Re-Engineering Investment in Students' Accommodation in Public Universities through Public-Private Partnerships in Kenya

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Abstract

The purpose of the study was to evaluate the role of PPP in investment in student accommodation in public universities in Kenya. The investigative issue was whether the perceived bridging of the financing gap and risk sharing occasioned by PPP has any effect on investment in student accommodation. The study employed a survey research design and both multinomial ordinal logistic regression analysis and factor analysis. The population comprised 115 university staff and 42 investors. 34 respondents from universities' upper and middle management and 6 investors were sampled. The findings indicate that while bridging of financing gap occasioned by PPP does not have a statistically significant effect on investment in student accommodation at 5 percent significance level, it does have a positive effect. Amongst the indicators of risk sharing, both skills and expertise and types of risk were found to have a significant effect on investment of student accommodation. Generally however, though risk sharing through PPP was found to have a positive effect, this effect was not statistically significant in influencing the investment in student accommodation at 5 percent significance level. Factor analysis results showed that PPP model choice is highly influenced by policy guidelines and investment cost. Universities therefore need to put in place clear policy guidelines on PPPs spelling out how the different types of risk are shared and the level of skills and expertise required. Future research may be done to evaluate the role that PPP could play in the development of on other infrastructural projects in public universities in Kenya besides investment in students' accommodation

Keywords: PPP, Student Accommodation, Risk Sharing, Finance, Public University and Private Investors

Introduction

Public Private Partnership (PPP) is an arrangement between a public and a private sector entity, for the provision of public assets, through investments being made and/or management being undertaken by the private sector entity (Yescombe, 2007). This is usually for a specified period of time, where there is well defined allocation of risk between the parties. Roger (2002) states that private partner receives performance linked payments that conform to specified and

pre-determined performance standards, measurable by the public entity. Over the past decade, the use of PPPs in the financing and management of education has generated considerable debate as to the meaning, purpose, status and outcomes. The debate is heated particularly in the education sector due to its widely-held view that education is a complex social and political activity that should remain largely, if not wholly, in the public sector domain and serving public interests (Robertson & Verger, 2012).

The increasing involvement of private actors which has lead to rapid expansion of PPPs in education, includes more of the traditional arenas of public education systems: policymaking, education infrastructure provision, inspection, school management and therefore deserves to be scrutinized (Hatcher, 2006; Ball, 2007; Bhanji, 2008; Saltman, 2010). To some, PPPs are simply a newer, friendlier, phase on a longer-standing 'privatization of education' agenda (Hatcher, 2006). Others however regard PPPs as an innovative means of financing education that draws upon the best of the public and the private with the potential to resolve deep systemic problems in education systems, in regard to access, quality and equity (King, 2009). There are several PPP models in use that allocate the responsibility and risks between the partners that include: built and transfers (BT), Build-Lease-and-Transfer (BLT) model, Build Operate and Transfer (BOT), Build-Own-Operate-and-Transfer (BOOT), Build-Own-and-Operate (BOO), Build-Operate-Share-Transfer (BOST) and Build-Own-Operate-Share-Transfer (BOOST) models. PPP can also be in form of agreement where the institution assures the private sector of accreditation after completion which is within the standards of the University.

The public-private partnership theory was promoted in 1997 with the publication a report, by the group gathered around Neil Kinnok, on the question of the financing projects regarding the trans-European transport network through partnerships between the private and public sectors (COM, 1997). The concept represented a form of "cooperation" between a public authority, the private sector and other parties for the provision of better services. Today, PPP is a notion more and more present in the economic media interest, within the international institutions, political discourses and economic and financial publications. In support of PPP is normative and positive theory of PPPs which advocate the importance of partnerships. To understand the optimal pattern of delegation, it is useful to keep in mind that most public services including accommodation in Public Universities require in fact to perform a complex array of tasks (David & Jerome, 2006).

Despite the advantages of PPP, not many Kenyan Universities have utilized PPP as a solution. The government of Kenya has established a PPP policy which is in line with Vision 2030 (RoK, 2012) to assist organizations and offer advisory services on the avenues and structuring of PPPs and PPP has been employed with a measure of success in other infrastructure projects in Kenya (Koimett, 2012). While PPP has been touted as a panacea for the housing problems in universities, very few have embraced the model in overcoming the perennial student accommodation shortage. The purpose of this paper is therefore to evaluate the role of PPP in investment in student accommodation in public universities in Kenya in solving student accommodation problem. In this regard we hypothesized as follows:

> **H1:** *There is no significant effect on investment in student accommodation in Public Universities in Kenya as a result the bridge in the finance gap occasioned by PPP.*

> **H2:** *There is no significant effect on investment in student accommodation in public universities as a result of risks sharing brought by PPP*

We additionally set out to investigate the key factors influencing the choice of PPP models by public universities.

Methodology

The study employed a survey research design because the information being sought was descriptive in nature. The study's population comprised 115 university staff (top and middle level management) and 42 investors in student accommodation facilities. Universities were selected through stratified simple random sampling, the basis of stratification being those institutions that have adopted PPP and those that have not. The study's sample comprised of 34 respondents from universities' upper and middle management and 6 investors. Sample size was determined following Cochram (1963). A Likert-type structured questionnaire whose reliability was score was 0.764 was used to collect data from 3rd to 21st of August 2015. Since data generated by Likert-type data collection instruments is ordinal in nature, data analysis involved conducting multinomial ordinal logistic regression analysis for the first and second hypothesis i.e. finance and risk sharing.

Model Specification

The general model tested for hypothesis one and two was:

$$\ln\left(\frac{P_{ij}}{P_{i1}}\right) = \beta_{0j} + \beta_1 x_1 + \beta_2 x_2 + ...\beta_J x_i + \varepsilon$$

Where:

ln = Natural log
P_{ij} = Probability of success
P_{i1} = Probability of failure or $1-P_{ij}$
β_{0j} = The intercept/ constant
$\beta_{1j}, \beta_{2j,}$ = The partial regression coefficients (slope)
X_{i1} = Finance
X_{i2} = Risk sharing
ε = Error term

The key factors influencing PPP model decision were identified using factor analysis.

Findings

The first objective of the study was to determine the extent to which PPP bridges the financing gap of investment in student accommodation in public universities in Kenya. The study hypothesized that: *There is no significant effect on investment in student accommodation in Public Universities in Kenya as a result the bridge in the finance gap occasioned by PPP.* To test this hypothesis, the specific model was formulated as follows:

$$\ln\left(\frac{P_{ij}}{P_{i1}}\right) = \beta_{0j} + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \varepsilon$$

Where:

ln = Natural log
P_{ij} = Probability of success
P_{i1} = Probability of failure or $1-P_{ij}$

β_{0j} = The intercept/ constant
β_{1j}, β_{2j} = The partial regression coefficients (slope)
X_1 - X_6= Indicators of bridging of finance gap: X_1- Hindering investment, X_2- Terms of access, X_3- Credit Facilities, X_4- Accelerate Investment, X_5- Budget, X_6- Value for money.
ε = Error term

Findings presented in table 1 indicate that the chi-square statistic for the predictors were respectively, Terms of access = 4.234, p-value of 0.645, Hindering investment = 2.811, p-value of 0.832. Credit Facilities= 4.352, p-value 0.887, Credit Facilities = 4.352, p-value 0.887, Credit Facilities = 4.352, p-value, 0.887 and Value for money = 14.239 p-value 0.286. While the predictors of bridging financing gap by PPP were found a positive effect on student accommodation, the effect was not significant at the 5 percent significance level because all the predictors had a p-value greater than 0.05 (p-value>0.05).

Table 1: Likelihood Ratio Tests on the effect of bridging of financing gap on investment in student accommodation

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	15.183[a]	.000	0	.
Hindering investment	17.994[b]	2.811	6	.832
Terms of access	19.417[b]	4.234	6	.645
Credit Facilities	19.535[b]	4.352	9	.887
Accelerate Investment	20.426[b]	5.243	9	.813
Budget	17.356[b]	2.173	9	.988
Value for money	29.422[b]	14.239	12	.286

Table 2 below indicates the model fitting information results that compares the final model against the baseline to see whether it has significantly improved the fit to the data. The Model fitting Information table gives the -2 log-likelihood values for the baseline and the final model, and also performs a chi square to test the difference between the -2log likelihood of the two models. From the table, the statistically significant chi-square statistic is 0.000 (p<0.05). This indicates that the final model gives a significant improvement over the baseline intercept-only model. This means that the model gives better predictions.

Table 2: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	56.100			
Final	.000	56.100	19	.000

Link function: Logit.

The effect of PPP in bridging of the financing gap in investment in student accommodation can be summarized in the following model.

Logit =15.183+ 17.994X₁+19.417X₂+19.535X₃+20.42X₄+17.35X₅+29.22X₆+ε

Though the effect of PPP bridging of the financing gap in investment in student accommodation was not found to be significant, the findings did show a positive effect none the less indicating that acceleration of investment in student accommodation increases with increase in access to resources brought about by PPP and also reducing budget constraints on capital intensive projects. The findings also agree that the terms of access to finance are enhanced with PPP together with increasing value for money in economic development of Public Universities. The findings are in agreement Shah (2005) who found that PPPs produced most savings and improved efficiency and effectives of service thus leading to value for money. Similarly, Nikolic & Maikisch (2006) found that the formation of PPPs can assist governments, in partnership with the private sector, to address financial and service delivery challenges.

The study also set to establish the effect of risk sharing through PPP in student accommodation investment in Public Universities in Kenya. The aim was to answer the question whether the risk sharing provided by PPP had any effect in enhancing student accommodation investment in Public Universities in Kenya. The study's hypothesis in this regard was that *there is no significant effect on investment in student accommodation in public universities as a result of risks sharing brought by PPP*. To test this hypothesis, the specific model was formulated as follows:

$$\ln\left(\frac{P_{ij}}{P_{i1}}\right) = \beta_{0j} + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \varepsilon$$

Where:
   ln = natural log
   P_{ij} = probability of success
   P_{i1} = Probability of failure or $1\text{-}P_{ij}$
   β_{0j} = the intercept/ constant
   $\beta_1, \beta_2, \ldots$ = the partial regression coefficients (slope)
   X_1 - X_6 = Indicators of sharing: X_1- Risk Transfer, X_2- Skills and Expertise sharing, X_3- Type of Risk, X_4- Risk Minimization, X_5- SWOT analysis, X_6- Revenue sharing
   ε = Error term

Findings presented in table 3 indicate that the Chi Square statistic for the predictors of risk sharing were respectively Risk Transfer = 6.150, p-value, 407, Skills and Expertise = 0.000, p-value, 0.000, Type of Risk= 0.000, p-value, 0.000, Risk Minimization = 5.410, p-value, 0.797, SWOT analysis = 4.251, p-value, 0.894, Revenue = 3.269, p-value, 0.774. This indicates that skills and expertise, types of risk have a significant effect on investment of student accommodation (p-value of 0.00<0.05). While the rest of the predictors of risk sharing had a positive effect on student accommodation investment the effect was not significant since the p-value was greater than 0.005.

Table 3: Likelihood Ratio Test statistics on the effect of risk sharing through PPP on investment in student accommodation

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	21.221[a]	.000	0	.000
Risk Transfer	27.372[b]	6.150	6	.407
Skills and Expertise	18.972[b]	.000	12	.000
Type of Risk	20.615[b]	.000	12	.000
Risk Minimization	26.632[b]	5.410	9	.797
SWOT analysis	25.473[b]	4.251	9	.894
Revenue	24.491[b]	3.269	6	.774

The model fitting information presented in Table 3 compares the final model against the baseline to see whether it has significantly improved the fit to the data. The Model fitting Information table gives the -2 log-likelihood values for the baseline and the final model, and also performs a chi square to test the difference between the -2log likelihood of the two models. The p-value is less than 0.005 indicating that the final model gives a significant improvement over the baseline intercept-only model.

Table 4: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	56.100			
Final	.000	56.100	19	.000

Link function: Logit.

The effect of PPP in promoting risk sharing in investment in student accommodation can be summarized in the following model.

$$Logit=21.221+27.372X_1+18.972X_2+20.615X_3+26.632X_4+25.473X_5+24.491X_6+\varepsilon$$

Generally the effect of risk sharing through PPP was not found to have a statistically significant effect on investment in student accommodation. However specific indicators of risk sharing that included risk transfer and skills and expertise were found to have a significant effect on student accommodation effect and generally even if the rest of the indicators were not significant, they had a positive effect. The findings therefore shows that risk should be shared to the party that can best bear it and both partners should be aware of the risks involved know how risk can be minimized to ensure effective risk sharing.

The study also set out to examine the factors that influence the choice of Public Private Partnerships (PPPs) model in Public Universities in Kenya. To achieve this, the study conducted factor analysis. As a necessary precondition for conducting factor analysis we conducted the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (see table 4 below). An MSA score of 0.523 was obtained. Since Kaiser (1970) recommended cut off is 0.50, the sample met the threshold for factor analysis.

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.523
Bartlett's Test of Sphericity	Approx. Chi-Square	81.452
	Df	15
	Sig.	0.000

The Scree plot presented in Figure 1 from the factor analysis output facilitates the determination of the number of factors to extract. Using the elbow rule, two components /factors (those above the asterix on the scree plot) were delineated for interpretation.
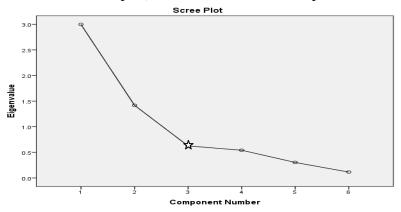

Figure 1: Scree plot

Table 5 presents the variation explained by the two extracted components /factors. The two components /factors combined explain 73.605% of the total variation. This means that they account for more than two thirds of the latent meanings in the original six variables.

Table 6: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumula tive %	Total	% of Variance	Cumulati ve %	Total	% of Variance	Cumula tive %
1	2.998	49.961	49.961	2.998	49.961	49.961	2.575	42.920	42.920
2	1.419	23.643	73.605	1.419	23.643	73.605	1.841	30.685	73.605
3	.625	10.422	84.027						
4	.541	9.019	93.046						
5	.303	5.046	98.092						
6	.114	1.908	100.000						

Extraction Method: Principal Component Analysis.

The next step in factor analysis is that of discerning the meanings that are represented by the two components. This is done though picking out the variables that have the highest correlation with the factor and determining what they represent collectively. A rotated component matrix helps in this process. The study used the varimax method of rotation with Kaizer normalization. From the component rotation matrix presented in Table 6 the variables with the highest correlation with component 1 were University policy (0.901) government

regulation (0.794) and PPP policy in place (0742) the study interprets this to mean the ***need for clear PPP policy guidelines***. While component 2 has high correlations with time when the investment is needed (0.935) and cost involved in an investment (0.895) the study interprets this to mean the ***timing of investment costs***.

Table 7: Rotated Component Matrix

	Component	
	1	2
University policy on Investment	.660	.347
Government regulation	.901	.171
Private investor expertise	.814	-.020
Time when the investment is required	.099	.935
PPP policy in place	.794	.120
Cost of investment	.161	.895

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Discussion

The findings of the study that PPP had positive effect (though not significant) on investment in student accommodation are in agreement Shah (2005) who found that PPPs produced most savings and improved efficiency and effectives of service thus leading to value for money. Similarly, Nikolic & Maikisch (2006) found that the formation of PPPs can assist governments, in partnership with the private sector, to address financial and service delivery challenges.

The finding that risk transfer and skills and expertise were found to have a significant effect on student accommodation, even if generally the rest of the indicators of risk sharing had a positive but not significant effect, is in agreement with Goldsmith and Eggers (2004) who argues that risk identification, allocation, and negotiation is essential in assigning risk to the organization that best understands and can control the risk and maximizes public benefit. The findings shows that risk should be shared to the party that can best bear it and both partners should be aware of the risks involved know how risk can be minimized to ensure effective risk sharing. With PPP management of Public Universities are able to gain skills and expertise from the private investors.

The study also sought to examine the factors that influence the choice of Public Private Partnerships (PPPs) model in Public Universities in Kenya. Factor analysis results show that PPP model choice is highly influenced by policy guidelines and investment cost. This is in line with the government move to set up a PPP unit that has drawn general guidelines to guide PPP projects. There is however need to customize the universities to customize the general guidelines to their specific and unique needs.

Conclusion

From the study it's concluded that PPP has positive but not significant effect on bridging the finance gap in Public University on investment not only in student accommodation. Also embracing PPP will enable the government to bridge the deficiency of social needs brought by scarcity of public resources. The study also concludes that through PPP has positive but not significant effect in minimizing risk thus increasing investment of student accommodation and if

embraced the challenge of bed capacity will be a thing of the past in public universities. From the study, the choice of PPP model is greatly influenced by government regulation, PPP policy and university policy on investment. The public universities are left to channel the available resources to their core functions when PPP is embraced.

It is recommended that the Government, public universities and other public institutions should advocate for more PPP in capital intensive projects that cannot be financed through the internal funds due to budget constraints. Public Institutions should develop and implement PPP policies that are enforceable and these will improve provision of social needs to the public that are more efficient and effective. PPP awareness should be created to both public and private by showing the win-win side of the concession agreement by increasing the will power of implementation between both parties. Universities therefore need to put in place clear policy guidelines on PPPs spelling out the how the different types of risk are shared and the level of skills and expertise required and the government should also provide incentive to private parties to reap value for money for both parties.

Further research may be done to evaluate the role that PPP could play in the development of on other infrastructural projects in public universities in Kenya besides investment in student's accommodation.

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