EFFICIENCY ASSESSMENT OF TANZANIAN PRIVATE UNIVERSITIES: DATA ENVELOPMENT ANALYSIS (DEA)

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ABSTRACT
This paper employs a two-stage Data Envelopment Analysis to examine the efficiency of private Universities in Tanzania in 2008-2012. First, both total technical efficiency and scale efficiency are measured through Data Envelopment Analysis. In the second stage, Tobit regression Model is used to ascertain efficiency determinants. We use primary and secondary data with three inputs and three outputs derived from multiples sources including 8 surveyed private universities. Results from stage one suggest that there is variability of technical efficiency among private Universities in Tanzania. However, the average technical efficiency is found to have a gradual increase year wise. We also identify that enrolment, academic staff, non-academic staff and consultancy services are statistically significant. While enrolment indicates a negative relationship with efficiency, the other three significant variables are positively related. Thus, private Universities could reduce enrolment and increase academic staff, non-academic staff and consultancy services, if they were to become efficient.
Key words: Private Universities, efficiency, DEA, Tobit regression

1.0 INTRODUCTION

The Ministry of Education and Vocational Training (MoEVT) defines University as the highest level of institution, dedicated to professional and intellectual development of mankind, and society in general. Private Universities on the other hand refers to all Universities owned and operated by private organizations or individuals, but controlled by MoEVT (URT, 1999). Since independence in 1961 all education institutions were established, operated and managed by the government. However, demand for higher education has been increasing over time, inversely to the government funding capacity. To address this challenge therefore, the government of Tanzania discretionary accepted private Universities to operate since 1995. The increased market demand both internal and external influenced this policy change in higher education. Privatization of higher education affected all other developing countries after the introduction of structural adjustment programmes (SAPs) in 1980s and 1990s, as were imposed by foreign donors (Grosen, and Coflkun, 2010).

As result of financial constraints, the government has not been able to build more Universities and provide sponsorship to all students joining in public Universities. Thus, establishment of private Universities has minimized the gap despite higher fees they charge. Parents, whose children are not posted to public Universities, send them to private Universities so long as they are able to incur expenses. Because of this high demand of University graduates, the expansion of private

Universities has been tremendous. Whereas in 1995 there were only 7 private Universities and colleges, today (2014) there are 32(74.4%), out of 43 registered and accredited Universities in Tanzania. Arguably, an impact of private University education in Tanzania is significant.

Enrollment in private University education on Mainland Tanzania has registered a continuous increase; for instance in 2003/04 to 2010/11, private Universities enrolment increased from 6.6% to 31.31% (see table 1) respectively (MoEVT, 2012). This trend is likely to ascend in line with the demand increase for University graduates' man power in the market. Nevertheless, enough has not been done by Universities to ensure efficiency for their sustainability. Thus, stakeholders are worried if Universities will meet their expectations, as graduates are reported to have low performance at work. So far, University efficiency is a global agenda calling researchers to work on it.

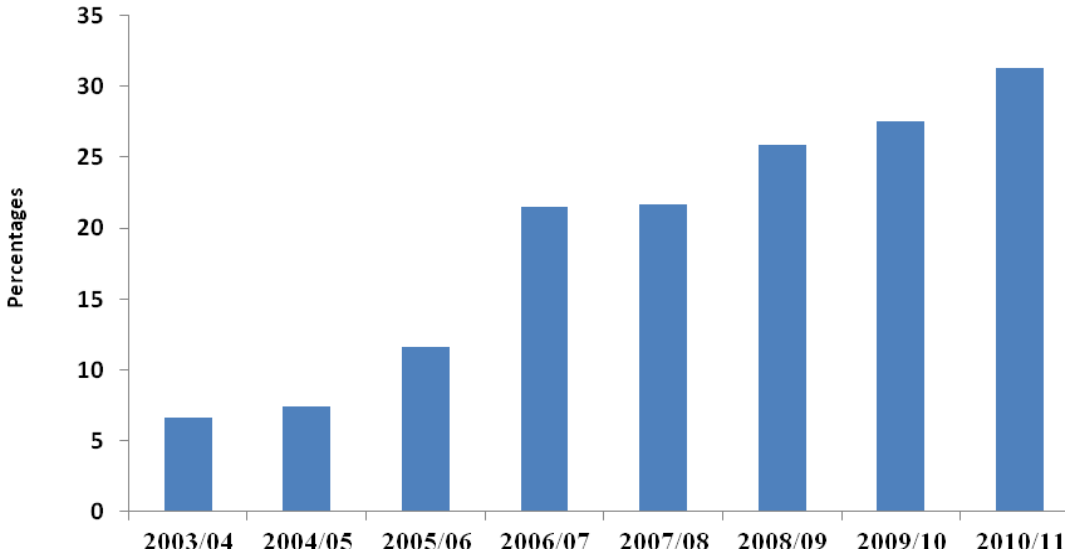
1.1 Private Universities' trend

The trend of private Universities in Tanzania has been and is increasing overtime though their enrolment rate is less compared to that of public Universities. Table 1 below provide evidence of enrolment trend in private Universities from 2003/04 to 2010/11.

Table 1 University Enrollment Trends and the Share of Nongovernmental Institutions, 2003/04-2010/11

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Total Enrolment	30,759	36,612	40,105	49,967	82,529	1,01,222	1,181,102	1,23,434
Percentage of Private University	6.60%	7.40%	11.60%	21.51%	21.65%	25.87%	27.53%	31.31%

Figure 1 Private University Enrolment Trend 2004/05-2010/11



Source: Extracted from website TCU

Notwithstanding higher costs, private Universities contribute in generation of graduates and for the national economic development (Vossensteyn, 2004). Since most private Universities are profit making orientated, the efficiency and quality of education they provide has been questioned by stakeholders. On the one hand, education stakeholders are highly concerned with quality of education they purchase for their children so that they can benefit from the expected educational returns. On the other hand, quality of higher education today is a necessity for global competitiveness of any country. University education therefore, determines the national growth, and is no longer a luxury, but it is a need (Reddy and Sujit, 2009). Surprisingly, none of the surveyed studies in Tanzania has examined the efficiency of private Universities, despite complaints uttered by stakeholders on poor performance of University graduates. In contrast, the higher education policy of 1999 is not adhered. The commitment on ensuring expansion private institutions while meeting the market demand has not been met (Mwollo-Ntallima, 2011).

Likewise, the current higher education development programme (HEDP), explicitly recognises the role of higher education in economic development. It states clear that higher education is an economic investment by parents to their children. Based on this fact, parents and other stakeholders are expecting quality education provided by Universities. Unfortunately, the dreams of these investors have not been realized, hence creating parents' mistrust to University education. Not only parents who are not satisfied with University graduates, but also employers in various sectors are sceptical about graduate's capability. For instance, teaching posts in most English medium primary schools and secondary schools in Tanzania are occupied by Kenyans and Ugandans (Rugemalila, 2005). This phenomenon signifies a black future for Tanzanian University graduates, both regionally and globally.

This study therefore, examines the efficiency of selected 8 private Universities in Tanzania which is yet to be done. We provide a surveyed literature review in the next section, which is followed by methodology used in section three. The fourth section, provide results analysis, conclusion and recommendations.

The current study is significant due to the fact that higher education is inevitable for production of skilled man power for both social and economic development. Under free market economy Tanzanian Universities are likely not to compete. Tanzania is among the five countries forming the East African Community (EAC) where competition for employment and business is vivid. Thus, Universities in Tanzania need to uplift their efficiency and quality so as to remain sustainable.

2.0 LITERATURE REVIEW

In this section, we provide definition of key terms; efficiency, DEA, and Tobit regression, before getting into empirical literature review.

2.1 Efficiency

The concept is borrowed from economics which refers to the ratio of total outputs to the total inputs in a firm production. Economists describe efficiency in three aspects; allocative efficiency (AE) which means the use of inputs in the correct proportions reflecting their marginal costs; scale efficiency (SE) which considers the optimal size of the establishment to minimize long-run costs; and technical efficiency (TE) which means that a firm use a minimum quantity of inputs to obtain

the maximum output under the given technology (Avkiran, 2001). In this context both TE and SE are appropriate efficiencies to be measured.

$$Efficiency = \frac{\text{Output}}{\text{Input}}$$

Generally, efficiency is the relationship between the results achieved and the resources used. It also refers to the cost in relation to the outcomes achieved. It is rarely possible to describe in absolute terms. One process is 'more efficient' than another if it achieves the same outcomes at lower cost. Efficiency in education is measured in terms of graduate rates, research publications, consultancy services, revenue generation etc as output, whereas enrolment, annual expenditure, academic staff, non-academic staff and quality of enrolled students as inputs (Kokkelenberg, 2008). Many studies have been conducted in education examining efficiency and performance. Performance is also measured through efficiency which is the major determinant of organization performance. However, efficiency measures the extent to which a particular unit adheres to or deviate from a set up standards/benchmarks of success. Based on DEA model, a unit is efficient if it has a maximum score of 1, and any score below that indicates inefficient. The current study therefore, examines technical efficiency of private Universities to identify if they are adhering to both local and international agreed standards.

2.2 Data Envelopment Analysis (DEA)

Data envelopment analysis is a non-parametric paradigm using linear programming to analysed efficiency of various decision making units (DMUs). The original of DEA goes back to Farrell (1957), whose work was extended by Charnes, Cooper and Rhodes (1978) known as CCR model before being modified by Bankar, Charnes and Cooper (1984), hence the name BCC model. Since then, DEA has become the most useful model than any other parametric approaches like stochastic frontier analysis (SFA) in evaluating efficiency. DEA model has been preferred due to advantages attached to this model. Apart from determining the efficiency of each measured DMU, it also provides a solution to those inefficient DMUs, what they do to become efficient. Some studies which have employed DEA in measuring educational efficiency include: Fandel (2003), Kiong (2004), Rosenmayer, (2014), Khezrimotlagh et al, (2012), Raa, (2004), Yang, (2000), Thanassoulis et al, 2008) to name a few. Thus, this study adopts an input oriented model to assess technical efficiency and scale efficiency. With DEA model, a decision making unit DMUs is full efficient if it has a maximum score of 1 (100%) and is termed as frontier DMU. All other DMUs with efficiency score below 1 up to zero (0 to 1) are identified as inefficient. Thus, all inefficient DMUs can adjust their efficiency score with respect to their frontier DMU. In this paper, both CCR and BCC models are employed so as to observe the difference of constant return to scale (CRS) and variable return to scale (VRS) assumptions.

2.3 Tobit regression model

Tobit regression model is a statistical non-linear model proposed by James Tobin to describe the relationship between a non-negative dependent variable Y_i and an independent variable X_i. The word Tobit is taken from the name Tobin and "it" is added to it (Joreskog, 2002). It is also known

as censored regression model designed to estimate linear relationships between variables, if the value of dependent variable is non-negative whereby negative variables ($_{Yi}$<0) are not observed. This model has been extensively used in estimating determinant variables on efficiency. It is mainly used with DEA model as the second stage of analysing efficiency in various fields including education. From Tobit model results t-value of ±1.96 and p-value at 1%, 5% or 10% significance levels are used. However, p-value 5% significance level is highly accepted and recommended. Studies which have employed two stage DEA model with Tobit regression in assessing education efficiency are Tóth, (2009), Denaux, Z. S. (2005), Agasisti (2012), Boujelben and Trabelsi-Ltifi (2013) and many others. We employ this model to determine the influence of technical efficiency in private Universities in Tanzania to determine their significant variables. This model is preferred to other models like, ordinary least square (OLS) due to its ability of avoiding biasness and inconsistency ignored by OLS (Forster and Kalenkoski, 2013).

2.2 Empirical Studies

Prior study done by Rahinnanin and Soltanifar, (2013), to measure efficiency of private Universities using DEA model with Malmquist productivity index over a period of 2004 - 2007, indicates variability among studied units. The number of research products and number of graduates are reported to have different gaps. It is important therefore, to determine the efficiency of each University and make comparison with others.

Another study by Calhoum and Hall (2011) analysed a relative efficiency involving both public and private universities in USA using a DEA model. First, the DEA model was employed to determine the aggregate frontier and the second model was for each group of institution in order to make comparison. Findings from aggregate efficiency indicated that higher learning institutions with low percentage of restricted revenue were more efficient compared to those with higher restrictions. This implies that management had little discretion of how to allocate their expenditures.

Likewise, efficiency assessment of 7 engineering and 7 polytechnic institutions in Kerala-India in the year 2006/07, adopted an input oriented DEA model with multiple inputs and a single output (Sunitha and Duraisamy, 2010). Both technical efficiency and scale efficiency were measured and compared. The study findings show that there was variation of average technical efficiency and scale efficiency for both engineering and polytechnic institutions. However, the average efficiency of polytechnic institutions was better than that of engineering.

Furthermore, findings from a study conducted in private Universities by Kokkelenberg (2008), focusing on graduation rates reveals a higher efficiency rate closer to 100%. These results were criticised in that there are other outputs of Universities than graduates. This study, measured the efficiency of private Universities by graduation rates as the major output through Ordinary Least Squares (OLS) and Stochastic Frontier Analysis (SFA). Since education has multiple inputs and outputs it is rational to involve more than one variable in assessing educational institutions so as to increase reliability of results.

Other studies done in Africa indicate that African countries for decades have been emphasizing on primary and secondary education at the expense of higher education. However, recently the role of higher education in economic and social development has been realised. According to Bloom (2006), Sub-Saharan Africa is far behind in higher education compared to the rest of the world. The study survey contradicts the myth that higher education has little impact on economic growth and

poverty reduction thus, calling for African governments to put more emphasis to it. In this regard therefore, assessing efficiency of private universities is inevitable, particularly at this time when the number of Universities is continually swelling. The case is similar to Tanzania private Universities situation today.

Notwithstanding high demand of University graduate manpower, and proliferation of private Universities in Tanzania, no study has been conducted to assess efficiency of private Universities and the application of DEA model is still new in the education sector in Tanzania. Few studies have evaluated the quality and performance of private Universities without touching efficiency. Makulilo (2012) contents that, for the higher education to meet both private and public demands, it must be of high quality. We also found that private Universities are said to be the source of quality problem in higher education as result of massive increase of these institutions without meeting stakeholders' demand. In contrast, we also found another argument that public Universities are observed to be ineffective and inefficiency compared to private **(**MIHAIU, 2010). The argument is based on both input and output of these two sectors. While in public Universities input and output are no well quantifies due to their complexity, in private institutions it is possible to quantify. Hence, examining efficiency also has become difficulty in public sectors compare to private.

The prevailing controversial arguments on the real cause of Universities' inefficiency, provides an impulsion to the current study to focus on efficiency of private Universities, the area which is yet to be assessed.

In this paper therefore, we adopt an input oriented DEA model to determine the relative efficiency of private Universities. The organization of this paper presents a literature review in section 2 and results are given in section 3. The paper ends by discussions of findings, concluding remarks and recommendations in section four.

3.0 METHODOLOGY

We select Farrell measure of technical efficiency (TE). They are the most resent used in efficiency analysis. In calculating TE measures assuming constant return to scale (CRS), we use the CCR model and BCC model. Based on both models, a University is efficient if TE = 1. Technical efficient less than 1 indicates University inefficient. Further, it implies to what extend the University should reduce inputs to be able to produce its level of output as efficient as technically efficient University (Farrell, 1957).

A DMU is said to be total efficient (TE_{CRS}) if it maximizes output with given inputs under a chosen technology. This full efficient or frontier is termed as the best practice observed under CRS assumption. Whereas total technical efficiency can be decomposed into pure technical efficient (TE_{VRS}) and scale efficiency (SE), in this study we mainly focus on both TE and SE. For scale efficiency calculation reference is made to Coelli, 1998 in Pandel, 2003. Scale efficiency assumes the calculation of TE under both CRS and VRS. The difference between TE scores under CRS and VRS indicates that the University is inefficient. Thus, SE is obtained from total technical efficiency divide by pure technical efficiency.

$$SE = \frac{TE_{\text{CRS}}}{\text{TE}_{\text{VRS}}}$$

Scale efficiency interpretation

- If SE = 1, then a University is scale efficient, i.e. combination of inputs and outputs is efficient both under CRS and VRS.
- If SE < 1, then the combination of inputs and outputs is not scale efficient.

3.1 CCR model

CCR introduced the following fractional programming problem to obtain values for input weights and output weights. Basic CCR formulation is;

$$\max \; ho(u,v) = \frac{\sum_{r=1}^{s} u_r y_{ro}}{\sum_{i=1}^{n} v_i x_{io}} \qquad (1)$$

Subject to:

$$\frac{\sum_{i=1}^{n} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1 \qquad j=1, 2\ldots n \qquad (2)$$

$$u_r \geq 0 \qquad r=1, 2\ldots s \qquad (3)$$

$$v_i \geq 0 \qquad i=1, 2\ldots m. \qquad (4)$$

Where xij is the observed amount of input ith of the jth DMU (xij > 0, I = 1, 2 …n, i= 1, 2…n) and yij = observed amount of output of the rth type for the jth DMU (yij > 0, r = 1, 2…3, j = 1, 2…n)

3.2 BCC model

The resulting DEA model that exhibits the VRS is called BCC model (Banker, Charnes and Cooper 1984). The input-oriented BCC model for the DMUo can be written formally as:

$$Min \; z_o = \theta$$

Subject to:

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{ro} \qquad r = 1, 2\ldots s \qquad (5)$$

$$\theta_o x_{io} - \sum_{j=1}^{n} \lambda_j x_{ij} \geq 0 \qquad i = 1, 2\ldots m \qquad (6)$$

$$\sum_{j-1}^{n} \lambda_j = 1 \qquad (7)$$

$$\lambda_j \geq 0 \qquad j = 1, 2\ldots n \qquad (8)$$

Where xij is the observed amount of input ith of the jth DMU (xij > 0, I = 1, 2 …n, i= 1, 2…n) and yij = observed amount of output of the rth type for the jth DMU (yij > 0, r = 1, 2…3, j = 1, 2…n)

3.3 Tobit regression model

Furthermore, to investigate the effect of concerned variables on technical efficiency of Universities, we employ Tobit regression model. The model consist of six independent variables, student enrolment (EN), academic staff (AS), non-academic staff (NAS), research publications (RP), number of graduates (GR) and consultancy services (CS). The technical efficiency (E) scores (from Appendix 2) serve as dependent variable. All those variables are measured at 5% level of significance. The identified efficiency determinants help inefficient Universities to pay attention on those, so as to become efficient. Tobit regression model is applied for both CCR (TE_{CRS}) and BCC (TE_{VRS}) and the results are tabulated as indicated in table 4 below. The following Tobit regression mode equation is used:

$$E_{i,t}= \alpha_0 + \alpha_1 EN_{i,t} + \alpha_2 AS_{i,t} + \alpha_3 NAS_{i,t} + \alpha_4 GR_{i,t} + \alpha_5 RP_{i,t} + \alpha_6 CS_{i,t} + e_{i,t}$$

Where,

$E_{i,t}$ = efficiency score, EN_{it} = student enrolment, AS_{it}= academic staff, $NAS_{i,t}$ = non-academic staff, GR_{it} number of graduates, $RP_{i,t}$ = research publications, CS_{it} = consultancy services, α_0 is a constant term, α1 - α6 = coefficient of independent variables, and e_{it} is the error term. The dependent variable in this model is the University efficiency $E_{i,t}$, where input and output are treated as independent variables. The sign of coefficients α1 - α6 is expected to be either positive (+) or negative (-). A positive sign implies a positive relationship between dependent variable and independent variable, whereas, a negative sign indicates a negative relation between independent and dependent variables.

4.0 EMPIRICAL FINDINGS

In this section, findings from both DEA and Tobit regression Models are presented.

Table 2 Efficiency Score results for 8 Universities - CCR and BCC models (2008 - 2012)

Year	No.of DMUs	No. Efficient DMUs	Total TE Mean (TE_{CRS})	Pure TE Mean(TE_{VRS})	Mean (SE)
2008	8	4	0.714	0.925	0.764
2009	8	5	0.835	0.924	0.910
2010	8	3	0.859	0.947	0.910
2011	8	5	0.866	0.937	0.913
2012	8	6	0.909	0.933	0.965

Source: Own calculation from Appendix 2

From table 2 above the efficiency scores show that 4(50%), 5(63%), 3(38%), 5(63%) and 6(75%) Universities were at the efficient frontier line with efficient score of 100% in 2008, 2009, 2010,

2011 and 2012 respectively. This implies that there is variation of mean efficiency among Universities across years similar to (Sunitha and Duraisamy, 2010**)**. On the other hand 4(50%), 3(38%), 5(63%), 3(38%), and 2(25%) Universities were inefficient in the respective five years of review. Among the inefficient universities, University 4 in 2008 and 2009 its technical efficiency (TE_{CRS}) scores were 43.2% and 32.6% below average of (50%), University 5 in 2008 had a technical efficient (TE_{CRS}) score of 29.3% and University 8 had a technical efficiency (TE_{CRS}) score 36.3% in 2008 and 49.3 in 2012 (see Appendix 2). This implies a very low managerial capacity of those Universities (Appendix 1) to convert inputs into expected outputs. It is also true that in education it is difficult to have proportional relationship between inputs and outputs due to their variations. We also ascertain that that University 2 and 6 were on efficient frontier in all the five years of review for both CCR and BCC DEA models.

The mean technical efficiency ((TE_{CRS})) in table 1 shows a considerable variability across years, but at increasing rate from 71.4% to 90.9% in 2008 and 2012 respectively. On average, Universities could have reduced their inputs to that mean level and still produce the same level of output. Similarly Universities wasted 28.6%, 16.5%, 14.1%, 13.4% and 9.1% of inputs in 2008, 2009, 2010, 2011 and 2012 respectively. It is also clear that many Universities have higher level (pure) technical efficiency indicated by mean technical efficiency ((TE_{VRS}) of 76.4%, 91.0%, 91.0%, 91.3% and 96.5% from 2008 to 2012 respectively. Nevertheless, they are not of correct size of operation to attain maximum efficiency. Mean scale efficiency of 23.6%, 9%, 9% 8.7% and 3.5% imply that Universities were inefficient by those scales across years. Thus, if Universities were size-adjusted, technical efficiency could increase. It is argued that the low level of pure technical efficiency in comparison with scale efficiency may result from inefficiency managerial practices (Pandel, 2003).

4.1 Benchmarks of inefficient Universities

Benchmarks or reference set refers to all efficient DMUs from which inefficient DMUs can gain experience to become efficient. It is also known as peer group of inefficient DMUs which also need to be fully efficient with 100% technical efficiency score (Khezrimotlagh et al, 2012).

Table 3 indicates the Peer counts of reference set extracted from Appendix 3. It shows the frequency of particular benchmark has appeared in each of the reviewed year from 2008-2012.

Table 3 ERS peer count summary of Private Universities in 2008-2012

NO	University	2008	2009	2010	2011	2012
1	AKU	1	1	1	2	3
2	HKMU	3	3	2	3	2
3	MWUCE	3	2	2	3	2
4	SJUT	0	0	0	0	3
5	TUDARCO	3	3	1	3	2
6	TUMA	0	1	2	2	1
7	UoA	1	2	1	0	0

Source: Own Calculations

From table 3 above HKMU, MWUCE and TUDARCO have been identified as relatively efficient with higher peer counts compared to other benchmarks. Thus, inefficient private Universities could learn better practices from them so as to become efficient frontiers.

4.2 Empirical results from Tobit regression model

We used Tobit regression model to determine variables which influence Technical efficiency in private Universities and the results are shown in table 4 below.

Table 4 Tobit regression model results

Variable	Coefficients.	Std. Err.	t	P>t	Coefficients	Std. Err.	t	P>t
Enrolment (EN)	-0.0001511*	0.0000652	-2.32	0.0270	-0.0000992	0.0000477	-2.08	0.045
Academic Staff (AS)	0.0045066*	0.0009358	4.82	0.0043	0.0016181	0.0006853	2.36	0.024
Non academic staff (NAS)	0.0009157*	0.0003208	2.85	0.0070	0.0004274	0.0002349	1.82	0.078
Graduates (GR)	0.0003610	0.0002137	1.69	0.1000	0.000107	0.0001566	0.68	0.499
Research publications (RP)	0.0058052	0.0046275	1.25	0.2180	-0.0045482	0.0033904	-1.34	0.189
Consultancy Services (CS)	0.0300404*	0.0099158	3.03	0.0050	0.016335	0.0072595	2.25	0.031

Source: Own Calculation

*Significant variable at 5% level of significance

According to Tobit model empirical results in table 4 above, indicate that enrolment (EN), academic staff, non-academic staff (NAS) and consultancy services (CS) are significant for University efficiency. Whereas enrolment indicates a negative relationship with University efficiency, academic staff, non-academic staff and consultancy services show a positive relationship. A negative relation indicated by enrolment implies that private Universities' enrolment is more than the input resources available to transform them into output. Thus, for any increase of enrolment will cause University efficiency to decline. To be on the frontier line therefore, private Universities could reduce the number of enrolment by 0.02% ($p<0.05$) of EN and obtain the same output. Furthermore, a positive relation shown by the academic staff, non-academic staff and consultancy services, signifies an increase of University efficiency when those variables are increased i.e. an increase by 0.451%, 0.092% and 3.0% ($p<0.05$) of AS, NAS and CS respectively could lift the University efficiency to 100%. Conclusively, based on Tobit model Universities could decrease the number of enrolment, increase a number of academic staff, non-academic staff and consultancy services to make Universities full efficient (100%) at 5% significance level. Meanwhile, research publications (RP) and graduates (GR) empirically could not show any significance to the Universities efficiency.

5.0 DISCUSSION OF FINDINGS

Our paper examines the efficiency of private Universities in Tanzania. Both technical efficiency and scale efficiency are assessed. We employ a two stage DEA model analysis; in the first stage

technical efficiency and scale efficiency of Universities are analysed through DEA model. In the second stage the efficiency influencers are determined through Tobit regression model analysis.

The results from DEA model analysis suggest that there is substantial efficiency variability among Universities. On average there was a gradual increase of average efficiency year wise for both technical efficiency and scale efficiency. It is also learnt that the input wasted by inefficient Universities ranged from 28.6% to 9.1% in 2008 and 2012 respectively. This shows a high increase in average efficiency by years despite the low efficiency of some individual Universities. With management improvement there could be a possibility of most Universities to become efficient if the trend is maintained. Scale efficiency is higher than technical efficiency as result of managerial disabilities to convert inputs into desirable outputs. Our results seem to be similar to that of Selim and Bursalioglu (2013) who examined University efficiency in Turkey employing a related approach. Thus, results signify that still there is variation of efficiency scores among private Universities regardless of belonging in the same category. This findings are not very different from what Kipesha (2013) observed in Public Universities. With such scenario, the government need to focus on both public and private Universities in examining efficiency for higher education sustainability. However, Research publications and graduates have not indicated any statistical significance on efficiency.

We also revealed that private Universities are inefficient in utilizing their input resources which include; enrolment, academic staff and non-academic staff to generate a desired consultancy services. This finding is based on Tobit regression model results. Four dependent variables namely; enrolment, academic staff, non-academic staff and consultancy services, are identified to be statistically significant on University efficiency. Therefore, Universities could improve their efficiency by reducing enrolment and increasing academic staff, non-academic staff and consultancy services, and become efficient. Arguably, it learned that private Universities are business oriented as they enrol more students to boost revenue collections while reducing costs for academic staff, non-academic staff and consultancy services (Arokiasamy, 2009; Cowen, 2009; Makulilo, 2013). Since the government capacity to expand public Universities and increase funding has been dwindling over time, this situation has become an opportunity for private Universities to boost enrolment. All those who do not get places in public Universities and they are able to pay, join private Universities. Consequently, there is unproportional teacher/student ration to realize University goals, hence lowering efficiency.

6.0 CONCLUSION

Generally, we conclude that the proliferation of private Universities in Tanzania is not in line with their efficiency, notwithstanding the gradual average efficiency increase at the rate of 4% revealed from this study. This trend indicates a very low capacity of Universities to manage input resources to generate desired outputs. Amazingly, private Universities are found not to pay attention to efficiency proximal variables like academic staff, non-academic staff, enrolment and consultancy services. Thus, if private Universities are to meet the market demands, and become competitive both regionally and globally, they should redress the identified drawbacks to elevate their efficiency. The increase of private Universities should also match with efficiency and quality. However, this study did not consider other exogenous factors which could result into different conclusions. Finally, further study can be done on the same by including all private Universities and increase the number of variables.

7.0 RECOMMANDATIONS

These findings have implication to both University owners and University regulators. Therefore, the following recommendation could help to redress the situation:

1. University owners need to be keen on student recruitment and staff employment based on merits. This will improve the efficiency of graduates, increase research products and consultancy services.
2. University regulator (Tanzania Commission for Universities -TCU) needs to improve their quality assurance processes, ensure legal student admission system and staff recruitment process.
3. Thorough and regular of evaluation of University teaching, research and consultancy should be done. Moreover, the TCU need to review its procedures of University registration to avoid registration of unqualified Universities.

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APPENDICES

Appendix 1

Reviewed Private Universities (2008 - 2012)

University Name	Acronym	Location
1. Agakhan University	AKU	Dar es Salaam
2. Hubert Kairuki Memorial University	HKMU	Dar es Salaam
3. International Medical & Technology University	IMTU	Dar es Salaam
4. Mwenge University College of Education	MWUCE	Kilimanjaro
5. St. John University of Tanzania	SJUT	Dodoma
6. Tumaini University Dar es Salaam College	TUDARCO	Dar es Salaam
7. Tumaini University Makumira Arusha	TUMA	Arusha
8. University of Arusha	UoA	Arusha

Source: TCU website 2014

Appendix 2

Efficiency Score results from CCR and BCC models

		Total Technical Efficiency (TE_{CRS}) CCR MODEL					**Pure Efficiency (TE_{VRS}) BCC MODEL**				
NO	**DMU**	**2008**	**2009**	**2010**	**2011**	**2012**	**2008**	**2009**	**2010**	**2011**	**2012**
1	AKU	1.00	1.00	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	HKMU	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	IMTU	1.00	0.66	0.78	0.80	0.78	1.00	0.67	1.00	0.99	0.81
4	MWUCE	0.43	0.33	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	SJUT	0.29	0.69	0.54	0.55	1.00	0.44	0.72	0.57	0.69	1.00
6	TUDARCO	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	TUMA	0.63	1.00	1.00	1.00	1.00	0.96	1.00	1.00	1.00	1.00
8	UoA	0.36	1.00	0.84	0.58	0.50	1.00	1.00	1.00	0.82	0.65
	Mean	**0.714**	**0.835**	**0.859**	**0.866**	**0.909**	**0.925**	**0.924**	**0.947**	**0.937**	**0.933**

SOURCE: Own Calculation

Appendix 3

Efficiency Reference Set (ERS) of Private Universities -BCC model in (2008 - 2012)

DMU No.	University	2008	2009	2010	2011	2012
1	AKU	AKU(1.000)	AKU(1.000)	AKU(1.000)	AKU(1.000)	AKU(1.000)
2	HKMU	HKMU(1.000)	HKMU(1.000)	HKMU(1.000)	HKMU(1.000)	HKMU(1.000)
3	IMTU	IMTU(1.000)	HKMU(0.984); MWUCE(0.015); TUDARCO(0.002)	IMTU(1.000)	HKMU(0.766); MWUCE(0.139) TUDARCO(0.095)	AKU(0.288); HKMU(0.473); MWUCE(0.211); SJUT(0.014); TUDARCO(0.014)
4	MWUCE	MWUCE(1.000)	MWUCE(1.000)	MWUCE(1.000)	MWUCE(1.000)	MWUCE(1.000)
5	SJUT	HKMU(0.091); MWUCE(0.451); TUDARCO(0.457)	HKMU(0.260); TUDARCO(0.657); UoA(0.083)	HKMU(0.396); MWUCE(0.155); TUMA(0.449)	MWUCE(0.353); TUDARCO(0.029) ; TUMA(0.618)	SJUT(1.000)
6	TUDARCO	TUDARCO(1.000)	TUDARCO(1.000)	TUDARCO(1.000)	TUDARCO(1.000)	TUDARCO(1.000)
7	TUMA	HKMU(0.207); MWUCE(0.382); TUDARCO(0.411)	TUMA(1.000)	TUMA(1.000)	TUMA(1.000)	TUMA(1.000)
8	UoA	UoA(1.000)	UoA(1.000)	UoA(1.000)	AKU(0.547); HKMU(0.221); TUDARCO(0.232)	AKU(0.662); SJUT(0.338)

Source: Own calculations