PRIVATE RATE OF RETURN TO UNIVERSITY SCHOOLING AMONG LECTURERS IN PUBLIC UNIVERSITIES IN KENYA

BY

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ABSTRACT

Influence of education on earnings among workers is well documented. However, the significant 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 profitability of university schooling among lecturers in public universities in Kenya. Specifically, this study sought to: determine direct private costs of obtaining university schooling in public universities in Kenya; establish lifetime earnings accruing by level of university degree to lecturers in Kenya; determine level of research output among lecturers in Kenya and; establish relationship between earnings and level of schooling among lecturers in Kenya. Null hypotheses were used to facilitate achievement of the objectives. 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 costs, earnings, age, schooling, experience and research output 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. Null hypotheses were rejected at 0.05 level of significance in a two-tailed test. 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-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; however, at the observed levels, research output was low in public universities; and, level of schooling determines lifetime earnings. It was therefore recommended that individuals should invest in university schooling but at an early age in order to maximize on lifetime earnings. 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 was among other recommendations in this study. For future research, this study recommends that a similar study be replicated among lecturers in private universities and those in public universities in other parts of East Africa for comparison purposes.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Education is widely acknowledged as an effective instrument for economic development of a society (Psacharopoulos & Woodhall, 1985; World Bank, 2003; Republic of Kenya, 2005a). However, higher education all over the world is viewed with keener interest. It is seen as a product, a service and a lifelong investment bought and paid for like other products in the market place (NCCHE, 1998). Rising costs and prices of higher education like that of other commodities in developed as well as developing countries are real.

University education has witnessed tremendous changes across the world (Teichler, 1988). Higher education in industrialized countries like Germany, France, Sweden, the Netherlands, United Kingdom, U.S.A., Japan and Australia, in the three decades prior to 1980 underwent the most intensive reform. That reform and debate about it have led to an increased variation in higher education organizations of the industrialized countries. Higher education policies over the decades emphasized expansion especially in terms of the increasing number of students. Expansion was of central importance – no matter whether policies addressed structural development, organization, research, curriculum, students, academic staff, or relationships between higher education and employment.

Expansion was the major focus because the internal situation of the institutions of 1950, universities were attended only by small elite of participants. In only a few

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countries did more than five percent of the corresponding age – groups enroll at institutions of higher education (Teichler, ibid.). By 1980, however, most of the industrialized countries had more than 20 per cent, in some countries more than a third, and in the United States of America even more than half of the corresponding age – group enrolled at institutions of higher education.

The development of university education in Africa was a reflection of the pattern, function and purpose of higher education in Britain in the late 1940s (Ashby & Anderson, 1966). African perception of university education developed on the basis of western academic traditions (Ashby & Anderson, ibid.). The University of London gave birth to the university of East Africa in June 1961 (Bogonko, 1992). On First July 1971, the University of East Africa split into three national universities namely: Makerere University in Uganda, University of Dar es Salaam in Tanzania; and Kenya's University of Nairobi (ibid.). Henceforth, universities in Kenya spring from either the lineage of the university of Nairobi or Moi University. Consequently, Kenyatta University grew from the University of Nairobi and sired Jomo Kenyatta University of Agriculture and Technology (ibid.).

Expansion of higher education throughout the world was justified by the American experience of rapid economic growth between 1930 and 1950. A large proportion of this growth was as a result of increased levels of education of the labourforce (Eckaus, 1962). Factors such as improved worker productivity, improved health of the population, reduced fertility rates as well as reasons of national security were used to appeal for public funding for education. Kenya considered education as a vehicle for

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speedy Kenyanization of the economy as well as tackling the problem of ignorance (Republic of Kenya, 1964). National Rainbow Coalition government, on ascending to power in 2003, expanded budgetary allocation to education (Republic of Kenya, 2006). It was argued that education is a key determinant of earnings and therefore an important exit route from poverty (Republic of Kenya, 2003a). 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.

Private individuals, however, invest in higher education to gain more personalized rewards such as improved social status, prestige, access to lucrative jobs and increased earnings (Aaronson, 2002; Hyder, 2007). Private demand for university schooling is therefore seen as a derived demand for higher income and prestige. The private rate of return has been widely used as measure of efficiency of private investments in education (Psacharopoulos, 2000; Woodhall, 2004; Hugget, 2009). Evidence shows that private rates of return are significantly positively influenced by level of education (Toh & Wong, 1999; Wei, et al., 1999; Soderbom, et al., 2006). Private rates of return were highest for university degree holders. Lifetime earnings, considered to be an accurate measure of wealth, also depend on an individual's level of education (Aaronson, 2002; Baum & Payea , 2004). Studies in Kenya (Manda, et

al., 2002), Uganda (Ssemambo, 2000) and, Kenya and Tanzania were unanimous that earnings were highest among individuals with university level of education.

Among individuals with different university degree levels, lifetime earnings have been shown to vary accordingly. In the United Kingdom and U.S.A., doctoral degrees generate the highest returns followed by Master's and bachelor degrees in that order (Pricewaterhousecoopers, 2005; Baum & Payea, 2004).

Increasing social demand arising from population explosion and intense private demand for university schooling culminated in expansion of higher education that consumed too much public revenues. In developed countries as well as in East Africa, it was feared that allocations to education sector would emasculate government investments in other sectors of the economy particularly development of the infrastructure necessary for economic advance (Aaronson, 2002; Ishengoma, 2004; Johnstone, 1993; Republic of Kenya, 1974, 1988, 2005a). Within the education sector, allocations to University sub-sector grew faster than the total budgetary allocation to education in Kenya as in the U.S.A. (Johnstone, 1993; 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). This saw the introduction of cost sharing in higher education in East Africa (Ishengoma, 2004; Mwinzi, 2002) while in U.S.A. and China universities engaged in aggressive fundraising and income generating activities (Johnstone, 1993).

Increased enrolments recorded between 1997 and 2006 overstretched available

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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).

Quest for non-tax revenue from parents, students, businesses and donors for financing university schooling has had serious effects on academic programmes and students. In Kenya, university students engage in small business activities within their halls of residence in order to supplement their cost of living (Ndirangu & Bosire, 2004; Mwinzi, 2002). It is common to find university students working as barbers, cobblers, hairdressers, 'brokers' in computer typing and typing, hawkers of light goods such as papers, electronics and cigarettes (Kosgei, et al., 2006). This denies the students adequate study time leading to poor coverage of the required content. Besides, students from poor families are being priced out of universities while those who get loans leave universities with heavy debts that limit their personal savings and investments.

Impacts of cost sharing are also seen in terms of reduced research funds leading to reduced academic research activity (Kobia, 2006). Flight of academic staff to the private sector, politics and even to foreign countries in search of better pay has become common. This leads to serious understaffing in areas such as medicine, information science and engineering. At the University of Dar es Salaam, through brain drain, the university lost 85 members of academic staff and during the 1999/2000 academic year the university had 307 approved but unfilled academic staff vacancies (Ishengoma, 2004). This indicates that while pursuing cost reduction efforts, quality is being compromised.

This coincided with soaring educated unemployment. 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 per cent but were marred by an average annual inflation rate of 14.5 per cent (Republic of Kenya, 2007) and a decline in job opportunities (ILO, 1972; World Bank, 2000; Republic of Kenya, 2003b). Coupled with high costs to the economy, the government shifted the educational cost burden to individuals and their families (Republic of Kenya, 2005b). Reduction in public financing was adopted because studies had indicated that primary level yields highest social returns compared to secondary and university levels (Psacharopoulos & Patrinos, 2002; Republic of Kenya, 2003). These studies concurred with earlier ones (Thias & 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, 2003c). 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.

1.2 Statement of the Problem

There is agreement among economists that education pays but at a high cost. Individuals who possess higher levels of education tend to access better paying jobs than their compatriots with lower qualifications. However, rising direct costs of education have priced out the poor from the education system. Those who dare remain in the system longer remain indebted for long after graduation. There is concern that university education continues to be a priority investment in every household in

Kenya despite the strangling burden this brings to the household. Private costs of university education have increased from zero in the 1970s to an average of Kenya Shillings 300,000 per annum in 2008. Despite the rising costs, enrolments in undergraduate programmes increased by 117.7 per cent between 1997 and 2006. Whereas the quantity of physical and human resources remained constant over the years, their quality dwindled. Consequently, two problems arose: real average earnings rose only marginally by 0.2 per cent in 2006, and graduate unemployment soared. This led to unprecedented brain drain.

Those in employment faced wage differentials between occupations and within industries. These differentials led to labour unrests among teachers, lecturers and other workers. In public universities the graduate assistants are the lowest paid academic staff and they earn a minimum of about 30,000 Kenya Shillings monthly. Professors on the other hand earn a minimum of about 90,000 Kenya Shillings monthly. Earnings and promotions among lecturers in public universities are determined by productivity besides level of education.

Considering that enjoyment of the high pay resulting from higher levels of schooling comes at unbearable costs among Kenyans, 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.

1.3 Purpose of the Study

The purpose of this study was to determine the private rate of return to university schooling among lecturers in public universities. Specific objectives of this study were to:

(i)   Determine the variance in direct private costs of obtaining different levels of university schooling by lecturers in public universities in Kenya;

(ii)   Establish lifetime earnings accruing by level of university degree to lecturers in public universities in Kenya;

(iii) Determine level of research output among lecturers in public universities in Kenya; and

(iv)   Establish the relationship between lifetime earnings and level of schooling among lecturers in public Universities in Kenya.

1.4 Research Hypotheses

The study was guided by the following null hypotheses:

(i).   There is no significant difference between direct private costs of obtaining schooling at Masters and Doctoral degree levels in public universities in Kenya;

(ii). 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;

(iii). There is no significant difference in level of research output among lecturers with Master degrees and those with Doctoral degrees in public universities in Kenya; and

(iv). There is no significant relationship between lifetime earnings and level of

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schooling among lecturers in public Universities in Kenya.

1.5 Significance of the Study

Findings of this study might assist policy makers, educationists and Ministry of Education officials to allocate resources among levels of university education in Kenya efficiently. The study findings may also guide administrators in public universities to decide on how high the cost of tuition at different degree levels should be set. Individuals and their families would be guided by these findings to decide on investment levels to be directed to university degrees. Teachers in schools would use the findings of this study to guide parents and students on the profitability of university qualifications. The findings of the study may shed more light on the Cost-Benefit Analysis of higher education in a developing country like Kenya particularly in the teaching profession.

1.6 Assumptions of the Study

This study proceeded on the following basic assumptions:

(i)   Individuals who entered and completed degree programmes are of high ability;

(ii)   Degree awarding institutions are of standardized quality;

(iii)   Education enhances economic productivity; and

(iv) There is no repetition of classes.

1.7 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 Becker (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 study sought to analyze the influence of schooling, age, experience and research output 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 Mincer (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 research output was considered. Rate of return to schooling was, therefore, obtained from a linear function stated as follows:

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

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

1.8 Conceptual Framework

Interaction among the variables as suggested by the theory of investment in human capital was conceptualized in a flow chart as shown in Figure 1. The figure indicates that earnings are likely to be influenced by age, schooling, and experience and research output among lecturers in public Universities. Figure 1 further indicates that lifetime earnings as a variable is a dependent one while age, schooling, experience and research output are independent variables.
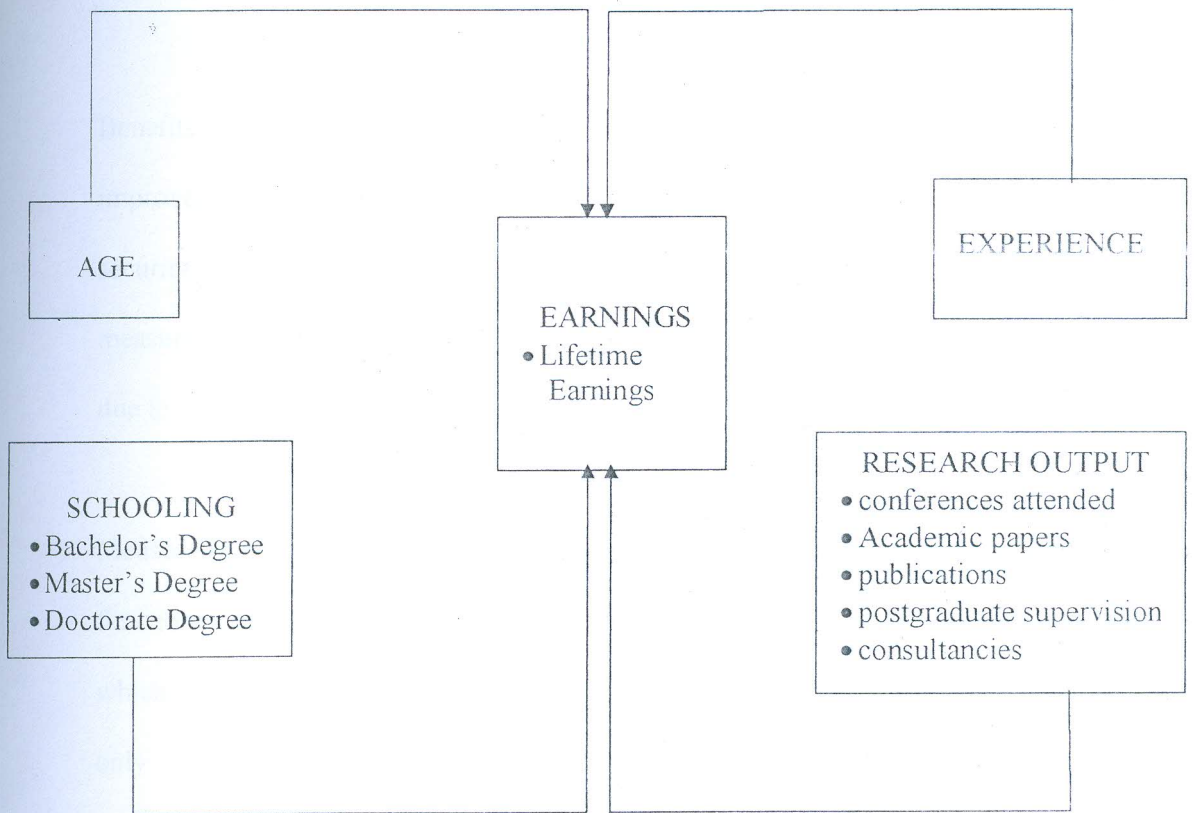
Figure 1: Conceptual framework showing the interrelationship among schooling, age, experience, research output and earnings.

Source: Review of literature: e.g., (Becker, 1962; Mincer, 1974; Ssemambo, 2000; Aduol, 1999; Kembo-Sure, 1994).

1.9 Scope of the Study

Efficiency is quite a broad subject. It is basically divided into internal efficiency and external efficiency. Internal efficiency of education relates inputs to outputs within an educational institution. External efficiency on the other hand, analyses how the educational system is able to achieve its national goals. One of the national goals of education in Kenya is to ensure equitable distribution of income. This study was

concerned with the external efficiency of education.

Benefits of education are numerous. Some of them, indirect benefits, such as improvements in health, technological advancement, increased national unity and security at social level remain unquantifiable. However, this study confined itself to measurable benefits specifically additional salary earnings accruing to an individual due to additional education.

Measurement of returns to education entails different methods including earnings functions and internal rate of return. Unlike previous cost benefit studies in Kenya which focused on all levels of education, this study singled out university education only. The university level was subdivided into three different levels namely Bachelors, Masters and Doctorate. University lecturers are hired on condition that they attained a minimum of a master's degree. However in this study, bachelor degree was included to form the basis for calculating marginal returns to a master's degree.

Data for the study were obtained from employees in the public sector. Specifically, lecturers in public universities formed the study population. University graduates working in the other sectors were not sampled for the purpose of this study. Likewise, workers aged 19 years and below were excluded from the study.

1.10 Limitations of the Study

This study belongs to the category of unconventional rate of return studies (Woodhall, 2004). It therefore lends itself to criticisms that have been directed at such studies.

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Rate of return studies are widely criticized for ignoring concerns that correlations between education and unobservable factors do render rate of return estimates misleading. Such unobservable factors include pre-existing worker ability, health, family background and school quality. This issue could not be addressed in this study because, like most conventional studies (Appleton, et al., 1995), data did not include measures of such variables.

1.11 Definition of Terms

Bachelor's degree: The first level of University education equivalent to 16 years of education.

Doctorate degree: The third level of University education equivalent to 21 years of education.

Experience: Number of complete years one served as a university lecturer.

Lifetime earnings: Gross Salary from employment measured in Kenya shillings converted into earnings for all working life of a lecturer.

Master's degree: The second level of University education equivalent to 18 years of education.

Rate of return: Amount of change in personal lifetime earnings associated with additional university schooling.

Research output: Sum of publications, unpublished papers presented at conferences, and supervision carried out by a lecturer.

Secondary level of Education: Lower level of education equivalent to 12 years of education.

University Schooling: Any one of the university degree levels namely Bachelors,

Master's and Doctorate's completed by a lecturer in public universities in Kenya regardless of the method of delivery of the degree programme.

Working life: Years during which a person is employed in the public universities estimated to be 38 years.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents a critical survey of literature relevant to: Direct private cost of university schooling; Lifetime earnings; Academic research output; and Relation between lifetime earnings and level of schooling.

2.1 Direct Private Cost of University Schooling

Education as an investment is both private and social in nature. As an investment, costs of education are shared by individual students, families, communities, employers, governments and international agencies (Psacharopoulos & Woodhall, 1985). What is crucial about the sharing is the variation in the sharing arrangement and in the proportions of public and private funds allocated to education. Variations occur in terms of the total allocations and allocations by level of education. While analyzing financing of educational programmes, Psacharopoulos and Woodhall (ibid.) underscored the burden borne by governments especially in the third world countries. They also indicated the scarcity of records about private financing of education especially between 1960 and 1985. They argued that even where such records exist, private schools still relied on government subsidies as in the case of Argentina and Brazil. They advanced arguments for public subsidy of education, outlined the effects of such subsidies on equity and efficiency, and even suggested cost-reduction measures. Among the measures recommended were direct tuition fees, student loans and increased community involvement in education. This work is important for the present study as it formed part of the impressive evidence available to the World Bank in the advancement of arguments against public financing of higher education in

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developing countries.

There is however no level of education in the developing countries that consumed more government allocations than university level. At this level, the global expenditure is estimated at U.S dollars 300 billion annually which is about one percent of global GDP (World Bank, 2000). The World Bank (ibid.) reported that a third of this expenditure is found in the third world countries whose university systems are dominated by public Universities. The World Bank however, noted that despite the growing public expenditures on education, the financial resources currently being directed to university education are inadequate. It further recognized declining quality of academic staff, poor quality teaching methodology and decaying equipment due to lack of maintenance and disuse (World Bank, ibid.). The cause of falling standards is attributed to decisions that were based on rate of return analysis by World Bank experts. The report argued for increased spending on education but remained clear that public resources in developing countries were exhausted. It called on beneficiaries of university education to pay more.

The Government of Kenya also adopted the stance that beneficiaries would pay more and allocations to university education continue to dwindle. The government officially increased user costs to cater for deficits created by non-availability of public funds for use in public Universities. This move was intended to contain allocations to education and training at not more than 30 percent of the civil recurrent expenditure (Republic of Kenya, 1989).

Cheboi (2001) noted that funding for higher education is on a downward trend because past social rates of return analysis had indicated that primary and basic levels

were more beneficial to society than university. While reiterating the call on the beneficiaries to contribute more for their education, he identified more possible causes of shortage. He attributed the constraints facing public Universities to: unprecedented growth in enrollment; decline in funding from government and donors, and inability of students to pay fees among others. He further enumerated interventions to address the funding constraints notably the introduction of full – cost charges for students who are able to pay for themselves.

The Commission for Higher Education, in a report of a regional workshop for vice chancellors from Eastern and Southern Africa (CHE, 2001), advised Kenyan university administrators to strengthen income generation activities. The workshop recognized the financial constraints, appreciated the causes and made valuable recommendations to arrest the situation. It became clear that all was set to change for the beneficiaries of higher education were to be prepared to pay more for their degrees. This report is particularly useful to this problem as it points out the real financial positions in public Universities.

In 2005, the government of Kenya released an official policy on education, training and research in the 21st century (Republic of Kenya, 2005). The policy affirmed that university education is expensive to the government and unsustainable within current resources. It was further stated that Universities have to reduce their dependence on the government by diversifying their sources of income. In a final statement, the government made it official that the strategy for financing Universities should entail requiring all beneficiaries of higher education to make higher contributions (Republic

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of Kenya, 2005). By this policy, the private cost of acquiring university education goes up and benefits would go down. The study by Psacharopoulos and Woodhall like Cheboi's does not show the variations and proportions of private and public funds allocated to university education in Kenya. It is not clear which degree level consumes more of public or private funds.

The consequences of increased direct private cost of university schooling have been highlighted. Studies in the United States of America paint a grim picture. According to the Pennsylvania Department of Education (2008), in a report to the Pennsylvania State Board of Education, a significant gap exists between available need-based grant and the total cost of attending either state university or community college. It further emerged that even at the state's most affordable public institutions; students had to utilize sizeable loans in order to finance their education. It was also reported that students graduating from Pennsylvania colleges and universities left school with the sixth highest debt load nationally. In Pennsylvania, 71 percent of students graduate with debt while the U.S. A. national average debt level was 59 percent.

In Kenya, Njiraini (2008) observed that many students get in debt in pursuit of higher education. He cited a case in which a public university in Kenya published names of more than 8000 students who had unpaid fees arrears. The university even threatened to deregister the said students.

Higher Education Loans Board (HELB), the official institution charged with the responsibility of managing post-secondary student loan scheme, also faces debt

collection crisis (Odebero, et al., 2005). It was found that HELB was ineffective in its recovery process. The study attributed ineffectiveness to weak legislative framework and insufficient dynamism among debt collection officers. What the study assumed was that the debtors had the money ready and they were only waiting for debt collectors. It becomes evident that in Kenya, as in the United States of America, students leave universities burdened with unpaid educational loans.

Ndirangu and Bosire (2004) carried out a case study of 50 university students involved in small business ventures at Egerton University. The study sought to find out the characteristics of student entrepreneurs, reasons for entry into business and how they coped with studies while operating businesses. Results showed that students engage in on-campus businesses in order to cope with the high cost of university education. They do business to survive. It was further established that most of the respondents came from humble background.

All studies on cost of higher education, except the Pennsylvania Department of Education Report (2008), did not avail actual cost burden on students. Given the consequences it became necessary to examine the cost of university schooling in Kenya. This was more relevant considering that questions have been raised whether investment in education gives the desired returns; and, whether the pursuit of university education is worth the agony and public humiliation to which debtors are subjected (Njiraini, 2008).

2.2 Lifetime Earnings among Lecturers in Public Universities

The role of education in promoting economic development has been widely studied. However, since 1960s, studies have approached this subject mainly from a human capital perspective (Psacharopoulos, 2000).

In a paper focusing on education as a major component of human capital, Psacharopoulos (2000) illustrated that many links exist between development and education. Based on evidence drawn from 15 OECD countries, he reaffirmed that the higher the level of education, the higher the chances that a person will be a formal participant in the labour market; and the higher the chances of employment, especially for women. The study points out that once in the labour force, more educated persons experienced less unemployment. In Ireland, for example, more than one half of the unemployed had a level of educational attainment at or below lower secondary. And, in Germany, there was a significant positive correlation between level of education and duration of unemployment (Psacharopoulos, ibid.). He averred that the more educated remained unemployed for shorter periods.

Psacharopoulos (2000) was in agreement with earlier studies (Schultz, 1961; Becker, 1962; Thias & Carnoy, 1972; Psacharopoulos & Woodhall, 1985) on the claim that higher levels of educational attainment translates into higher earnings for individuals, especially women (Psacharopoulos, 2000). It was reasoned that according to the founders of the notion of human capital, employers recognize the productivity of more educated employees and are willing to pay them more.

From the point of view the study by Psacharopoulos (ibid.), university lecturers would

not suffer from unemployment. This is important in the determination of lifetime earnings especially in a country like Kenya.

Effect of education on productivity recently received attention from Kenyan scholars (Ombati, et al., 2006; Onyuma & Icart, 2005; Ondieki, et al., 2006). In a study conducted among farmers in Nakuru-Kenya, Ombati et al. (2006) examined factors influencing farmers' adoption of information and communications technologies in accessing agricultural information. Using survey data from 16 administrative divisions within the district, the study found that farmers were well aware and willing to adopt information and communication technologies to revolutionize their access to agricultural information. It was established that farmers in Nakuru district suffered from poor infrastructure, lack of government initiative and computer illiteracy. These factors impeded utilization of information and communications technology, which, further hampered access to agricultural information from other parts of the world. What has not come out clearly is the effect of under capacity on agricultural productivity. However, the study implied that human capital, seen in terms of computer literacy, was crucial for improved production in agriculture.

Another study conducted in rural Kenya provides corroborating evidence. Using a modified Cob-Douglas function with data collected from small scale farmers in Kisii district, Onyuma and Icart (2005) investigated how productivity of small holders could be improved by determining the role of formal and semi-formal education in production. Results from this study indicated that schooling and extension services positively and significantly influenced agricultural production. The study established

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that these factors combined to improve farmers' allocative efficiency. Schooling and experience were found to be substitute during production decisions and the three showed a complementary relationship. The study recommended human capital development through training for rural farmers.

The position that education enhances productivity was further affirmed in a study carried among arc welders in the small scale metal work sub-sector (Ondieki, et al., 2006). This study found that artisans with secondary education produced a higher product quality than those with primary level of education.

It is evident from the three studies from Kenya that human capital influences lifetime earnings in more subtle ways (Ombati, et al., 2006; Onyuma & Icart, 2005; and Ondieki, et al., 2006). These studies further suggest that influence of education permeates into both formal and informal sectors of the economy.

A more explicit analysis of the relationship between lifetime earnings and level of schooling was done by the United States Bureau of the Census (1994). This study reports that, in U. S. A. it is worthwhile to stay in school and earn a higher degree. Using data from population surveys, the Bureau of Census estimated the total earnings adults were likely to accumulate over the course of their working life. The study affirmed that more education means greater earnings over a year's time; and that over the length of one's working life, these differences became enormous. The formula used by the Bureau of Census in determining lifetime earnings was useful for computing lifetime earnings among lecturers in the present study.

Another study in the United States of America (Hugget, et al., 2009) sought to determine whether lifetime inequality was mainly due to differences across people established early in life or due to differences in luck experienced over the working lifetime. This question was answered using a model that featured idiosyncratic shocks to human capital estimated directly from data, as well as heterogeneity in ability to learn, initial human capital, and initial wealth. These features matched the properties of earnings dynamics well. Hugget, et al. (Ibid) established that as of age 20, differences in initial conditions account for more of the variation in lifetime utility, lifetime earnings and lifetime wealth than do differences in shocks received over the lifetime. The study concluded that among initial conditions, variation in initial human capital was substantially more important than variation in learning ability or initial wealth for determining how a person fares in life.

The study by Hugget, et al. (2009) strengthens the assumption in the present study that lecturers in public universities were of equal ability. It further makes it easy to downplay the effects of inherited family wealth on lifetime earnings among lecturers. This extraneous influence had, however, been obviated in the present study by considering salaries as the sole source of lifetime earnings among the lecturers in public universities.

Two studies in Kenya do concur that lifetime earnings do rise with increases in levels of education (Appleton, et al., 1999 & Manda, et al., 2002). The study by Appleton et al. (1999) focused on the twin phenomena of educational expansion and poor

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economic performance which is rampant throughout sub-Saharan Africa. The paper showed how returns to schooling in Kenya have changed over the last two decades of educational expansion and economic decline. With the help of data from the 1978 Labour-force survey, 1986 Urban Labour-force survey and the 1995 Regional Programme on Enterprise Development survey, the study found that generally, wages fell over the same period. The study further points out that the impact of Kenya's educational expansion was evident in the rise in level of education of the workforce overtime. Even of more significance was the finding that social returns to secondary education declined from 20 percent in 1978 to six percent in 1995. Wage benefits from primary level of education fell between 1978 and 1995 but returns remained unchanged owing to corresponding falls in costs at that level. Over the period between 1978 and 1995, returns to tertiary education did not fall (Appleton, et al., 1999).

While Manda et al. (2002) observed similar patterns in the relationship between level of education and returns, their study found that the general increase in women's education benefits both men and women. What is more intriguing is the finding that men benefited more from women's education than women themselves. This finding contradicted the position of earlier studies in East Africa (Galabawa, 1991; Ssemambo, 2000) which held that women benefited from tertiary education more than men.

Whereas most of these studies analyzed the influence of education on gender distribution of earnings, the present study assumed that gender does not influence earnings at this level. All the above studies used survey data across occupations and

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professions. The present study used data from a survey of characteristics specific to lecturers in public universities.

2.3 Academic Research Output among University Lecturers

Performance contracting has become a serious consideration among management in relation to their subordinates. In public universities in Kenya, the issue gained significance in the 1990s. Kembo-Sure (1994) sought to highlight factors considered crucial in the enhancement of teaching at the university. Through a survey design he sampled students, lecturers and administrators. It occurred that among crucial factors, besides level of education, productivity ranked high according to lecturers and administrators.

Olel (2006) carried out an analysis of the internal efficiency of three public universities in East Africa. Focusing on the contribution of privately sponsored students programs in those universities, she found that level of motivation increased among the teaching staff. This was attributed to increased remuneration that was possible as a result of additional funds availed by module II students. Aduol (1999) established a method of calculating staffing requirements for universities. He called the formula 'Full Time Staff Equivalent' (F.T.S.E.). It was reported that a full time staff equivalent of 1.00 was an ideal measure of efficient use of staff.

The government of Kenya, in her policy guideline on university education stated that public universities were to ensure more cost effective use of institutional resources (Republic of Kenya, 2005a). It was further stated that universities would be

encouraged to ensure that a performance based system of appointments and promotions is developed. The policy emphasized that universities would maintain records on academic productivity.

Kigotho (2008) decried the death of research in Africa. He observed that the scientific gap between Sub-Saharan African countries and the rest of the world was widening to unacceptable levels. He attributed the gap to weak or total absence of research policies. He observed that published scientific papers and patent applications, which are a measure of scientific output, were scarce in sub Saharan Africa. Citing evidence gleaned from Pascal Database, Kigotho (Ibid) further reported that, in Kenya there were only about 1000 fulltime researchers producing an average of 500 scientific papers annually.

Olukoju (2002) studied the crisis of research and academic publishing in Nigerian universities and confirmed that academic publishing is the index of scholarly research. He concurred with Kigotho (2008) that academic publishing had declined since late 1970s. Olukoju observed that the decline was in terms of output, quality and regularity of publications. While attributing the crisis to numerous causes, Olukoju (2002) examined coping strategies adopted by Nigerian scholars and confirmed that multi- and inter-disciplinary collaborative research and research networks, new journals, conferences and, self-publishing were strategies adopted by Nigerian scholars.

In the mid 1990s, the Association of African Universities sponsored a study into the efficiency of resource use in public universities in Kenya (Abagi, 1997). This

exploratory and descriptive study gathered both qualitative and quantitative data from Kenyatta University and University of Nairobi. One of the key objectives of the study was to examine efficiency in the utilization of both physical and human resources. Using 'revealed standards' approach, Abagi (1997) found that in addition to offering teaching services at both undergraduate and postgraduate levels, a number of university departments were engaged in research. It was reported that 90 percent of the teaching staff interviewed intimated that most of the research they engaged in were not university projects but their private undertakings with external funding. The study further found that senior academic staff in the two public universities spent approximately 80 percent of their time on consultancy projects. Such projects were not initiated by the universities but by individuals through direct contact with donors, private firms and non governmental organizations. Both human and physical resources were under utilized while missions were pursued inefficiently (Abagi, 1997). The underutilization of human resources provokes the need for the determination of level of research output among lecturers in public universities.

Kobia (2006) carried out an assessment of what he called 'book famine' in Kenya. This paper concerned itself with two issues: (i) publishing and its role in educational development in the context of higher education in Kenya; and, (ii) challenges and prospects of publishing educational materials for purposes of learning and teaching at institutions of higher learning. Kobia (ibid) observed that publishing is a complex process that involves various stakeholders including authors, publishers, printers, artists, translators, distributors, booksellers and readers He recognized that 'book famine' was more pronounced in scholarly publishing for institutions of higher

learning than in other forms of publishing in Africa in general and Kenya in particular. Kobia (2006) corroborates views held by others (Kigotho, 2008; Olukoju, 2002) that locally published scholarly books and journals were very few, while imported ones were rare and expensive. He concluded with a look into the consequences of the 'book famine'. He stated that it leads to deprivation of knowledge, discourages a reading culture, and above all, makes it impossible to mass educate and mobilize through collective intelligence encapsulated in books.

These studies highlight serious challenges to scholarship and lend credence to journalistic claims that Doctoral qualifications are rare in African universities (Kigotho, 2008) and that courses such as medicine and engineering were worst affected by shortage of Doctoral qualifications (Otieno & Anyira, 2008). Slow pace of expansion at Maseno University has been attributed to fear of compromising quality of education by engaging non-qualified teaching staff (Anyira & Ayodo, 2008).

The study by Kembo-Sure (1994) and the Sessional paper no.1 of 2005 (Republic of Kenya, 2005) are important for this study because they define productivity indicators in measurable terms. Olel (2006) and Aduol (1999) have established useful performance indicators. The present study used a modified form of these indicators to determine productivity levels among lecturers in public universities.

Whereas these studies (Kembo-Sure, 1994; Aduol, 1999; Olukoju, 2002; Kobia, 2006; Olel, 2006; Kigotho, 2008; Otieno & Anyira, 2008; and Anyira & Ayodo, 2008) reveal a decline in academic publishing, none of them considered the influence

of level of education on academic research output nor did they examine the contribution of academic publishing to earnings among scholars. There was need therefore, to analyze the relationship between schooling and academic research output.

2.4 Relation between Lifetime Earnings and Level of Schooling

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 the 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. These applications helped to provide a proper 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.

Woodhall (2004) grounded her presentation on the universal recognition of education

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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. 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. The study identified data sources for earnings studies. He concluded, from 53 rate of return studies in 32 countries, that earnings data used varied widely in form and comprehensiveness. He also observed that quality also varied widely due to quality of data accessible to the researcher.

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 valuables 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 1958 National Child Development Survey (NCDS) 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); 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.

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. Benefits of completing a bachelor's

degree or higher produces greater benefits than high school or college education in America (Baum & Payea, 2004).

Pricewaterhousecoopers (2005) showed that a first university degree in the United Kingdom yields higher returns than lower qualifications. This study pooled information from the quarterly labour 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. Pricewaterhousecoopers (2005) further compared returns to different degree subjects in the United Kingdom and 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 Pricewaterhousecoopers (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 21 percent, 11 percent for secondary and 20 percent 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 percent, 13.7 percent and 31.2 percent for primary, secondary and university respectively.

Private rates of return to education in Kenya indicate that primary level yields 12.6 percent, secondary 37.3 percent and university education 53 percent (Republic of Kenya, 2003b). This result seems to differ from the trend of private returns 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 percent, 24.6 percent and 27.8 percent for primary, secondary and higher education respectively. In the early 1970s, Thias and Carnoy (1972) had

indicated that 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.

Studies in the United Kingdom and United States of America (Baum & Payea, 2004; Day & 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 at three levels namely: primary, secondary and university. These studies relied on official databases. They did not look at specific industries like teaching at the university level as proposed in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the research design; area of study; population and sample; research instruments; validity and reliability of the instrument; pilot study; data collection procedures; and data analysis.

3.1 Research Design

This study used both descriptive survey and correlational research designs. Descriptive survey is useful whenever 'it is necessary to know something about the characteristics of the subjects' of a study (Kathuri & Pals, 1993, p. 33). Its main purpose is to explore and describe characteristics of whole populations (Kerlinger, 1973). The survey made it possible to establish the sex, age, educational background and experience of lecturers in public universities.

Correlational research design shows the closeness of relationship between two variables (Gall, Gall & Borg, 1996). This design makes it possible to compare two or more different characteristics from the same group of people (Kathuri & Pals, 1993). The present study used correlational research design to carry out the more complex process of testing research hypotheses. Correlation coefficient (r) was used to show the magnitude of relationship between earnings; and, schooling, age, and experience while multiple regression coefficients (R) were used to predict earnings from a set of independent variables namely: age, schooling, experience and research output. Meanwhile, coefficient of determination (R^2) was used to explain variance in the dependent variable. In descriptive survey and correlation research designs,

measurements of the variables are taken using observations, questionnaires, documents or tests. This study used a questionnaire and document analysis.

3.2 Area of the Study

The study was carried out in public universities in the Republic of Kenya. Kenya occupies a land area measuring square kilometers 5,821, 677.20 with a population of about 40.0 million people. There are 42 ethnic groupings speaking over 40 different languages and even more dialects. Kiswahili and English are both official languages but English is the language of instruction in the Kenyan education system.

There are seven full-fledged public Universities and 13 University colleges. Growth in number of universities in Kenya has been rapid, since only 30 years ago there was only one University. Expansion in enrolment in these institutions has also been phenomenal. During 1963/1964 academic year there were 565 undergraduate students and by 2006/2007 academic year enrolment in public universities stood at 91,337 undergraduates (Republic of Kenya, 2007).

Universities run two modules: public-funded regular students and self sponsored students. Admission into university regular programmes is centrally managed through the Joint Admission Board. Parallel or self-sponsored students gain admission through direct application to a university of their own choice and pay higher direct fees.

According to various university catalogues academic staff population during the 2006/2007 academic year was 4300 in public Universities in Kenya (Egerton, 2002;

Jomo Kenyatta University of Agriculture & Technology, 2004; Kenyatta, 2002; Maseno, 2007; Moi, 2002; University of Nairobi, 2003). Average academic staff to student ratio was 1:22 (Republic of Kenya, 2007). Terms and conditions of employment of academic staff are approved by each University council but regulated by the Ministry responsible for higher education through the Commission for Higher Education (CHE). They are hired in grades XI-XV as assistant lecturers, lecturers, senior lecturers, associate professors and professors. Lecturers in grades XI-XIII retire at the age of 65 years while those in grades XIV-XV retire at 70 years. CHE also ensures quality of academic programmes, academic staff as well as suitability and adequacy of physical facilities.

Academic staffs of public Universities engage in research to upgrade their qualifications and to gain promotion. Research funds are raised by the research divisions of each university and are competitively awarded to staff. Other sources of research funds include CHE and the National Council Science and Technology. Research findings are communicated through Journals, workshop proceedings as well as international conferences. Academic journals are established at faculty level and publishing houses have also been established to facilitate communication among scholars.

3.3 Study Population

The study population comprised 4,300 male and female lecturers in public Universities in Kenya (Republic of Kenya 2006). They were aged between 27 and 70 years. 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 among the seven public Universities across Kenya. 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.

3.4 Study Sample and Sampling Technique

The universe of 4300 lecturers spread in seven universities was first stratified according to level of University degree as follows: Bachelors 254, Masters 2090 and Doctorates 1956. A formula provided by Krejcie and Morgan (1970), and reproduced in Kathuri and Pals (1993) was used to determine the sample size for this study. The formula was as follows:

$$S = [X^2 NP (1-P)]/ [d^2 (N-1) + X^2 P (1-P)] \quad \text{in which:}$$

S = required sample size;

N = 4300, the study population size;

P = population proportion which, for this study, was assumed to be .50. This magnitude yields maximum possible sample size required (Kathuri & Pals, 1993).

d = degree of accuracy as reflected by the amount of error that can be tolerated in the fluctuation of a sample proportion p about the proportion P (Kathuri & Pals,

1993:54), which, in this study, was .05, a quantity equal to plus or minus
1.96 standard deviations.

X^2 = table value of chi square for one degree of freedom relative to the desired level
of confidence, which was 3.841 for .95 confidence level selected for this study.

The formula yielded a generic sample of 253 lecturers. These were identified from two public universities which are 30 percent of all public universities in Kenya (Mugenda & Mugenda, 1999). The two universities, namely: Egerton and Maseno were purposively sampled to represent the old and new public universities respectively. Lists of names of lecturers were obtained from offices of deputy vice chancellors in charge of administration in the universities. The names were then assigned numbers from first to last across the lists. Then a simple random sample was drawn from the list using a table of random numbers on the basis of sampling without replacement.

3.5 Research Instruments

Research data consisted of responses from lecturers in the two universities and official information from documents. Direct responses were elicited using a questionnaire entitled: "Lecturer's Questionnaire on Schooling and Earnings" a sample of which was included as appendix 1. 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 generated information on workload, attendance to conferences and presentation of papers in

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those conferences (Item 9). Items 10, 11 and 12 sought information about supervision of post-graduate candidates; research activity, publications and research dissemination outlets; and consultancies accomplished in the past five years respectively. Section C (Item 13) elicited information about earnings among the respondents.

Document analysis guide (Appendix 2) was used to examine official documents which comprised of fees guidelines for postgraduate programmes in public universities in Kenya. These were authoritative organizational communications targeting potential students, their families and sponsors. They were signed by academic registrars and bore official stamps of the universities. The documents provided information regarding current direct private costs incurred by students enrolled in masters and doctoral programmes.

3.6 Validity of the Research Instruments

To ensure that the data resulting from the administration of this questionnaire accurately represented the variables under examination (Kathuri & Pals, 1993), the instrument was given to experts in the area of planning and economics of education for face validation. They confirmed that it looked like it was measuring what it was supposed to. The experts further ascertained that given the purpose and the target population, the questionnaire reflected seriousness and could be treated as such by the lecturers in public universities. The instrument was therefore judged face valid.

Validity of official documents was checked using 'written document analysis worksheet' designed in U.S.A. by the education staff of the national archives and

records administration (National Archives and Records Administration, 2003). They set out criteria for choosing dependable documents for analysis. These included time, purpose, confidentiality, expertise, built in bias and openness. The fees guidelines satisfied all conditions necessary for a document to be dependable.

3.7 Reliability of Research Instruments

Reliability measures the degree to which a research instrument yields consistent results or data. Acceptable reliability level is 0.70 and above (Nkpa, 1997). However exceptions to this rule do exist (Mugenda & Mugenda, 1999). These include instances when the sample size is very big; and, where the variables under study differ greatly among subjects. Nature of information sought by an instrument such as private and confidential data also contributes to a lower reliability (Mugenda & Mugenda, 1999; Nkpa, 1997; Kerlinger, 1973). In this study it was observed that the sample size was not very big; and variables did not differ among respondents for example lifetime earnings depended on common factors such as working life and scheme of service. Although information sought by the questionnaire was confidential, respondents volunteered accurate information.

Further, to ascertain that the questionnaire yielded consistent results from all respondents, it was pre-tested in a pilot study and then post-tested to people not participating in the study. At the pilot stage, the questionnaire was administered to 25 academic staff in August 2008. This represented 10 percent 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 questionnaire in less than an hour, others took more than five days to return the forms. Reliability at Cronbach alpha level of 0.8520 was obtained for the instrument.

Results of the pilot study led to amendments to the 'lecturer's questionnaire on schooling and earnings' including instructions which were unclear. The introduction to the questionnaire was also recast. Item 13 which had income brackets for respondents proved difficult to analyze as grouped data and led to inaccurate measurements. Consequently, the income brackets were replaced with an open space to be completed by the respondents. These changes on the questionnaire made it possible to generate accurate data.

Official documents analyzed in this study were university fees guidelines. These documents had been used by students and their parents to project direct private cost of university schooling in public universities. The documents were free from unnecessary adjustments at the time of their creation as the authors did not have reason to do so. Consequently, the documents reflected accurate measure of direct private cost of university schooling in public universities.

3.8 Data Collection Procedures

Using a research authorization from Ministry of Higher Education Science and Technology (Appendix 5), offices of Vice Chancellors of two public universities were visited in September 2008. The purpose of the visits was to explain the study and to

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notify the authorities about research activities that were to be undertaken within the universities. Request for university fees guidelines and academic staff lists that were to be used to identify participants for the study were also presented to those offices during the visits. The official fees guidelines were obtained from the offices of academic registrars in public universities. The questionnaire was taken to the respondents and delivered by hand. Respondents 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.

3.9 Data Analysis

Research data for this study was obtained from official university documents and a questionnaire that generated direct responses from lecturers in public universities. Document analysis generated information on direct private cost of obtaining university degrees. Using document analysis guide (appendix 2) and the case study aggregation method of document analysis (National Archives and Records Administration, 1998) direct private costs were analyzed to determine differences by level of university degree. The data from official documents were subjected to descriptive statistical analysis such as the mean to determine average direct private cost of Bachelor, Master, and doctoral degree. The data was further analyzed using inferential statistics such as Analysis of Variance to determine whether differences among direct private cost of Bachelor, Master and doctoral degrees were statistically significant. Results were then displayed in tables and figures to enhance interpretation of results.

Data obtained from the administration of the questionnaire were classified (Mugenda & Mugenda, 1999) according to level of university schooling in Kenya. The levels were: Bachelors, Masters and doctorate. These levels were measured in complete years as follows: Bachelors was equivalent to 16 years of schooling; master's degree was 18 years and doctorate was 21 years. Responses were then summarized in tables. Descriptive statistics (Kerlinger, 1973) such as frequency counts were used to quantify schooling, research output, age, experience and earnings among the respondents. Percentages were used to establish the distribution of schooling, research output, age, and experience and lifetime earnings among the lecturers in public universities in Kenya. Responses to schooling, research output, 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 regressions (Moore & McCabe, 1993) was used to determine levels of relationship among schooling, research output, age, experience and earnings. Standard regression procedures were used to fit a linear regression model. 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.

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Regression analysis is based on assumptions of normality of variance, linearity of relationships among variables, and homoscedasticity (Lovie & Lovie, 1991). Scatter-plots, Normal P-P Plots and a histogram were used to test whether any of these regression assumptions was violated. Results displayed in Figures 8, 9, and 10 in Appendix 4 indicated that the model did not violate any regression assumption. Null hypotheses were either rejected or accepted at 95 percent confidence level in a two-tailed t-test and F-statistics at 95 percent level of confidence.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of this study was to determine the profitability of higher education especially Masters and Doctoral degrees among lecturers in public universities. This chapter reports findings derived from the analysis of a survey conducted in two public universities in Kenya between September 2008 and April 30, 2009.

4.1 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.

Ho_1: 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 (Appendix 1), which requested respondents to state how much money they spent in pursuit of university degrees; and, official documentation were 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, (Ibid.) whenever 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

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and value of scholarships from public funds (Ibid, p.17). 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 summarized and categorized into three namely: Cost S_1, Cost S_2 and Cost S_3 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 were reported in Table 4.1.

Table 4.1: Descriptive statistics for direct private cost of university schooling (Kshs)

	N	Minimum Kshs	Maximum Kshs	Mean	Std. Deviation
Cost s_1	81	30,000.00	2,000,000.00	323,765.45	311876.15
Cost s_2	70	96,000.00	1,000,000.00	290,057.15	134331.40
Cost s_3	50	133,000.00	11,000,000.00	995,760.00	2088918.60

Table 4.1 indicates that out of 253 respondents 81 or 32.01 percent supplied information on cost of Bachelor's; 70 respondents which was equivalent to 27.67 percent stated the cost of their Master's degree; and 50 respondents or about 20 percent declared the direct cost of obtaining Doctorate degree. Table 4.1 further shows that Doctorate degree was the most expensive of all university degrees. With an average total direct cost of Kshs 995760.00 a Doctoral degree was more than thrice the direct cost of either Master's or Bachelor's degree. Table 4.1 also reveals that doctoral degrees had the largest standard deviation from the mean direct private cost. Table 4.1 further indicates the gaps between minimum and maximum direct private

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costs of university degrees were wide. Direct private costs of Bachelor's degree, for instance, ranged from Kshs 30000 to Kshs 2,000,000 among respondents.

Results in Table 4.1 were further displayed in Figure 2. Figure 2 reveals that direct private costs of bachelor's and doctoral degree were higher than that of Master's degree.
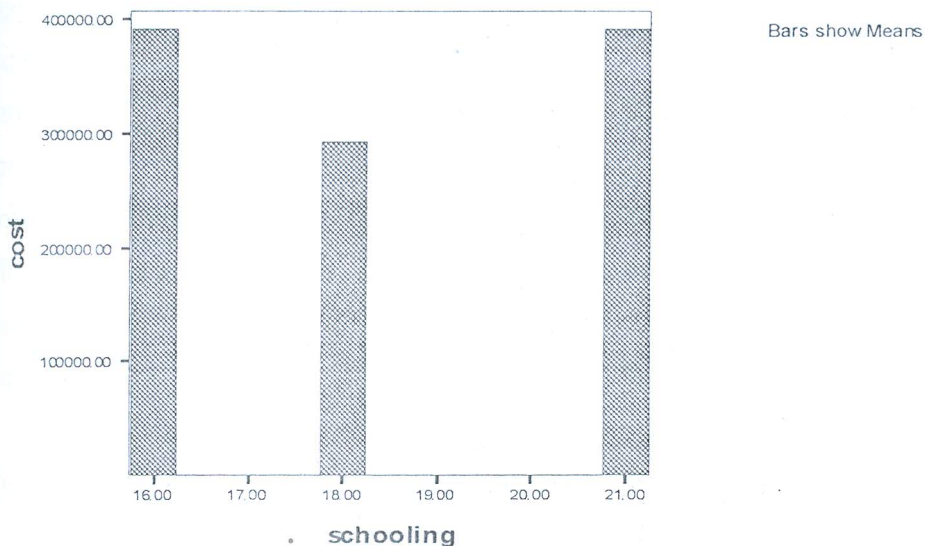

Figure 2: Direct private cost of university schooling

It is observable from Table 4.1 that only 79.45 percent of respondents gave information relevant for determination of direct private costs. The other 20.55 percent could not remember the expenses while others never got to know 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 kept by the academic divisions of the public 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 4.2 and 4.3.

Table 4.2: Direct private cost of master's degree in Kshs

	ARTS-BASED		SCIENCE-BASED	
	Document 1	Document 2	Document 1	Document 2
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 /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 Services	-	4,000	-	4,000
Sub-Total	236,700	240,700	236,700	270,700
Other Expenses	350,000*	378,000**	500,000*	378,000**
Grand-Total	**586,700**	**618,700**	**736,700**	**648,700**

*Includes book allowance, project/thesis research, and thesis preparation.
** Fieldwork/ Lab/Computer, Book allowance/Stationery and Living Expenses.

The sub-total in Table 4.2 represents the fees students pay into university accounts in order to register and be allowed to participate in university programmes. The Table also indicates that other direct costs, such as books and stationery, project and thesis research, thesis preparation and living expenses were higher than fees demanded by

universities.

Table 4.3 presents direct private cost of obtaining a doctoral degree at public Universities in Kenya. As indicated in Table 4.2, the sub-total in Table 4.3 was also a summary of money that students surrender to universities in order to participate in university programmes. This money included tuition and fees.

Table 4.3 indicates that direct private cost of science-based doctoral degree programmes were higher than direct private cost of arts-based doctoral degrees in public Universities.

Table 4.3: Direct private cost of doctorate degrees in Kshs

ITEMS	ARTS-BASED		SCIENCE- BASED	
	Document 1	Document 2	Document 1	Document 2
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

Direct private costs of university schooling in Tables 4.2 and 4.3 were further analyzed using descriptive statistics including mean and standard deviation across disciplines. Results were summarized and presented in Table 4.4.

Table 4.4: Descriptive statistics for discipline-based direct cost of higher degrees in Kshs.

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

Table 4.4 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.

Table 4.4 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 4.1 shows that a difference existed between direct private costs of masters and doctorate degrees. Analysis of official documents which results were presented in Table 4.4 confirmed that indeed there was a difference. Consequently the first hypothesis was tested to determine the significance of the observed differences in direct private costs.

Data for Cost S_2 and Cost S_3 were subjected to paired-samples t test. This test is used for making comparisons for correlated values (Nassiuma & Mwangi, 2004). It compares the means of two variables for a single group. Further, it computes the differences between values of the two variables for each case and tests whether the average differs from zero.

In this study, level of significance was fixed at alpha = .05 in a two-tail test. Decision rules were: Reject null hypothesis if the observed value of t is greater than ± 1.96; accept null hypothesis if observed value of t is less than ± 1.96. Results of paired-samples t test were summarized into statistics, correlations and differences between means of Cost S_2 and Cost S_3, and were presented in Tables 4.5, 4.6 and 4.7 respectively.

Table 4.5: 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	24428.53979
	Cost s_3	1140921.0526	38	2383161.84910	386599.90195

Table 4.5 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 4.6 shows that a weak positive correlation $r = .264$ existed between Cost S_2 and Cost S_3. Table 4.6 also suggests that the correlation had a low level of significance at .109. What was important for this study was the existence of a correlation between mean direct private costs of master's degrees and mean direct private costs of doctorate degrees. This was found to be significant.

Table 4.6: Paired samples correlations for Cost S_2 and Cost S_3

		N	Correlation	Sig.
Pair 1	Cost s_2 & Cost s_3	38	.264	.109

Table 4.7 shows that sample mean difference of -821421.0526 between Cost S_2 and Cost S_3 was within the 95 percent Confidence Interval of the difference with lower limit of -1593149.7268 and an upper limit of -49692.3785. Furthermore, Table 4.7 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 a value that was less than

the preset value of $\alpha = .05$.

Table 4.7: Paired samples test of differences between means of Cost S_2 & Cost S_3

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
					Lower	Upper			
Pai r 1	Cost S_2 - Cost S_3	- 821 421. 05	234787 9.15	38087 6.29	- 159314 9.73	- 49692.3 8	-2.16	37	.038

Table 4.7 indicates that the true population mean falls within the range

-1593149.7268 to -49692.3785 Ninety-five per cent of the time. And, the probability

that the true population mean lies outside the range is 38 out of 1000. The sample

mean lies within the observed range implying that the sample mean was an accurate

representation of the population mean. Therefore, there was 95 percent certainty that

the sample drawn was representative of the experience in public universities with

regard to direct private costs of masters and doctoral degrees.

Scholars do agree that t-test is a test that tells whether an observed difference is less

likely as a result of chance (Kerlinger, 1973; Malec, 1993; Kathuri & Pals, 1993,

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Borg, et al., 1996; Mugenda & Mugenda, 1999; Nassiuma & Mwangi, 2004). To arrive at this decision, the observed value of t is compared to a corresponding table value of t at corresponding degrees of freedom and at a predetermined alpha value (Malec, 1993). If observed value of t is greater than the table value of t at the corresponding degrees of freedom and at the predetermined level of significance, the null hypothesis is rejected. In case of the reverse, then the null hypothesis is not rejected. This would mean that the difference is equal to zero.

In this study, the observed value of t was -2.157 within 37 degrees of freedom in a 2-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 a significant difference exists in direct private costs of obtaining a master's degree and a doctoral degree. Consequently, the null hypothesis was rejected.

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

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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.

4.2 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.

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Ho$_2$: 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 the data collection instrument (Appendix 1) were analyzed using descriptive statistics and the results were presented in Appendix 3 and Table 4.8

Table 4.8: Sources of income among lecturers in 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

Table 4.8 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. Statistics presented in Appendix 3 were further summarized and presented in Table 4.9.

Table 4.9: Distribution of lifetime earnings by university degree in Kshs

Schooling	Mean	N	Std. Deviation
16.00	19,792,102.40	15	8197771.74196
18.00	31,987,519.90	123	4530382.77785
21.00	47,291,209.20	115	14536846.52817
Total	38,220,693.85	253	13637872.75617

Table 4.9 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 31,987,519.90. The rest of the respondents had doctorate degrees and mean lifetime earnings of Kshs 47,291,209.20. Table 4.9 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 3 and 4.
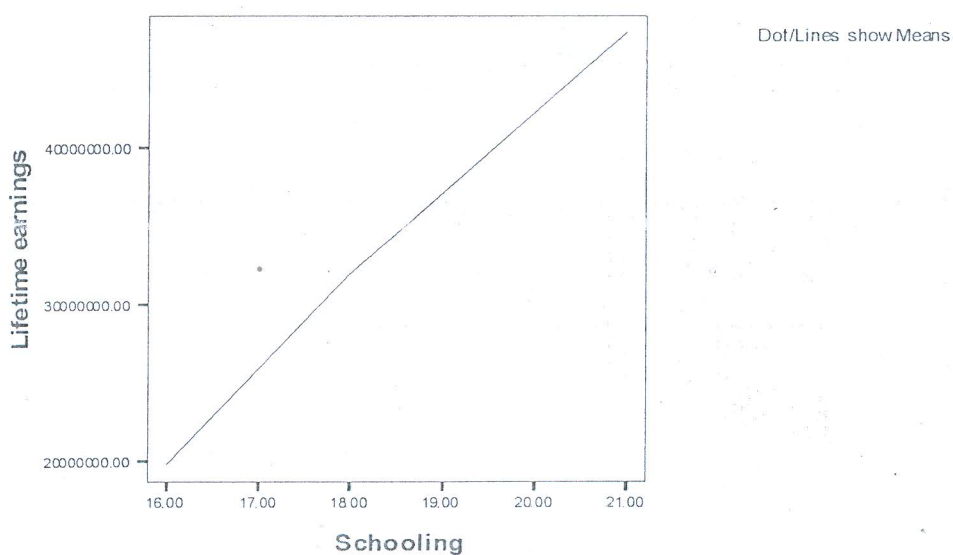

Figure 3: Trend of lifetime earnings across degree levels.

Figure 3 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 4 makes each degree level to stand out and lifetime earnings differences to be more visible.
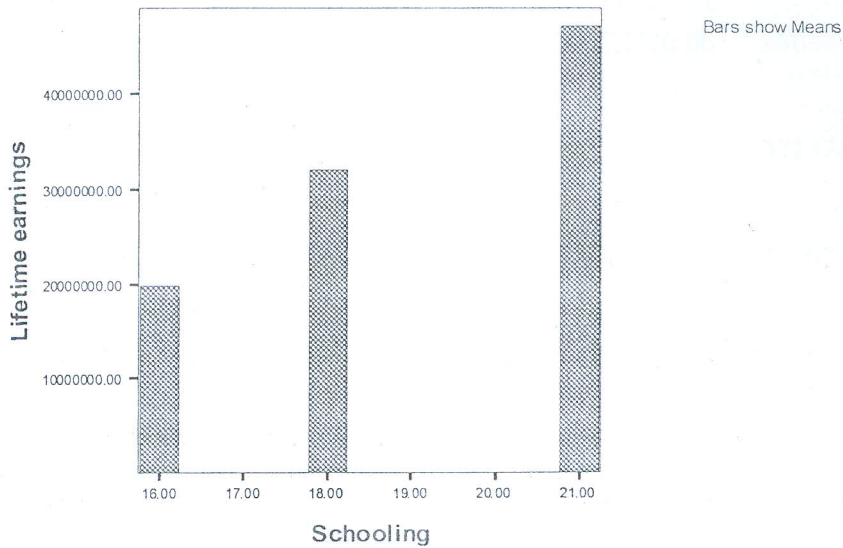

Figure 4: Lifetime earnings (Kshs) by level of university degree.

Figure 4 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. 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 4.10.

Table 4.10: Distribution of lifetime earnings by age and level of university degree in Kshs

			16.00	18.00	21.00
				Schooling	
Age	27.00	Lifetime earnings	14227200.00	27585530.00	.
	32.00	Lifetime earnings	24504984.00	28272720.00	33694911.60
	37.00	Lifetime earnings	24817800.00	29714307.41	37147625.45
	42.00	Lifetime earnings	.	33180146.09	42402368.40
	47.00	Lifetime earnings	.	37251970.00	47598352.94
	52.00	Lifetime earnings	.	32137056.00	51807030.55
	57.00	Lifetime earnings	.	37107000.00	55783126.00
	58.00	Lifetime earnings	.	.	38623200.00
	59.00	Lifetime earnings	.	.	71197560.00
	62.00	Lifetime earnings	.	.	58932300.00
	65.00	Lifetime earnings	.	36229200.00	44368800.00

Table 4.10 indicates that respondents with 16 years of schooling were the youngest and expected least lifetime earnings. 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 4.10, 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 upwards. 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 it 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 level 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 4.11.

Table 4.11: Marginal returns to university schooling in Kshs

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.

Whereas lifetime earnings differentials in Table 4.11 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 complacence arose from a dearth of empirical evidence. Table 4.11 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 percent and 47.84 percent gains for masters and doctoral degrees respectively. When these gains were divided by the duration of the masters and doctorates, Table 4.11 shows that, a year spent by a respondent pursuing a master's degree generated an additional 30.81 percent of lifetime earnings. Doctorates, however, yielded 15.95 percent 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 4.9, 4.10 and 4.11 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 4.12.

Table 4.12: 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 .05 level.

Table 4.12 shows that the mean difference was significant at the .05 level and (p = .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.

The principle underlying the purpose of this study was the theory that recognized education as form of investment in human beings. In the 1960s, scholars established ways of measuring the new form of investment which they called investment in human capital (Hansen, 1963; Becker, 1962; Mincer, 1962; Renshaw, 1960; Eckaus, 1960; Vaizey, 1962). In the decade that followed, case studies were done to analyze

profitability of various forms of investment in human capital (Thias & Carnoy, 1971; Psacharopoulos, 1973; Mincer, 1974). More recently, Baum & Payea (2004) showed that education pays in the United States of America. Hyder (2007) also, in her study of wage differentials in the public and private sectors in Pakistan, confirmed that investments in human capital development were profitable.

Woodhall (2004) described ideal ways of determining earnings that were attributable to rising educational levels. However, these ideals could not be attained in the present study. The strength of this study was buttressed by Woodhall's observation that ideal data for cost-benefit analysis was unavailable in developing countries. She further stated that due to scarcity of the right data, approximations of earnings to determine marginal returns to education were acceptable (Woodhall, op. cit).

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.

4.3 Level of Research Output among University Lecturers

In this study, the third objective was to: Determine the level of research output among lecturers in public universities in Kenya.

Ho$_3$: There is no significant difference in level of research output among lecturers with master's degree and those with doctoral degrees in public universities in Kenya.

Research output was categorized into: Conference papers; supervision of postgraduate work such as projects and theses; research projects undertaken; and publications. Responses were analyzed and summarized using descriptive statistics. The results were reported in Table 4.13.

Table 4.13: Descriptive statistics of research output

	N	Minimum	Maximum	Mean	Std. Deviation
Conference papers	253	.00	18.00	3.1976	3.00272
Supervision	253	.00	26.00	2.2055	4.24606
Research done	253	.00	16.00	2.2174	2.36126
Publications	253	.00	13.00	1.6047	1.95431
Valid N (listwise)	253				

Table 4.13 shows that research output ranged from a minimum of zero to a maximum of 26 for supervision of postgraduate candidates work. In five years time respondents had attended conferences and presented an average of 3.1976 papers. Over the same period, respondents had supervised an average of 2.2055 postgraduate students. Supervised work included postgraduate diploma projects, masters and doctoral theses. An average of 2.2174 research projects was accomplished in five years. Meanwhile, 1.6047 papers were published per respondent over the same period. As indicated by the standard deviations in the last column of Table 4.13, all types of research output

were widely dispersed among the respondents. Data on research output were further analyzed and the results were reported in Table 4.14.

Table 4.14: Distribution of research output by level of university degree

Schooling		Conference papers	Supervision	Research done	Publications
16.00	Mean	.7333	.0000	.4667	.0667
	N	15	15	15	15
	Std. Deviation	1.38701	.00000	1.06010	.25820
18.00	Mean	2.2114	.8211	1.2602	.7561
	N	123	123	123	123
	Std. Deviation	2.62476	3.41173	1.06999	.94385
21.00	Mean	4.5739	3.9739	3.4696	2.7130
	N	115	115	115	115
	Std. Deviation	2.92617	4.64052	2.82632	2.27019
Total	Mean	3.1976	2.2055	2.2174	1.6047
	N	253	253	253	253
	Std. Deviation	3.00272	4.24606	2.36126	1.95431

Table 4.14 indicates that each category of research output had three different means according to level of university degree. It was observed that presentations in conferences increased across levels of university schooling. Respondents with 21 years of schooling reported the highest mean presentation of papers at conferences as Figure 5 shows.
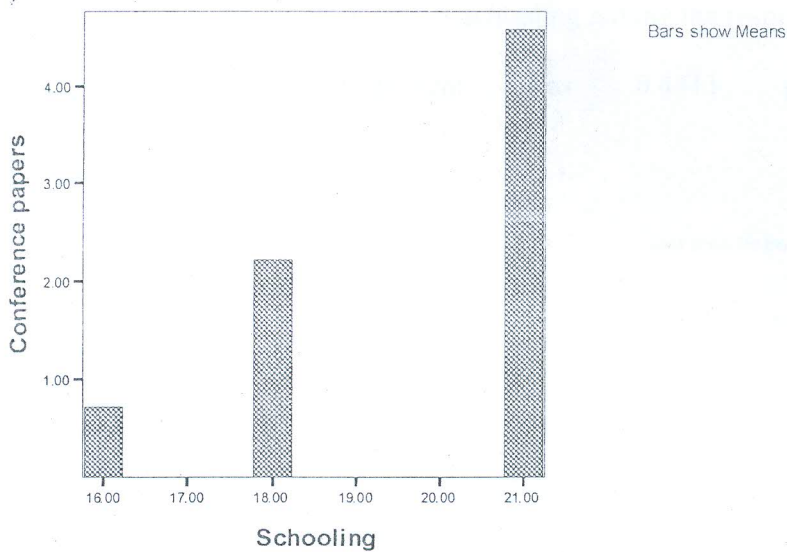
Figure 5: Presentations of research papers at conferences

Mean presentations at conferences were in the order of 0.7333, 2.2114 and 4.5739 for bachelors, masters and doctorates. When mean presentations were further analyzed and distributed over the five year period, annual results were in the order of: 0.1466, 0.4423, and 0.9148 papers per respondent for bachelors, masters and doctorates respectively. A total mean annual presentation at conferences was 0.6395 papers per respondent.

Supervision of postgraduate projects and theses was presented in column four of Table 4.14. It was observed that most supervisory work was done by respondents with doctoral degrees. Respondents with bachelor degree returned zero supervisory work involvement. However those respondents who had master's degree had supervised a few postgraduate candidates. They returned postgraduate supervision mean of 0.8211

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candidates per respondent over the past five years. Figure 6 depicts a clear picture of this variation across levels of university schooling among the respondents. Total mean annual supervisory engagement was 0.4411 per respondent.
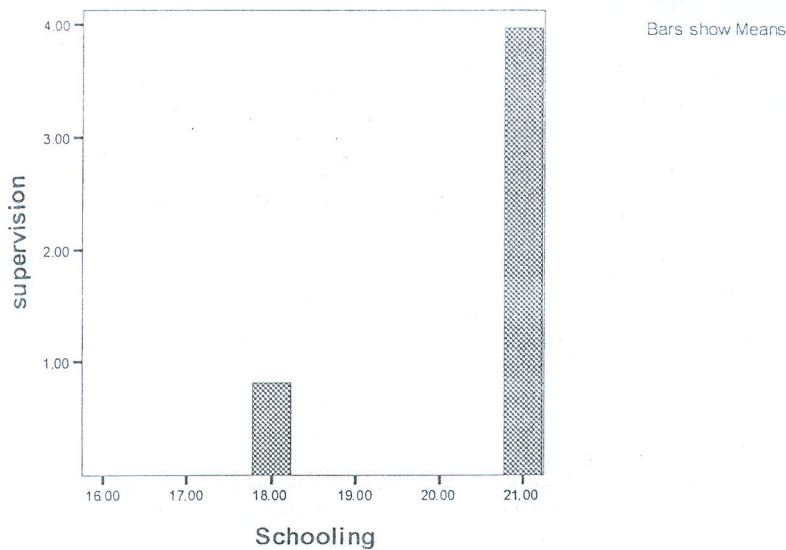

Figure 6: Distribution of postgraduate supervision by level of university degree

Level of engagement in research projects was presented in the fifth column of Table 4.24. Over the past five years, an average of 2.2174 research projects was undertaken by the respondents. It is further indicated that research activity increased as years of schooling increased among the respondents. Table 4.24 shows that mean research done was in the order of 0.4667, 1.2602 and 3.4696 among respondents with bachelors, masters and doctorate respectively.

The last column of Table 4.14 displays results relating to publication of research findings. It was noted that like the other forms of research output already reported,

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publications increased as schooling increased among respondents. There were differences across levels of university degrees with the lowest mean publication being associated with bachelor's degree. Doctorate on the other hand, reported the highest mean publications as displayed in Figure 7.
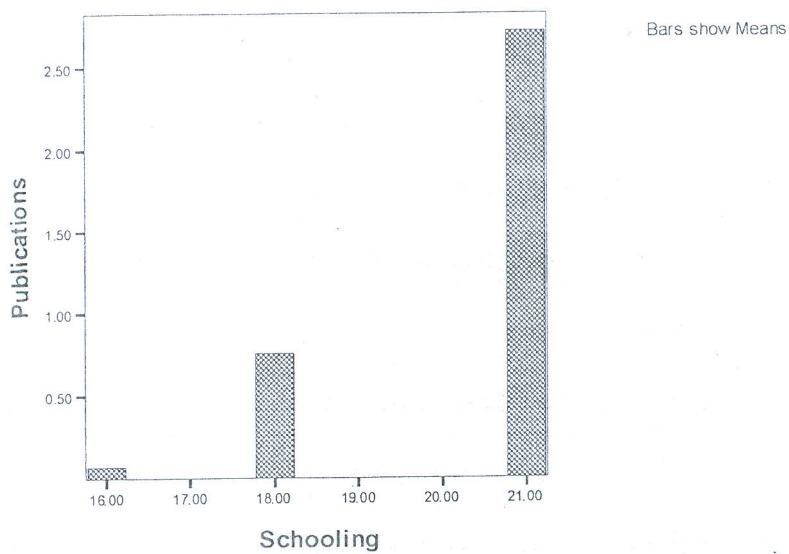

Figure 7: Distribution of publications by level of university schooling

Total mean publication was distributed over the period of five years. The result was that annual publications output per respondent were 0.2292. Research publication outlets were analyzed and results distributed in frequencies and percentages as presented in Table 4.15.

Table 4.15: Research publication outlets

Form of publication	Frequency	Percent	Valid Percent
Journals	119.0	47.0	75.3
Technical working papers	12.0	4.7	7.6
Text Books/text book chapters	8.0	3.2	5.1
Conference proceedings	19.0	7.5	12.0
Total	158.0	62.5	100.0

Publication outlets included for this study as shown in Table 4.15 were journals, technical working papers, text books and conference proceedings. It was observed that a total of 158 respondents or 62.5 percent had had their research findings published. Out of this 119 or 75 percent of all publications were in form of journals. The least used form of research outlet was the text book as only 5.1 percent of respondents had published in text books. Table 4.15 further indicates that conference proceedings ranked second after journals followed by technical working papers. It was established that the journal was the leading avenue of research communication among the respondents.

Table 4.14 showed that differences in research out existed across all categories of research and across levels of university schooling. Publications, for example, had three means each according to level of university degree. The concern of this study was to determine whether the differences in research output were statistically significant. Test of hypothesis further establishes a level of confidence that can be vested in the findings of a study. For the purposes of testing the null hypothesis

research output means published research. This was based on the knowledge that the ultimate goal of all research activity was to communicate the findings to the wider world. It has also been emphasized (Olukoju, 2002) that among academics, it was either 'publish or perish'. This meant that academic publishing was the lifeline and a measure of success among scholars in research universities.

Mean differences in publications as shown in the last column of Table 4.14 were subjected to Post Hoc Multiple Comparisons using Tukey's Honestly Significant Difference test. Results were reported in Table 4.16.

Table 4.16: Results of post hoc multiple comparisons of publications

	(I) Schooling	(J) Schooling	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	16.00	18.00	-.6894	.45670	.288	-1.7662	.3874
		21.00	-2.6464(*)	.45843	.000	-3.7272	-1.5655
	18.00	16.00	.6894	.45670	.288	-.3874	1.7662
		21.00	-1.9569(*)	.21661	.000	-2.4677	-1.4462
	21.00	16.00	2.6464(*)	.45843	.000	1.5655	3.7272
		18.00	1.9569(*)	.21661	.000	1.4462	2.4677

* The mean difference is significant at the .05 level

The last two rows of Table 4.16 carry results that were useful for this study. It was shown that mean difference between number of publications by doctorates and number of publications by master's degree holders was significant at the .05 level and (p = .000). The null hypothesis was therefore rejected. This study established that

research output measured in terms of publications varied significantly according to whether the respondent had a doctorate or masters degree.

It was also established that population mean lied within the range of 95 percent of the time. Given the low standard error of the mean it was certain that the sample mean was representative of population mean. Results of this study could therefore be generalized to the community of scholars in public universities.

Present result agrees with earlier studies (Kembo-Sure, 1994; Aduol, 1999; Olukoju, 2002; Kobia, 2006; Olel, 2006; Kigotho, 2008; Otieno & Anyira, 2008; and Anyira & Ayodo, 2008) that research output, seen in terms of scientific publications was low in sub-Saharan African universities. As a measure of level of efficiency of resource utilization in universities (Abagi, 1997) this result confirms the conclusion drawn by Abagi (1997) that there was underutilization of human and physical resources.

These findings concur with the findings of a study by Olukoju (2002). He found that academic writers heavily relied on the journal as the main research outlet. He further observed that when journals collapsed in West Africa academic publishing also declined.

Kembo-Sure (1994) pointed out the importance attached to level of education and academic productivity among university lecturers as determinants of quality of teaching. His findings differ from the present one in the sense that the present study looked at level of research output in relation to level of university degree attained by university lecturers. However, as a valued determinant of promotions and

appointments to positions in universities (Republic of Kenya, 2005a), this finding buttresses government policy position that requires universities to maintain records on academic productivity.

The finding that level of university degree was a significant predictor of research output among lecturers seems to have escaped the attention of earlier studies. However, the decline of academic publishing in Nigeria since 1970 (Olukoju, 2002) and the 'book famine' in Kenya (Kobia, 2006) seem to lend credence to journalistic claims that doctoral qualifications are rare in African universities (Kigotho, 2008). The dearth of doctoral qualifications in African universities has also been used to explain slow pace of expansion at Maseno University (Anyira & Ayodo, 2008). For fear of compromising quality of education, universities do not engage non-qualified teaching staff. Commentators link poor standards in higher education to scarcity of lecturers with doctorates (Kigotho, 2008). If the quality of learning in universities was determined by research activities in those institutions then doctorates determine the quality. Considering that, in five years, respondents reported a total mean of 2.2174 research projects done; therefore annual research projects undertaken by each respondent was 0.4435. Like it was reported in the case of Nigeria (Olukoju, 2002), this finding pointed to a research crisis.

This finding concurred with journalistic reports of Anyira and Ayodo (2008) that Masinde Muliro University authorities ensured that postgraduate supervision was done by doctorates only. However at a rate of 0.4411 postgraduate candidates per year, either the students took longer time than normal to graduate or rate of admission

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into these programmes was low. This was pure conjecture and a matter for future investigation.

4.4 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.

Ho$_4$: 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 Appendix 4. 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 percent of variations in lifetime earnings among lecturers 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 4.17 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.

Appendix 4 shows that with the exception of publications, all the other variables in the original model were highly significant at the .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 .05 level of significance in a 2-tailed test and ($p = 0.000$). Null hypothesis was therefore rejected.

The coefficient of schooling in model 4 in Appendix 4 gives the rate of return to an additional university degree an individual obtains. This rate was 47.8 percent. An individual will thus raise his or her lifetime earnings by about 47.8 percentage points by obtaining a higher university degree. The private rate of return to university schooling according to the government of Kenya was 53 percent (Republic of Kenya, 2003). 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.

Experience and age were seen to affect returns to university schooling as depicted by the positive coefficients of the experience and age terms in Appendix 4. 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).

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 Appendix 4. 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 4.17 shows that a strong positive linear relationship in which $R = 0.712$ existed between schooling and lifetime earnings.

F-statistics in Appendix 4 indicates a highly significant relationship between schooling and lifetime earnings at .05 level of significance with p value = .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 Hyder (2007) had 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. Whereas studies like Pricewaterhousecoopers (2005) and Blundell, Dearden and Sianesi (2001), not only had superior data from national censuses, they also had superior analytical tools. This study therefore may not have brought the best from the data. However, as observed by Psacharopoulos (1973) from 53 rate of return studies in 32 countries those earnings data varied widely in comprehensiveness and form. He also noted wide variations in quality arising from data quality.

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 percent (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.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This last chapter presents a summary of findings of the study, implications of the findings, conclusions, recommendations and suggestions for further research.

5.1 Summary of Research Findings

This section presents a summary of the results of the study. It covers four main areas in line with the objectives and hypotheses of this study.

5.1.1 Direct Private Costs of University Schooling

Direct private costs of arts-based master's degree were Kenya shillings 586,700 and 618700 at Maseno and Egerton Universities respectively. For science-based master's degree, the direct private cost was Kshs 736,700 at Maseno while it costs Kshs 618,700 to complete a similar course at Egerton University.

Arts-based doctoral degree costs individuals Kshs 735,000 and Kshs 952,200 to complete at Maseno and Egerton respectively. The direct private cost of a science-based doctoral degree was found to be Kshs 885,000 at Maseno University and Kshs 1,022,000 at Egerton University. On average, arts-based courses cost Kshs 602,700 and Kshs 843,500 for a master's and a doctoral degree respectively. Science-based courses, on the other hand, costs Kshs 677,700 to complete a master's degree and Kshs 953,500 to complete a doctorate. Direct private cost of masters differed significantly from the direct private cost of doctoral degree. The difference was highly significant at .05 level of significance in a two-tailed T-test with p = (.038).

5.1.2 Lifetime Earnings Accruing by Level of University Degree

When lifetime earnings accruing by level of university schooling were determined, results showed that lifetime earnings increased with increase in university degree level. Lecturers with bachelor's degree were likely to accumulate Kshs 19,792,102.40 throughout their working life. Those lecturers with master's degrees would expect to earn Kshs 31,987,519.88 in a working life of 38 years. A lifetime earnings accruing to lecturers with doctorates was found to be Kshs 47,291,209.23.

However, it was observed that master degree generated a higher percentage differential 61.2 percent than doctorate at 47.8 percent. Investments in higher degrees yield rates of return in the order of 30.81 and 15.95 for masters and doctorate respectively. F-statistics showed that lifetime earnings accruing to lecturers holding a master's degree and those with a doctorate were significantly different at the .05 level of significance and $p = (.000)$.

5.1.3 Level of Research Output among University Lecturers

This study found a wide range in research output with a minimum of zero and a maximum of 13 publications in five years. It was also established that an average of 1.60 research findings were published in the past five years. This translated to 0.23 publications per lecturer per year. Other indicators of research output showed the following results: Supervision of postgraduate students was 2.21 students in five years; mean presentations at conferences was 3.20 papers in five years; and, an average of 2.22 research projects had been accomplished in five years.

Lecturers who had doctorates presented an average of 4.57 papers at conferences

while those who had master's degree had presented an average of 2.21 papers in five years. Furthermore, lecturers holding doctorates supervised five times more postgraduate students than their colleagues with master's degree. They had also engaged in more research projects than those of them who had master degrees.

Journals were found to be the leading medium for communicating research findings by lecturers. Text books emerged the least utilized research publication outlet. The difference in research output between lecturers who had masters and those with doctorates was found to be significant at .05 level of significance with $p = (.000)$.

5.1.4 Relationship between Level of University Schooling and Lifetime Earnings

The coefficient of multiple correlations R was .712. This means that a strong positive correlation exists between level of university schooling and lifetime earnings. It was established that private rate of returns to university schooling was 47.8 percent. This study also found that a combination of schooling and experience explained 70.3 percent of variations in lifetime earnings among lecturers.

However, experience was found to have a point beyond which it did not impact positively on earnings and in fact began to decline. The study also established that the relationship between university schooling and lifetime earnings was highly significant at .05 level of significance with $p = (0.000)$.

5.2 Conclusions

Based on the findings of this study, the following conclusions were drawn:

5.2.1 Direct Private Costs of University schooling

Given the wide variations in direct private costs of university schooling by level of degree this study concludes that doctoral degrees were the most expensive in Kenya. 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 have master's degrees for doctoral training. 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.

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.

5.2.2 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

percent. It also emerged that doctorate was the most profitable level of university schooling but master degree paid back faster. This implies that the high private demand for higher university degrees will continue. This demand will create most pressure on lecturers and facilities for master's courses as this study established that it pays faster than doctorate.

5.2.3 Research output among lecturers in public universities.

Following findings from analysis of research output among lecturers, this study concludes that level of research output in universities was low. It is also reasonable to conclude that the most productive academic staff in universities was one who had a doctorate. This means that in universities and departments with few or no doctorates, research output could be very low. New knowledge based on research will not be generated in an environment in which the proportion of staff with doctorate was lower. Scarcity of lecturers of such caliber therefore compromises quality of education.

5.2.4 Relationship between lifetime earnings and University schooling

This study also concludes that it is profitable to stay longer at school to obtain more degrees and that university schooling is a strong predictor of lifetime earnings among university lecturers in Kenya. 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.

5.3 Recommendations

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

1. Due to high direct private costs of doctoral degrees, it was recommended that individuals intending to invest in university schooling at doctoral degree level should make adequate financial arrangements to complete the programme on schedule. This follows reports that some universities threaten to deregister fees defaulters.

2. Lifetime earnings increase with increase in university schooling and the highest possible lifetime earnings go to lecturers with doctoral degrees. In view of this 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.

3. The place of doctoral qualifications in promoting research has been established in this study. Since universities are research institutions, they need more doctorates. It is therefore recommended that universities refocus their savings and income to train more staff at doctoral level.

4. Since it is profitable for individuals to invest in more university schooling, this study recommends that public universities continue with self-sponsored postgraduate programmes as a viable strategy for diversifying their sources of income.

5.4 Suggestions for Further Research

Considering the findings of the present study it appears necessary that investigations be conducted in areas remotely related to this topic.

1. This study established that, among lecturers in public universities in Kenya, lifetime earnings and research output are significantly influenced by university schooling. Whether the same is the case among lecturers in private universities in Kenya or whether the same is true among lecturers in other countries in East Africa remains uncertain. It is therefore recommended that a similar study be replicated among lecturers in private universities for comparison purposes. Such a study could also be extended to other universities in East Africa.

2. Previous studies established declining trends in research output in sub-Saharan African Universities. It is also one of the findings of this study that research output is low among lecturers in public Universities in Kenya. What remains a matter of speculation are the root causes of this low level of achievement among lecturers. It is also unclear whether gender differences have any role to play in academic productivity. It is therefore recommended that a study to investigate causes of low research output and to determine gender role in academic research output among lecturers in public universities in Kenya.

3. Education of the individual is known to be a burden to the individual, his or her family and the wider society. It is also known that educational costs are both direct and indirect. However, the present study focused only on direct and private costs leaving the social and indirect costs untouched. It is therefore recommended that a comprehensive cost analysis of university education in Kenya be carried out.

REFERENCES

Aaronson, S. R. (2002). The Rise in Lifetime Earnings Inequality among Men. Pdf.
Adobe Acrobat document accessed on August 1, 2009.

Abagi, O. (1997). *Revitalizing Financing of Higher Education in Kenya: Resource Utilization in Public Universities*. Nairobi: Kenyatta University

Aduol, F.W.O. (1999). *Establishing Teaching Staff Requirements for University Academic Programmes*. Higher Education Policy 12 (1999) pp 101-106. Pergamon: Elsevier Science Ltd.

Anyira G. & Ayodo H. (2008, July 9). Masinde Muliro Seeks Help From Research Institutions. *East African Standard*, p 31.

Appleton, S., Bigsten, A. and Manda, D. K. (1999). *Educational Expansion and Economic Decline: Returns to Education in Kenya, 1978-1995*. Oxford: Centre for the Study of African Economies

Ashby, E. & Anderson M. (1966). *Universities: British, Indian, African: A Study in the Ecology of Higher Education*. London: Weidenfeld and Nicolson.

Bartholomew J. & Sons Ltd (1977). *The Times Atlas of the World: Comprehensive Edition*. London: Times Books.

Baum, S. & Payea, K. (2004). *Education Pays: The Benefits of Higher Education for Individuals and Society*, Washington D.C.: College Board.

Becker, G. S. (1962). "Investment in Human Capital: A Theoretical Analysis" In: UNESCO (1971). *Readings in the Economics of Education*, Paris: UNESCO

Blundell, R., Dearden, L. & Sianesi, B. (2001). *Estimating the Returns to Education: Models, Methods and Results*. London: Center for the Economics of Education.

Bogonko, S. N., (1992). *A History of Modern Education in Kenya (1895-1991)*.

Nairobi: Evans Brothers Kenya Ltd.

Boothby, D. & Rowe, G. (2002). *Rate of Return to Education: A Distributional Analysis using the Lifepaths Model.* Hull: Applied Research Branch

Borland, J. (2002). *New Estimates of the Private Rate of Return to University Education in Australia.* Melbourne Institute Working Paper No. 14/02

Bowman, M. J. (1962*).* "Human Capital: Concepts and Measures". In United Nations Education, Social & Cultural Organization (1971). *Readings in the Economics of Education.* Paris: UNESCO.

Bray, M., & Lillis, K. (1988). *Community Financing of Education: Issues and Policy Implications in Less Developed Countries.* Oxford: Pergamon Press.

Cheboi, B.C. (2006). *Funding Patterns and Their Effects on Quality of Higher Education in Kenya.* Unpublished paper presented at Kenyatta University on 6th November 2006.

Commission for Higher Education (2001). *Vice Chancellors' Regional Workshop on Strategic Planning and Resources Management for Universities.* Nairobi, Kenya 17th – 19th July 2001. Unpublished Report.

Commission for Higher Education (2003). *Re-engineering Education for National Development.* Unpublished paper presented at the National Conference on Education on Nov 26-29, 2003. KICC, Nairobi.

Dasgupta, A. K. & Pearce, D. W. (1978). *Cost-Benefit Analysis.* London: Macmillan Press Ltd.

Day, J. C., & Newburger, E. C. (2002). *The Big Payoff: Educational Attainment and Synthetic Estimates of Work life and Earnings,* Washington D.C.: Census Bureau.

Digolo, O. O. (2006). *The Challenges of Education in Kenya in the 21*st *Century.* The
Educator 1 (1), xv – xxviii.

Eckaus, R. S. (1962). "Education and Economic Growth." In United Nations
Education Social & Cultural Organization (1971). *Readings in the Economics of
Education*, Paris: UNESCO.

Egerton University (2002). *Egerton University Catalogue 2002 – 2008.* Njoro,
Kenya: Egerton university.

Galabawa, J. C. J. (1991). Gender and Private Monetary Benefits among Tanzania
University Graduates. *East African Journal of Education 1 (1), 14 – 28.*

Gall, M. D., Gall, W. & Borg, W. (1996). *Educational Research: An Introduction (6*th
ed). London: Longman.

Hansen, L. W. (1963). "Total and private Rates of Return to Investment in
Schooling" In United Nations Education, Social & Cultural Organization (1971).
Readings in the Economics of Education. Paris: UNESCO.

Huggett, M., Ventura, G. & Yaron A. (2009). Sources of Lifetime Inequality. *Journal
of Education and Learning.* E21, D3, D91

Hyder, A. (2007). *Wage Differentials, Rate of Return to Education, and Occupational
Wage Share in the Labour Market of Pakistan.* Islamabad: Pakistan Institute of
development Economics.

Igwe, S. O. (1988). "Community Financing of Schools in Eastern Nigeria" In Bray,
M. (Ed). *Community Financing of Education: Issues and Policy Implications in
Less Developed Countries.* Oxford: Pergamon Press.

International Labour Organization (1972*). Employment, Incomes and Equality: A
Strategy for Increasing Productive Employment in Kenya.* Geneva: ILO

Ishengoma, J. M. (2004). *Cost Sharing and Participation in Higher Education in Sub Saharan Africa: The Case of Tanzania*. A Paper Presented at the United Nations Education Social Cultural Organization Forum on Higher Education, Research and Knowledge, Paris: December 1-3, 2004.

Johnes, J. & Taylor, J. (1990). *Performance Indicators in Higher Education*. Buckingham: Society for Research into Higher Education and Open University Press.

Johnstone D. B. (1993). The costs of Higher education: Worldwide Issues and Trends for the 1990s. In P.G.Altbach & D. B. Johnstone (Eds), *The funding of higher education: International perspectives*. New York: Garland Publishing.

Jomo Kenyatta University of Agriculture & Technology (2004). *Jomo Kenyatta University of Agriculture & Technology Calendar 2004-2005*. Jomo Kenyatta University of Agriculture & Technology.

Kallenbach, S. (2004). *The High Cost of Higher Education*. Boston: World Education.

Kathuri, N. J. & Pals, D.A. (1993). *Introduction to Educational Research*. Njoro, Kenya: Egerton University Press.

Kembo-Sure (1994). Myths and Methods in High Education. *Moi Journal of Education, Arts & Science. 2 (1), 26- 40*.

Kenyatta University (2003). *Kenyatta University: Catalogue 2003-2008*. Kenyatta University

Kerlinger, F. N. (1973). *Foundations of Behavioral Research (2nd ed)*. New York: Holt,Rinehart and Winston, INC.

Kigotho, W. (2008, July 9). PhD: Rare Qualification in African Universities. *East African Standard*, p 29 – 31.

Kobia, J. M. (2006). *Publishing Educational Materials for Institutions of Higher Education in Kenya: Challenges and Prospects.* The educator 1 (1), 93 – 101.

Kosgei, Z., Maiyo, K. J. & Chepkurui, R. (2006). *Challenges Facing the Financing of Education in Developing Countries in the Twenty – First Century: A Case of Kenya.* The educator 1 (1), 101 – 111.

Lipsey, R. G. (1989). *An Introduction to Positive Economics.* London: Weidenfeld and Nicolson Ltd. (7th Edition)

Lovie, P. & Lovie, A. D. (eds) (1991). *New Developments in Statistics for Psychology and the Social Sciences Vol. II.* London: The British Psychological Society.

Malec, M. A. (1993). *Essential Statistics for Social Research.* Colorado and Oxford: Westview Press, Inc.

Manda, D. K., Mwabu, G. & Kimenyi, M. S. (2002). *Human Capital Externalities and Returns to Educationin Kenya.* Kenya Institute for Public Policy Research and Analysis (KIPPRA): Discussion Paper No.13 April 2002.

Maseno University, (2007). *Maseno University: Catalogue 2007-2012.* Maseno University.

Mincer, J. (1962). "On-The-Job Training: costs; Returns and some Implications." In United Nations Education Social & Cultural Organization (1971). *Readings in the Economics of Education.* Paris: UNESCO.

Mincer, J. (1974). *Schooling, Experience and Earnings.* New York: National Bureau of Economic Research.

Mkude, D., Cooksey, B. & Levey, L. (2003). *Higher Education in Tanzania: A Case Study.* Oxford: James Currey.

Moi University. (2002). *Moi University: Catalogue 2003-2008*. Moi University.

Moore, D.S. & McCabe, G.P. (1993). *Introduction to the Practice of Statistics*. New York: W.H. Freeman & Co.

Mugenda, O.M. & Mugenda, A.G. (1999). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: ACTS Press.

Mwinzi, D. (2002). *The impact of cost sharing policy on the living conditios of students in kenyan public universities: the case of Nairobi and Moi universities*. A paper presented at the 28th annual international symposium on African universities in the 21st century 25-27 April, 2002 Dakar-Senegal.

Nassiuma, D. K. & Mwangi, J. W. (2004). *Statistical Methods for Information Analysis: An Introduction*. Njoro - Kenya: Egerton University Press.

National Archives and Records Administration, (2003). Data Collection: Core Competencies .*Social Education 67(7)*, 417-428.

National Commission on the Cost of Higher Education, (1998). *Straight Talk About College Costs and Prices*. A Report of the National Commission on the Cost of Higher Education. MHTML Document. Retrieved: July 30, 2009.

Ndirangu, M. & Bosire, J. (2004). Student Entrepreneurship on Campus: A Survival Response or a Career Rehearsal? The Case of Egerton University Student Entrepreneurs. *Education, Arts & Social Science Research Reviews, 20 (1)*, 51-61.

Njiraini, J. (2008, August 18). Firms Pay Big Salaries to Highly Qualified Staff. *East African Standard*, p 21.

Njiraini, J. (2008, August 18). Banking on Education. *East African Standard*, p 19 – 20

Nkpa, N. (1997). *Educational Research for Modern Scholars*. Enugu: Fourth

Dimensions Publishers.

Nzomo, N. (1978). *Education for Executive Jobs: A Study in Occupational Kenyanization – indigenization.* Nairobi: Kenya Literature Bureau.

Odebero, S.O., Ngala, F.B.J.A. & Sang, A.K. (2005). Higher Education Loans Board Financing of University Education in Kenya: The Effectiveness of Loan Recovery. *Journal of Education and Human Resources, 3(2)*, 16-26.

Olel, M. A. (2006).*The Effect of Privately Sponsored Students Programme on Efficiency and Equity in Public Universities in Kenya and Uganda.* Unpublished Doctoral Thesis. Maseno University.

Olukoju, A. (2002). *The Crisis of Research and Academic Publishing in Nigerian Universities: The Twentieth Century and Beyond.* A Paper for the 28th Annual Spring Symposium, "African Universities in 21st Century", Dakar. CODESRIA.

Ombati, J.M., Ngesa, F.U. & Githeko, J. M. (2006). Factors Influencing Farmers Adoption of Information and Communication Technologies in Accessing Agricultural Information: The Case of Nakuru District, Kenya. In *Proceedings of the First Research Week 17th - 21st July, 2006.* Njoro, Kenya: Egerton University.

Ondieki, C. M. M., Nyaanga, D. M., Nassiuma, D. K. & Asher M. (2006). Impact of Education Levels on Product Quality: The Case Study of ARC Welding in Small Scale Metal Working Enterprises in Kenya. In *Proceedings of the First Research Week 17th - 21st July, 2006.* Njoro-Kenya: Egerton University.

Onyuma, S. O., & Icart, E. (2005). Effect of Education on Labour Productivity of Small Scale Farmers in Kisii District, Kenya. *Journal of Education and Human Resources 3(2), 1-19.*

Otieno, S. & Anyira, G. (2008, July 9). Who Qualifies to Teach at University? *East*

African Standard, p 30 – 31.

Palme, M.O. & Wright, R.E. (1998*). Changes in the Rate of Return to Education in Sweden: 1968-1991.* Applied Economics, 1998, 30, 1653-1663.

Pennsylvania Department of Education (2008). *The Cost of Higher Education in Pennsylvania: Report to the Pennsylvania Board of Education.* Harrisburg, PA: Pennsylvania Department of Education

Pricewaterhousecoopers, L. L. P. (2005). *The Economics Benefits of Higher Education Qualifications: A Report produced for the Royal Society of Chemistry and the Institute of Physics.* London: Pricewaterhousecoopers.

Psacharopoulos, G. (1973). *Returns to Education: An International Comparison.* Amsterdam: Elsevier Scientific Publishing Company

Psacharopoulos, G. (1994). *Return to investment in Education: a Global update.* World Development 22:9, 1325 – 1325.

Psacharopoulos, G. (2000). "Building Human Capital in Europe: Issues and Methods." In OECD (2000). *The Appraisal of Investments in Educational Facilities.* Paris: Organisation for Economic Co-operation and Development pp 17-31.

Psacharopoulos, G. and Patrinos, H. A. (2002). *Return to Investment in Education, the World Bank (Policy Research Working Paper No. 2881).* Washington D. C.: World Bank.

Psacharopoulos, G. & Woodhall, M. (1985). *Education for Development: An Analysis of Investment Choice.* New York: Oxford University Press.

Renshaw, E. F. (1960). "Estimating the Returns to Education." In: UNESCO (1971). *Readings in the Economics of Education.* Paris: UNESCO.

Republic of Kenya, (1964). *Kenya Education Commission Report.* Nairobi: Government Printers.

Republic of Kenya (1965). *African socialism and its Application to Planning in Kenya. Sessional paper No.10 of 1965.* Nairobi: Government Printer.

Republic of Kenya (1974). *National Development Plan – 1974-78.* Nairobi: Government Printer.

Republic of Kenya (1988). *Education and Manpower Training for the Next Decade and Beyond: Report of the Presidential Working Party.* Nairobi: Government Printer.

Republic of Kenya (1998). *Master Plan on Education and Training 1997-2010.* Nairobi: Jomo Kenyatta Foundation.

Republic of Kenya (2001). 1999 *Population and Housing Census: Counting our people for Development Volumes I and II.* Nairobi: Central Bureau of Statistics.

Republic of Kenya (2003a). *Statistical Abstract 2003.* Nairobi: Central Bureau of Statistics.

Republic of Kenya (2003b). *Report of the Sector Review and Development Direction, Technical Working Group.* Nairobi: Ministry of Education.

Republic of Kenya (2003c). *Economic Recovery Strategy for Wealth and Employment Creation 2003 – 2007.* Nairobi: Government Printers.

Republic of Kenya (2005a). *A Policy Framework for Education, Training and Research: Meeting the Challenges of Education, Training and Research in Kenya in the 21st Century, Sessional paper No. 1 of 2005.* Nairobi: Government Printers.

Republic of Kenya (2005b). *Kenya Education Sector support Programme 2005 – 2010: Delivering Quality Education and Training to all Kenyans.* Nairobi:

Government Printer.

Republic of Kenya (2006). *Statistical Abstract 2006*. Nairobi: Kenya National Bureau of Statistics.

Republic of Kenya (2007). *Economic Survey 2007*. Nairobi: Kenya National Bureau of Statistics.

Schultz, W. T. (1961). "Investment in Man: An Economist's View". In UNESCO (1971). *Readings in the Economics of Education*. Paris: UNESCO.

Ssemambo, E. (2000). *Measuring Private Returns to Education in Uganda*. Unpublished M.Stat. Thesis submitted to Makerere university, Kampala – Uganda.

Teichler, U. (1988). *Changing Patterns of the Higher Education System: The Experience of Three Decades*. London: Jessica Kingsley publishers.

Thias, H. H. & Carnoy, M. (1972). *Cost Benefit Analysis in Education: A Case Study of Kenya*. Baltimore: Johns Hopkins Press.

Toh, M. H. & Wong, C. S. (1999). Rates of Return to Education in Singapore. *Economics of education 7 (3)*, 235-252.

University of Nairobi (2003). *University of Nairobi catalogue: 2003-2008*. Nairobi: University of Nairobi.

U. S. Bureau of the Census. (1994). *More Education Means Higher Career Earnings: Statistical Brief*. Washington D.C.: U S Government Printing Office.

Vaizey, J. (1962). "The Returns of Education" In UNESCO (1971). *Readings in the Economics of Education*. Paris: UNESCO.

Wei, X., Tsang, M. C., Xu W. & Chen, L. K.(1999). Education and Earnings in Rural China. *Education Economics. 7 (2)*, 167-187

Woodhall, M. (2004). *Cost-Benefit Analysis in Educational Planning (4th Ed)*. Paris: UNESCO – IIEP.

World Bank (2000). *Higher Education in Developing Countries: Peril and Promise*. Washington D.C.: World Bank.

World Bank (2003). *African Development Indicators*. Washington D.C.: World Bank.