate of capital projects in universities in Kenya the case of JKUAT. There were a total of 25 capital projects that were work-in-progress in JKUAT as at the time of study. This implies that all the 25 project accountants were sampled using a census design. Given that this was a survey study, secondary data was the most appropriate (Mugenda and Mugenda, 2009) and therefore a data collection sheet was used to collect data. In addition, in order to collect quantitative data, the secondary data was structural.

Results And Discussion

Financing Sources

Table 1 presents results of the financing sources for the 26 capital projects that were work-in-progress.

Table 1 Financing Sources

Source	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Government	11	42.3	42.3	42.3
AIA	12	46.2	46.2	89.5
Bank Funding	2	7.7	7.7	97.2
Donor Funding	1	3.8	3.8	100.0
Total	26	100.0	100.0	

Information in Table 1 shows that out of the 26 projects, 11 projects were funded by the government. This represents 42.3% of the total number of capital projects in the University. The greatest percentage of the projects (46.2%) on the other hand were financed by AIA. These were a total of 12 projects. The projects that were sponsored by commercial bank loans comprised 7.7% (2 projects) while only one project being funded by foreign donor funding. This generally implies that most projects in JKUAT are financed by money sourced internally through

Appropriation-in-Aid. This is possibly due to the government requiring universities to generate their own sources of financing. This is followed by government funding. The least form of financing is that of foreign donor financing.

Project Duration

Since the objective of the study was to establish the role of financing options on completion rates of capital projects, it was necessary to establish the duration that the capital projects take. The information is presented in Table 2 below.

Table 2: Project Duration

Duration (Yrs)	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Below 1 year	2	7.7	7.7	7.7
Between 1 and 5	7	26.9	26.9	34.6
Between 5 and 10	13	50.0	50.0	84.6
Over 10 years	4	15.4	15.4	100.0
Total	26	100.0	100.0	

Table 2 above shows that most capital projects in JKUAT have lasted for between 5 and 10 years. This is represented by 50% of the projects. This implies that the projects take too long before they are completed. Moreover, 15.4% of the projects take over 10 years. This represents over 5 years over the average time that the projects should take. Those projects taking between one and five years and below one year represent 7% and 2% respectively. Generally, Table 4.2 reveals that project duration for the capital projects in JKUAT is longer than expected which shows that the efficiency in completion is low.

Project Completion Rate

Before establishing the establish the role of financing options on completion rates of capital projects, the completion rates was established and presented in Figure 1 below. This was necessary in order to analyse the true rates of completion of capital projects in JKUAT.
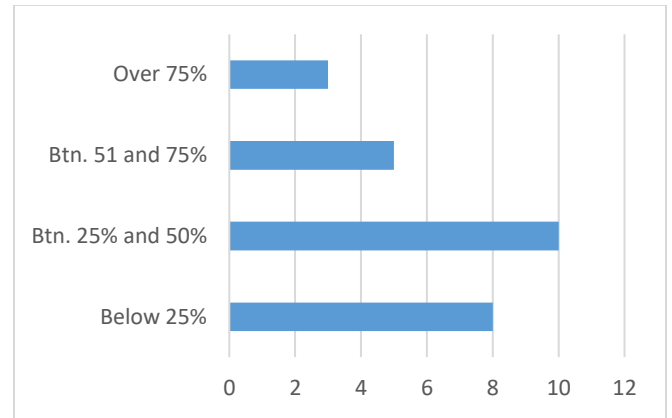
Figure 1: Project Completion Rates

Figure 1 shows most projects have a completion rate of between 25 % and 50%. This represents 10 projects (39%). This is followed by those projects whose completion rate is below 25% (8 projects) and those whose completion rate is between 51% and 75% (5 projects). It is further shown that the least number of projects (3)have a completion rate of over 75%. Since completion rate is measured as the ratio between the number of budgeted years to the number of years to completion, it clearly shows that most projects have low completion rates. This implies that most capital projects in JKUAT have low completion rates.

Effect of Financing Sources on Completion Rates

The specific objectives of the study were to: find out the effect of Government funds financing on the completion rate of capital projects in JKUAT; find out the effect of Commercial bank loans financing on the completion rate of capital projects in JKUAT; find out the effect of Appropriation in Aid financing on the completion rate of capital projects in JKUAT; and, to find out the effects of foreign donor fund financing the completion rate of capital projects in JKUAT. To establish this, a correlation analysis was done to establish the influence of the financing options on each other and on the dependent variable. The findings are discussed in the sub-sections below.

Correlation between Financing Options and Completion Rates of Capital Projects

To establish whether there was a relationship between the variables, a correlation analysis was conducted. The correlation analysis shows the direction, strength, and significance of the relationships among the variables of the study (Sekaran & Bougie, 2010). A positive correlation indicates that as one variable increases, the other variables will also increase. On the other hand, a negative correlation indicates that as one variable increases the other variable decreases (Sekaran, 2003). The model that was tested is presented below:

$COMRATE = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where: *COMPRATE* is the project completion rate;

β_0 is the constant project implementation rate without the financing sources;

β_1, β_2, β_3, and β_4 are the parameters to be estimated;

X_1, X_2, X_3 and X_4 represent Government financing (GOVT),

Commercial banks financing (COMLOAN), and Appropriation-in-aid financing (AIA) and Foreign donor funding (FORDON) respectively.

ε is the error term which was assumed to be normally distributed.

Results of the correlation are shown in Table 3.

Table 3: Correlation between Financing Options and Completion Rates

	COMPRATE	GOVT	COMLOAN	AIA	FORDON
COMPRATE	1				
GOVT	.346***	1			
COMLAON	.494***	.136	1		
AIA	.272***	.124	.056	1	
FORDON	.621***	.182	.289	.093	1

Note: *** $p < 0.05$

From the results in Table 3, several conclusions can be drawn. First, all correlation coefficients are less than 0.80 in general and therefore there is no issue of multicollinearity between the independent variables (Gujarati and Porter, 2009). Second, it has been indicated that Government financing (GOVT) is significantly and positively correlated with completion rates of capital projects in JKUAT. This is indicated by the correlation coefficient of 0.346 which is significant ($p < 0.05$). The inference here is that as Government financing increases, there is likely to be an increase in the completion rates of capital projects in JKUAT. These findings however contradict those by Kavindu (2012) who reported that government financing reduces completion rates of capital projects.

Thirdly, the correlation results indicate that Commercial loan financing (COMLOAN) has a significant correlation with the completion rates of capital projects in JKUAT. This is shown by a correlation coefficient of 0.494 ($p < 0.05$). This implies that as Commercial loan financing increases by one unit, there is a 0.494 increase in the completion rates of capital projects in JKUAT. This means that that there is a positive relationship between two variables indicating that Commercial loans financing is an important source of finance in terms of completion of capital projects. Karanja (2014) also reported that commercial loans financing increases completion rates of capital projects.

Fourthly, Table 3 shows that the correlation between Appropriation-in Aid and completion rates is positive and significant ($p < 0.01$). The Table shows that there is a 0.272 correlation between the two variables showing that for every unit increase in AIA, there is a 0.272 increase in completion rates of capital projects in JKUAT. Although the correlation is positive, the correlation coefficient is the lowest among the financing options indicating that those projects financed by AIA have the lowest correlation with completion rates. This implies that they take long to be completed. The results agree with those by Kajirwa (2015) who reported that AIA financing of capital projects reduces completion rate of capital projects.

Lastly, the results in Table 4.3 indicate that Foreign Donor financing source is positively and highly correlated with project completion rates (R = 0.621, p < 0.05) implying that for every unit increase in Foreign donor financing, there is a corresponding increase in completion rate of 0.621. This further seems to imply that foreign donor financing has the highest correlation with completion rates indicating that those capital projects that are financed by foreign donor funding have high completion rates. Daniel and Wandela (2013) also reported similar findings in their study.

Relationship between Financing Option and Completion rates

In order to answer the research objectives, a regression analysis was carried out to determine the effect of financing options and completion rates of capital projects in JKUAT. Results are presented and discussed below.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig
1	.856ᵃ	.732	.728	0.553	.043

The model summary in Table 4 above indicates that the general correlation between project financing options and completion rates is positive and high. This is shown by the model correlation coefficient of 0.856. The suitability of the model in predicting real estate growth was revealed by R square value of 0.728. This implies that the 72.8% of completion rates can be predicted by using financing options, or that financing options determine 72.8% of completion rates with other factors not in the model predicting the remaining 27.2%.

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.425	3	28.808	118.270	.000ᵃ
	Residual	6.773	91	.174		
	Total	67.198	94			

a. Predictors: (Constant), **GOVT, COMLOAN, AIA, FORDON**

b. Dependent Variable: **COMPRATE**

The model regression relationship in the ANOVA Table 5, it can be inferred that the general relationship between the variables is strong. The present study was carried out on the hypothesis that there is no relationship between project financing options and the completion rates of capital projects in JKUAT. The p-value of 0.00 (p<0.05) in the model implies that the null hypothesis is rejected and therefore the alternative hypothesis is accepted. It therefore implies that there is a significant relationship between project financing options and the completion rates of capital projects in JKUAT.

Table 6: Effect of Financing Sources on Completion Rates(Coefficients)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t-Value	Sig
(Constant)	.571	.198		1.879	.000
GOVT	.446	.180	.457	0.276	.000
COMLOAN	.194	.171	.180	2.189	.023
AIA	-0.372	.162	.369	1.776	.000
FORDON	.516	.202	.232	0.287	.000

Table 6 confirms the correlation coefficients that were found in Table 3. Since the first specific objective was to establish the effect of Government financing on completion rates of capital projects in JKUAT, the null hypothesis was set that Government financing has no effect on the

completion rates of the projects. The value and the beta coefficient (β= 0.571, p = 0.000) leads us to reject the null hypothesis of Government financing having no significant effect on completion rates of capital projects in JKUAT. It therefore implies that Government financing has a positive significant effect on completion rates of capital projects in JKUAT. These findings are in tandem with those of Andrew and Euclid (2006) who reported that government financing of capital projects increases their completion rates.

Table 6 also shows that the beta coefficient for commercial banks' financing on the completion rates growth is positive and insignificant, (β= 0.194, p= 0.023). Since the null hypothesis was set that Commercial banks' financing has no effect on completion rate, we therefore reject it and conclude that Commercial banks' financing has a significant effect on completion rate of capital projects in JKUAT. This is a likely indication that Commercial banks' financing of capital projects influences the completion rates of the projects significantly. Kavindu (2012), and Kivuva (2004) report that Commercial banks' financing has a significant effect on completion rate of capital projects.

The regression coefficient for Appropriation-in-Aid financing was also found to be significant with a beta value of -0.372 (p-value = 0.000). This means that use of AIA in financing capital projects has a negative but significant effect on completion rates of projects. This implies that we reject the null hypothesis that AIA financing has no effect on completion rates of capital projects and conclude that use of AIA in financing capital projects has a negative but significant effect on completion rates of projects. This further indicates that using AIA to finance capital projects in JKUAT reduces completion rates of the projects. Daniel and Wandera (2013) also reported similar findings in their study.

Table 5 further shows that using foreign donor funds to finance capital projects has a positive significant effect on completion rates of capital projects in JKUAT. This was sh6wn by the beta coefficient of 0.516 (p = 0.000) indicating that the use of foreign donor funds has a positive effect on completion rates of the capital projects. Lemma and Negash (2013) and Cheboi (2014) in their studies reported that the use of foreign donor funds in financing capital projects greatly influences their completion rates since the donors monitor their projects.

Summary of Findings

Effect of Government Financing on Completion Rate of Capital Projects

Correlation results showed that Government financing is significantly and positively correlated with completion rates of capital projects in JKUAT. The inference here is that as Government financing increases, there is likely to be an increase in the completion rates of capital projects in JKUAT. The correlation results further indicate that Commercial loan financing has a significant correlation with the completion rates of capital projects in JKUAT implying that as Commercial loan financing increases there is increase in the completion rates of capital projects in JKUAT. This means that there is a positive relationship between two variables indicating that Commercial loans financing is an important source of finance in terms of completion of capital projects. The correlation between Appropriation-in Aid and completion rates is positive and significant. It was found that although the correlation is positive, the correlation coefficient is the lowest among the financing options indicating that those projects financed by AIA have the lowest correlation with completion rates. This implies that they take long to be completed.

Lastly, it was found that Foreign Donor financing source is positively and highly correlated with project completion rates. This further seems to imply that foreign donor financing has the highest correlation with completion rates indicating that

those capital projects that are financed by foreign donor funding have high completion rates.

Findings based on the first objective which was to find out the effect of Government financing on completion rates, it was found that Government financing has a positive significant effect on completion rates of capital projects in JKUAT.

Effect of Bank Loan Financing on Completion Rate of Capital Projects

The second objective was to find out the effect of commercial banks' financing on the completion rate of capital projects in JKUAT. The study found out that Commercial banks' financing has a significant effect on completion rate of capital projects in JKUAT. This is a likely indication that Commercial banks' financing of capital projects influences the completion rates of the projects significantly.

Effect of AIA Financing on Completion Rate of Capital Projects

The third objective of this study was to find out the effect of Appropriation-in-Aid financing on completion rates of capital projects in JKUAT. Study findings indicate that AIA financing of capital projects has a negative but significant effect on completion rates of projects which indicates that using AIA to finance capital projects in JKUAT reduces completion rates of the projects.

Effect of Foreign Donor Financing on Completion Rate of Capital Projects

Findings based on the fourth objective which was to find out the effect of foreign donor financing on completion rates of capital projects in JKUAT indicate that foreign donor financing of capital projects has a positive significant effect on completion rates of capital projects in JKUAT.

Conclusions

Based on the findings from the study, the following conclusions that be drawn. Based on the first objective for which it was found that Government

financing has a positive significant effect on completion rates of capital projects in JKUAT, it is concluded that Government financing is an important source of financing capital projects in JKUAT since it influences faster completion of the projects.

Secondly, the effect of Commercial banks' financing on the completion rate of capital projects in JKUAT was found to be positive and significant and it is therefore concluded that financing of capital projects by using commercial banks' financing is necessary if the projects are to be completed on time. This is because Commercial banks' financing of capital projects positively and significantly influences the completion rates of the projects.

Study findings based on the third objective indicate that AIA financing of capital projects has a negative but significant effect on completion rates of projects which indicates that using AIA to finance capital projects in JKUAT reduces completion rates of the projects. It is therefore concluded that using AIA to finance capital projects reduces their completion rates.

Findings based on the fourth objective which was to find out the effect of foreign donor financing on completion rates of capital projects in JKUAT indicate that foreign donor financing of capital projects has a positive significant effect on completion rates of capital projects in JKUAT. It is concluded that foreign donor financing of capital projects positively influences their completion rates.

Recommendations

Based on the findings and conclusions from the study, the following recommendations can be made. Based on the conclusion for the first objective that Government financing is an important source of financing capital projects in JKUAT since it influences faster completion of the projects, it is recommended that JKUAT embraces government financing of capital projects by

applying for more funds if it is desired that more projects are completed on time.

Secondly, based on the conclusion from findings from the second objective that financing of capital projects by using commercial banks' financing is necessary if the projects are to be completed on time, it is recommended that JKUAT seeks financing from commercial banks for faster completion of projects. This could be due to the fact that commercial banks require the collateral before financing the projects.

Study findings and conclusions based on the third objective that using AIA to finance capital projects reduces their completion rates, it is recommended that JKUAT reduces the use of AIA to finance capital projects since projects financed by AIA take long to be completed. This could be due to the need to divert funds raised by AIA to finance recurrent expenditure.

Findings based on the fourth objective indicated that foreign donor financing of capital projects has a positive significant effect on completion rates of capital projects in JKUAT. It was concluded that foreign donor financing of capital projects positively influences their completion rates and recommended that JKUAT seeks more foreign aid funding since projects financed by foreign donor financiers have the fastest completion rates.

Suggestions for Further Research

The research puts forward the following suggestions for further research:

- A study on the role of financing options on completion rates of projects across several universities.

- A study on the role of financing options on completion rates of capital projects for non-governmental organizations.

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