

Full Length Research Paper

Rate of financial return to university schooling among lecturers in two public universities in Kenya

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Influence of education on earnings among workers is well documented. However, the level of relationship that exists between earnings and schooling among lecturers in public universities in Kenya remain undetermined. The purpose of this study was to establish the financial profitability of university schooling in Kenya. The study was based on the theory of investment in human capital which states that earnings rise with additional years of schooling. A combination of descriptive survey and correlation research designs were used in this study. Study population comprised of 4300 lecturers in seven public universities in Kenya. Using stratified sampling technique, 253 lecturers were sampled from two public universities. Primary data on financial costs, earnings, age, schooling, and experience were obtained through use of a questionnaire while secondary data from official documents provided additional data on costs. Data was analyzed using descriptive and inferential statistics. This study found that direct cost of obtaining a master degree was significantly different from direct cost of doctoral degree at $p = (.038)$. F-Statistics showed that a highly significant relationship existed between level of university schooling and earnings with $p\text{-value} = 0.000$. This study concluded that: direct private costs of doctoral programmes were higher than direct private costs of master degree; investing in university schooling was highly profitable; and level of schooling determines lifetime earnings.

Key words: Rate of return, University, schooling, lecturers, Kenya

INTRODUCTION

Education is widely acknowledged as an effective instrument for economic development of a society (Psacharopoulos and Woodhall, 1985; World Bank, 2003; Republic of Kenya, 2005b). Kenya considered education as a vehicle for speedy Kenyanization of the economy as well as tackling the problem of ignorance (Republic of Kenya, 1964). In this endeavour there has been expansion of education at all levels to meet the challenges of rising social demand and rapid population growth. At the university level, the number of public universities rose from one University College in 1963 with an enrolment of 565 undergraduates and 6 postgraduates to 7 public universities and 14 private universities with an enrolment of 67,558 in the 2003/04 academic year (Republic of Kenya, 2005a).

This growth in the provision and demand for university education confirms it as a preferred investment option for society and private individuals. However these gains have not been evenly distributed across the three levels of university education, that is, bachelor, master and doctorate (Cheboi, 2001; World Bank 2000; Republic of Kenya 2003a). Expansion in education caused concern that it consumed too much public revenues. It was feared that the allocation to education sector would emasculate government investments in other sectors of the economy particularly development of the infrastructure necessary for economic advance (Republic of Kenya, 1974). Within the education sector, allocations to university sub-sector grew faster than the total budgetary allocation to education (Republic of Kenya, 1998). Consequently, the government moved in to contain allocations to education at not more than 30 percent of total recurrent civil expenditure (Republic of Kenya, 1988).

National Rainbow Coalition government, on ascending to power in 2003, expanded budgetary allocation to edu-

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cation. It was argued that education is a key determinant of earnings and therefore an important exit route from poverty (Republic of Kenya, 2003c). To date, as would be observed in any society of the world, poverty and income inequality remain among Kenyans in spite of the heavy investments in education (Republic of Kenya, 2007).

Rising social demand for formal education culminated in growth in enrollment at all levels. Increased enrolments recorded between 1997 and 2006 overstretched available facilities in public universities in Kenya (Republic of Kenya, 2006). At the University of Nairobi, congestion in the library and lecture theatre was one of the reasons that led to a sit-in by regular law students in September 2003 (Olel, 2006). This coincided with reduced public funding for public universities in Kenya. The government stated that it had inadequate capacity to cater for the growing demand for more places in the universities (Republic of Kenya, 2005a). Consequently user fees and other private costs were increased at a time when educated unemployment soared.

During 2005/2006 financial year wage employment in the public sector declined in spite of selected recruitment in the civil service. Real average earnings rose marginally by 0.2% but marred by an average annual inflation rate of 14.5 per cent (Republic of Kenya, 2007). This coincided with a decline in job opportunities (ILO, 1972; World Bank 2000; Government of Kenya, 2003a). Coupled with high costs to the economy, the government shifted the educational cost burden to individuals and their families (Republic of Kenya, 2005b). This financing policy was adopted because studies had indicated that primary level yields highest social returns compared to secondary and university levels (Psacharopoulos and Patrinos, 2002, Republic of Kenya, 2003b). These studies concurred with earlier ones (Thias and Carnoy, 1972; Psacharopoulos, 1973) which revealed that private rates of return to university education were highest. Together, these studies were used to justify increased spending on primary level of education (Kenya, 2003b). However, the relative profitability of the various levels of university schooling in Kenya remains unclear and unexplored. The present study attempts to provide a justification for private expenditure at all degree levels.

Like in all other investments, education as an investment lends itself to all forms of technical project appraisals. Dasgupta and Pearce (1978) offered a theoretical analysis of cost-benefit in the first three parts of their book. In this book, the 'objective function' of cost-benefit objective of maximizing gains to social welfare is explained. It deals with accounting or shadow prices and also discusses the appropriate 'normalization' techniques including net present value and internal rate of return. Two detailed applications of cost benefit analysis in both developed and developing countries concludes the book. It was, however, noted that Dasgupta and Pearce (1978) did not apply cost-benefit analysis to educational institutions. Even in its general form, cost-benefit analysis was

not applied to the measurement of returns to investment in human capital. Although these applications seem to possess remote bearing on human capital, they helped to provide insight into the main problems which arise when cost-benefit analysis is actually applied.

Hansen (1963), Becker (1962), Mincer (1962), Renshaw (1960), Eckaus (1962) and Vaizey (1962) grappled with the problem of measurement of the value of human capital. In varying degrees of accuracy, they overcame all the doubts and resistance against the comparison of human beings to physical capital. Once human beings were accepted as forms of investment, a method suitable for measuring the profitability of investments such as the application of Cost-Benefit Analysis became a necessity. They, however, did not focus on the important question of the contribution of education to income differentials within occupations. This was because their data comprised information from across various occupations and levels of education.

Woodhall (2004) grounded her presentation on the universal recognition of education as a form of investment in human beings. She proceeded to define the purpose of cost-benefit analysis measurement of costs, measurement of benefits, measurement of a discounted cash flow and rate of return on investment in education were explained adequately to suit the requirements of the present problem. She further analyzed the theoretical objections to cost-benefit analysis that are likely to obscure the importance of any cost-benefit analysis study such as the present one. Of more relevance to this study is the presentation on calculations of rates of return and interpretation of rates of return. She concluded with examples of cost-benefit analysis in education and a note on the practical usefulness of cost-benefit analysis in educational planning. The study however focused on theory at the expense of the more empirical cases such as the response of workers to the marginal effects of university degrees on workers' lifetime earnings. Such approach could be of relevance in public universities where higher qualifications are a basic requirement for entry into certain job grades. In spite of the weakness, this work forms an important theoretical foundation for the solution of the present problem.

Psacharopoulos (1973) asserted that the relationship between benefits and costs associated with different levels of schooling is the cornerstone of economics of education. He studied the methodology of Cost-Benefit Analysis and advocated for the adoption of the internal rate of return as a more widely used tool in the analysis of education projects. He presented a summary of previous cost-benefit studies in both developed and the developing worlds. Through this, he raised a debate on the return to postgraduate programmes. He observed that the rate of return to a master's degree in the United States and Great Britain has a negative value and a doctorate degree only a very modest positive one. What was unclear was the influence of pay policies in different

occupations and professions as data was generated from across industries. The study identified data sources for earnings studies and concluded, from 53 rate of return studies in 32 countries, that earnings data used varied widely in form and comprehensiveness. He also observed that comparability limitations exist among rate of return studies due to quality of data accessible to the researchers in different countries. Therefore, a small-scale survey designed by the researcher for the purpose of estimating rate of returns to schooling within a specific occupation was necessary.

More recently, Blundell et al. (2001) reviewed appropriate non-experimental methods and micro-econometric models for covering the returns to education. Estimators such as matching methods, instrumental variables methods and control function methods were considered. They investigated the properties of these methods for data with multiple treatments and heterogeneous returns. The data from the British National Child Development Survey (NCDS) 1958 birth cohort were used to estimate returns to schooling and to illustrate the sensitivity of different estimators to model specifications and data availability.

The works of Dasgupta and Pearce (1978), Becker (1962), Vaizey (1962), Mincer (1962), Woodhall (2004) and Blundell et al. (2001), established reliable economic tools for rate of return analysis. The present study seeks to deploy this methodology to assess the profitability of university schooling in Kenya among university lecturers. A common characteristic runs through all these theoretical studies: they use secondary data to estimate returns across levels of education. The present study used primary data from university level of education.

Studies across the developed and developing countries further show consistent results that are in agreement with human capital theory. In the United States of America, Baum and Payea (2004) outlined many of the benefits generated from higher education. The study described differences in educational attainment among various groups within American society. The authors noted that despite the twin problem of rising college prices and budget constraints at all levels of government there was increased participation in higher education. The study concluded that there was a correlation between higher levels of education and higher earnings for all racial and ethnic groups, even for men and women alike. The study particularly pointed out that the benefits of completing a bachelor's degree or higher produces greater benefits than high school or college education in America.

A study by Pricewaterhouse Coopers (2005) showed that a first university degree in the United Kingdom yields higher returns than lower qualifications. This study pooled information from the quarterly labor force surveys between 2002 and 2004. The Analysis involved the calculation of the economic costs and benefits associated with education to first degree standard. Having its reference category as individuals in possession of two or

more 'A' levels, the study compared the initial costs and lifetime benefits associated with higher education qualification attainment with the earnings associated with the next highest level of qualification. Other than level of education attainment, the study analyzed the contribution of other variables such as age, gender and region of residence. This study is particularly important because it compared returns to different degree subjects in the United Kingdom. It was reported that a wide variation existed in the value of different degree subjects. Graduates in chemistry and physics earned well above the average lifetime earnings of £129,000. This study concurred with Borland (2002) and Day and Newburger (2002) over the general trend of returns to different degree subjects. These studies assigned highest returns to Medicine, Engineering and Law. The lowest returns were reported for history, languages, culture and society.

Boothby and Rowe (2002) reported a similar trend as the Pricewaterhouse Coopers (2005) report with regard to the gender role in earnings-education relationship in Canada. Returns to women were higher than those for men in Canada and the United Kingdom.

Experience from developing countries show a different trend of returns to levels of education. More recently, Hyder (2007) undertook to examine the magnitude of public and private wage differentials in Pakistan. Using cross-section data drawn from the nationally representative labour force survey of Pakistan for 2001 and 2002, the role of human capital in wage gap was examined. Results showed that primary and university levels reported higher rates of return than secondary level of education in Pakistan. This result was consistent with an earlier study by Psacharopoulos (1994) which reported that rate of returns to educational level in Pakistan were highest for university, that is, 21, 11% for secondary and 20% for primary levels of education. However Psacharopoulos and Patrinos (2002), in a global update for the rate of returns to levels of education, showed that in the case of Pakistan the order was 8.4, 13.7 and 31.2% for primary, secondary and university respectively. Private rates of return to education in Kenya indicate that primary level yields 12.6%, secondary 37.3% and university education 53% (Republic of Kenya, 2003b). This result seems to contradict the trend in the sub-Saharan region as presented by Psacharopoulos and Patrinos (2002). According to them, across all the regions the pattern was that secondary school level reported lower returns than those for both primary and university levels. Sub-Saharan Africa for example reported 37.6, 24.6 and 27.8% for primary, secondary and higher education respectively. In the early 1970s, Thias and Carnoy (1972) had indicated that financial returns to education showed a progressive trend with private rates of return to primary being lower than rate of returns to secondary but the rate of returns to university was highest for the individual. It could have been necessary to provide a justification for the trend. Why, for example,

was the society deriving decreasing returns across levels of education? Why the reverse trend for the private individual? Answers to these questions do not belong to this study but could be pursued in future studies.

Studies in the United Kingdom and United States of America (Baum and Payea, 2004; Day and Newburger, 2002; Pricewaterhousecoopers, 2005) assessed the relative profitability of degrees and individual subjects at university level. However, studies in the developing countries analyzed profitability of education across three levels namely: primary, secondary and university. The aim of these studies was to guide allocation of resources among different levels of education. They did not consider the issue of whether it was the high returns associated with more schooling that made individuals to demand for more education. The present study was guided by the view held by Psacharopoulos and Woodhall (1985) that the demand for education is a derived demand for higher incomes associated with more education. If the same position obtains among lecturers with varying levels of university degrees, then why were the universities in Kenya staffed with more Master degree holders than doctorates? Studies in Kenya have not yet responded to this problem (Thias and Carnoy, 1972; Psacharopoulos and Patrinos, 2002; Republic of Kenya, 2003c). They did not look at specific industries like teaching at the university level as was done in the present study.

Considering that attainment of equitable income distribution among Kenyans remains unachieved, it was necessary to assess the profitability of investments in university education. The question to ask is: does university education in Kenya deserve the current levels of investment? This study therefore, sought to determine the significant level of relationship that exists between earnings and schooling among lecturers in public universities in Kenya. Specifically, the study pursued the following objectives:

- (1) Determine the variance in direct private costs of obtaining different levels of university schooling by lecturers in public universities in Kenya.
- (2) Establish lifetime earnings accruing by level of university degree to lecturers in public universities in Kenya.
- (3) Establish the relationship between lifetime earnings and level of schooling among lecturers in public universities in Kenya.

RESEARCH HYPOTHESES

The study was guided by the following null hypotheses:

- (1) There is no significant difference between direct private costs of obtaining schooling at Masters and Doctoral degree levels in public universities in Kenya.
- (2) There is no significant difference between lifetime earnings accruing to lecturers with master degrees and

those accruing to lecturers with Doctoral degrees in public universities in Kenya.

- (3) There is no significant relationship between lifetime earnings and level of schooling among lecturers in public Universities in Kenya.

Decision for accepting or rejecting null-hypotheses was based on reference to a p-value. Null hypotheses were to be rejected if p-value was less than $\Theta = 0.05$ level of significance; and accept null hypothesis if p-value equals or greater than $\Theta = 0.05$. Degrees of freedom were 253-1.

THEORETICAL FRAMEWORK

The focus of this study was to analyze the returns to each level of university education. In so doing the study established the degree that was most profitable to individuals. This study lent itself to the theory of investment in human capital as developed by Gary S. Becker in 1962. The theory of investment in human capital postulates that 'most investments in human capital both raise observed earnings at older ages, because returns are added to earnings then, and lower them at younger ages, because costs are deducted from earnings then' (Becker, 1962). He applied the theory to the study of activities that influence future real income through the imbedding of resources in people in the United States of America. The activities included in the study were: On-the-job-training, Schooling, Information and Health. He concluded that Human capital theory has important implications ranging from interpersonal and inter-area differences in earnings, to the shape of age earnings profiles, to the effect of specialization on skill. Since the proposed study seeks to analyze the influence of schooling and other factors on earnings differentials this theory provides a firm base.

The theory of investment in human capital employs various Cost-Benefit Analysis methods in project appraisal such as "internal rate of return" (Psacharopoulos, 1973; 1975; Thias and Carnoy, 1972; Ssemambo, 2000; Palme and Wright, 1998; Boothby and Rowe, 2002; Borland, 2002; Pricewaterhousecoopers, 2005). According to this theory, the rate of return on a project is a summary statistic which describes the relationship between the costs and benefits associated with the project.

Apart from cost-benefit analysis method, returns to education are measured using earnings functions as developed by Jacob Mincer in 1974. He called it the semi-log earnings function (Mincer, 1974).

Semi-log earnings function has the advantage of accommodating other factors other than schooling that may influence earnings among lecturers. In the present study influence of age, experience and productivity was to be considered. Rate of return to schooling was, therefore, obtained from a linear function stated as follows:

$$Y = Y(A, E, S);$$

Where; Y was earnings (salary income); A was age; E was experience; and S was schooling.

Interaction between the dependent variable and independent variables was established to be directly proportional. Earnings were likely to be increased as age and schooling among lecturers increased. It was also shown that schooling might act in concert with age and experience to determine earnings among the lecturers in public universities in Kenya.

METHODOLOGY

This study used both descriptive survey and correlational research designs. The survey made it possible to establish the sex, age, educational background, experience and earnings among lecturers in public universities. Correlational research design was used to determine the direction and magnitude of relationships among earnings, age, experience and schooling; and in the process of testing research hypotheses.

Sample selection

The study population comprised 4,300 lecturers in public universities in Kenya. It was a homogeneous population in terms of the schemes of service. Their earnings were governed by common regulations overseen by the commission for higher education.

The 4,300 lecturers were scattered across various disciplines among seven public Universities. Geographically, two public Universities Moi and Egerton are in the Rift valley while University of Nairobi and Kenyatta University are in Nairobi city; Jomo Kenyatta, Maseno and Masinde Muliro Universities are in Central, Nyanza and Western provinces respectively. Using a formula developed by Krejcie and Morgan (1970), and reproduced in Kathuri and Pals (1993) a generic sample of 253 lecturers were drawn from two public universities namely: Egerton and Maseno.

Questionnaire design

Data used in this study were obtained through use of official documents and an own constructed questionnaire (see appendix).

The questionnaire was divided into three sections: A, B, and C. Section A elicited demographic information including sex, age and educational background of the respondents (Items 1, 2, 3 and 4). Work experience among the respondents was obtained through items 5, 6, 7, and 8.

Section B (Item 9) elicited information about earnings among the respondents elicited information about earnings among the respondents.

The questionnaire was examined by three experts in the area of planning and economics of education for face validation. It was further piloted to establish its reliability. At the pilot stage, the questionnaire was administered to 25 academic staff of Laikipia Campus of Egerton University in August 2008. This was 10 per cent of the study sample. Respondents were identified from departmental lists. Questionnaires were handed over to the respondents in their offices and were requested to complete it at their own pace but within a limit of five days. It was observed that, while a few respondents completed the questionnaires in less than an hour, others took more than five days to return the forms. Reliability at an alpha level of 0.8520 was obtained for the instrument.

Data collection

The questionnaire was taken to the respondents and delivered by hand. They were given two weeks within which to respond and then, at the expiry of the two weeks, each university was visited again to collect the completed questionnaires.

Data analysis

Data obtained from the administration of the questionnaire were classified according to level of university schooling in Kenya. The levels were: bachelors, masters and doctorate. These levels were measured in complete years as follows: a bachelor was equivalent to 16 years of schooling; master's degree was 18 years and doctorate was 21 years. This was based on the assumption that respondents completed their studies within the normal time fixed for the degree programme. Responses were then summarized in tables. Descriptive statistics such as frequency counts were used to quantify schooling, age, experience and earnings among the respondents. Percentages were used to establish the distribution of schooling, age, experience and lifetime earnings among the lecturers in public universities in Kenya. Responses to schooling, age, experience, and earnings were displayed in simple bar charts. Scatter plots were used to ascertain association between schooling and earnings. In addition, inferential statistics such as multiple linear regression was used to determine levels of relationship among schooling, age, experience and earnings. Standard regression procedures were used to fit a linear regression model. Null hypotheses were tested and were either rejected or accepted at 95 percent confidence level in a two-tailed t-test; and F-statistics at $\alpha = 0.05$ level of significance.

RESULTS AND DISCUSSION

Direct private costs of university schooling

The first objective of this study was: To determine the direct private cost of obtaining various levels of university schooling in public universities in Kenya.

H_{01} : There is no significant difference in direct private costs of obtaining university schooling at master's degree level and doctoral degree level in public universities.

Data on direct cost of university schooling were obtained from two sources namely: the questionnaire which requested respondents to state how much money they spent in pursuit of university degrees; and official documentation availed for this study by the academic divisions of the two universities.

Measurement of costs in a cost-benefit analysis takes various forms. These forms depend on whether the purpose of evaluating educational investment is social or private (Woodhall, 2004). According to Woodhall (2004) when the purpose of cost-benefit analysis is to determine profitability of private investments in education then the relevant costs are those borne by the individual and the family. She singled out: fees charged by institutions, expenditure on books, other direct costs like travel and value of scholarships from public funds (Woodhall, 2004). Besides, earnings foregone by an individual while undertaking a course of study is also to be included.

In this study, responses from the lecturers were

Table 1. Descriptive statistics for direct private cost of university schooling.

	N	Minimum	Maximum	Mean	Std. Deviation
Cost s ₁	81	30,000.00	2,000,000.00	323,765.45	311,876.15
Cost s ₂	70	96,000.00	1,000,000.00	290,057.15	134,331.40
Cost s ₃	50	133,000.00	11,000,000.00	995,760.00	2,088,918.60

Source: Field data (2009).

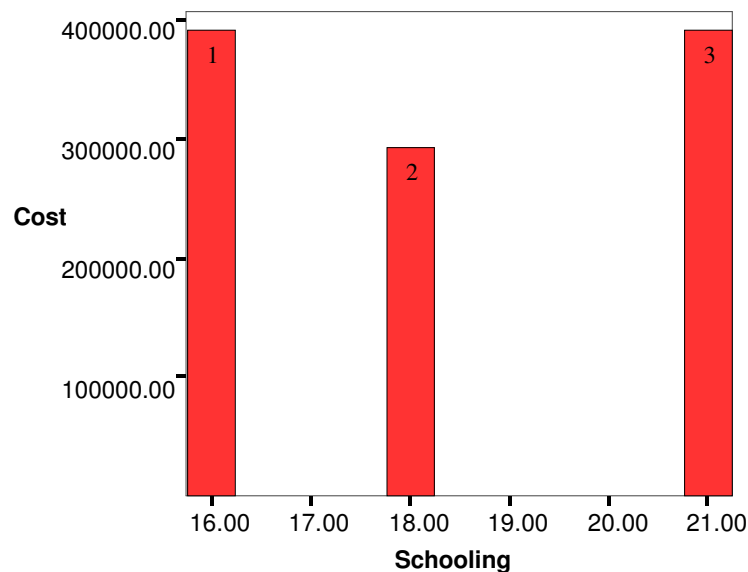


Figure 1. Direct private cost of university schooling; bars show means; Cost represents financial costs in Kenya Shillings; Schooling expressed in years. 1 Bachelor's Degree, 2 Master's Degree, 3 Doctoral Degrees. Source: Field data (2009).

summarized and categorized into three namely: Cost S₁, Cost S₂ and Cost S₃ thus representing costs of obtaining bachelor's, masters and doctorate degrees respectively. The three categories of direct costs were analyzed using descriptive statistics including mean and standard deviation and the results are reported in Table 1.

Table 1 indicates that out of 253 respondents 81 or 32.01% supplied information on cost of bachelor's; 70 respondents which was equivalent to 27.67% stated the cost of their master's degree; and 50 respondents or about 20 percent declared the direct cost of obtaining doctorate degree. Table 1 further show that doctorate degree was the most expensive of all university degrees. With an average total direct cost of Kshs 995,760.00 a doctorate degree was more than thrice the direct cost of either master's or bachelor's degree. Table 1 also reveals that doctoral degrees had the largest standard deviation from the mean direct private cost. Table 1 further indicates the gaps between minimum and maximum direct private costs of university degrees were wide. Direct private costs of bachelor's degree, for instance, ranged from Kshs 30,000 to Kshs 2,000,000 among respondents.

Results in Table 1 were further displayed in Figure 1. Figure 1 reveals that direct private costs of bachelor's and doctoral degree were higher than that of Master's degree.

It is observable from Table 1 that 32.01% of respondents gave information relevant for determination of direct private costs. The rest of the respondents could neither remember the direct private financial expenditures on university degrees nor recall the value of institutional scholarships.

To overcome the effects of memory failure among respondents, direct private costs of university schooling were also obtained from official documents held in the academic divisions of Egerton and Maseno universities. The documents were analyzed according to level of university degree and in terms of disciplines, that is, Arts-based and Science-based. Results of document analysis were presented in Tables 2 and 3.

The sub-total in Table 2 represents the fees students pay into university accounts in order to register and be allowed to participate in university programmes. Table 2 shows that Arts-based master's degree courses were cheaper than Science-based courses at Maseno while at

Table 2. Direct private cost of master's degree in Kenya shillings.

	Arts-based		Science-based	
	Maseno	Egerton	Maseno	Egerton
Tuition	139,200	190,000	139,200	220,000
Registration	2,000	2,500	2,000	2,500
Student ID card	500	200	500	200
Examination	20,000	20,000	20,000	20,000
Supervision	20,000	20,000	20,000	20,000
Computer	-	-	-	-
Time/Library	20,000	2,000	20,000	2,000
Field/Laboratory	30,000	-	30,000	-
Caution money	5,000	2,000	5,000	2,000
Medical	-	4,000	-	4,000
Services	236,700	240,700	236,700	270,700
Sub-Total	350,000*	378,000**	500,000*	378,000**
Other Expenses	-	-	-	-
Grand-Total	586,700	618,700	736,700	618,700

*Includes book allowance, project/thesis research, and thesis preparation.

** Fieldwork/ Lab/Computer, Book allowance/Stationery and Living Expenses.

Sources: Schools of Graduate Studies, Egerton and Maseno Universities.

Table 3. Direct private cost of doctorate degrees in Kenya shillings.

Items	Arts-based		Science-based	
	Maseno	Egerton	Maseno	Egerton
Tuition	252,000	240,000	252,000	300,000
Registration	2,500	3,000	2,500	3,000
Student ID card	500	200	500	200
Examination	20,000	30,000	20,000	30,000
Supervision	35,000	45,000	35,000	45,000
Computer time/ Library	20,000	6,000	20,000	6,000
Field/Laboratory	50,000	-	50,000	-
Caution money	5,000	2,000	5,000	2,000
Medical services	-	6,000	-	6,000
Sub-total	385,000	332,200	385,000	392,000
Other expenses	350,000*	630,000**	500,000*	630,000**
Grand-total	735,000	952,200	885,000	1,022,000

* Includes book allowance, project/thesis research, and thesis preparation. ** Fieldwork/ Lab/Computer, Book allowance/Stationery and living expenses. Sources: Schools of Graduate Studies, Egerton and Maseno Universities.

Egerton University the cost was the same. It also indicates that other direct costs such as books and stationery, project and thesis research, thesis preparation and living expenses were more expensive than fees demanded by universities.

Table 3 presents direct private cost of obtaining a doctorate degree at Maseno and Egerton Universities. As indicated in Table 2, the sub-total in Table 3 was also a summary of money that students surrender to universities in order to participate in university programmes. Table 3

shows that direct private cost of science-based doctoral degree programmes were higher than direct private cost of arts-based doctoral degrees at both Maseno and Egerton Universities. It was further reflected in Table 3 that doctoral degrees at Egerton University appeared more expensive than doctoral degrees at Maseno University. However this was because Maseno University excluded cost of living from their documents while Egerton University included an estimate of living expenses in their fees structure. That means, therefore,

Table 4. Descriptive statistics for discipline-based direct cost of higher degrees.

Schooling		Art-based	Science-based
18.00	Mean	602,700.00	677,700.00
	N	2	2
	Std. deviation	22,627.40	83,438.60
21.00	Mean	843,500.00	953,500.00
	N	2	2
	Std. deviation	153,442.20	96,873.62
Total	Mean	723,100.00	815,600.00
	N	4	4
	Std. deviation	165,369.45	175,510.81

Source: Schools of Graduate Studies, Egerton and Maseno Universities.

Table 5. Paired samples statistics for cost S_2 and cost S_3 .

	Mean	N	Std. deviation	Std. error mean
Pair 1	Cost s_2	319500.0000	38	150587.63274
	Cost s_3	1140921.0526	38	2383161.84910

Source: Field data (2009).

that direct private costs of doctoral degrees in both institutions were uniform.

Direct private costs of university schooling in Tables 2 and 3 were further analyzed using descriptive statistics including mean and standard deviation across disciplines. Results were summarized and presented in Table 4.

Table 4 shows that average direct private costs of doctoral degrees were higher than average direct private costs of master's degrees across disciplines. For, the average direct private costs of doctoral degrees were Kshs 843,000 and Kshs 953,500 for arts-based and science-based respectively; and for master's arts-based and science-based degrees, the direct private costs were Kshs 602,700 and Kshs 677,700 respectively. Evidence from Tables 2 and 3 suggests that variations in direct private costs were a result of higher cost of tuition, supervision, field and laboratory, and medical in the doctoral programmes. Table 4 further shows that with a mean direct private cost of Kshs 723,100 arts-based degrees were cheaper than science-based degrees which, on average, would cost an individual Kshs 815,600 across degree levels.

Analysis of data from questionnaire administration presented in Table 1 shows that a difference existed between direct private costs of masters and doctorate degrees. Analysis of official documents of which results were presented in Table 4 confirmed that indeed there was a difference. What remained unclear, however, was whether this difference was statistically significant or not. Therefore the first hypothesis was tested to determine the significance of the observed differences in direct private costs.

In this study, an alpha level of .05 was used for statistical tests. Results of paired-samples t test were summarized into statistics and differences between means of Cost S_2 and Cost S_3 , and were presented in Tables 5 and 6.

Table 5 shows that measurement of Cost S_2 and Cost S_3 were taken from 38 respondents. This Table also indicates that the mean, standard deviation and standard error mean for Cost S_2 were smaller than the mean, standard deviation and standard error mean for Cost S_3 .

Table 6 shows that sample mean difference of -821,421.0526 between Cost S_2 and Cost S_3 was within the 95% Confidence Interval of the difference with lower limit of -1,593,149.7268 and an upper limit of -49,692.3785. Table 6 further indicates that the true population mean falls within the range -1593149.7268 to -49692.3785 at 95% confidence level. This means that in repeated sampling of cost of masters and doctoral degrees from public universities, 95% of the intervals will contain the unknown true population mean. Furthermore, Table 6 shows that observed value of t was -2.157 within 37 degrees of freedom. Observed level of significance was $\alpha = .038$ in a two-tailed test. The corresponding table value of t was 2.021 at 37 degrees of freedom for 2-tailed test and at $\alpha = .05$. It was therefore observed that the difference that exists between direct private costs of obtaining a master's degree and a doctoral degree was statistically significant $t(37) = -2.157$, $p = .038$. Consequently, the null hypothesis was rejected.

T-statistic in Table 6 means that the difference between the cost of obtaining doctoral and master's degrees in public universities was less likely due to chance. This

Table 6. Paired samples test of differences between means of cost S_2 and cost S_3

		Paired differences					T	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference				
					Lower	Upper			
Pair 1	Cost s_2 - Cost s_3	-821,421.0526	2,347,879.15375	38,0876.29297	-1,593,149.7268	-49,692.3785	-2.157	37	.038

Source: Field data (2009).

Table 7. Sources of income among lecturers in Kenya shillings (Kshs).

Earnings	Mean	Std. deviation
salary before joining university	24,938.01	28,865.13
Consultancy contribution	268,489.43	437,762.50
Current gross salary	141,451.45	130,823.75
Average	144,959.63	199,150.46

Source: Field data (2009).

difference arises from variations in the cost of tuition, supervision, and field and laboratory. These costs are higher at doctoral level than at master's degree level.

This finding agrees with those of Teichler (1988) and the Pennsylvania Department of Education report (2008) that rising costs of higher education had been transferred to individual beneficiaries and their families. According to the latter, this has forced university students to leave colleges suffering from heavy debt burdens. A study in Kenya by Odebero (2002) concluded that Higher Education Loans Board was ineffective in its debt recovery efforts. This suggests that Kenyan graduates were so much indebted that they find servicing their loans difficult.

The findings of the present study however, contradicted the World Bank position that no level of education in developing countries ever consumed more government allocations than university level (World Bank, 2000). The view of the World Bank was shared by Psacharopoulos and Woodhall (1985) who reported that in Brazil and Argentina even private higher institutions were given subsidies by the government. These two positions were informed by a more general view from university level of education. Since 2000, radical educational financing policies were introduced in Kenya (Republic of Kenya, 2005). This policy change resulted in a cut in public allocations to universities and removal of scholarships and bursaries for postgraduate students. The net effect was the higher direct private cost of obtaining master and doctorate degrees.

In a country that is battling high poverty levels and the attendant high dependency ratio, most Kenyan households would ill afford to pay for doctoral degree programmes. Even cash-strapped public universities can not afford to sponsor all their staff that has masters for

doctoral degrees. This could explain a small proportion of the population with doctorates which translates into fewer lecturers with doctoral degrees. This study established the proportion of lecturers who sponsored their own doctoral studies was small. On the other hand those who pursued their master degrees on self-sponsorship were higher. It was this relatively low direct private cost of masters programmes that makes it more attractive unlike doctoral degree programmes.

Lifetime earnings accruing by level of university degree

The second objective of this study was to: Establish lifetime earnings accruing by level of university degree to lecturers in public universities in Kenya.

H_{02} : There is no significant difference between lifetime earnings accruing to lecturers with master degrees and that accruing to lecturers with doctoral degrees in public universities in Kenya.

To achieve this objective, responses to questionnaire were analyzed using descriptive statistics and the results are presented in Table 7.

Table 7 shows three types of earnings in this study. These included salary before joining university employment, earnings from consultancies and current gross salary as they were paid by the university. With an average gross salary of Kshs 141,451.45 the respondents were receiving more than six times what they earned in their previous jobs. It is further indicated that consultancies generated an average income of Kshs 268,489.43 for respondents making it a lucrative activity. Lifetime earnings were further summarized by level of university degree and presented in Table 8.

Table 8. Distribution of lifetime earnings by university degree.

Schooling	Mean	N	Std. deviation
16.00	19,792,102.4000	15	8,197,771.74196
18.00	31,987,519.8829	123	4,530,382.77785
21.00	47,291,209.2313	115	14,536,846.52817
Total	38,220,693.8466	253	13,637,872.75617

Source: Field data (2009).

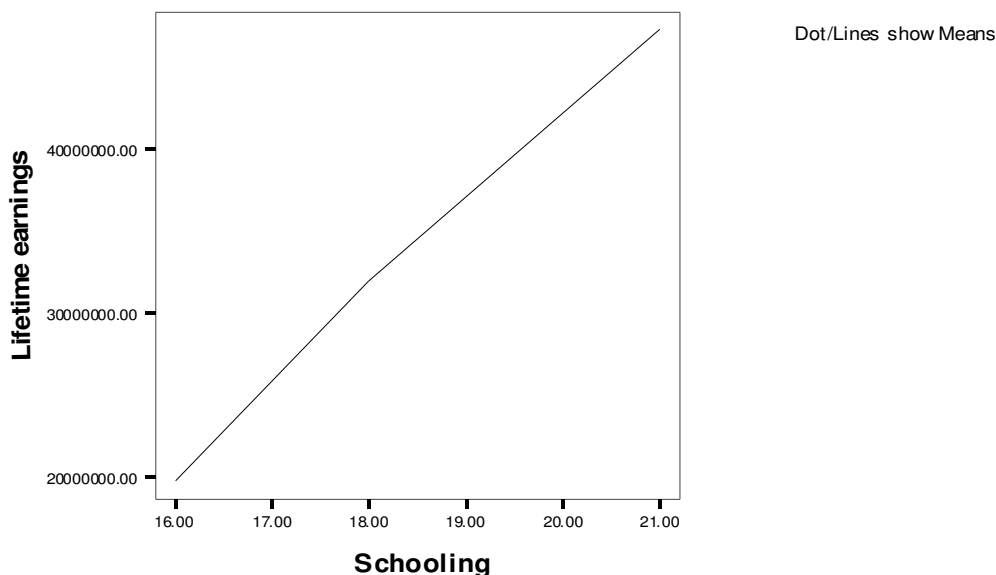
**Figure 2.** Trend of lifetime earnings across degree levels. Source: Field data (2009).

Table 8 indicates that 15 respondents who had up to 16 years of schooling or a bachelor's degree earned a mean lifetime earnings amounting to Kshs 19,792,102.40. One hundred and twenty-three of them had 18 years of schooling or a master's degree and a mean lifetime earning of Kshs 31,987,519.88. The rest of the respondents had doctorate degrees and mean lifetime earnings of Kshs 47,291,209.23. Table 8 also shows that there was an increase of lifetime earnings across university degree levels. This meant that, for the respondents, an increase in level of schooling translated into higher lifetime earnings. This information was graphed and presented in Figures 2 and 3.

Figure 2 portrays an increasing trend in lifetime earnings that was steeper between 16 and 18 years of schooling than between 18 and 21 years of schooling. However, it is clear that more years of university schooling translate into higher lifetime earnings.

Figure 3 makes each degree level to stand out and differences to be more visible. Figure 3 isolated the mean lifetime earnings accruing to respondents with different levels of university degrees. It shows that mean lifetime earnings was lowest among respondents with only 16

years of schooling or a bachelor's degree. However, this cadre of staff is employed either as graduate assistants or teaching assistants on temporary terms. They enroll in the postgraduate degree programmes in their respective departments to pursue master degrees. On successful completion of master degree course, a teaching assistant gets a promotion to a higher grade. It should be noted that teaching assistants or graduate assistants are few in the universities and nonexistent in some departments. The highest lifetime earnings were accumulated by respondents who had up to 21 years of schooling or a doctoral degree. Mean lifetime earnings were further cross-tabulated according to age and level of university schooling and the result was reported in Table 9.

Table 9 indicates that respondents with 16 years of schooling were the youngest and expected least lifetime earnings. This means that they just joined the faculty as junior staff with prospects of growing through the ranks. It also suggests that lecturers in universities do not work without master degree for long. It further implies that graduate assistants who fail to earn their master degrees have their appointments terminated. However, their inclusion in this study was important as it served as a basis for

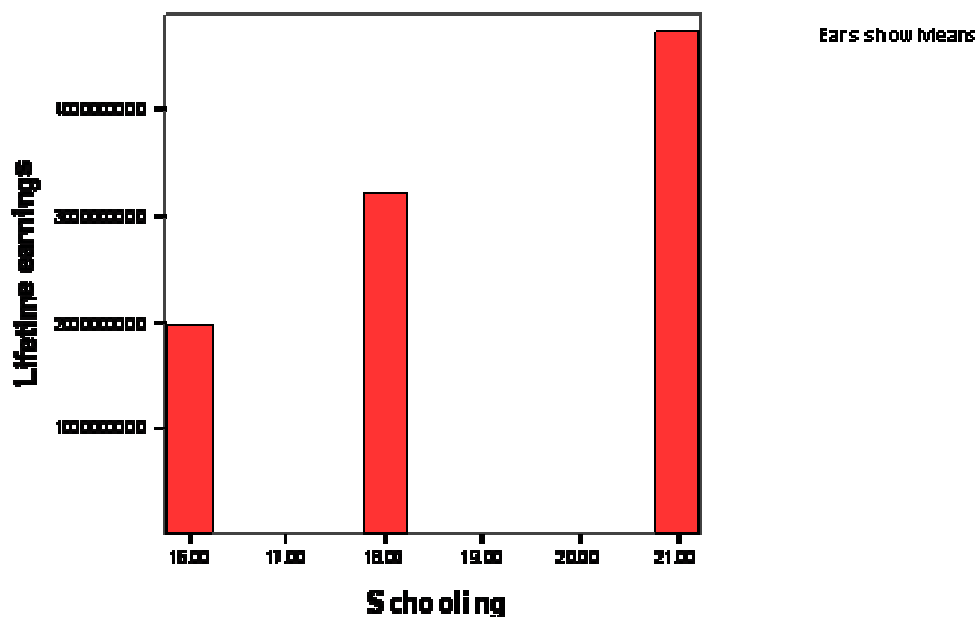


Figure 3. Lifetime earnings by level of university degree. Source: Field data (2009).

Table 9. Distribution of lifetime earnings by age and level of University degree.

		16.00	18.00	21.00	
		Schooling			
Age	27.00	Lifetime earnings	14,227,200.00	27,585,530.00	.
	32.00	Lifetime earnings	24,504,984.00	28,272,720.00	33,694,911.60
	37.00	Lifetime earnings	24,817,800.00	29,714,307.41	37,147,625.45
	42.00	Lifetime earnings	.	33,180,146.09	42,402,368.40
	47.00	Lifetime earnings	.	37,251,970.00	47,598,352.94
	52.00	Lifetime earnings	.	32,137,056.00	51,807,030.55
	57.00	Lifetime earnings	.	37,107,000.00	55,783,126.00
	58.00	Lifetime earnings	.	.	38,623,200.00
	59.00	Lifetime earnings	.	.	71,197,560.00
	62.00	Lifetime earnings	.	.	58,932,300.00
65.00	Lifetime earnings	.	36,229,200.00	44,368,800.00	

Source: Field data (2009).

determining the returns to a master degree qualification among university lecturers. It was observable that lifetime earnings rose with age among respondents with 16 and 18 years of schooling. Age, however, did not influence lifetime earnings among respondents with doctoral degrees until after the age of 59 years when lifetime earnings showed a steady decline with rising age. As indicated in Table 9, lifetime earnings rose with increasing years of schooling among respondents of the same age. Respondents who had doctoral qualifications reached their peak later than all others. Those with 18 years of schooling had their lifetime earnings decline from the age of 47 years onwards. On the other hand those

respondents with 21 years of schooling had their lifetime earnings growing up to about the age of 60 years when began to decline.

Further analysis was done to determine rate of return to university degrees using the Mincerian model (Mincer, 1974). To achieve this mean lifetime earnings differentials by levels of university schooling was computed. The differentials were converted into percentages and further, average percentage lifetime earnings differentials were computed based on the duration of the university degree programme. For this purpose, masters and doctoral degree programmes were assigned two and three years respectively. Results were presented in Table 10.

Table 10. Marginal returns to University schooling.

Schooling	Mean lifetime earnings	Lifetime earnings differentials	Percentage differentials	Rate of return
16	19,792,102			
18	31,987,519	12,195,417	61.62	30.81% p.a.
21	47,291,209	15,303,690	47.84	15.95% p.a.

Source: Field data (2009)

Whereas lifetime earnings differentials in Table 10 may appear ordinary material, it remains important considering that the proportion of lecturers holding masters degrees as their highest qualification was greater than those with doctorates. It was also observed that lecturers in the universities stayed for up to 20 years without registering for a doctoral degree. Perhaps the complacency arose from a dearth of empirical evidence. Table 10 indicates that respondents with 18 years of schooling accumulated Kshs 12,195,417 more than those respondents who had up to 16 years of schooling. Respondents with 21 years of schooling earned Kshs 15,303,690 more in their lifetime than those with 18 years of schooling. The differentials represented 61.62 and 47.84% gains for masters and doctoral degrees respectively.

When these gains were divided by the duration of the masters and doctorates, Table 10 shows that, a year spent by a respondent pursuing a master's degree generated an additional 30.81% of lifetime earnings. Doctorates, however, yielded 15.95% of lifetime earnings per year spent by respondents studying for the degree. This means that master's degrees paid faster in lifetime earnings among respondents than a doctoral degree.

Evidence in Tables 8, 9 and 10 shows, that there were three mean lifetime earnings according to level of university degree. In order to ascertain whether the mean differences in lifetime earnings are more or less likely due to chance, test of hypothesis was done. In this study post hoc multiple comparisons were run using Tukey's Honestly Significant Difference (HSD) Test. This made it possible for comparison of three mean lifetime earnings. The results were reported in Table 11.

Table 11 shows that the mean difference was significant at the 0.05 level and ($p = 0.000$). Null hypothesis was therefore rejected. Consequently, differences in lifetime earnings among lecturers in public universities were held to be more likely due to differences in level of educational attainment.

The significant lifetime differentials are due to varying entry points which are determined by level of education. In public universities, first time applicants for teaching positions, who have no experience in university teaching, would in normal cases be hired as follows: Bachelors-only holders would be graduate assistants; master's degree holders would enter as tutorial fellows or assistant lecturers; doctorates would enter as lecturers. These positions are also associated with varying salary scales.

Retirement from teaching and research at university

also depend on whether one has a doctorate or not. Teaching staff with up to master's degree would retire earlier than doctorates, research output notwithstanding. Among doctorates research output is main determinant of progress. Those who complete their research projects and publish results earn their promotions and rise faster to become professors. Professors do retire after the age of 70 years. Thus doctorates stand to work for longer, may be to compensate for the time and resources sacrificed in pursuit of the doctoral degree. Doctorates with higher research output are also more likely to win higher research grants, obtain and renew post-retirement teaching and research contracts as well as consultancies for projects in and outside government. These translate to higher lifetime earnings.

This finding is similar to the results obtained by Appleton, Bigsten and Manda (1999) and Manda et al. (2002) which established that in Kenya, lifetime earnings do rise with increases in levels of education. Although the present sample was governed by common promotion policies that recognised level of education, it should be noted that for advancement beyond the position of lecturer, an academic staff needs to publish. This means that despite other requirements for promotion, the role of academic qualification remains important.

Relationship between level of university schooling and lifetime earnings

The last objective of this study was to: Establish the relationship between lifetime earnings and level of schooling among lecturers in public universities in Kenya.

Ho₄: There is no significant relationship between lifetime earnings and university schooling among lecturers in public universities in Kenya.

Linear regression model was fitted to the data using stepwise regression procedure and the results were presented in Table 12.

Table 12 presents a summary of the stepwise regression. It shows an R value of .712 for the correlation between schooling and lifetime earnings.

This means a strong positive correlation exists between university schooling and lifetime earnings among lecturers in public universities.

It was observed that a combination of schooling, experience, the square of experience and age explained 70.3% of variations in lifetime earnings among lecturers

Table 11. Results of multiple comparisons of lifetime earnings.

(I) Schooling	(J) Schooling	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
					Lower bound	Upper bound
16.00	18.00	-12195417.4829(*)	2870226.61387	.000	-18962719.7831	-5428115.1827
	21.00	-27499106.8313(*)	2881057.69619	.000	-34291946.2120	-20706267.4506
18.00	16.00	12195417.4829(*)	2870226.61387	.000	5428115.1827	18962719.7831
	21.00	-15303689.3484(*)	1361325.03628	.000	-18513365.5477	-12094013.1490
21.00	16.00	27499106.8313(*)	2881057.69619	.000	20706267.4506	34291946.2120
	18.00	15303689.3484(*)	1361325.03628	.000	12094013.1490	18513365.5477

The mean difference is significant at the 0.05 level.

Source: Field data (2009).

Table 12. Regression model summary.

Model	R	R Square	Adjusted R square	Std. error of the estimate
1	.712(a)	.506	.504	.10125
2	.828(b)	.685	.682	.08105
3	.838(c)	.703	.699	.07887
4	.842(d)	.708	.703	.07831

a Predictors: (Constant), Schooling

b Predictors: (Constant), Schooling, Experience

c Predictors: (Constant), Schooling, Experience, square experience

d Predictors: (Constant), Schooling, Experience, square experience, Age

e Dependent Variable: lifetime earnings

Source: Field data (2009).

with an error of 0.07831. This left a residual of 29.7 percent of that variation unexplained. This model was therefore adequate. However university schooling on its own explained 50.4 percent of the variations. Table 12 further indicates that the influence of age on lifetime earnings was negligible. As it turned out, publications as a variable was removed from the model. This means it did not have a significant explanatory power over lifetime earnings.

Results show that with the exception of publications, all the other variables in the original model were highly significant at alpha = 0.05 level of significance. In particular, it was observed that there existed a positive and highly significant relationship between university schooling and lifetime earnings at the 0.05 level of significance in a 2-tailed test and ($p = 0.000$).

The coefficient of schooling in model 1 in Table 12 gives the rate of return to an additional university degree an individual obtains. This rate is 50.4%. An individual will thus raise his or her lifetime earnings by about 50.4 percentage points by obtaining a higher university degree. This finding seems to vary from an earlier private rate of return to university schooling determined by the government of Kenya at 53% (Republic of Kenya, 2003b). This makes this estimate appear conservative; however, it could be a result of the difference in data set. The government had a mixed data which ran across professions and occupations but the present study

focused on a small section of that universe. The difference, though, is negligible as it lies within an acceptable error margin of $\pm 5\%$.

Experience and age were seen to affect returns to university schooling as depicted by the positive coefficients of the experience and age terms in Table 12. However, the coefficients to the experience squared term were negative. This was an indication that the effect of experience on lifetime earnings would, after some point, grow at a decreasing rate. This finding agrees with the findings of Ssemambo (2000) who observed a similar trend among Ugandan workers. Psacharopoulos and Woodhall had established that "average earnings tend to rise to a peak in mid career or later and then stabilize or decline until the age of retirement" (1985: 40).

Reliability of the model

Regression analysis is based on an assumption of normality of variance, linearity of relationships among variables and homogeneity (Lovie and Lovie, 1991). These assumptions were tested to determine the reliability of the regression model. Plot of the residuals against the predicted values was displayed in Figure 4. The scatter diagram in Figure 4 shows that there was no general pattern as all the points scattered around the zero mean implying there was no systematic tendencies to be positive

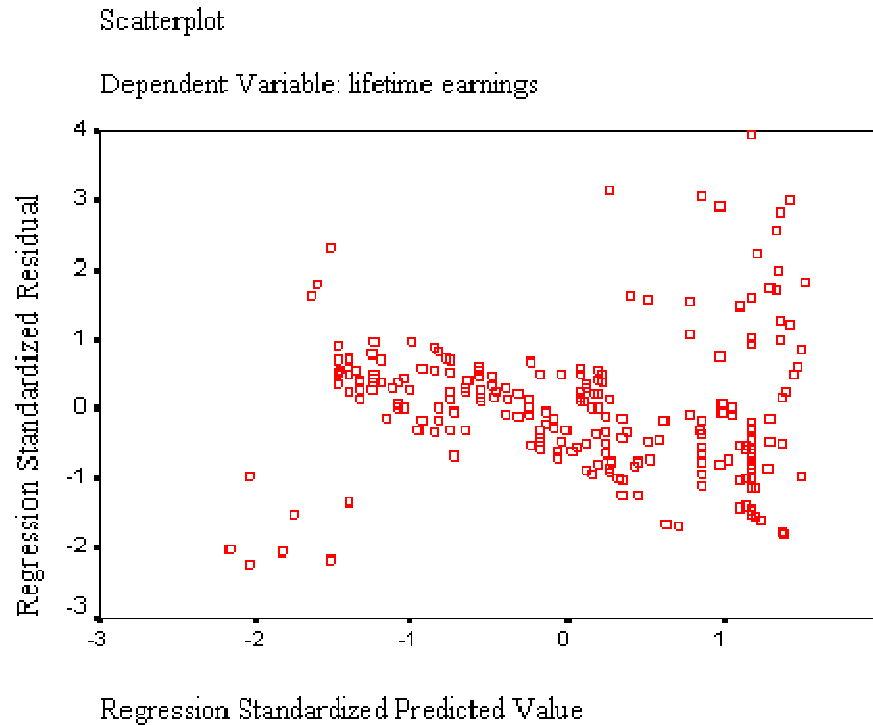


Figure 4. Plot of residuals against predicted values.

or negative. This means that the residuals had a common variance and therefore the assumption of homoscedasticity was not violated.

Normal probability plot in Figure 5 shows a general linear pattern. This means that linearity assumption was not violated. Colinearity diagnostics in Appendix 3 also indicate that the model was free from colinearity problem.

The histogram of residuals in Figure 6 was not far from symmetrical and was bell-shaped. Figures 4, 5 and 6 suggest that the residuals were nearly normally distributed with zero mean and constant variance σ^2 . This indicates that the normality assumption of the regression model was not violated. It was therefore reasonable to assume that the observed sample came from a normal distribution.

This study hypothesized that there was no significant relationship between lifetime earnings and university schooling among lecturers in public universities in Kenya. This could mean that the coefficient of schooling b_2 in the model was zero. If extended, it means that the interaction between schooling and lifetime earnings results in zero lifetime earnings or that schooling does not explain any variation in lifetime earnings among lecturers.

This hypothesis was tested using ANOVA which is inbuilt in the regression analysis. The results were presented in Table 12. It was shown that schooling was never removed from the regression model in all the four models created by the stepwise regression procedure. It was also observed that in each of those four models, beta coefficients of schooling were consistently high.

Furthermore, the coefficient of multiple regression R in Table 12 shows that a strong positive linear relationship in which $R = 0.712$ existed between schooling and lifetime earnings.

F-statistics indicates a highly significant relationship between schooling and lifetime earnings at 0.05 level of significance with p value = 0.000. The null hypothesis was therefore rejected. It was therefore held that a significant linear relationship exists between level of university schooling and lifetime earnings among lecturers in public universities.

These findings agree with the position held by Baum and Payea (2004) that the benefits of completing a bachelor's degree or higher produces greater benefits. Earlier studies by Becker (1962), Psacharopoulos (1973, 1994), Psacharopoulos and Patrinos (2002) and even later ones like Hyder (2007) established that education had great influence on individual earnings both in developed and developing countries. Studies like Hyder's established that these benefits even varied by gender. Hyder found that in Pakistan women gained more from increased education than men. Galabawa (1991) had the same finding and reported that the earnings of women rose faster than those of men. The influence of gender on the benefits of education, though important and pertinent was not investigated in this study. The present study further fell short of the precision of the earlier studies owing to differences in data sets. Studies like Pricewaterhousecoopers (2005) and Blundell et al. (2001) had superior data from national censuses. This

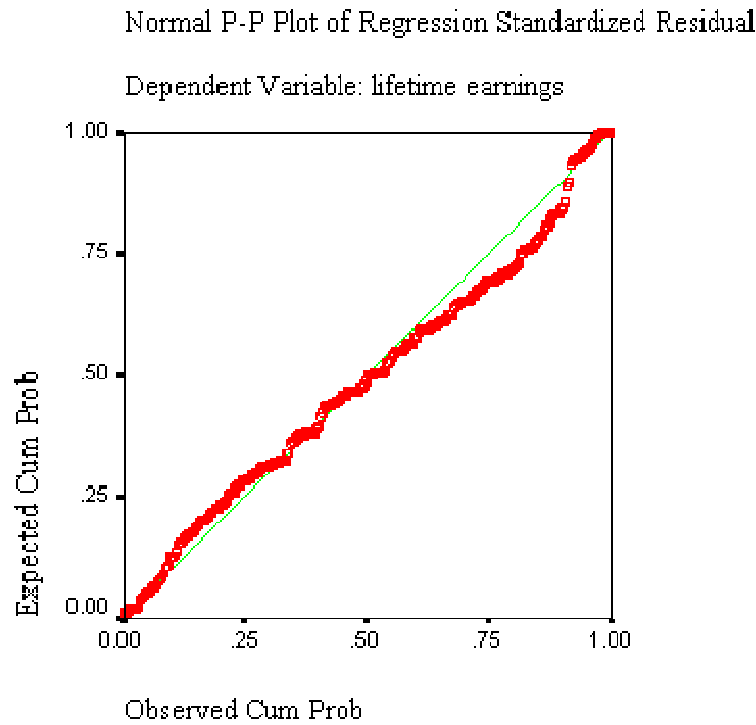


Figure 5. Normal P-P Plot of regression standardized residuals.

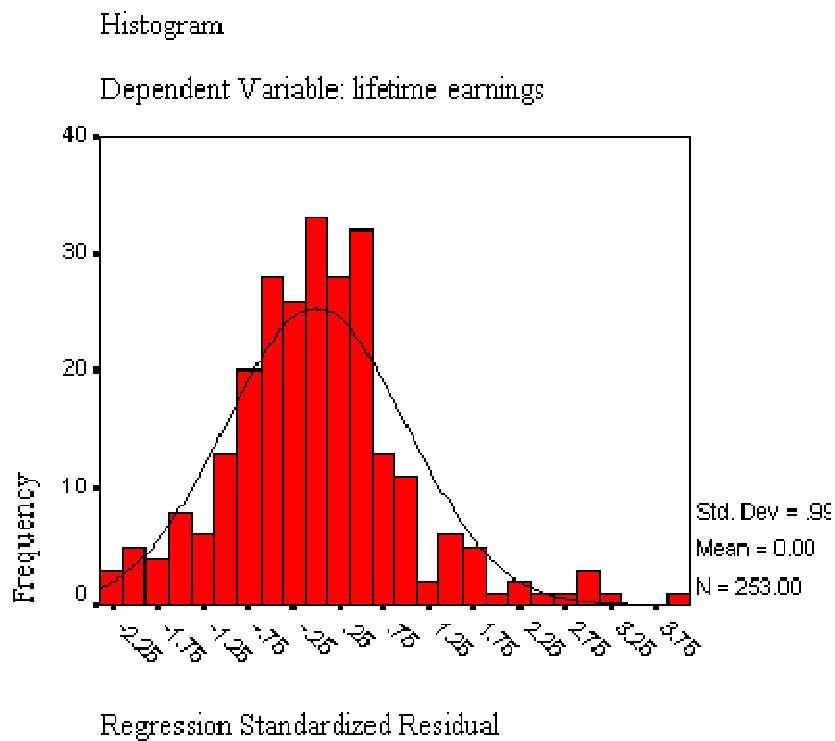


Figure 6. Histogram of residuals.

study therefore may not have used the best data. However, as observed by Psacharopoulos (1973) from 53

rates of return studies in 32 countries earnings data varied widely in comprehensiveness and form across

countries. He also noted that these variations did not diminish the technical usefulness of the studies. Psacharopoulos and Patrinos (2002) found that rate of returns to university education in Kenya was contradicting the trend in sub Saharan Africa. According to the government of Kenya, private rate of return to university schooling was 53% (Republic of Kenya, 2003). The finding of this study put rate of return to university schooling at 47.8 per cent. All these studies however concur that university education had significant relationship with earnings among individuals.

However, it should be noted that earnings among teaching staff in public universities in Kenya are regulated by the commission for higher education. University lecturers in Kenya, therefore, receive equal remuneration based on post and qualifications. This means the findings of the present study may not be extrapolated to the wider workforce, including private universities, where such clear-cut regulations may not be in force.

Conclusions

On the basis of the objectives and findings of this study, the following conclusions were drawn.

Direct private costs of University schooling

The first objective was to: determine the variance in direct private cost of obtaining different levels of university degree in Kenya.

Given the wide variations in direct private costs of university education by level of degree, this study concludes that doctoral degrees were the most expensive in Kenya. Enrolments in doctoral degree programmes in general, and in particular science-based degree courses, will continue to be low. This conclusion arose from the finding that science-based courses were more expensive than the arts-based ones. This further translates into fewer research scientists and an under supplied technology-based economy. It also implies low supervision rates among university lecturers.

Lifetime earnings accruing by level of University degree

The second objective was to: Establish lifetime earnings accruing by level of university degree. Given that lifetime earnings rose with increasing levels of university schooling it is reasonable to conclude that it was profitable to invest in more university schooling. This conclusion was buttressed by the rate of return which was found to be 47.8%. It also emerged that doctorate was the most profitable level of university schooling but master degree paid back faster. Boosted by the knowledge of cost differences and the degree level that is

most profitable, the already high private demand for higher university degrees will continue growing. This demand will create most pressure on lecturers and facilities for master's courses as this study established that it pays faster than doctorate.

Relationship between lifetime earnings and schooling

The last objective was to: establish the relationship between level of schooling and lifetime earnings accruing to lecturers in public universities in Kenya. This study also concludes that there was a highly significant positive relationship between level of university schooling and lifetime earnings. This means that differences in earnings among lecturers could be explained by varying levels of university schooling among them. Like studies carried out before it, this study reaffirms that investment in human beings by the same human beings paid high dividend.

RECOMMENDATIONS

Arising from the findings and conclusions already highlighted, this study makes the following recommendations:

- (1) Due to high direct private costs, it was recommended that individuals intending to invest in higher university degrees should do so at an early age to enable them reap optimal benefits from their investments in education.
- (2) Since the number of master's degree holders is higher than doctorates among lecturers in public universities, public funds set aside for research and training in government ministries and universities should be directed to training more masters and doctorates.
- (3) Since it is profitable for individuals to invest in university schooling, this study recommends that public universities continue with self-sponsored postgraduate programmes as a viable strategy for diversifying their sources of income.

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LECTURER'S QUESTIONNAIRE ON SCHOOLING AND EARNINGS (LQSE)

Confidential

Code of Institution.....

This questionnaire is designed to elicit responses from university dons. It is divided into two sections A and B. First Section requests you to supply demographic information while section B seeks information about earnings. Please fill in the spaces and/or tick (✓) the boxes/parentheses provided. This information will be used to establish the rate of return to university schooling in Kenya and will be used for academic purposes only.

Section A: Demographic information

1. Sex (Please tick (✓) the relevant one)

Sex Male (M) Female (F)

2. Age (Tick (✓) the suitable age group)

20 – 24 ()	45 – 49 ()
25 – 29 ()	50 – 54 ()
30 – 34 ()	55 – 59 ()
35 – 39 ()	60 – 64 ()
40 – 44 ()	65 + ()

3 a) Type of secondary school attended:

Technical..... General.....

b) What was the type of sponsorship for the school?

Government Mission.....

Harambee.....

c) What exams did you attempt?

CSC..... GCE KCE..... KCSE..... EACE.....

d) What was the mean grade obtained?

DIV III ()	B+ ()
DIV II ()	B ()
DIV I ()	B- ()
Grade A ()	C+ ()
A- ()	C ()

4. University education

a) Bachelor's degree

(i) Complete

Incomplete

(ii) Location: Kenya

Other East Africa

Abroad

(iii) Faculty

Subject.....

(iv) Length of study..... years

(v) How did you finance the course?

Full scholarship () Partial scholarship () Self-sponsored (including HELB loan) () Total cost Kshs.....

b) Master's degree

(i) Complete

Incomplete

(ii) Location: Kenya

Other East Africa

Abroad

(iii) Faculty

Subject.....

(iv) Length of study..... years

(v) How did you finance the course?

Full scholarship () Partial scholarship () Self-sponsored (including HELB loan) () Total cost Kshs.....

c) Doctorate degree

- (i) Complete Incomplete
- (ii) Location: Kenya Other East Africa Abroad
- (iii) Faculty Subject.....
- (iv) Length of study..... years
- (v) How did you finance the course?
Full scholarship () Partial scholarship () Self-sponsored (including HELB loan) () Total cost Kshs.....

5. At what age did you leave school to look for employment?

6. At what age did you enter formal employment?

- 7. (i) What was your occupation before you joined the University Employment?.....
- (ii) What was your last salary before you joined present job? (Kshs).....

- 8. (i) How long have you been teaching in this university?.....years
- (ii) What is your present grade? (*Please tick appropriate one*).

- | | | | |
|--------------------|-----|---------------------|-----|
| Graduate assistant | () | Tutorial fellow | () |
| Assistant lecturer | () | Lecturer | () |
| Senior lecturer | () | Associate professor | () |
| Professor | () | | |

Section B: Earnings

9. What is your current gross monthly pay in Kenya shillings?