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Returns To Formal Education In Ghana

by

Emmanuel M. Addo

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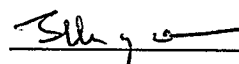
The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for the acceptance, a thesis entitled, "Returns to Formal Education in Ghana" submitted by Emmanuel Maxwell Addo in partial fulfillment of the requirements for the degree of Master of Arts.

Supervisor,

Dr. P.N.V. Tu

Department of Economics

Dr. P.C. Afxentiou

Department of Economics

Dr. S. Ameyaw

Faculty of Environmental Design

Date <u>May 10, 1991</u>

ABSTRACT

The importance of education to developing African countries is evidenced by the high public resources that goes into its finanacing in these countries. Coming out of colonialism plagued with disease, poverty, ignorance, and illiteracy, educational development was seen as one of the key ingredients needed to transform their economies and set them on the path of economic development. Therefore even in periods of tight budgetary constraints and intersectoral competition for limited resources, education continue to absorb a relatively high proportion of public resources.

In the case of Ghana, returns to such high public resources going into educational financing suggests that not only is education a socially profitable investment, the increasing not decreasing returns further suggests that notwithstanding the high public investment, Ghana's education is still in the 'early' stages of development. The high returns to education relative to physical capital, making education a socially profitable proposition, and the increasing returns to resources invested in it over time, both naturally calls for further increases in investment in education.

However unlike developed countries, the quality of education in Ghana just like other developing African countries cannot be taken for granted, and the findings of educational profitability studies should always be viewed with caution. The dismal performance of the economy especially during the past two decades have had an adverse effect on the educational system as academic supplies were

cut and trained teachers left in large numbers in search of greener pastures elsewhere.

Thus the nature of the increased investment that is called for in education should be a matter of concern. Such increased investment are especially required to upgrade or improve the quality of education through basic academic supplies that are woefully lacking since high returns to investment in poor quality education can be very misleading in informing educational policy decisions. Where educational quality cannot be taken for granted the conventional interpretation of rates of return that increased resources should go to that level with the highest returns cannot be defended. In situations like this it is proper to perceive returns as giving signals as to the relative needs of each level to raise its quality.

Considerably more research will be needed in a developing country like Ghana in the profitability of investment in education if this is to play a more meaningful role in informing educational policy decisions. The effect of the massive brain drain on such returns, returns not very much by level but by types of courses since courses cut across levels, as well as returns to informal schooling like apprenticeship and on-the-job training which are also very important in training manpower in Ghana are some of the areas where further research is required.

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CHAPTER ONE

GENERAL OVERVIEW

1.1   Introduction

Education constitutes a very important sector of the economy, such that it is often referred to in most countries as "The Education Industry". It touches a very large number of people in the economy, it absorbs substantial quantities of resources. It is therefore only natural that the economist should be brought in to assess its returns or profitability to ensure that resources used in its financing are best spent.

Education is indeed a commodity albeit a very peculiar one. It is at once an investment good and a consumption good. As an investment good it is a means to an end, and as a consumption good it is an end in itself. It is also a private as well as a public good, generating vast amounts of externalities, a commodity incorporated into its owner from whom it is inseparable and hence an investment of a very peculiar kind. Education has also been perceived not only as a means of reducing inequality but also as a means of making other investments more productive, and as an avenue for social and political development (Haveman and Wolfe, 1984).

It is these peculiarities among others that cause distortions in its price and hence result in market failure which tends to characterize most public goods. It is therefore only natural that the economist should play a key role in sorting out these issues and assessing its profitability in order that he (the economist) will be

able to give meaningful advise regarding the efficient allocation of scarce resources not only between education and other sectors but also within the different levels of education. Clearly the issues raised so far which constitute just a small part of the complex and intricate attributes of the educational commodity cannot all be treated in this thesis. We shall therefore concentrate on the consumption and more importantly on the investment aspect of education, assessing its costs and benefits as a basis to estimating its private and social rates of returns.

The view that it is the human resources of a nation, not so much its capital or material resources that ultimately determine the character and pace of its economic and social development has been supported by writers like Todaro (1989), and Harbison (1973). Harbison for instance has observed that human resources constitute the ultimate basis for the wealth of nations. Capital and natural resources to him are passive factors of production; human beings are the active agents who accumulate capital, exploit natural resources and carry forward national development. Therefore a country that is unable to develop the skills and knowledge of its people and utilize them in the national economy will be unable to develop anything else (Harbison, 1973). Education, both formal and informal, has long been the mechanism for developing such human skills and knowledge.

1.2 Education and Economic Development

The view so far suggests a relationship between education and economic growth. Economists have been increasingly aware of this

relationship between educational development and economic growth, but what they seem to disagree is the direction of causation of this relationship. One school contends that educational development is instrumental for economic growth. Their argument seems to be supported by findings in most developed countries that increased productivity has resulted not only from growth in physical capital and labour force but especially from education and training (Denison,1962; Rosenzweig, 1990; Lucas, 1988). The residual factor in the growth of total output has been attributed to a large extent to education and training.

There is also the view that it is economic growth that makes possible the availability and expansion of education. If that is the case then educational expansion cannot be used to stimulate economic growth (Psacharopoulos, 1988). This ambiguity is, however, circumvented by the distinction between education as an investment good which contributes to production and growth, and education as a superior consumption good in the sense that it is an increasing function of income.

To some extent the argument that educational expansion is the result rather than the cause of economic development can be defended in affluent societies but certainly not in developing countries like Ghana. At the early stage in a country's development it is the investment aspect of education. As the country develops, and its income per head and standard of living increases, the consumption aspect of education begins to manifest itself. Ghana has not developed to this stage. Like all developing African countries it is plagued with hunger, poverty, ignorance, illiteracy, and disease,

and scarce resources have to be allocated in an effort to solve all these problems. It is therefore only natural that educational development is perceived as the cause rather than the result of economic growth in Ghana. Since independence educational development, especially universal primary and middle education, has been seen as the key to national development, and has therefore received greater emphasis in most educational plans.

It is because of this that education continue to be very costly, especially from the government point of view. It has been claiming roughly 4 percent of gross domestic product and 20 percent of total government expenditure in Ghana since independence (U.N Statistical Yearbook, various issues). Such expenditures on education can aptly be perceived as investment in the context of educational development as the cause rather than the result of economic growth. With such high expenditures there is the tendency to investigate the extent to which education has contributed to the country's economic growth. Pioneering work in this area has been done for most developed countries like the United States (Denison, 1962). This thesis is however not intended to go into the question of how much education is contributing to Ghana's economic growth in view of data unavailability. For the most part, it is restricted to formal schooling, and even then, to the main academic stream which is categorized into levels, the first comprising the elementary school system; the second represented by the general secondary school system; and the third represented by the universities.

This is due to the special interest attached to the academic main stream and formal education by many parents as the quickest

and surest way for their children to acquire an elite university education, and to make a significant headway on the ladder of social mobility. This should not be seen as an attempt to belittle the importance to Ghana of technical, vocational, commercial institutions and teachers' training colleges which form the other segments of the second level, and the polytechnics, advanced and specialist diploma awarding training institutions, and other non-university third level institutions. Nor is it an acknowledgement of the relative unimportance of on-the-job training and apprenticeship as a very effective means of training manpower in Ghana. Their exclusion from estimates of returns to education in Ghana undertaken in this study is due to data unavailability. There is no disguising the fact that all these aspects of education are making significant contributions to the economy of Ghana.

Like any other form of investment, education yields a stream of benefits in the future. To the extent that the present value of the future benefits is greater than the present value of costs, education is seen as a good investment.

1.3 Objective and Plan of Study

One technique that has widely been used to assess the profitability of investment in education is the internal rate of return. The main objective of this study is to employ this technique to assess the profitability of educational investment in Ghana from both the individual and society's point of view, for the years 1974 and 1980. It should be emphasized that these two years of reference are to be seen as two different points in time. For example in view of the vast

difference in economic conditions for both years, data for 1980 projected from 1974 might be entirely different from the actual 1980 data. However it is the end results, the rates of return computed for these two survey years that are of interest in this study. The rates so estimated will then form the basis of a comparative analysis with similar rates estimated for alternative public investments. The consistency of the results of the current study can also be assessed by drawing on the results of earlier works done for Ghana for purposes of comparison. It is envisaged that this study will be valuable to the educational policy maker in Ghana, especially in such areas as the perennial issue of educational financing, in deciding to what extent the costs of providing education services at each level be shifted to the individual in view of the tight budgetary constraint and increased intersectoral competition for the limited public resources.

The thesis thus sets out to examine the costs of financing education in Ghana, especially from the social point of view, analyze the profitability of such investments, and adduce reasons to support why in spite of such social costs the educational system does not seem to bring about the much anticipated economic development. Since the study uses Ghana as the case study, the writer finds it expedient to introduce Ghana in chapter two. This chapter highlights such issues as population and its growth over the years, the performance of the Ghanaian economy, the educational system and its quantitative expansion in terms of enrollment and public expenditure going into its financing, the rate of illiteracy over the years, as well as the shortcomings that seem to be inherent in the

educational system. Chapter three presents a theoretical framework for rates of return to investment in education. It dwells on the benefits to education, both direct and indirect, as well as the private and social costs, also direct and indirect. The model for estimating educational rate of return and the overall social rate are also presented.

Educational benefits and costs in Ghana are the subject of chapter four. Ghanaian data are presented and used to estimate benefits and costs, both private and social, by level of education, which form the basis for the private and social rates of returns to be estimated in chapter five. In addition chapter five also presents the result of the study. A comparative analysis is made of the results obtained for 1974 and 1980 of this study. A comparison of the result is also made with that for earlier works done for Ghana as well as other African and advanced countries. The chapter also compares the rates estimated in this study with that for alternative public investment in order to determine whether there is overinvestment or underinvestment in education. Chapter six deals with policy implications that arise from the results of the study. It highlights such things as the problems encountered in the study and how they are overcome, limitations due to lack of data, conclusions emerging for policy recommendations, and the assessment of the contribution of this thesis. Chapter seven is reserved for a summary and conclusion of the study and recommendations for further investigation.

CHAPTER TWO.

GHANA

2.1 Introduction

This chapter gives a brief overview of Ghana and touches on such areas as population and its growth over time, the performance of the economy and the growth of real gross domestic product and real per capita gross domestic product. The educational system that evolved during the colonial days up to 1980, as well as the emerging system from the decade of the 1980s is also discussed. It also touches on the rate of illiteracy and how this has behaved over the years. Population growth has brought in its trail increased pressure for expansion in school places to satisfy the growing needs of children of school going age. Evidence is provided to show how the educational system has expanded in terms of enrollment and public expenditure on education. It is doubtful whether the educational system developed under colonial rule and bequeathed to the country has been very useful in solving particular problems of Ghana, apart from producing graduates with literary skills. Some shortcomings inherent in the educational system which tend to militate against its efficient performance are also highlighted in this chapter.

2.2 Population

Ghana's population has increased from just over 5 million in 1950 to 12.3 million in 1984, as shown in table 2.1. The population has been

Table 2.1
The Population of Ghana

Year	Population
1950	5024000
1960	6776000
1970	8628000
1975	9873000
1980	11500000
1984	12296000

Source:　UN Statistical Yearbook
(various issues)
UN Compendium of Social
Statistics (1978).

growing at an average annual rate of about 3 percent, and at this rate it is estimated that it will be in the neighbourhood of 15 million by the turn of the century. A breakdown of the population by age group shows that in 1980, out of the approximately 11.5 million population, 20 percent were in the age group 0-4; 16 percent in the age group 5-9; 12 percent in the age group 10-14; 11 percent in the 15-19 years age group; 8 percent in the 20-24 age group; and the remaining 33 percent in the age group 25+. In fact only 4 percent of the population in 1980 were above the compulsory retiring age of 60. Table 2.2 gives this breakdown of the population in 1980.

It is therefore clear that Ghana, in 1980, had a relatively young population, with 67 percent below 25 years. The pressure on the educational system to provide school places for this relatively young population is exacerbated by the fact that whereas 39 percent of the population were already in the school going age (5-24), another 20 percent who were in the age group 0-4 were due to enter the school system shortly. The unfortunate thing is that this enormous pressure is being exerted on the educational system by the increasing population within the framework of Ghana's dismal economic performance.

2.3 The Economy of Ghana

Ghana's economy has for long been heavily dependent on the export of agricultural and other primary products such as cocoa, timber, gold, and diamonds, and this heavy dependence makes the economy vulnerable to the effects of the fluctuations in world prices

Table 2.2
Population Estimates by Broad Age, 1980 ('000).

Age Group	Population	% of Pop. in Age Group
0--4	2285	19.9
5--9	1820	15.8
10--14	1369	11.9
15--19	1311	11.4
20--24	962	8.4
25--29	708	6.2
30--34	609	5.3
35--39	558	4.9
40--44	488	4.2
45--49	390	3.4
50--54	298	2.6
55--59	233	2.0.
60--64	172	1.5
65--69	118	1.0.
70--74	83	0.7
75+	96	0.8
Total:	11500	100

Source: Ghana, Policies and Program for Adjustment, 1984.

of these products. Over the past four decades, the performance of the economy has been closely linked to the world prices of these products, especially cocoa, which in the 1960s provided an average of 65 percent of total merchandise exports (Survey of African Economies, vol. 6). In the 1950s and 1960s, Ghana enjoyed about one of the largest income per head of population in sub-saharan Africa. This was the result of booming cocoa exports which were accompanied by a relative increase in the world price of cocoa. The 1970s, however, saw a steady deterioration of the economy. Apart from the adverse impact of the world oil price hike on her fragile economy, cocoa output started declining, for example from 368,000 tons in 1973 to 189,357 tons in 1979. By 1981 for instance Ghana's cocoa output was only 45 percent of the 1965 peak. At the same time gold and diamond production had also fallen to about a third of their peak in the mid-1960s (Peoples' Daily Graphic, Ghana).

The economy also suffered severe hyper-inflation, with the national consumer price index increasing by 12,358 percent between 1973 and 1983. With the index for 1977 at 100, it rose from 19 in 1973 to 2367 in 1983 (Peoples' Daily Graphic, Ghana). This was very much the result of a drastic decline in production and an excessive printing of cash to finance government expenditure. An Economic Recovery Program, launched by the government, acting on the advice of the World Bank since 1983, in an attempt to arrest the downward trend in the economy has produced positive results in terms of growth in gross domestic product. Its real positive impact on the average Ghanaian is however yet to be felt.

That the economy has been in deep crisis over the years is manifested by the fact that population has been growing at a faster rate than the growth in real output.   In fact growth in real gross domestic product was in itself negative for the most part from 1975 to 1983.   Between 1960 and 1980, real per capita gross domestic product fell by 33 percent from C292.00 to C197.00.   Table 2.3 gives real GDP and real per capita GDP for selected years.   It is clear that the performance of the economy, especially for the past two decades has not been encouraging.

2.4   The Educational System in 1980

The structure of Ghana's educational system has, at least up to 1980, deviated very little from that modelled and bequeathed to the country by the colonialist.   Education preceding the first level consisted basically of pre-primary day nurseries with limited enrollments.   Therefore many children had to start primary school without having enjoyed the benefits derived from these day nurseries.   The first level consisted of public primary and middle school systems.   Together this was referred to as the elementary school system.   The duration for completing the elementary school was 10 years; 6 years for primary and 4 years for middle schools, although most people who continued their education at the general secondary schools did not have to complete middle form four.   In fact, the majority of them left after passing the common entrance examination in middle forms two and three.   However,

Table 2.3
Real GDP and Real Per Capita GDP for Selected Years

Year	Real GDP (millions cedis)	Real Per Capita GDP
1960	1974	292
1970	2259	262
1975	2298	233
1980	2262	197

Source: U.N. Statistical Yearbook, (various issues).

students who entered technical and vocational institutions had to obtain the middle school leaving certificate as a prerequisite.

Another component of the first level was the private preparatory schools that were mostly limited to the urban areas. These schools had seven years duration and mostly prepared students for secondary school work and the entrance examination into secondary schools. Generally preparatory schools were very expensive relative to the public primary and middle schools, at least from the individual's point of view.

The second level put together the general secondary with 5-year duration, plus a 2-year sixth form that served to prepare students for university work; Teacher Training Colleges with 4-year duration; Post-secondary Teacher Training Colleges with 3-year duration; Secondary-Commercials, Vocational, and Technical institutions, all with 4-year durations. The third level consisted of the universities, three in number, the polytechnics as well as other non-university diploma awarding institutions. The structure described so far is presented in the form of a chart, as shown in figure 2.1.

Under the system as it operated until 1980 therefore, a representative student who left the public elementary school after the 9th grade, did 7 years secondary work (5 years for general secondary, plus 2 year sixth form) and got admission into the university for three years, ended up spending 19 years in the school system, assuming away the possibility of repetition. Since the school starting age has always been around 6 years, a fresh university graduate was always aged in the neighbourhood of 25

Structure of the Educational System Before 1980

pre-school day nursary

Primary School (6 years)

private preparatory schools
(6 years)

Middle School (4 years)

Secondary School
(5 years)

Teachers' Training
College (4 years)

Technical and
vocational
institutes
(4 years)

Sixth Form
(2 years)

Post-Secondary
Training College
(3 years)

University
(3 years)

Specialist and
Advanced Training
College
(3 years)

Polytechnic
(3 years)
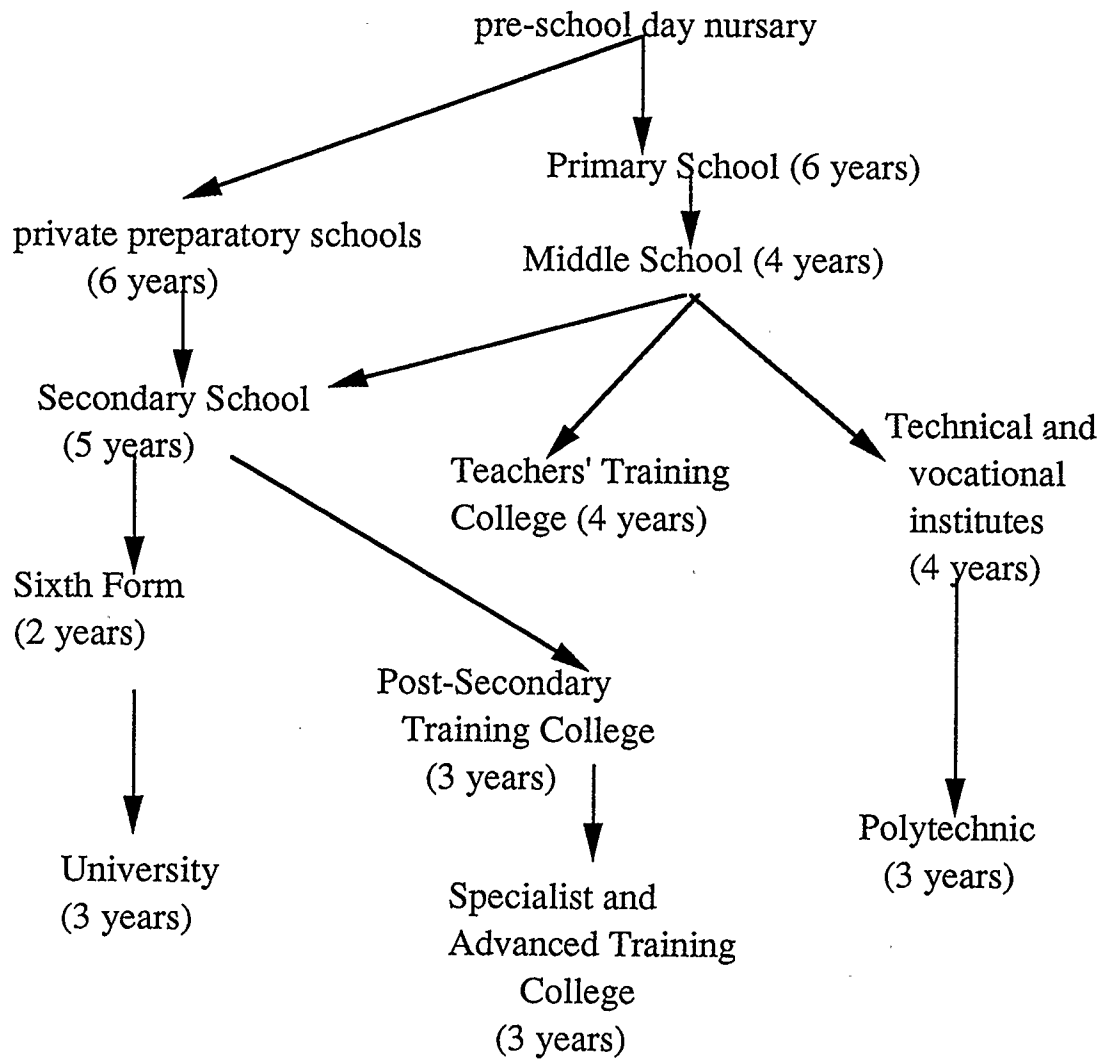
Figure 2.1

years. With a compulsory retiring age of 60 years, a typical university graduate could only work for 35 years This was the structure of the educational system that had been in operation from colonial days up to the early 1980s. Apart from the unusually long duration, the curriculum itself made the educational system too bookish and less problem oriented. The need for a change in such a system was long overdue. It was only a matter of time for such a change to be put into effect.

2.5   The System After the 1980s

In an attempt to make the school system more problem oriented, the Junior Secondary School (JSS) concept was proposed in the early 1970s by the government, but its implementation was saddled with problems, mainly equipment and other materials required for its take-off. The whole idea therefore had to be shelved for almost a decade. With its inception in the early 1980s, it was envisaged that the 4-year middle school system would eventually be phased out and replaced by a 3-year JSS. The unique feature of this new concept is that in addition to the general subjects offered, students are introduced to a variety of trades such as carpentry, masonry, modern agricultural practices, automechanics and the like. The significance of this to the economy cannot be overemphasized, considering the fact that in 1980 for example, enrollment at the second level of the educational system was only 7.3 percent of that at the first level (Ghana: Policies and Program for Adjustment, 1984). Unemployment among elementary school leavers has always been very high in view of the fact that clerical and other public sector jobs

that used to be available to them during colonial and early post colonial days were given to second level graduates.

It was therefore envisaged that the introduction of the JSS concept would help solve the problem of unemployment among the vast majority of elementary school graduates who for certain reasons cannot make it to secondary schools. This no doubt would help make them more productive within the economy. The JSS however is still being haunted by the lack of required equipment and other materials, and the peoples' attitude that such trades are the prerogative of "the not too good" students has meant that the real positive impact of the JSS is yet to be seen.

With the introduction of the JSS, the entrance examination into secondary schools was eventually abolished. This has meant that the private preparatory schools that restricted themselves to training children to pass this examination had to be phased out. Most of them have already folded, and the few remaining ones had to establish their own JSS to serve as outlets for their students. The cost involved in this is phenomenal. When the last batch of candidates for the middle school leaving certificate examination wrote it in August 1990, a chapter in the structure of Ghana's educational system was closed, as this marked the end of the middle school system, thereby restricting the first level of the educational system to only the primary schools.

The general secondary school system has also come to be known as Senior Secondary School (SSS). Its duration has also been reduced. Successful JSS students need 3 year SSS education instead of 5 years, plus the usual 2 year sixth form work for those going

through the SSS successfully before entering the university. With this new arrangement, the duration of the education system has been reduced from 20 years (10+7+3) to 17 years (6+8+3). That is to say, the first level duration has been reduced considerably, while the second level duration has been slightly increased. This change in duration has been carried out alongside marked changes in the curriculum, especially at the second level and for that matter the JSS where greater emphasis is now being placed on the practical and problem oriented approach to most courses instead of just developing the literary skills of students. Figure 2.2 illustrates the new structure that has emerged from the 1980s.

2.6   Enrollment in the school system

The enormous expansion in the Ghanaian educational system can be viewed first in terms of expansion in enrollment and enrollment ratio over the years. Although there has been significant expansion since the inception of the school system in Ghana, rapid expansion started with the introduction of the Accelerated Development Plan for Education under the 1951 constitution. The main objective of this plan was to help develop a balanced system, working towards universal primary education as rapidly as consideration of finances and teacher training allowed, but maintaining at the same time, proportionate facilities for further education for those most fitted to receive it (Graham, 1971). The limiting factors under the plan therefore had to do with finance and inadequate supply of trained teachers. There was also the

Structure of the Educational System

After 1980.

Primary school (6 years)

Junior Sec. School   (3 years)

Senior Sec. School (3 years)

Training College
(4 years)

Sixth Form
(2 years)

Technical and
Vocational Schools
(4 years)

Post Secondary
Training College
(3 years)

University

(3 years)

Polytechnic
(3 years)

Specialist and Advance
Training College
(3 years)
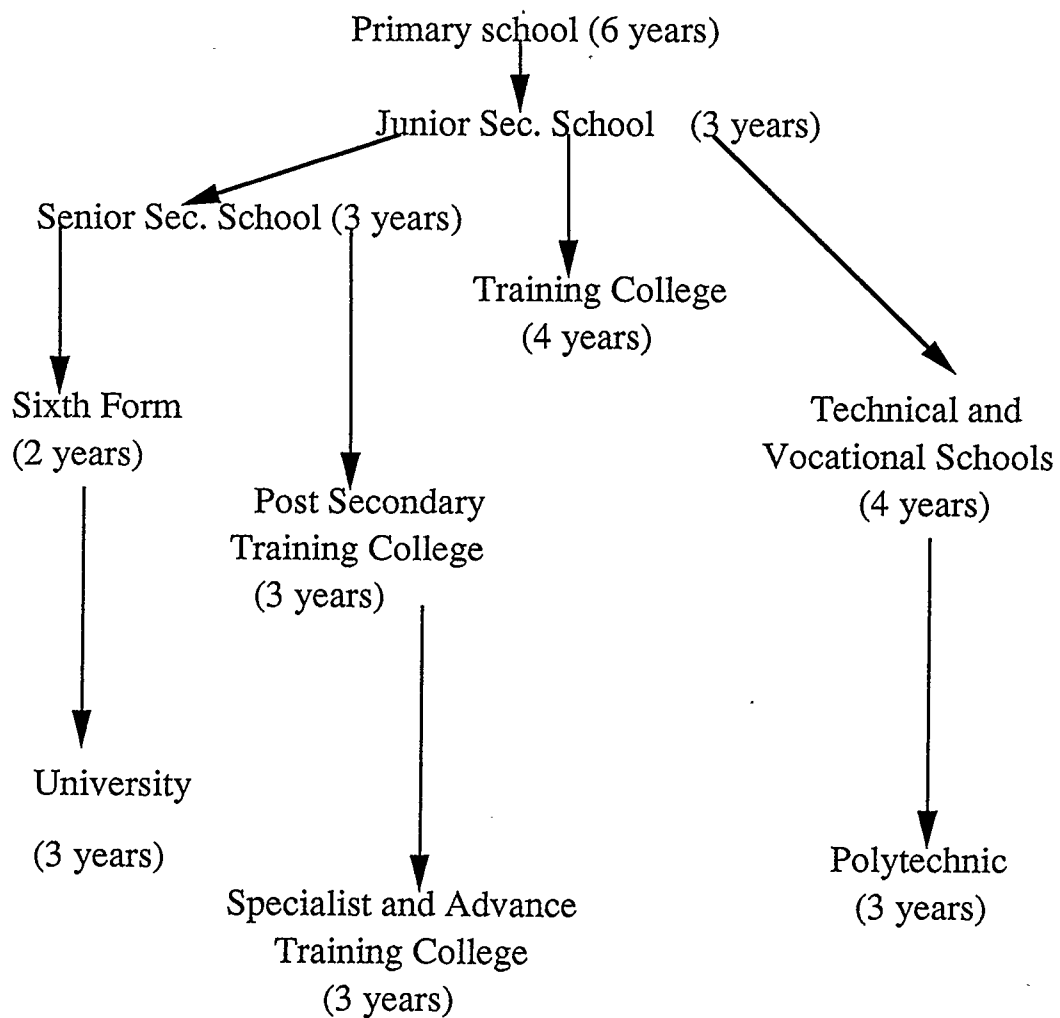
Figure 2.2

Education Act of 1961 which established free and compulsory elementary school education for all children, and this might have been a major contributing factor to the rapid expansion after 1961. Table 2.4 shows the growth in primary and middle school enrollment for selected years.

Enrollment at the second and third levels equally grew at a fast rate. At the second level it grew from 72,379 in 1968 to 92,311 in 1974 and 139,660 by 1980. Third level enrollment also grew from approximately 5,783 in 1971 to 8,022 in 1974 and 9,745 by 1979 (UNESCO Statistical Yearbook, (various issues); Ghana: Policies and Program for Adjustment, 1984).

The analysis can be made more succinct by the use of enrollment ratios. Enrollment ratio at the first level grew from a low of 15 percent in 1950 to 73 percent by 1980. At the second level it was 11 percent and 36 percent respectively for the two years. Enrollment ratio at the third level is, however, still very low, 0.24 percent in 1960 and 1.0 percent by 1980 (UNESCO Statistical Yearbook, (various issues), UNESCO Statistical Digest, (1985)). By 1980 therefore only 1.0 percent of the population of university going age (20-24) were enrolled in a third level institution, whereas 73 percent of the population within the elementary school going age were enrolled in the first level. Hence in spite of the significant expansion in enrollment at the third level, almost doubling between 1970 and 1980, the figure is still woefully low in terms of the population within that age group.

Expansion in the educational system can also be seen through the increasing drain of the educational sector on the economy of the

Table 2.4
Growth of Primary and Middle School
Enrollment, Ghana.

Year	Primary Enrollment	Middle Enrollment
1952	338000	92000
1959	484000	154000
1971	960403	455398
1974	1051012	439655
1980	1379030	528727

Source: 1952 &1959: UNESCO Statistical Yearbook
1971, 1974, and 1980: Ghana, Policies
and Program For Adjustment, 1984.

country as evidenced by the proportion of public expenditure and GDP absorbed by it.

2.7   Public Expenditure on Education.

Conventionally, public expenditure on education is related to GDP and total government expenditure.   Table 2.5 relates total educational expenditure to GDP for selected years from 1965 to 1980.   It is clear from table 2.5 that education claims a large part of GDP in Ghana.   Between 1965 and 1980, it claimed around 4 percent on the average.   But GDP in real terms did not grow significantly over the period.   In fact from table 2.3, real GDP in 1975 was higher than in 1980.   Recurrent and development expenditure on education has also been high relative to total public recurrent and development expenditure.   In table 2.6, total recurrent and development expenditure and educational recurrent and development expenditure for the period 1970 to 1980 are presented.   The table also shows the latter as a percentage of the former.

Recurrent and development expenditure on education claimed a sizeable share of over 20 percent on the average of total government recurrent and development expenditure over the period. A closer look at public expenditure on education reveals that it is the recurrent aspect of educational expenditure, not very much the development expenditure that drives the total educational expenditure high, and thus put a great deal of pressure on total government expenditure.   Table 2.7 makes this clear by relating recurrent educational expenditure to total government recurrent

Table 2.5
Total Educational Expenditure as a Percentage of GDP for Selected Years, Ghana.

Year	Educational Expenditure as % GDP
1965	4.6
1968	3.9
1970	4.2
1971	4.6
1975	5.9
1976	4.2
1978	2.5
1979	2.8
1980	1.9

Source: UNESCO Statistical Yearbook, (various issues).

Table 2.6
Total Recurrent and Development Expenditure and
Educational Recurrent and Development Expenditure
1970-1980, (in million cedis).

Year	Total Recurrent & Development Expenditure	Educational Recurrent & Devt. Expenditure	ERDE as % of TRDE
1970	439.3	90.8	20.7
1971	496.4	108.6	21.9
1972	523.0.	111.0.	21.2
1973	727.4	146.5	20.1
1974	1085.3	235.8	21.7
1975	1438.3	321.7	22.4
1976	1945.2	416.3	21.4
1977	3017.6	660.3	21.9
1978	4094.2	950.8	23.2
1979	4671.5	1025.6	22.0.
1980	7719.3	1318.9	17.1

Source: Ghana, Policies and Program for
Adjustment, 1984.

Table 2.7
Recurrent Educational Expenditure as a Percentage of Total Government Recurrent Expenditure 1970-1980.

Year	Rec. Educ. Expd. as % of Total Govt. Rec. Expd.	Devt. Educ. Expd. as % of Total Govt. Devt. Expd.
1970	23.7	7.4
1971	24.9	9.5
1972	24.0.	7.0.
1973	22.4	9.7
1974	23.9	14.0.
1975	24.1	17.6
1976	24.0.	16.1
1977	23.8	15.4
1978	25.3	14.0.
1979	23.7	10.2
1980	19.6	5.5

Source: Computed from Ghana, Policies and Program For Adjustment, 1984.

expenditure, and development educational expenditure to total government development expenditure for the period 1970 to 1980. When educational recurrent expenditure as a percentage of total government recurrent expenditure reached a high of 25.3 in 1978 (table 2.7), it was reflected in the high figure of educational recurrent and development expenditure as a percentage of total government recurrent and development expenditure for the same year of 23.2, (table 2.6). On the whole, both recurrent and development expenditures on education claimed a significantly high proportion of government resources for the period.

One significant point worth noting is the decline in the total educational expenditure as a percentage of both GDP and total government expenditure, especially from the mid-1970s, reaching a low of 1.9 percent and 17.1 percent respectively by 1980. In fact both the recurrent expenditure on education as a percentage of government recurrent expenditure, and development educational expenditure as a percentage of total government development expenditure behaved in the same manner over the period. With tight overall finances, increased intersectoral competition for resources tend to put a great deal of pressure on government expenditure, and this, coupled with substantial increases in resources needed to service Ghana's domestic and foreign debt, especially since the oil price hike in the mid-1970s might have accounted for the decline in the budget share of public education and educational expenditure as a percentage of GDP to a low by 1980. In spite of the apparent high public resources going into educational finance in

Ghana as well as the phenomenal increases in enrollment and enrollment ratios, illiteracy rate continue to be relatively high.

2.8   Rate of Illiteracy

That Ghana's educational policy over the years has been geared towards reducing the high level of illiteracy cannot be overemphasized.   Table 2.8 gives the rate of illiteracy for selected years and age groups.   From the table it is observed that rate of illiteracy among the population of 15 years and above has decreased from a high of 80.6 percent in 1962 to 70 percent in 1970 and 55 percent by 1980.   This is a substantial reduction, considering the fact that this age group constituted roughly 47 percent of the population in 1980 (Ghana: Policies and Program for Adjustment, 1984). Illiteracy rate among the population of 6 years and above also dropped considerably from 73.0 percent to 56.8 percent between 1960 and 1970.   At the same time whereas 86.2 percent of the population 25 years and over were illiterates in 1960, the figure decreased to 77.7 percent by 1970.   It can · therefore be said that between 1960 and 1980, illiteracy among the population of school going age (6-25 years) dropped substantially.   Probably this state of affair is attributable to the introduction of the Accelerated Development plan for Education under the 1951 Constitution, and most especially the Education Act of 1961 which established free and compulsory education for all children at the elementary school level.

One interesting observation is the fact that for each age group and year of reference, the illiteracy rate was higher among females than males.   In fact for all age groups the illiteracy rate among males

Table 2.8
Rate of Illiteracy for Selected Years and Age Groups

		6+	Selected Age Groups: 15+	25+
	Total	73	--	86.2
1960	Male	63.3	--	--
	Female	83.3	--	94.1
	Total	--	80.6	--
1962	Male	--	71	--
	Female	--	90	--
	Total	56.8	69.8	77.7
1970	Male	47.3	56.9	--
	Female	66.2	81.6	88
	Total	--	55.2	--
1980	Male	--	46.3	--
	Female	--	63.8	--

Source: UNESCO Statistical Yearbook, (various issues).

Figures unavailable for years: age groups denoted with --.

was less than that for both sexes together, whereas that for females was higher than the total. This is quite disturbing since the female population has been greater than the male population in all censuses conducted in Ghana. For example out of the 11.5 million people in 1980, the female population was made up of 5.8 million while 5.7 million were males (Ghana: Policies and Program for Adjustment, 1984). Thus the high illiteracy rates in Ghana over the years can, to a very large extent be attributed to the very high illiterate female population. A recent Ghana Living Standard Survey (West Africa, 1990) reveals certain facts about literacy rates by age groups. Table 2.9 presents an aspect of the findings of this survey.

The disturbing aspect is the very low literacy rate for the age group 9-14 years, (literacy rate is defined here as the percentage of the people in that age group who can read and write). This is inconsistent with the increased enrollment ratio at the first level of education (age group 6-16) from a low of 15 percent in 1950 to 73 percent by 1980. Of course one would expect increased enrollment or enrollment ratios to be accompanied by increased literacy rates. Reasons can however be adduced to explain why this is not the case among the population of age group 9-14 years.

Since the late 1970s there has been a gradual deterioration in educational quality in Ghana, and this has probably manifested itself in the low literacy rates. This falling quality can, to a very large extent, be attributed to the exodus of highly trained Ghanaian teachers to neighbouring countries during the latter part of the 1970s and early 1980s, especially to Nigeria and Libya in response to

Table 2.9
Literacy Rate by Age Groups, 1990.

Age Group	Total	Male	Female
9--14	11.1	11.8	10.4
15--24	49.1	59.4	38.5
25--34	49.4	64.2	37.8
35--44	39.8	58.1	23.3
45--54	23.8	40.2	10
55+	11.3	20.4	3.4
All	32.1	41.7	23.2

Source: West Africa, No. 3780.

the oil boom in these countries which brought in its trail higher remunerations and better working conditions. The departure of these trained teachers meant that for the most part untrained and mediocre teachers had to be employed to fill their positions as an interim measure while ad hoc plans were instituted to give these teachers short in-service trainings whenever schools were in recess. The lack of the expertise skills required of trained teachers manifested itself in the very low quality of education.

The low literacy rate can also be explained by the lack of motivation on the part of children to go to school, especially since the beginning of the 1980s. The poor performance of the economy has made education less and less lucrative and trading more and more profitable. Cases of educated unemployment has become commonplace especially in the 1980s, not only among first level graduates but even among university graduates. Those who secure employment earn monthly salaries that can hardly sustain them for a week, in view of the high rate of inflation. The poor performance of the economy has therefore become a disincentive to education as teachers look for other means for survival in addition to teaching, and therefore their full work potential is not being realized. Most children do not enroll in the school system, and for those who do, attendance has been very low.

Though there are child labour laws that prevents children from engaging in trading, these laws have never been strictly implemented, with the result that children stay out of school to engage in petty trading. Therefore the low literacy rate among the

age group 9-14 is to a very large extent the consequence of the poor performance of the economy.

Going back to table 2.9 it is realized that the highest rate of literacy is among the age group 15-24 and 25-34, and this point to the fact that the country is producing less literates now than it did 20 to 40 years ago. In fact there is reason to believe that the Accelerated Development Plan for Education (1951) and the Education Act (1961), which established free and compulsory elementary education for all children must have accounted for the high literacy rate among these age groups. One other significant observation from table 2.9 is the apparent elimination of the gap between male and female literacy rates for the age group 9-14 years. This is in sharp contrast to what obtains for the other age groups. Though the 10.4 percent rate for females is still lower than the overall figure of 11.1 percent, it compares favourably with the 11.8 percent rate for males. It is envisaged that as this population grows, the great disparity between the literacy rates for males and females will, to a very large extent, be eliminated.

2.9   Some Shortcomings in the Educational System.

As much as possible, formal education developed in every society should be geared in addition to developing the literary skills of individuals, to identifying the developmental needs of the society and addressing these needs. This is one area where the Ghanaian educational system has for long failed.

The educational system developed under colonial rule was intended to develop only the literary skills required of middle level

manpower to help with the clerical and other aspects of administering the colony. The curriculum was therefore not very much problem oriented. After independence the need for high and middle level manpower to take over from the expatriates in running the governmental machinery meant not only maintaining but placing much greater emphasis on the status quo. Of course one would expect the educational system of a predominantly agricultural society like Ghana to place greater emphases on the development of appropriate farming practices that will make the farmer more productive and bring about increased productivity in the agricultural sector. This unfortunately has not been the case, and the system has rather tended to alienate agriculture from the very beginning to the extent most people have come to perceive it as an occupation for illiterates. It is not surprising that the educational system is often criticized as being too bookish and therefore quite unsuitable to Ghana.

It should be pointed out however, that the subsistent agriculture that has been practised in Ghana for a long time has been the prerogative of people with no education, and therefore the notion is that it is a waste of time to spend so many years in school only to end up engaging in subsistent agriculture. Probably this is more the result of peoples' perception of farming as being a job for failures and drop-outs and those who for some reasons could not go to school at all. There is no disguising the fact that people with even basic education will tend to accept innovations in agriculture more than those with no education. Formal education has therefore tended to serve as a ladder of social mobility in the sense that the higher one

goes on this ladder the greater the tendency of migrating to the urban center in search of white-collar jobs which in most cases are not readily available, and the less the likelihood of one going into agriculture.

To the extent that the educational system makes farming less attractive and trains people mostly for white-collar jobs which in most cases are not readily available, thereby enhancing the rural-urban drift, it tends to promote unemployment among the educated. Of course job openings have failed to keep pace with the output of the educational system, and unemployment not only among first and second level graduates but even among university graduates has become commonplace since the last decade.

Apart from the anomaly inherent in the curriculum itself, the educational system has often been criticized of having an unnecessarily long duration. Although the introduction of the JSS and SSS concepts alongside the abolition of the middle school system in the 1980s has meant a reduction in the duration from 20 years to 17 years the duration still seems to be long.

The massive brain drain that has been Ghana's problem, especially since the mid-1970s has, to some extent, been blamed on the educational system, though this certainly tends to be more the result of the poor economic performance of the country than the educational system. The argument is that the educational system should trains people for them to accept the startling realities of the economic hardships which is faced by many developing countries, and learn not only to live with it but also contribute their quota towards eradicating these hardships and subsequently help develop

the country. With free tuition and huge government subsidy at all levels of education, Ghana finds itself in a situation where huge investments are made in education only for their returns in terms of increased productivity to be realized in other countries where Ghanaian nationals go to work.

Thus far this chapter has reviewed such issues as Ghana's population, the economic performance, the educational system and its expansion in terms of both enrollment and public expenditure that has been going into its financing. The other areas touched were the illiteracy rate and some serious shortcomings that seem to be inherent in the educational system. In the next chapter, a theoretical framework of educational rate of return is presented as a basis for the estimation of Ghana's rates of return to education.

CHAPTER THREE

THEORETICAL FRAMEWORK FOR THE RATES OF RETURN TO EDUCATION

3.1   Introduction.

This chapter outlines the theoretical framework for the estimation of internal rates of return to investment in education and therefore provides a basis for the empirical work to be done in the subsequent chapters.   It highlights the various components of educational benefits and costs that are required for rates of return computation as well as the model employed in estimating such rates. The overall social rates of return to educational investment is also discussed and a model for their estimation presented.

The theoretical framework for rates of return to educational investment has evolved from attempts by economists to estimate the economic returns to investment in education, in order to ensure that resources are optimally allocated not only between human and physical capital but also among various levels of education.   The rate of return is defined as that rate of discount which equates the present value of future benefits expected from a capital asset, education in this case, during its economic life with its supply price. It is essentially a cost-benefit analysis since all the costs and benefits associated with the investment project are reduced to a single rate which shows the rate of interest at which the present discounted

value of future income is exactly equal to the present discounted value of costs (Woodhall, 1987)

3.2   Educational Benefits.

Educational benefits can be categorized into direct and indirect. Direct benefits manifest themselves in the form of higher lifetime earnings resulting from education, which accrues to the individual. The indirect benefits which tend to accrue to society as a whole include a well informed public, the effect of education on health, nutrition, and fertility, especially in developing countries, among others.   For purposes of rate of return computation, educational benefits are often restricted to the more direct benefits to the individuals and society as a result of education. Education, it has been noted, bestows on the individual, a higher earnings potential than he would otherwise have received.   Thus the assumption is that given two individuals entering the labour force at the same time with no prior work experience, differences in their earnings are to a very large extent explained by differences in their educational attainment.   Higher lifetime earnings is therefore taken as the best approximation of the direct benefits of education to the individual. For society as a whole, educational benefits manifest themselves through increased productivity of educated workers and their additional contribution to the national income over their entire working lives (Psacharopoulos, 1985).   Certain key points are worth noting in using only the direct lifetime earnings of educated workers as the individual's and society's benefits, for purposes of educational rates of return computation.

1.   The use of direct benefits to represent educational benefits should not be seen as an attempt to devalue the indirect benefits. The latter tend to be overlooked in computations of educational rates of return in view of the difficulty involved in giving numerical values to such subjective judgements as the indirect effects of education on nutrition, health, and fertility, among other things, especially in developing countries. The significance of such indirect benefits in developing countries where illiteracy is high, especially among women, and where population explosion has become an endemic feature cannot be overemphasized. For example educated women can have significant impact on a country's economy through lower fertility rates and health information, even if they do not participate in the labour force.

It has also been observed that education does not relate only to the modern wage sector. Farmers and self employed who constitute a sizeable proportion of the economically active population in most developing countries are thought of as contributing more to their country's economy if they have formal education (World Bank, 1984). In general people without formal education tend to be averse to innovations because of lack of understanding of the intricacies and complexities involved in these new ideas. Thus it is clear that the indirect benefits of giving basic education to a large illiterate population as in Africa will be significant. Such benefits are, however, yet to be reflected in computations of educational rates of return.

2.   It should also be pointed out that using all the differentials between two individuals' earnings as a measure of the benefits from more education implies attributing too much to education. In spite of the fact that studies have shown that a positive relationship exist between earnings and the amount of formal schooling received, (Becker, 1962; Schultz, 1963), other studies have established that differences in schooling alone does not account for all the disparity in two individuals' earnings (Denison, 1962). Socio-economic factors such as home background, ability, sex, tribe (especially in Africa), achievement motivation, as well as institutional factors like union action, government employment and subsidies, where they are important, will influence the wages paid, and possibly also earning differences between schooling levels (Thias and Carnoy, 1972).

Attempts to circumvent this problem of too much being attributed to education include an application of an adjustment factor known as the "alpha coefficient" to the earning differentials to account for the other wage-earner characteristics besides education (Blaug, 1965). Another method involves the process of earning standardization through regression analysis. By this, an equation is constructed expressing the dependence of income on all factors except years of schooling for all those with a given level of schooling. This way earning functions are estimated and earning differentials between different schooling levels are standardized for factors other than education (Psacharopoulos, 1973). Thias and Carnoy (1972) have, however, observed that to the extent job-related characteristics like occupational distribution, sector of employment, type of school attended, additional education and training, are

probably closely related to the amount and quality of schooling received, they should not be isolated from the effect of schooling on earnings. In other words, having a specific occupation is to a very large extent a consequence of having a given amount of schooling. If there is the need to separate anything, it is the more exogenous factors like union affiliation.

Whatever the upward bias or overestimation to educational benefits in rate of return computation resulting from attributing the entire earning differentials to further education, at least in developing African countries with a relatively large illiterate population, this can, to a very large extent, be offset by the net external benefits of education which are yet to be quantified with any degree of accuracy.

3.   Another pertinent issue that presents itself for discussion when using earnings as a measure of educational benefits, especially for society at large as opposed to the individual is the link between education and productivity. It should be known whether the worker's productivity is influenced by his educational attainment, and if so, to what extent is this influence manifesting itself in earnings, or whether education is only being used as a 'convenient screening device' in the sense that it merely identifies workers with superior ability and personal characteristics which employers look for, a feature that has variously been referred to in the literature as "credentialism" (Spencer, 1976) or the "screening hypothesis" (Arrow, 1973).

According to the credentialist argument, workers may be paid on the basis of their educational attainments regardless of whether or not they become more productive with these educational attainments. The screening hypothesis on the other hand argues that education does not necessarily impart productive skills to workers but provides information on workers to the employer by ranking workers according to their innate ability. The argument is that if education directly increases the worker's productivity, society is better off, and higher earnings of educated workers will be commensurate to increased society's total output.

For earnings to be a good measure of educational benefits to society reflecting increased productivity, there should be perfect competition not only in the labour market but in the factor market as a whole. This way, since factors will earn income commensurate to their marginal product, wages will be equal to the value of marginal product for labour, and earning differential will be an apt measure of increased productivity. Extra earnings of educated workers could then be used as a measure of their additional contribution to output (Psacharopoulos and Woodhall, 1985).

It should however be noted that perfect competition is still rather unattainable even in the developed market economies of the West, and institutional rigidities tend to bring about distortions in the pattern of relative wages especially in developing countries. Civil Service Salary Scales in developing African countries like Ghana tend, for the most part, to be tied rigidly to the "paper qualification syndrome" rather than to marginal productivity. The market forces of demand and supply may play a lesser role in determining civil

service salary scale, and earnings will not be a good reflection of society's benefits from education.

Earnings, it has been observed, will also not be a good measure of the benefits of education for workers in the non-wage sector of the economy such as the self employed and subsistent farmers who constitutes more than half of the economically active population in developing African countries. It has therefore been suggested that in situations like this it may be preferable to measure the effect of education on physical measures of output rather than to use wage as proxy for productivity (Psacharopoulos & Woodhall, 1985). Notwithstanding these limitations, however, earnings continue to be used as a surrogate or measure of educational benefits to society for want of a more satisfactory measure.

3.3   Educational Costs.

The costs of education for purposes of educational rate of return estimation is perceived from two viewpoints; costs to the individual and costs to society. These costs, often referred to as private and social costs respectively, may be either direct or measured in terms of opportunity cost. To the individual the direct costs of education include tuition fees, boarding and lodging fees, expenditure for academic supplies, textbook fees, as well as transport cost for travelling to and from educational institutions. The opportunity cost is the earnings the individual has to forego while he or she remains a student, since the alternative to further education is in most cases being in a paid employment. From society's point of view the direct costs of education include the public expenditures for

teachers' emoluments, books, supplies and equipment over and above what is covered by tuition and textbook fees, administrative costs, depreciation cost, and imputed interest., Other elements of social direct cost are scholarships, bursaries, and most especially government subsidies to education. In almost all developing African countries the fact that education at the third level has virtually been free for a long time to the individual has meant that their governments have had to heavily or fully subsidize it. Even at the second level where private direct costs have traditionally been high, government subsidies to supplement these private direct costs have been very large.

The opportunity cost to society is the value of output that is foregone because students are not in the labour force. All these elements of private and social costs are more or less self explanatory. While data on most of them can be obtained readily from the appropriate ministries, the estimation of the depreciation cost and imputed interest may entail some element of subjectivity. Probably what needs further elucidation is the opportunity cost of education to the individual and society.

The time of teachers and students represents one of the most important resources used in education. Whereas the value of teachers' time is seen in terms of the wages and salaries they earn, that of the student can only be estimated in terms of the value of the alternative opportunities foregone by himself and society, by electing to go to school, and the monetary value of this cost is derived by calculating earnings foregone. Psacharopoulos and Woodhall (1985) have observed that wages and salaries that a student must forego in

order to enroll in education rather than find employment represent a cost not only to the individual but also to society at large since they reflect the value of goods and services that the student could have produced in employment.

The treatment of expenditures on scholarship and bursary is also worth noting. It has been observed that such expenditures should not be included in the estimation of social costs of education since they represents a transfer payment which transfers purchasing power from one group in society to another, and they do not use up real resources and therefore do not involve any opportunity costs. However, to the extent these expenditure reduces the private costs of education, they should be deducted from private costs (Psacharopoulos and Woodhall, 1985). Thus far educational benefits and costs required for educational rates of return computation have been outlined. Some adjutments however, are conventionally required in these benefits and costs in estimating the rates of return.

3.4 Educational Benefits and Costs Adjustment

Earning profiles derived from civil service salary scales and national surveys normally assume that labour is in a state of full employment and all school leavers get employed immediately after graduation. This is not very realistic, not only in developing countries but even in the developed world. In countries with high levels of unemployment, actual earnings will tend to overestimate educational benefits to the extent that most graduates will be unable to find jobs for a considerable length of time. It will also tend to overestimate the opportunity cost of students' time since the

alternative to education for some students would be unemployment rather than wages.

This problem is dealt with by finding the probability of a worker with a given level of educational attainment obtaining a paid employment, and using this probability as a weight to scale down actual earnings of workers with that level of educational attainment. In other words, full employment profiles are converted to ones allowing for unemployment by multiplying the full employment wage by the percentage unemployed at each level of education

Earnings data are also adjusted downward for income tax if our interest is in private rather than social rates. Another downward adjustment is required for the probability of survival at each age of productive employment since individuals may not necessarily live to a given age in order to enjoy the earnings associated with that age (Psacharopoulos, 1973). This might be of particular importance in developing countries where life expectancy is low.

Cost figures also need adjustment to account for dropout and failure rates. In developing African countries, wastage and repetition is very high and the cost of such wastage and repetition will always add to the cost of education. Adjustments like these to the benefits and costs figures will no doubt relate the resultant rates of return to education more to the realities of the economy they represent. Thus far the benefits and costs required for educational rates of return computation have been discussed. Attention is now focused on how these benefits and costs fits into the rate of return model.

3.5 The Rate of Return Model.

The rate of return to any investment project has been defined as that rate of interest which will equate the discounted benefits from, and the discounted costs to the project. If the expected benefits and costs of the project per year are represented by B_t and C_t respectively over n period of time then its rate of return is defined by solving equation 3.1 below for r.

$$\sum_{t=1}^{m} B_t \, (1+r)^{-t} = \sum_{t=1}^{n} C_t \, (1+r)^{-t} \qquad (3.1)$$

Applied to investment in education the rate of return to investment in a particular level of education is estimated by comparing the costs and benefits associated with that level. In this case however the costs and benefits will accrue at different time periods. For each level the n representing the period of time on the cost side (right hand side of equation 3.1) will depend on the minimum number of years required to graduate from that level, and the m on the benefit side (left hand side of equation 3.1) will depend on the average number of years a graduate from that particular level of education will be in the labour force before reaching the compulsory retiring age. Therefore all costs are cumulated forward and all benefits are discounted back to the same point in time.

To make this more succinct let us assume an elementary education of duration 10 years, a compulsory retiring age of 60 years, a school starting age of 6 years, and a heroic assumption that jobs are readily available after graduation. This implies that

elementary school graduates can legally work in the public services for 44 years before reaching the compulsory retiring age, during which time the benefits from investment in their education will be realized by themselves and their families as well as by society at large. The costs of their education however will cover a period of 10 years. The rate of return to that level of education is then defined by solving equation 3.2 below for r.

$$\sum_{t=-9}^{0} C_t(1+r)^{-t} = \sum_{t=1}^{44} B_t(1+r)^{-t} \qquad (3.2).$$

This is the model employed to estimate private and social rates of return to investment in the various levels of education.

3.6 The Overall Social Rate of Return Model.

The overall social rate of return gives an indication of the profitability of investment in education as a whole to society as opposed to investment in the various levels of education to society. The overall social rate of return figure is compared to the social opportunity cost of physical capital to ascertain how profitable investment in education is to society.

Extensive work on the estimation of the overall social rate of return has been done by Psacharopoulos (1973). This is estimated as a weighted average of the social rates of return at each level of education for a given year, the weights used being the total social costs of education at the respective level in a given year. Mathematically this is given by

$$rH = \frac{\sum\limits_{i=1}^{3} r_i C_i}{\sum\limits_{i=1}^{3} C_i} \qquad (3.3).$$

where rH is the overall social rate, r_i is the social rate of return to investment in education level i, C_i is the total annual social costs of education at level i, and i runs over the various levels of education which is three in almost all cases. The cost weights, it should be pointed out, are obtained by multiplying the number of students enrolled at each given level by the per unit annual social cost of that level. These are the models employed in this study to assess how profitable investments in education are in Ghana from both the individual and socity's perspective.

Thus far this chapter has reviewed the theoretical framework for estimating educational rates of return and the corresponding overall social rates of return. Models for their estimation have also been examined. In the next chapter, educational costs and benefits in Ghana are outlined and data on them presented, and subsequently assessed to determine the profitability of investment in education in Ghana.

CHAPTER FOUR

BENEFITS AND COSTS OF EDUCATION IN GHANA

4.1   Introduction

This chapter presents data to show the magnitude of educational benefits and costs to the individual and society for 1974 and 1980.   Distinction is made between private and social benefits as well as their corresponding costs.   While the only adjustment in the earnings data that was possible in view of data unavailability was that for unemployment, no adjustment could be made in the cost data for the same reason.

4.2   Educational Benefits in Ghana

The earnings data by educational attainment in Ghana for both 1974 and 1980 were obtained directly from public services pay scales for these years.   In the absence of a more comprehensive cross-sectional data based either on population census or large well-constructed sample surveys for Ghana, data which has very often been used in rates of return computation for most advanced countries, the use of such pay scales become inevitable.   In tables 4.1 and 4.2, a comparison of educational attainment and salaries for 1974 and 1980 respectively as obtained from the public services pay scales are given.

It will be noticed that both tables give figures on earnings for only the second and third level graduates.   Both the 'O' and 'A' levels are examinations taken at different stages in the second level, the 'O' level (Ordinary level) taken after the first 5 years, after which

Table 4.1

Comparison of Starting Salaries by Educational
Attainment, 1974.

Educational Attainment	Years & Salaries in cedis per annum.						
	1	2	3	4	5	6	7
'O' Level	840	864	888	912	936	960	984
'A' Level	--	--	1008	1044	1080	1116	1152
University Degree	--	--	- -	--	--	1440*	2244

Source: Paper Qualification Syndrome and Unemployment
of School Leavers, I.L.O., 1982.

*   One year national service allowance.

The exchange rate between the Ghanaian cedi and the U.S. dollar in
1974 was US$1.00=C1.15.

Table 4.2

Comparison of Starting Salaries by Educational Attainment, 1980.

Educational Attainment	Years & Salaries in cedis per annum.						
	1	2	3	4	5	6	7
'O' Level	2352	2406	2460	2514	2568	2742	2808
'A' Level	--	--	2742	2808	2874	2940	3006
University Degree	--	--	- -	--	--	3900*	4866

Source: Paper Qualification Syndrome and Unemployment of School Leavers (I.L.O.), 1982.

*   One year national service allowance.

The exchange rate for 1980 was US$1.00=C2.75.

successful students enroll in a 2-year sixth form program and should pass the 'A' level (Advanced level) as a prerequisite for admission into the university. At least this was the system in operation in 1980. In the absence of data for workers with elementary education and those with no education at all in tables 4.1 and 4.2 these had to be obtained through informal communications and the writer's own personal knowledge of the Ghanaian system, guided as much as possible by educated guesses. Heroic assumptions which may appear quite arbitrary at times had to be made under the circumstances.

With respect to those with no education at all, the average agricultural wage was used. The notion has long been that there is no need to waste 10 or 15 years in school only to end up in farming since the subsistence system of farming that has been in operation from time immemorial is believed to require no formal education. In fact peoples' perception of farming as being the occupation for those with no education makes the use of average agricultural wage as earning for workers with no education justified to a very large extent. For the year 1974, the average agricultural wage was approximately C501.00 per annum (Paper Qualification Syndrome, 1982). In 1980, the average agricultural wage was estimated to be approximately C1503.00[1] per annum.

For elementary school graduates, the best available figures that can give a rough estimate of their earnings are the salaries of artisans[2]. The minimum educational requirement for an artisan was middle school leaving certificate. The starting salary for an artisan in 1974 was C960.00 per annum (Paper Qualification Syndrome, 1982). I scale this figure down to C550.00 for elementary school graduates

in an attempt to eliminate the effect of the 5-year intensive on-the-job training received by these artisans. The starting artisan salary in 1980 of C2514.00 per annum is also scaled down to C1640.00 for the same reason. The absence of a comprehensive data on salaries of workers in these two categories make such seemingly arbitrary adjustments inevitable in the present study.

It will be realized that in 1974, by my adjustment artisans were earning approximately 75 percent more than elementary school graduates, but by 1980, this had decreased to 53 percent. This is consistent with the fact that the differential between the salaries of workers with different educational attainment was drastically reduced by 1980 compared with 1974. For example the differential between salaries of third and second level graduates dropped 46 percentage points from 123 percent in 1974 to 77 percent in 1980. Probably this drastic reduction in differential by 1980 can be explained by the fact that there were significant increases in the supply of graduates from all levels, including the supply of artisans. Though it has been pointed out that public sector salary scales tend to be tied rigidly to educational qualification, the effect of the supply and demand for graduates of particular educational attainment on the salary scale cannot be ruled out completely.

Although these adjustments may seem arbitrary, workers in this category (artisans), most of whom became auto mechanics, carpenters, draughtsmen and the like, were receiving salaries far in excess of that received by labourers and messengers whose only educational qualification were elementary school certificates. In the public sector itself most people were not interested in such on-the-

job training or apprenticeship. Most of them who acquired such skills went into the more lucrative private sector. It was therefore more the competition between the private and public sectors for the limited supply of workers with such skills which forced the public sector wage for artisans to be so much above that earned by workers with only elementary school certificates and no additional expertise skills.

4.3 Earning Differentials and their Adjustment for Unemployment, 1974 and 1980.

Taking tables 4.1 and 4.2 as well as the assumptions made to derive salaries for workers with educational attainments not accounted for in tables 4.1 and 4.2, the starting salaries for workers with different categories of educational attainment in the public services for 1974 and 1980 and the differentials between each category and the one preceding it are given in tables 4.3 and 4.4 respectively. It is however important to adjust the earning differentials presented in table 4.4 downwards for the probability that some graduates from all levels of education might have been unemployed for both years under review before the data can be used for the construction of meaningful earning profiles of workers in each category. This is to ensure that earning profiles do not overestimate the benefits of education at each level, since labour was not fully employed. The degree of overestimation will be greater if the level of unemployment was very high, and more so for a particular category if the rate of unemployment was unusually high among workers with that educational attainment.

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Table 4.3
Starting Salaries (in cedis per annum) by Educationa Attainment, 1974 and 1980.

Educational Attainment	Starting Salary, (1974).	Starting Salary, (1980).
No Education	501	1503
Elementary	550	1640
Secondary (plus 6TH form)	1008	2742
University Degree	2244	4866

Source: From tables 4.1 and 4.2.

Table 4.4
Earning Differentials, 1974 and 1980,
(in cedis).

	1974	1980
Elementary over No Education	49	137
Secondary (plus 6TH form) over Elementary	458	1102
University over Secondary (plus 6TH form)	1236	2124
University over No Education	1743	3363

Source: From table 4.3.

The rate of unemployment in Ghana for 1974 and 1980 were 6 percent and 8 percent respectively (United Nations Statistical Yearbook, 1982). Unfortunately there is no information on unemployment among graduates by educational attainment, which will be very useful in adjusting earning differentials for each category for probability of unemployment. Available information however, gives the general level of unemployment by occupation, and it is this information that the writer uses as the basis in his attempt to arrive at the appropriate rates of unemployment among graduates from various levels of education. The rates so arrived at then become probability weights to scale down the respective earnings by workers with different educational attainments.

I assumed that professional, technical and related workers as well as administrative and managerial workers constitute the bulk of third level graduates. Unemployment among this group of workers was 1 percent in 1974 and 1.3 percent in 1980. Clerical and related jobs as well as sales and service employments are assumed to have been dominated by second level graduates. Unemployment among this group were 19 percent and 10.3 percent for the two years under consideration respectively. Elementary school graduates and people with no education are assumed to have formed the bulk of workers in agriculture and animal husbandry, forestry, fishing and hunting, production related occupation, transport equipment operators, and labourers. Though some category of jobs listed here were almost invariably opened to only one category of workers; either people with elementary education or those with no education, there were a great deal of overlaps, which makes grouping them under one

umbrella for purposes of arriving at rate of unemployment by level of education not far from correct. In fact it is common knowledge that unemployment among elementary graduates and people with no education has been very high for some time now. Unemployment among this category was 80 percent and 88 percent in 1974 and 1980 respectively of the general level of unemployment (UN Statistical Yearbook, 1982)

From this information, unemployment "by educational attainment" is derived as shown in table 4.5, and these are used as probability values to scale down the earnings of workers with the respective educational attainments. With this, tables 4.3 and 4.4 are reproduced as 4.6 and 4.7, but this time the starting salaries and earning differentials respectively are adjusted for unemployment. It is these earning differentials adjusted for unemployment (table 4.7) which are used to construct earning profiles representing educational benefits for the various levels of education.

4.4   Private and Social Benefits of Education

Earning profiles that will be obtained from table 4.7 will show educational benefits that will accrue to the individual. In other words, such profiles will only indicate private benefits of education. To determine the corresponding social benefits, the non-monetary benefits of education, also referred to as externalities are added to private benefits. However as has already been pointed out in this study, these externalities are yet to lend themselves to quantitative analysis. Therefore the private benefits from education also do serve

Table 4.5
Unemployment Among Graduates with various Educational Attainment, 1974 and 1980, (in percentages)

Year	Unemploy- ment Rate	1st Level and No Education	Second Level	Third Level
1974	6	4.8	1.14	0.06
1980	8	7.07	0.82	0.1

Source: Estimated from U.N. Statistical Yearbook, 1982.

Table 4.6
Starting Salaries (in cedis per annum), Adjusted for Unemployment, 1974 and 1980.

Educational Attainment:	Starting Salary, (1974).	Starting Salary, (1980).
No Education	477	1396
Elementary Education	524	1524
Secondary Education	996	2724
University Degree	2242	4861

Source: Tables 4.3 and 4.5.

Table 4.7.
Earning Differentials Adjusted for Unemployment, 1974 and 1980.

	1974	1980
Elementary over No Educ.	47	128
Secondary over Elementary	472	1196
University over Secondary	1246	2141
Univ. over No Education	1765	3465

Source: Table 4.6

as the social benefits for purposes of educational rates of return computation.

4.5 Educational Costs in Ghana

Educational costs for purposes of rate of return computation is broadly classified under private and social costs. Under these broad classifications we have direct and indirect or opportunity costs.

4.5.1 Private Direct Costs

Private direct costs in Ghana for purposes of this study include boarding and lodging fees and textbook fees, while opportunity cost is measured in terms of foregone earnings. Tuition has been free at all levels of education in Ghana since long, and it was not until 1965 that the policy of free textbook fees was cancelled and textbook fees were instituted (West Africa, 1990). At the first level the main element of private direct cost that can be considered is textbook fees. Expenditures on items such as stationary, school uniforms, and more recently furniture (since students have had to provide their own tables and chairs) also forms an increasing part of private direct costs at this level. However, data on these expenditures are not available to be included in the present study. The average direct cost (textbook fees) in 1974 and 1980 for the first level were C3.50 and C7.50 respectively[3].

Perhaps the impact of direct costs on private rates of return is mostly felt at the second level where the individual is called upon to bear part of the boarding and lodging costs, textbook costs, beside paying fully for other academic supplies as stationary, school

uniforms, medical and sport fees and transportation costs. Boarding and lodging fees as well as textbook fees have always been heavily subsidized by the government. To the individual therefore, the second level has always represented the most expensive level of education. The only exception to this has been the Teachers' Training Colleges where boarding and lodging fees were free and students also received some allowances as an incentive.

The fact that the second level has been very expensive to the individual relative to the other levels is not surprising since the general secondary, technical and vocational institutions as well as training colleges that were established during the colonial era and post independence period were mostly boarding schools in nature. There was very little or no emphasis on day schools at the second level. The average boarding and lodging fees per student per year in 1974 and 1980 were C168.00 and C270.00 respectively. Textbook fees remained unchanged for both years at C24.00 per year per student. The other elements of direct cost at the second level were however excluded from this study due mostly to lack of data than their relative unimportance. It should also be pointed out that no private direct cost was allowed for the 2-year sixth form preparation for university work since all students who qualified into the sixth form enjoyed a government bursary that covered boarding and lodging as well as textbook fees.

At least up to 1980 there was no direct cost of education at the third level that could be considered for purposes of private rates of return computation. In addition to free tuition, textbook fees was also non-existent so to speak. Beginning 1975, university students

enjoyed a book loan of C700.00 per student per year to cover their textbook expenses. The writer did not however find it expedient to regard the book loans as private cost for the simple reason that no arrangement was in place to ensure that students paid back these loans after graduation. Students therefore enjoyed the supposed bookloans without paying anything back. The Ghana Commercial Bank, suppliers of the loans, disclosed in 1985 that some 27,000 university graduates owed the bank to the tune of C50 million since the inception of the bookloan scheme in 1975 (West Africa, Dec. 9, 1985). Though efforts are being made now to retrieve the more recent loans (those dating back to 1986), especially so since these loans were increased to C5000.00 per student per year from that year, those given out up to 1980 can conveniently be written off when we consider the direct cost of education to the individual. It might probably be proper to categorize these bookloans under the social costs of education at the third level for that period.

Boarding and lodging fees were also absent at the third level, and students enjoyed a feeding subsidy which in 1982 was C7.00 per student per day but had increased to C34.00 by 1984/85 academic year. Table 4.8 gives estimated total private costs by level of education for selected years required for the respective levels' private rates of return computation. From table 4.8 private direct costs were very low at the first level and absent at the third level. It

Table 4.8.

Private Direct Costs by Level of Education for Selected
Years, (current price cedis).

	1965	1968	1974	1980
First Level	1.5	1.5	3.5	7.5
Second Level	- -	90	168	294
Third Level	- -	- -	- -	- -

Source: Ghana Education Service, Accra, (first level)
          Accra Girls' Secondary School, Accra, (second level).

will also be noticed from table 4.8 that private direct cost figures for terminal years 1965 and 1974, and 1971 and 1980 for the first level; 1968 and 1974, as well as 1974 and 1980 for the second level are given. Figures for the intervening years are obtained by interpolation.

4.5.2 Private Opportunity Cost

Foregone earnings measure the opportunity cost of students' time in terms of salaries they could have earned by being employed rather than pursuing further education. The data for foregone earnings in this study were obtained from the civil service salary scales by educational attainment as reported in the International Labour Office Paper Qualification Syndrome and Unemployment of School Leavers (1982). The salary scale for workers with elementary education for example represents earnings foregone by second level students by virtue of their enrolling in school. To the extent that some graduates from all levels of education suffered unemployment during the period actual earnings will tend to overestimate foregone earnings for each level. Foregone earnings are therefore adjusted by the probability that some students were unemployed.

No foregone earnings are allowed for elementary school or first level graduates. The most appropriate figures would have been the earnings of workers with no education, but the interesting point is that both first level graduates and people with no education enter the labour force at about the same age. It should however be pointed out that most children tend to flout the existence of a child labour law that prohibits them from engaging in any paid

employment simply because this law is not rigidly implemented. Therefore since children can earn income by engaging in some illegal activity if they choose not to enroll in elementary school, it is only proper that allowance should be made for forgone earnings at this level.

Probably the earnings of 'shoe-shine' boys in the urban centers, most of whom are either elementary school drop-outs or children who have never attended school at all, or some fraction of average agricultural earnings could aptly be used to represent foregone earnings at the first level. In the rural areas the only alternative to going to school, at least at the first level, is for children to help their parents with their farming activities. No information exists on the earnings of shoe-shine boys, and what fraction of agricultural earnings to be used as foregone earnings at this level will also entail a great deal of subjectivity.

The earnings of elementary school leavers serve as the closest estimates of foregone earnings at the second level. However, to the extent that the majority of students who continued their education at the secondary level did not have to complete the first level and therefore entered the second level around the age of 14, using the earning figures of the first level graduates is an overestimation. This is more so when it is realized that no employer is willing to employ first level graduates below the age of 18 because of the dexterity involved in the nature of jobs opened to them. Therefore between the ages of 14 and 18 there is reason to believe that most second level students would have been unemployed, and the concept of foregone earnings would be less significant. Notwithstanding this

limitation, earnings of first level graduates remain the best approximation to foregone earnings at the second level. In tables 4.9 and 4.10, foregone earnings for the periods 1968-74 and 1974-80 for the second level are presented.

The yearly increase in the earnings (unadjusted) was based on the increases observed in the earnings of graduates with higher educational attainments. It should be pointed out that a great deal of arbitrariness is inherent in arriving at these figures. The figures are based on rational educated guess as a result of the writer's personal knowledge of Ghana. It should be emphasized that such rational educated guesses are inevitable in studies related to developing countries in view of problems associated with data acquisition. The initial unadjusted figures of C550.00 and C1640.00 for the periods 1968-74 and 1974-80 respectively were allowed yearly increases of C20.00 and C45.00 respectively, based on the fact that second level graduates who were earning C840.00 and C2352.00 in 1974 and 1980 respectively had yearly increases of C24.00 and C54.00 respectively (PQS, ILO, 1982). In spite of the seemingly inherent arbitrariness, such rational educated guesses based on the writer's personal knowledge of the Ghanaian system cannot be avoided because of the serious limitation imposed by lack of the required data.

Foregone earnings for third level students are the most reliable in this study since complete data on that is readily obtained. Tables 4.11 and 4.12 presents both unadjusted and adjusted third level foregone earnings for the periods 1972-74 and 1978-80

Table 4.9
Foregone Earnings of Second Level Students,
1968-74, (current price cedis).

Year	Unadjusted	Adjusted
1968	550	524
1969	570	543
1970	590	562
1971	610	581
1972	630	600
1973	650	619
1974	670	638

Source: Unadjusted from P.Q.S., I.L.O., 1982.
Adjusted from unadjusted and Table 4.5.

Table 4.10
Foregone Earnings of Second Level Students,
1974-80, (current price cedis).

Year	Unadjusted	Adjusted
1974	1640	1524
1975	1685	1565
1976	1730	1607
1977	1775	1649
1978	1820	1691
1979	1865	1733
1980	1910	1774

Source: Unadjusted from P.Q.S., I.L.O., 1982.
Adjusted figures from the unadjusted and Table 4.5.

Table 4.11
Foregone Earnings of Third Level Students,
1972-74, (current price cedis).

Year	Unadjusted	Adjusted
1972	1008	996
1973	1044	1031
1974	1080	1067

Source: Unadjusted from P.Q.S. , I.L.O. 1982;
          Adjusted from Unadjusted and Table 4.5.

Table 4.12
Foregone Earnings of Third Level Students,
1978-80, (current price cedis).

Year	Unadjusted	Adjusted
1978	2742	2720
1979	2808	2786
1980	2874	2851

Source: Unadjusted figures from P.Q.S., I.L.O., 1982;
          Adjusted from unadjusted and Table 4.5.

respectively. Thus far data on private direct costs and private foregone earnings which are required for assessing the profitability of educational investment to the individual have been presented. However it is the profitability of educational investment to society at large that is very important for educational planning policy.

4.6   Social Cost of Education in Ghana

The costs of education to society include the public expenditure on education. They also include foregone earnings to students to the extent that salaries a student has to forego in order to enroll in education rather than being employed represents cost to himself and to society as a whole since they reflect a fall in current output to society because of his being in school. In other words they reflect the value of goods and services that could have been produced by the student in employment, or the value of goods and services that society has to forego besides the direct cost of education. The issue here is not whether or not society's loss in this case will be more than offset by society's gain through increased productivity of the student after completing his education. To the extent that society has to accept a lower level of output while the student is enrolled in school, his foregone earnings is also a cost to society.

Private foregone earnings presented in the previous section also holds for society as a whole, and since this has already been exhausted in detail, attention is focused on the other aspect of social cost of education, namely public expenditure on education. It has been pointed out that educational finance in Ghana for the most part has long been the responsibility of the government. The fact that

tuition is free at all levels, and textbook fees are charged only at the first and second levels is an indication of the fact that the greatest burden of educational finance rest on the government. Even the approximately C144.00 and C270.00 paid by each second level student (except those in teachers' training colleges) in 1974 and 1980 respectively had to be subsidized to the tune of C111.00 and C526.50 per student by the government[4]. In fact educational expenditure as a percentage of total government expenditure has been hovering around 20 percent from 1960 to 1980 (UNESCO Statistical Yearbook, various issues).

What is however required for social rates of return computation is per student public expenditure by various levels of education. Total public expenditure on education consist of public current and public capital expenditures. Public current educational expenditure consist of expenditures on teachers' emoluments and teaching materials, administration, scholarships, and welfare services. In this study however, public current expenditure is restricted to expenditures on teachers' emoluments and teaching materials which, apart from constituting the greatest proportion of current educational expenditure, are more direct instructional costs. Again data on the proportion of public current expenditure that goes into paying teachers' salaries and on teaching materials at all levels are readily available. Scholarships are excluded since as has already been pointed out, they constitute transfer payments, transferring purchasing power from one group in society to another. Table 4.13 shows total public current expenditure on education and their breakdown by educational levels.

Table 4.13
Public Current Expenditure on Education and Distribution by Level of Education for Selected Years ('000 of current price cedis).

Year	Public Current Expenditure on Education	Allocation to:		
		First Level	Second Level	Third Level
1965	56099	20140	13239	14922
1968	74979	28717	19719	21294
1969	76403	30867	21622	17573
1970	83813	32855	23300	21037
1971	97483	38018	25736	23688
1973	103750	51564	27390	24381
1974	194114	83469	42317	38435
1975	240682	58967	89053	40435
1976	251123	76844	112503	75274
1978	441088	131003	180405	109263
1979	728093	213331	313808	127392
1980	734256	215137	284157	153217

Source: UNESCO Statistical Yearbook, (various issues).

4.7   Expenditure on Teachers' Salaries and Teaching Materials

Data on the proportion of public current expenditure on education that went into paying teachers salaries and covering teaching materials at various level of education in Ghana over the years are scanty.   However, once they are obtained for a few years, they are used as a basis to arrive at those for the other years by interpolation.   In table 4.14, expenditures on teachers' emolument and teaching materials as a percentage of public current expenditure for selected years are presented.   It is observed that on the average, over 90 percent of public current expenditure on education at all levels went into paying teachers remuneration and teaching materials.

Using tables 4.13 and 4.14, expenditures on teachers' emoluments and teaching materials for the various levels of education are obtained and presented in table 4.15.   I assumed 90 percent of public current expenditure on education at all levels went into teachers' salaries and teaching material for those years where data on this breakdown is not available.   To get a complete picture of public expenditure by level of education however, there is the need to add to the public current educational expenditure by levels, the corresponding public capital expenditures.

4.8   Public Capital Expenditure on Education

Capital expenditures on education presents a problem to the extent that they are not fully expended or utilized in one year but adds to the educational capital stock.   They are for the most part

Table 4.14
Expenditure on Teachers' Emoluments and Teaching Materials as Percentage of Public Current Education Expenditure for Selected Years.

Year	First Level	Second Level	Third Level
1976	96	87	89
1977	95	86	89
1978	96	86	89
1979	93	84	87
1980	99	99	98
1981	99.6	99.6	99.3

Source: 1976, 1979, 1981; from UNESCO Statistical Yearbook. Others by interpolation.

Table 4.15
Public Current Expenditure on Teachers' Emoluments and Teaching Materials by Level of Education, ('000 of current price cedis).

Year	First Level	Second Level	Third Level
1965	18126	11915	13430
1966	20772	13859	15342
1967	23345	15759	17241
1968	25845	17747	19165
1969	27780	19460	15816
1970	26613	20970	18933
1971	34216	23162	21319
1972	40312	23907	21631
1973	46408	24651	21943
1974	75122	38085	34592
1975	53070	80148	36392
1976	73770	97878	66994
1977	98457	125611	81573
1978	125763	155148	97244
1979	198398	263599	110831
1980	214276	283020	152144

Source: Tables 4.13 and 4.14.

used either for the construction of new structures or to renovate existing school structures. The writer makes the heroic assumption that structures for the second and third levels have life span of 60 years since they are usually built with very strong materials. At the first level however, structures are assumed to have an average life span of 15 years since these are mostly built by local residents through communal labour, and with the use of as much local materials as possible.

The capital stock is further assumed to wear itself out at a constant rate until it is completely exhausted at the end of its life span. Though this is not a very realistic assumption, it enable us to treat educational capital expenditure as an item that is consumed equally by all students from its first year to the last year after which it is no longer useable. Table 4.16 presents data on public capital expenditure by level of education. By dividing each expenditure at the first level by 15, and the corresponding second and third level figures by 60 and further adding them to their corresponding public current educational expenditure values presented in table 4.15, a complete picture of public expenditure on education is obtained as shown in table 4.17. Our interest however is in per unit private and social costs of education, and this requires information on enrollment at each level over the period under consideration.

4.9 Enrollment by Level of Education.

Although growth in enrollment by level of education was highlighted in chapter 2, it was raised within the framework of examining the quantitative expansion in the Ghanaian educational

Table 4.16
Public Capital Expenditure by Level of Education
For Selected Years, ('000 of current price cedis).

Year	Public Capital Expd. on Education	Allocation	to:	
		First Level	Second Level	Third Level
1965	9303	214	2718	5688
1967	6598	145	2560	3497
1968	5014	115	2186	2457
1969	10119	233	4898	4554
1970	11617	256	6145	4705
1971	18052	307	8322	6047
1973	12880	206	7573	1971
1974	33962	374	24317	6894
1975	68341	820	51119	9021
1976	95526	955	78140	2293
1978	47603	952	38082	4776
1979	41522	830	33218	2491
1980	47100	942	38151	2355

Source: UNESCO Statistical Yearbook, (various issues).
For years with no data on percentage distribution, distribution
by level is by interpolation.

Table 4.17
Total Public Expenditure by Level of Education,
1965-1980, ('000 of current price cedis).

Year	First Level	Second Level	Third Level
1965	18140	11960	13525
1966	20784	13903	15418
1967	23355	15802	17299
1968	25853	17783	19206
1969	27796	19542	15892
1970	26630	21072	19011
1971	34236	23301	21420
1972	40329	24040	21698
1973	46422	24777	21976
1974	88713	38490	34707
1975	53125	81000	36542
1976	73834	99180	67032
1977	98520	126579	81631
1978	126715	193230	102020
1979	198453	264153	110873
1980	214339	283656	152183

Source: Tables 4.15, 4.16, and some interpolations.

system over the years. A much more detailed presentation of data on enrollment at each level over the years is made in table 4.18 as a basis to arriving at private and social unit costs of education. It should however be pointed out that from 1974 , the middle school system which was hitherto classified under first level was, for purposes of public expenditure allocation by educational levels classified under the second level. Therefore unlike the period before 1974, the first level enrollment figures from 1974 to 1980 represents enrollment in primary schools alone, and that for the second level during that period represents enrollment in both the traditional second level institutions and the middle school system. For example it will be observed from chapter 2 that the actual enrollment in the first level (primary and middle schools together) for 1974 and 1980 were 1,490,667 and 1,907,757 respectively. However, with the classification of middle schools under general secondary schools since 1974 for purposes of public expenditure allocation, the figures dropped to only 1,051,012 and 1,379,030 respectively. Enrollment in the second level for the same reason is 532,966 and 668,387 respectively instead of 92,311 and 139,660 given in chapter 2.

The implication of this is that the private and social unit costs for the first level up to 1974 should be seen as representing both the primary and middle school systems. Beyond that, private and social unit costs for the first level is specifically for the primary schools while that for the second level includes the middle schools. Much in the same way rates of return computed for the first level in 1974 should be viewed as representative of the entire elementary school

Table 4.18

Enrollment by Level of Education, 1965-1980.

Year	First Level	Second Level	Third Level
1965	1413517	--	--
1966	1411942	--	--
1967	1408112	--	--
1968	1404085	72379	--
1969	1400059	85839	--
1970	1419838	99299	--
1971	1415801	97793	5783
1972	1447205	96287	6625
1973	1454999	94781	7466
1974	1051012	531966	8022
1975	1157303	555980	--
1976	1213291	576979	--
1977	1246482	592526	--
1978	1295525	613710	9850
1979	1335463	630607	9745
1980	1379030	668387	9451

Source: UNESCO Statistical Yearbook, (various issues)
Note: For each level data could only be provided for those years required in computing rates for that particular level.

system (i.e., primary and middle schools together), and that computed for 1980 should be seen as that for only the primary school system. The 1980 figure for the second level should be interpreted to include the middle school system.

Table 4.19 shows public expenditure per student year by level of education. Public expenditure per third level student in 1973 was 90 times greater than that per first level student, and 11 times greater than that per second level student. By 1980, however this has increased to approximately 103 times and 38 times respectively. This no doubt shows how costly it is from the government's point of view to educate one university student relative to students at the other levels. In other words in 1980, 103 times as many resources were required by the government to educate one university student relative to one primary school pupil, and 38 times as many required relative to a secondary school student.

4.10 Private and Social Unit Costs.

Private and social unit costs by level of education can now be determined from the per unit direct cost, foregone earnings, and per unit public expenditure on eduction, all by level of education. Private unit cost combines private per unit direct cost and foregone earnings by level of education. In tables 4.20 and 4.21, private unit cost by level of education which is required to compute private educational rates of return for 1974 and 1980 respectively is presented. For each level data is provided for only those years required for the computation of private rates. Private unit costs for the first level is very low relative to the other levels in view of the

Table 4.19

Public Expenditure Per Student Per Year by Level of Education, 1965-1980, (in cedis at current price).

Year	First Level	Second Level	Third Level
1965	12	--	--
1966	13	--	--
1967	15	--	--
1968	16	246	--
1969	18	228	--
1970	19	212	--
1971	23	238	--
1972	27	250	3275
1973	29	261	2943
1974	57	214	4326
1975	49	146	--
1976	60	172	--
1977	76	214	--
1978	92	313	10357
1979	145	419	11377
1980	147	424	16102

Source: Tables 4.17 and 4.18

Figures provided for only those years required to compute rates of return for each level.

Table 4.20

Private Unit Cost by Level of Education (in current
price cedis), 1965-1974.

Year	First Level	Second Level	Third Level
1965	2	--	--
1966	2	--	--
1967	2	--	--
1968	2	614	--
1969	3	646	--
1970	3	678	--
1971	4	710	--
1972	4	742	996
1973	4	619	1031
1974	4	638	1067

Source: Tables 4.8, 4.9, and 4.11.

Table 4.21

Private Unit Cost by Level of Education (in current
price cedis), 1971-1980.

Year	First Level	Second Level	Third Level
1971	4	--	--
1972	4	--	--
1973	4	--	--
1974	4	1692	--
1975	4	1754	--
1976	4	1817	--
1977	8	1880	--
1978	8	1943	2719
1979	8	1733	2786
1980	8	1774	2851

Source: Tables 4.8, 4.10, 4.12.
               Figures round up to the nearest cedi.

fact that no foregone earnings were allowed for that level. In fact foregone earnings alone constitutes roughly 90 percent of private unit cost at the second level, and the entire figure for the third level since no direct cost was allowed for the latter.

It will also be noticed that private unit cost figures for the last two years at the second level for both tables 4.20 and 4.21 were lower than those for the years just preceding them. This is explained by the fact that no direct costs were allowed for the last two years devoted to sixth form work since all students enjoyed government bursary that covered boarding and lodging as well as textbook fees. Thus the only element of private unit costs for those two years, just like the third level, were foregone earnings.

Social unit costs by level of education are presented in tables 4.22 and 4.23. They combine per unit public expenditure and foregone earnings, and just like the private unit costs, for each level of education they are only provided for those years required for the computation of social rates for that level. For the most part the social unit cost figures behave in the same way as the private unit costs. For any given year, costs are lowest at the first level and highest at the third level.

So far this chapter has been devoted to analyzing empirical data on educational benefits and the various components of private and social costs of education in Ghana. The foundation has therefore been laid for the computation of both private and social rates of return not only by level but also the overall social rates. The next chapter presents these results and examines how these results compare with others estimated for Ghana and other countries.

Table 4.22

Social Unit Cost by Level of Education (in current price cedis), 1965-1974.

Year	First Level	Second Level	Third Level
1965	12	--	--
1966	13	--	--
1967	15	--	--
1968	16	740	--
1969	18	767	--
1970	19	793	--
1971	23	788	--
1972	27	812	4022
1973	29	834	3460
1974	57	696	4499

Source: Tables 4.9, 4.11, 4.19.

Table 4.23

Social Unit Cost by Level of Education (in current price cedis), 1971-1980.

Year	First Level	Second Level	Third Level
1971	23	--	--
1972	27	--	--
1973	29	--	--
1974	57	1749	--
1975	49	1895	--
1976	60	1972	--
1977	76	2074	--
1978	92	2169	11742
1979	145	2111	14033
1980	147	2154	15078

Source: Tables 4.10, 4.12, 4.19.

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1   Based on my personal knowledge of the Ghanaian system, and rational educated guess   influenced for the most part by personal informal communications with people who were in the labour force at that time.

2   An artisan in the Civil Service is a workman who has undergone a systematic apprenticeship in a government department for a period of five years in a prescribed trade.   The minimum educational requirement is Middle School or 10 years.

3   Figures obtained from Ghana Education Service through informal communication.

4   Figures obtained from the Finance Office, Accra Girls' Secondary School, Accra, Ghana, through informal communication.

CHAPTER FIVE

MONETARY RETURNS TO EDUCATIONAL INVESTMENT IN GHANA

5.1 Introduction

This chapter presents the results of the study. Private and social rates of return to investment in education by level is presented for 1974 and 1980. The results for these two periods are compared and used as the basis to examine the extent of educational development in Ghana. Comparison is also made of the results of this study with that of other works done for Ghana as well as educational rates of return for other African and some advanced countries. Overall social rates of return for 1974 and 1980 are also estimated and compared with rate of return to investment in physical capital which is often used as a yardstick in an attempt to ascertain the profitability of investment in human capital. This also help us to answer the question whether society's resources are being efficiently allocated between human and physical capital, or more specifically whether or not there is underinvestment or overinvestment in human capital vis-a-vis physical capital. Before the results of the study are presented however, it is imperative to present the final benefit and cost figures arrived at for each level of education and how these are used to compute the rates.

5.2 Benefit and Cost Figures for Ghana

Final figures for Ghana's educational benefits that are used to compute educational rates of return in this study are presented in

table 5.1. These figures have already been highlighted separately in chapter 4, but they are being grouped together only for purposes of summarizing them to give an indication of the final figures arrived at. It is these earning differentials representing educational benefits that are assumed to persist over the period when graduates from the respective levels of education legally remain in the labour force.

It is important to examine how these earning differentials behaved in relative terms for the two years of reference in order to ascertain their consistency and how reliable they are as a measure of educational benefits in Ghana. If for example it is realized that their relative magnitude declined in 1980 compared to 1974, it will suggest that the benefits of education in Ghana have been declining over the years, in which case it would not make a lot of sense to estimate the returns to education. Table 5.2 shows earning differential for each level as a ratio of that for the subsequent one for 1974 and 1980. From the table it is observed that the ratio of the differentials of the first level to the second level increased in 1980 from 10.0 percent in 1974 to 10.7 percent, that of the second level to the third level increased form 37.9 percent to 55.9 percent, while that of the first level to the third level rose from 3.8 percent to 6.0 percent over the period. Table 5.2 is a manifestation of the fact that educational benefits in Ghana have been increasing.

After graduating at age 16, first level graduates could work in the public sector for 44 years before the compulsory retiring age of 60 is reached. Therefore their earning differential of C47.00 in 1974 (table 5.1) is projected 44 years into the future with an interest rate of 6 percent to arrive at the earning profile for this level of

Table 5.1

Educational Benefits by Level, 1974 and 1980
(current price cedis).

	1974	1980
First Level	47	128
Second Level	472	1196
Third Level	1246	2141

Source: Table 4.7.

Table 5.2

Earning Differential by Educational Attainment
Expressed as Percentage of that for the next
1974 and 1980.

	1974	1980
First as % of Second	10.0.	10.7
Second as % of Third	37.9	55.9
First as % of Third	3.8	6.0.

Source: Estimated from Table 4.7.

education. Second and third level graduates could also work for 38 years and 35 years respectively after graduation. Their earning differentials of C472.00 and C1246.00 respectively in 1974 are projected over these years, with the 6 percent interest rate to arrive at their earning profiles. Earning profiles for all three levels in 1980 are similarly estimated with their earning differentials of C128.00, C1196.00, and C2141.00 (table 5.1) respectively, but this time with an interest rate of 13.5 percent. The estimation procedure of these earning profiles is represented by the benefit side (right hand side) of equation 5.1 to 5.3 overleaf.

For purposes of the rates of return computation, it is assumed that these future streams of income are known, and that they are discounted back to the year for which these rates are being computed, i.e. the year of reference, and the rate of discount used is the rate of interest which is the bank rate in this study

The private and social unit costs for each level of education covers the average number of years required to complete that particular level of education in 1974 and 1980; 10 years for the first level, 7 years for the second level, and 3 years for the third. The realistic assumption is that 10 years of private and social unit costs must be incurred at the first level before the 44 years of benefits can be reaped. Likewise 7 years and 3 years respectively of private and social costs must be incurred before the 38 years and 35 years of benefits can be reaped by the second and third level graduates respectively, and society at large. Private and social unit costs are cumulated forward, using the same interest rate used to discount the benefits, to the year of reference. Cumulated private and social costs

by educational level, using interest rates 6 percent and 13.5 percent for 1974 and 1980 respectively are shown on the cost side (left hand side) of equations 5.1 to 5.3. Private and social unit costs figures by level of education is presented in chapter four and these are reproduced in Appendix A for the estimation of the private and social rates of return. What are presented in table 5.3 are just the private and social unit costs for the two years of reference.

The computation of both private and social rates for each level of education for 1974 and 1980 are presented in Appendix A. Suffice it to say for now that the rates of return to investment in education at the first, second and third levels are derived by solving equation 5.1, 5.2, and 5.3 below respectively for r, when the actual benefits and costs (B_t and C_t respectively) figures for each level are substituted into the respective equation.

$$\sum_{t=-9}^{0} C_t(1+r)^{-t} = \sum_{t=1}^{44} B_t(1+r)^{-t} \qquad (5.1)$$

$$\sum_{t=-6}^{0} C_t(1+r)^{-t} = \sum_{t=1}^{38} B_t(1+r)^{-t} \qquad (5.2).$$

$$\sum_{t=-2}^{0} C_t(1+r)^{-t} = \sum_{t=1}^{35} B_t(1+r)^{-t} \qquad (5.3).$$

5.3   The Result of the Study

The 1974 and 1980 private and social rates of return to investment in the various levels of education in Ghana are presented

Table 5.3

Private and Social Unit Costs by Level of Education,
(in current 1974 and 1980 cedis respectively).

	1974		1980	
	Private Unit Cost	Social Unit Cost	Private Unit Cost	Social Unit Cost
First Level	4	57	8	147
Second Level	638	696	1774	2154
Third Level	1067	4499	2851	15078

Source: Tables 4.20, 4.21, 4.22, and 4.23.

in table 5.4. From these results the first striking observation is the fact that private rates exceed social rates at all levels and for both years. This situation is to be expected as long as social unit costs are greater than private unit costs at all levels, and both private and social benefits are represented by the same earning differential because the non-monetary social benefits do not lend themselves to quantification and are therefore excluded. It has been pointed out that the greatest burden of the cost of providing educational services in Ghana has always been borne by the government. This is evidenced by the fact that tuition at all levels has always been free.

Rates are also highest at the first level, followed by the third level, and lowest at the second level for both 1974 and 1980. Textbook fees that were very low constituted the only element of private cost at the first level. Foregone earings which constituted approximately 90 percent of private unit cost at the second level was absent at the first level. Thus private unit costs are very low at the first level, and this is reflected in the very high private rates of return figures of 33.6 percent and 39.3 percent for 1974 and 1980 respectively. At the third level where there were no private direct costs so to speak, foregone earnings represented the only element of private cost. The absence of boarding and lodging fees at this level meant that the government had to cater not only for feeding but also accommodation and other related services. Thus the entire 'private' and social direct costs had to be borne by the government. With salaries rigidly tied to educational attainment and to a very large extent favouring university graduates, it is not surprising that private rates are very high at the third level, exceeding 30 percent

Table 5.4
Social and Private Rates of Return by Level of
Education, 1974 and 1980, (percentages).

		1974	1980
	First Level	14.5	18.2
Social Rate for:	Second Level	9.9	14.5
	Third Level	13.9	14.9
	First Level	33.7	39.3
Private Rate for:	Second Level	10.9	14.9
	Third Level	33.3	30.0.

for both 1974 and 1980, while the corresponding social rates are relatively low. In fact for both the first and third levels, social rates are less than half the value of the private rates for both years.

It is only at the second level where both direct costs and foregone earnings together constituted private cost, and this is the level with the least private and social rates. The difference between private and social rates is also the least at this level, 1.0 in 1974 and 0.4 in 1980, suggesting that there is not much difference between the cost of education borne by the government and the individual. In fact it has been pointed out that the second level represented the most costly level to the individual, and the relatively low private rates is a manifestation of that. It is therefore the difference between the social direct cost (per unit public expenditure) and the private direct cost that place a wedge between the private and social rates at the second level, since foregone earnings are present in the computation of both.

5.4 Comparison of the Results for 1974 and 1980.

It has been observed that for countries where time-series evidence on educational rates of return exist, as in the United States, this evidence suggests that rates of return to education have not only remained relatively stable over time, but they have also been found to decrease with the level of economic development (The World Bank, 1986), which will also suggest a similar relationship between these rates and the level of educational development. It is against this background that I attempt to make a comparative analysis of the rates of return computed for 1974 and 1980.

In fact one would expect the rates estimated for 1980 to deviate very little from that estimated for 1974. This, however, is not the case in the present study. From the results presented in table 5.4, social rates increased from 14.5 percent to 18.2 percent for the first level; 9.9 percent to 14.5 percent for the second level; and 13.9 percent to 14.9 percent for the third level. Private rates also went up from 33.6 percent in 1974 to 39.3 percent in 1980 for the first level, 10.9 percent to 14.9 percent for the second level, but dropped from 33.3 percent to 30.0 percent for the third level. It is pertinent at this point to examine these rates within the framework of economic theory in order to find out whether there are increasing or decreasing returns to resources invested in education in Ghana. This will also give us an idea about the stage of educational development in Ghana.

5.5   The Education Product Curves Analysis

With increased investment to expand education, figure 5.1 shows how the educational Total Product (TPe), Marginal Product (MPe), and Average Product (APe) curves will behave. With time, as the stock of educated people increases with the increased resources to expand education, educational marginal product increases at first, reaches a maximum, and then declines. Educational average product also increases at low levels of stock of educated people, reaches a maximum and then declines. Economists find it useful to partition the product curves into regions shown as stages I, II, and III. In this analysis our interest is in the marginal product, which is equal in equilibrium to the remuneration to educated manpower. This in turn

Educational Total Product, Marginal Product,
and Average Product.
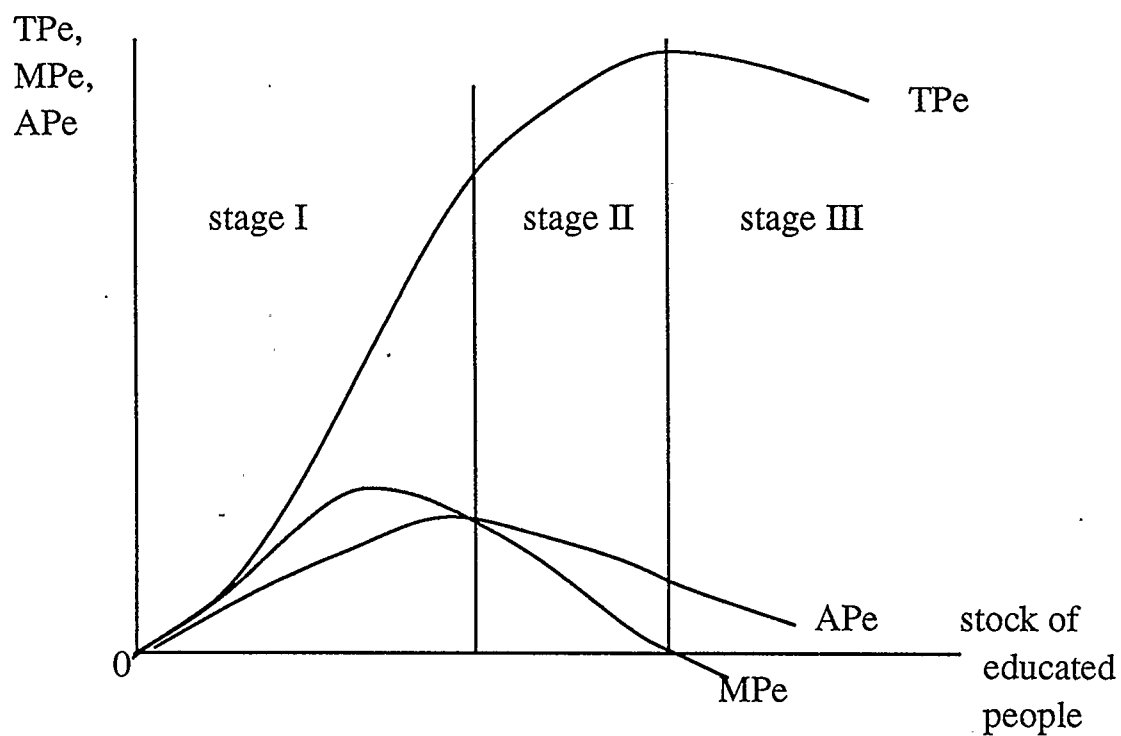
Figure 5.1

allows us to compare with the wage of the untrained and unskilled labourer, and hence to calculate the rate of return on education.

In stage I which ends when the average product is at its maximum point, there is increasing returns to resources invested in education. However it is unwise to produce in this stage because marginal product is increasing so increased investment in education increases the stock of educated people in greater proportion. Although beyond a certain point marginal product starts to decline, the average product is still rising until it reaches a maximum. There is an incentive to expand production beyond this region into stage II since increased 'profits' or 'returns' can be reaped. Stage II is characterized by decreasing returns to educational investment as total product increases but at a decreasing rate, and both marginal product (rate of retun) and average product decreases as the stock of educated people increases. Stage III is not economically feasible since total product is falling and marginal product is negative. Production cost is higher but returns is lower, and the rational producer will never operate in this stage.

We expect production to take place in stage II where the marginal product (reflecting the marginal efficiency of human capital) or educational rate of return falls with increased stock of educated people with time. If the Ghanaian educational system was operating in this stage (illustrated by figure 5.2), one would expect educational rates of return computed for 1980 to be less than those for 1974. As time increases from 1974 to 1980, the educational system will turn out more educated manpower, in which case we will expect rate of return on education to fall.

Returns to Education in stage II
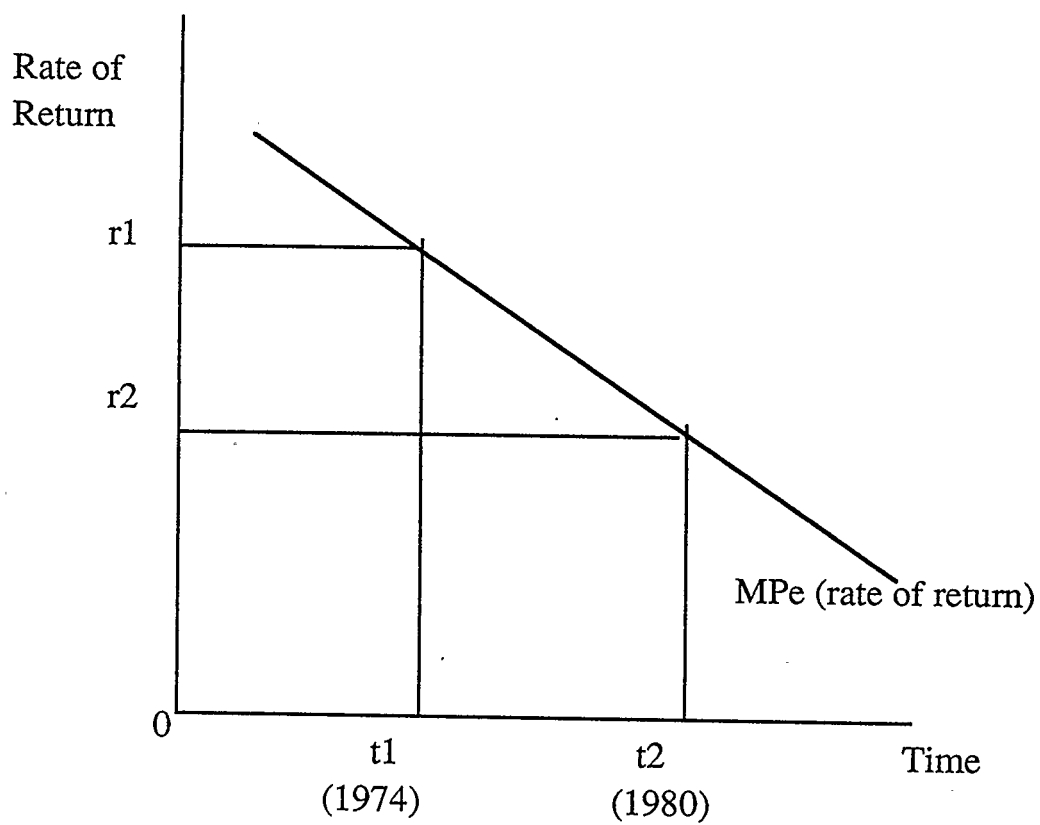
Figure 5.2

It is only the third level private rates that satisfies this condition. Social rates by every level and private rates for first and second levels, all for 1980 are higher than those for 1974. This suggests that to a very large extent, education in Ghana, at least up to 1980, was still in the 'early' stages of development. The educational system is still operating in stage I where increasing returns to educational investment obtains, and as time increases from 1974 to 1980, both the stock of educated manpower and the rate of return on education increases, as illustrated in figure 5.3. Probably from the individual's point of view, university education has developed beyond the 'early' stage. Reasons can however be adduced to explain the disparity between the rates for 1974 and 1980, which will tend to reduce to some extent the potency of the assertion that educational development in Ghana is still in its early stage.

5.6 Other Reasons Accounting for Disparity in Returns for 1974 and 1980

It should be pointed out that unlike the United States and other advanced countries where economic conditions are relatively stable over time, economic conditions in Ghana are highly unstable, and evidence can be adduced to show that economic conditions in 1974 were completely different from what existed in 1980. For example the rate of discount of the Bank of Ghana (Central Bank) used to discount earning differentials and costs more than doubled from 6.0 percent in 1974 to 13.5 percent in 1980. Of course this tend to cast a lot of doubt on earning profiles projected over 30 to 40 years into the future since actual earnings may vary significantly from the

Returns to Education in stage I
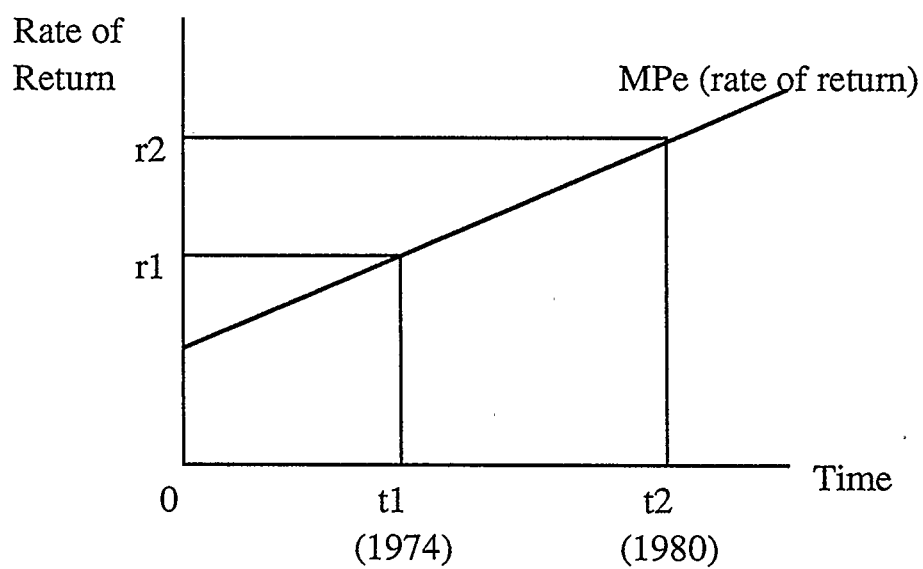
Figure 5.3

projected earnings. Cost figures are also subject to the same inconsistency when we use 1980 discount rate to cumulate costs from 1971 to 1980. It is not exactly known the effect of this increase in discount rate on educational rates of return computed for 1980, but at least the sharp increase in the discount rate gives an indication of the volatile nature of the Ghanaian economy over time.

Apart from the differences in economic conditions, the differences in results between these two years of reference can also be attributed to a change, after 1974, in the allocation of public expenditure between the first and second levels of education. It has already been pointed out that for purposes of public expenditure allocation the middle school system which, to all intents and purposes, was an integral part of the first level, commonly referred to as the elementary school system, was from 1974 put in the same category with the second level institutions. Of course the per unit private cost and per unit public expenditure on a middle school student was far below that on a secondary school student in view of the fact that second level institutions were mostly boarding schools. For example in 1973 the per unit public expenditure for the first level grouping primary and middle schools was C32.00, whereas that for the second level was C261.00. With middle school enrollment of 439,655 added to the second level enrollment of 92,311 in 1974, and a similar picture for the entire period from 1974 to 1980, there is bound to be significant underestimation of per student public expenditure at the second level since the middle schools with enrollment more than 4 times greater than that of the traditional

second level institutions did not require even half the public expenditure that went to the other second level institutions.

Out of the total enrollment of 668,387 used to compute the per unit public expenditure for the second level in 1980 only 21 percent were traditional second level students by the 1974 standards, the remaining 79 percent were middle school students. Herein lies the underestimation of the second level per unit public expenditure, resulting in a higher social rate of return for that level in 1980.

The problem tends to be exacerbated by the fact that it is not exactly known how much of the public expenditure went into middle schools and how much went into secondary schools so that the necessary reallocation can be done to make possible the grouping of the primary and middle schools under the first level as was done for 1974. At best it could be said that private and social rates of return for the first level in 1974 represented that for the entire elementary school system whereas that for 1980 represented only the primary school system to the extent that middle schools were classified under the second level.

Any analysis of the stage of educational development in Ghana can however be based on the behaviour of returns to education at the third level for 1974 and 1980 since the structure as it obtained at this level for 1974 was maintained in its entirety by 1980. The social rate which is of greater interest for educational policy purposes showed an increase at the third level from 13.9 in 1974 to 14.9 in 1980. Taking this level as a typical scenario of the entire educational system, this reinforces the assertion that educational development in Ghana is still in stage I where returns are increasing

over time. However the fall in private rate from 33.3 percent to 30.0 percent indicates that to the individual educational development at the third level is in stage II, where although returns are still high, they are decreasing over time.

5.7   Comparison with Other Studies for Ghana

1.   Hinchliffe (1967)

A comparison of the results of a study like this with other studies is a helpful check on the results of the present study. Pioneering work in educational rates of return in Ghana has been done by Hinchliffe for 1967 (Economic Bulletin of Ghana, June 1971). Before any meaningful comparison can be made between the results for these two studies, some conceptual and definitional differences between them have to be pointed out, so that the comparison would be made within the framework of these differences.

Hinchcliffe's work estimate rates of return for primary schools, general secondary including middle schools, and higher education represented by university (Psacharopoulos, 1973). Therefore his classification of the education system is almost the same as my 1980 classification when the middle school system was put in the same group as the second level schools for purposes of public expenditure allocation. However, my 1974 classification groups the primary and middle schools into the first level.

Hinchliffe's private rates were estimated on the assumption that textbook fee was the only private direct cost (Psacharopoulos, 1973). In the present study, beside textbook fees, boarding and lodging fees were included as the other component. of private direct

costs, where applicable. Again his results were adjusted for unemployment as well as wastage and repetition whereas the only adjustment that could be made in the present study was for unemployment in view of data unavailability. Table 5.5 presents Hinchliffe's results together with the 1980 results of the present study for purposes of comparison.

It is observed that some consistency exist between the results of both studies, at least in terms of relative magnitude among various levels, with respect to the social rates of return. In both studies social rates are highest at the first level (or primary level), followed by the third level (or higher level), with the second level (or secondary level) having the least. In fact the 1980 results of the present study provide a greater basis for comparison with Hinchliffe's result since in the case of the former, by putting middle schools and second level schools in the same category for purposes of public expenditure allocation, the first level is restricted to only the primary school system.

Hinchliffe's figure of 18.0 percent for first level social rate compares favourably with the 18.2 percent for the same level obtained for this study in 1980. His secondary and higher level social rates of 13.0 percent and 16.5 percent are also in the same neighbourhood as the 14.5 percent and 14.8 percent respectively for 1980 in the present study. The difference between these two results is the fact that the gap between my second and third level social rates (1980) tend to be significantly narrow, compared to Hinchliffe's (1967). This I will argue, was more the result of the considerable reduction by 1980 in the differentials between earnings of graduates

Table 5.5
Comparison of the Current Results (1980)
with Hinchliffe's Results (1967).

		Hinchliffe (1967).	Current Study (1980)
Social Rate for:	First Level	18.0.	18.2
	Second Level	13.0.	14.5
	Third Level	16.5	14.9
Private Rate for:	First Level	24.5	39.3
	Second Level	17.0.	14.9
	Third Level	37.0.	30.0.

Source: Hinchliffe (1967) from Psacharopoulos and
           Woodhall, (1985);
           Current Study (1980) from Table 5.4.

from these two levels of education by allowing earnings of second level graduates to increase faster than those for third level graduates.

There is however not much consistency between the two studies in rankings of the private rates by level of education. Hinchliffe's recorded his highest private rate at the third level, followed by the primary level, with the secondary level having the least private rate. This is in contrast to the the private rates obtained in this study which were highest in the first level, followed by the third level, with the second level having the lowest. It is true that to a very large extent government salary scales have been based on educational qualification. However the influence of the forces of demand and supply of graduates with particular educational attainment in arriving at these scales cannot be ruled out completely.

After independence in 1957, the demand for Ghanaian high level manpower to take over from expatriates was far greater than the supply. With the establishment of universities in the early 1960s, the increased demand for university graduates around 1967 vis-a-vis their limited supply might have influenced government salary scales very much in their favour. By 1980, demand and supply conditions were very different and there was a tremendous increase in the supply of university graduates to the extent that though salary differential was still in their favour, the relative magnitude of this had fallen considerably.

The implication of this is that private unit cost for the third level (represented by only foregone earnings) had increased in relative terms by 1980. However the absence of foregone earnings

at the first level meant that private unit cost at that level was still very low relative to the other levels. The net result of this is that though private rate of return for the third level might have been higher than that for the first level from the 1960s, this situation must have been reversed by 1980.

2.   Glewwe, (1990)

A very recent study on returns to investment in education in Ghana has been done by Glewwe (1990). Using an econometric model, he employs data set from Ghana which includes tests of ability and cognitive skills administered to survey respondents to distinguish between the returns to years of schooling and the returns to human capital as measured by cognitive skills. His results are not directly comparable with those for the present study in view of differences in estimation technique employed. This study is not intended to go into the review of his methodology, suffice it to say that the econometric models he employed are different from the internal rate of return technique used in estimating rates in the present study, so are the results for both studies.

5.8   Comparison with Other Studies from Africa and the Developed World

Comparison of the results of this study with those for other countries will be restricted for the most part to social rates since these have greater significance for purposes of educational policy formulation. Comparable results are available from studies of rates of return to education for a limited number of African countries, the

results of which are presented in table 5.6. It must be emphasized that these results are being presented only for purposes of comparative analysis. The writer does not intend to go into the different assumptions and adjustments made and the different systems of education for the individual countries.

The striking similarity between these rates and the results of the current study is the relatively high social rate values, especially for the primary level. However the 50.5 percent primary level social rate for Morocco and 66.0 percent for Uganda seem extremely high compared to Ghana's 18.2 percent for the same level for 1980 obtained in this study. Figures for Nigeria and Morocco are similar to the current results to the extent that the primary level has the highest social rate, followed by the third or higher level, with the second level having the lowest rates. For all the countries it is only in Sierra Leone that social rates was highest at the second level.

One other observation is the relatively low social rates at the third level for these countries. In fact social rates were lowest at the third level for four out of the six countries. This may be the result of a very high public expenditure on higher education in these countries since university financing has since independence been the responsibility of the government in almost all African countries. Any attempt on the part of the government to change the status quo by shifting part of the cost of providing university education to students has met with fierce resistance culminating in the numerous cases of students unrest on almost all university campuses. One wonders how long these governments are going to be able to sustain this

Table 5.6
Social Rate of Return to Education by Level for Selected
Countries (percentages).

Country	Survey Year	Social Rate For:		
		Primary	Secondary	Higher
Ethiopia	1972	20.3	18.7	9.7
Kenya	1971	21.7	19.2	8.8
Morocco	1970	50.5	10	13
Nigeria	1966	23	12.8	17
Sierra Leone	1971	20	22	9.5
Uganda	1965	66	28.6	12
United Kingdon	1972	--	3.6	8.3
United States	1969	--	10.9	10.9
**Ghana	1980	18.2	14.5	14.9

Source: Education and Income, 1980.
**:   From current study.

pressure within the framework of an increasingly tight budgetary constraint.

It is also observed that social rates for advanced countries also provided in table 5.6 are lower than those obtained in this study. This observation is consistent with the finding that returns are by far highest in the poorest countries and declines with the level of economic development (The World Bank, 1986).

Private and social rates of return to investment in every level of education in Ghana has been found to be high. There is however, the need to find out whether or not resources are being optimally allocated between education (human capital) and physical capital, and also among the various levels of education in Ghana, and this calls for the estimation of the overall social rate of return to investment in education.

5.9   Overall Social Rates of Return

The overall social rates of return to education in Ghana for 1974 and 1980 are presented in this section. However before this is done, the estimation procedure and the final data used to estimate these are presented. The overall social rate of education has been defined as a weighted average of the social rates at each level of education, the weights being the total social costs of education at the respective levels in a given year. Thus we will need data on total social costs by level of education and social rates of return to investment in each level of education for both years of reference in order to estimate the overall social rate for both years separately.

The total annual social costs by level of education is obtained by multiplying the number of students enrolled at each level by the per unit annual social cost at that level. Enrollment by educational level for the two years of reference, 1974 and 1980 are given in table 5.7, while table 5.8 also presents the per unit annual social costs for each educational level for both years. From tables 5.7 and 5.8 total annual social costs by level of education for each of the two years are derived and presented in table 5.9. These are the cost weights to be applied in estimating the overall social rates

The other component required is the social rates by level of education for both years. These are presented table 5.10. Thus in tables 5.9 and 5.10 we have all the information required to estimate the overall social rates of return to investment in education for 1974 and 1980. By using equation 5.4 below these overall social rates are computed (Appendix B).

$$rH = \frac{\sum\limits_{i=0}^{m} r_i C_i}{\sum\limits_{i=0}^{m} C_i} \qquad (5.4)$$

where r_i and C_i are the social rates and cost weights for educational level i and rH is the overall social rate.

The overall social rates of return to investment in education in Ghana are estimated to be 10.8 percent and 15.0 percent respectively for 1974 and 1980 (Appendix B). Just like the social rates for 1974 and 1980 computed for each level of education (table

Table 5.7
Enrollment by Level of Education, 1974 and 1980.

Year	First Level	Second Level	Third Level
1974	1051012	531966	8022
1980	1379030	668387	9451

Source: Table 4.18

Table 5.8
Per Unit Annual Social Cost by Educational Level, 1974 and 1980 (in current price cedis).

Year	First Level	Second Level	Third Level
1974	57	696	4499
1980	147	2154	15078

Source: Table 4.19

Table 5.9
Total Annual Social Cost by Level of Education
1974 and 1980, (in current price cedis).

Year	First Level	Second Level	Third Level
1974	59907684	370248336	36090978
1980	202717410	1439705598	142502178

Source: Tables 5.7 and 5.8.

Table 5.10
Social Rate by Level of Education, 1974 and
1980   (percentages).

Year	First Level	Second Level	Third Level
1974	14.5	9.9	13.9
1980	18.2	14.5	14.9

Source: Table 5.4.

5.10), there is a marked increase in the 1980 overall social rate, reinforcing the assertion that Ghana's educational development from society's point of view is still in the early stages. It is this overall social rates that are compared with alternative rates of return obtained from investment in physical capital to determine whether or not resources are being efficiently allocated between human capital and physical capital, and also among the various levels of education.

5.10 Investment in Human versus Physical Capital.

Overall social rates of return to education in Ghana for 1974 and 1980 have been estimated to be 10.8 percent and 15.0 percent respectively. This further suggests that Ghana is operating within the increasing return range (stage I) in her educational development, and this calls for more public resources to expand and improve it until stage II is reached. This assertion cannot however, be wholly embraced to account for the increase in the overall social rate. Differences in economic performance for the two periods, reflecting for example differences in discount rates, and the classification of the middle school system under the second level might have contributed to this disparity. Nonetheless social rates for the third level where there were no reclassifications in institutions between 1974 and 1980 tend to support the point that education is still in its early stages of development as far as Ghana is concerned.

The 1980 figure of 15.0 percent compares favourably with the 15.1 percent obtained by Psacharopoulos for Ghana based on Hinchliffe's 1967 educational returns data (Psacharopoulos, 1973).

This is not surprising since there was to a very large extent, some consistency between Hinchliffe's social rates by level of education (1967) and those obtained in this study for 1980.

To be able to make any meaningful comparison between the profitability of investment in education and that in physical capital, the social rate of return to investment in physical capital, or what is normally referred to as the social opportunity cost of physical capital is required alongside the overall social rates of return to investment in education. Unfortunately there is not much documented evidence of social rates of return estimated for physical capital or capital projects for Ghana which could provide any basis of comparison. The common practice in most developing countries now is the use of 10.0 percent as a yardstick to indicate the opportunity cost of physical capital (Psacharopoulos, 1980). Therefore in the absence of any relatively recent study that can give a comparable result for the opportunity cost of physical capital, the writer finds it expedient to evaluate the result of this study within the framework of the 10.0 percent opportunity cost for physical capital.

Application of economic theory will suggest, based on the overall social rates and the social opportunity cost of physical capital, that in terms of resources going into both human and physical capital, there is underinvestment in the former.

5.11 Underinvestment in Education

For purposes of analysis we assume that marginal product of human capital (reflecting the overall social rate of return to education in this analysis) declines over time so that we are

operating within stage II. Realistically then we would expect the 1980 overall social rate to be less than the 1974 rate. This is however not the case in the present study. Using the 1980 overall social rate of 15.0 percent and the social opportunity cost allowed for physical capital of 10.0 percent, figures 5.4 and 5.5 are presented to illustrate the marginal products of human and physical capital respectively (which could be viewed as marginal efficiency of human and physical capital respectively). Returns to human capital are higher than that to physical capital, suggesting a case of underinvestment in the former and overinvestment in the latter. Figure 5.6 combine figures 5.4 and 5.5 to show this underinvestment in education.

This calls for redirecting of some public resources away from physical capital to human capital. Economic theory postulates that as more resources are directed away from the former, its rate of return (social opportunity cost of physical capital) rises. Overall social rate of return to education also falls with the increased investment. This will continue until an equilibrium rate of return is reached (r* in figure 5.6) which equates the returns to both human capital (education) and physical capital. At this rate, resources have been reallocated such that the underinvestment in education and the corresponding overinvestment in physical capital are eliminated. The equilibrium level of investment is I* (figure 5.6), indicating an increase in human capital investment and a decrease in physical capital investment.

Returns to Human Capital

MPH

Marginal Product

15.0%
r (H)

0   I (H)   Units of investment
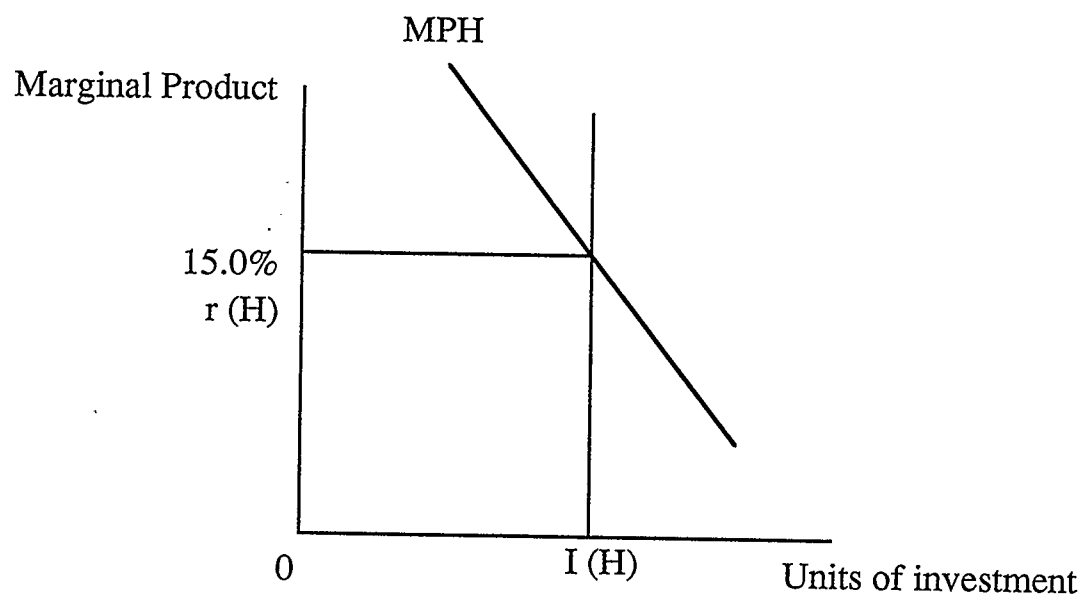
Figure 5.4

Returns to Physical Capital
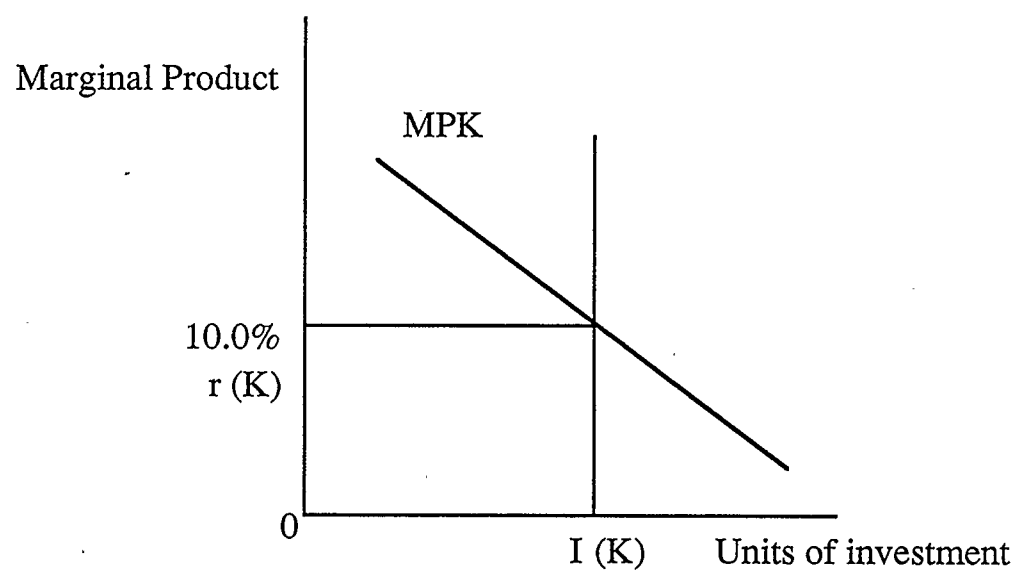
Figure 5.5

Equilibrium Rate of Return and

Investment Level
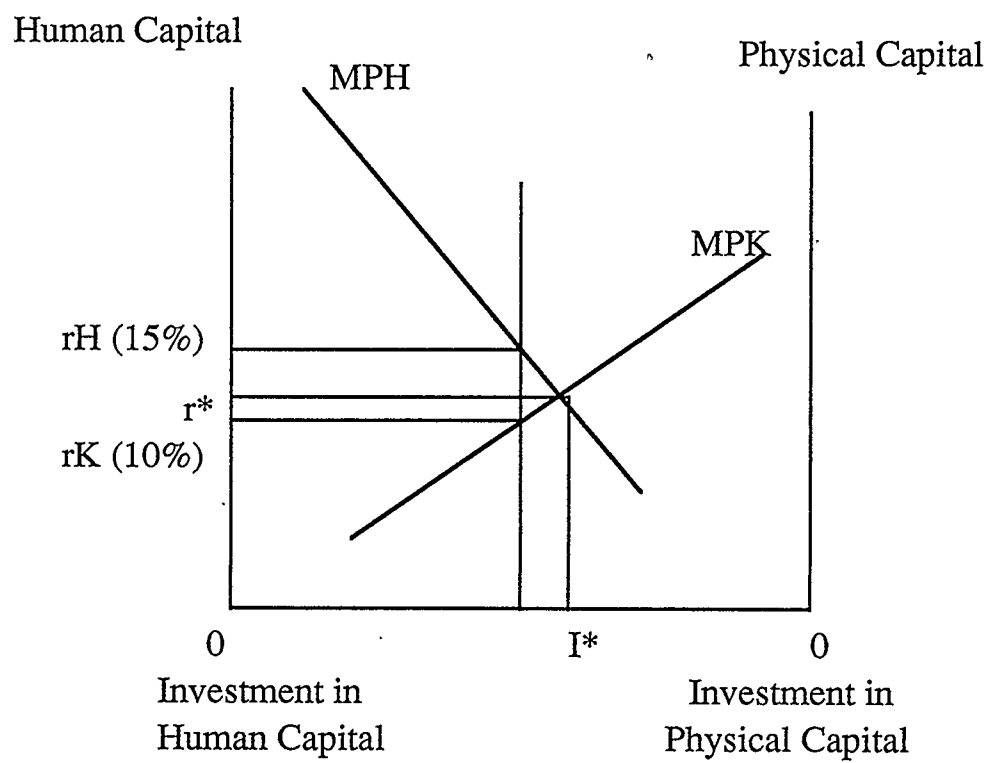
Figure 5.6

Comparison of the overall social rates for 1974 and 1980 as well as the respective social rates by level of education with the opportunity cost of physical capital indicates that there is a substantial underinvestment in education as a whole and also in every level of education. The 10.8 percent and 15.0 percent overall social rates for 1974 and 1980 respectively obtained in this study are higher than the 10.0 percent opportunity cost of physical capital, making investment in education as a whole a socially profitable venture. Again the 1980 social rates by level of education of 18.2 percent, 14.5 percent, and 14.8 percent for the first, second, and third levels respectively are all way above the 10.0 percent yardstick.

It is only the second level social rate for 1974 of 9.9 percent which is below the 10.0 percent mark. Even then when we consider the fact that substantial external benefits to education exist for society which should manifest themselves in the social rates but which are excluded for difficulty to give numerical values to them, the 9.9 percent cannot be considered too low. The 1974 first and third level social rates of 14.5 percent and 13.9 percent respectively are also above the 10.0 percent yardstick. It can thus be said that investment in education at the various levels is also socially profitable.

The result of the study therefore support the fact that not only is education a socially profitable investment in Ghana, there is significant underinvestment of public resources in it. In the next chapter policy implications flowing from these results are examined.

CHAPTER SIX

POLICY IMPLICATIONS OF THE RESULTS OF THE STUDY

6.1   Introduction

This chapter outlines the implications of the findings of this study for educational planning in Ghana.   It highlights the problems encountered in the study and how they can be overcome, as well as the limitations due to lack of data.   Conclusions that seem to emanate from the study in spite of the limitations are also outlined for policy recommendations.   An assessment is also made of the contributions of this thesis.

6.2   Problems   Encountered

Educational planning policies based on studies like this should normally be viewed within the framework of the major constraints or problems encountered during the study, and hence the limitations imposed on the results by these constraints.   The main problem has to do with data availability.   The absence some of the data needed in this study meant that is some instances the writer had to fall on his personal knowledge of the Ghanaian system to make rational guesses.

Earnings by educational attainment, it has been pointed out, were obtained from government salary scales.   The most reliable earning figures by level of educational attainment were those for the second and third level graduates since these were well documented. Earnings of first level graduates and workers with no education at all

were not provided in the government salary scales. The former had to be estimated from artisan's salaries since workers in this category were required to be elementary school graduates who had to undergo five-year apprenticeship in the public service in order to qualify as artisans. The demand for these artisans were far greater than their supply, and a more lucrative private sector employment for them meant that the public sector had to pay them salaries so much higher than first level graduates without the added skills of the artisans. I scaled down the salaries of the artisans to account for the increased earnings resulting from the five-year apprenticeship. Some element of subjectivity or arbitrariness cannot completely be ruled out in this scaling down process. However the final figures arrived at were influenced to a large extent by figures obtained through informal communications from some well informed people who were in the labour force at that time.

Salaries of workers with no education had to be estimated from earnings of wage farming since farming in Ghana has for a long time been the occupation of people with no formal education. The figures arrived at for 1974 were based for the most part on the corresponding figure for 1973, but the 1980 figures were based entirely on informal communications and rational educated guesses based on the writer's personal knowledge of the Ghanaian system.

In arriving at the earning figures for the first level graduates and workers with no education the writer was guided by two important observations; the fact that the Ghana government salary scales tend to be tied to a vey large extent to educational attainment, and secondly, that subsequent salary scales have attempted to

drastically reduce the differential between the highest and the lowest salaries. However to the extent that the results of the study were to a very large extent consistent with those estimated for Ghana and other African countries, the assumptions underlying the derivation of these earning figures cannot be far from correct.

With respect to cost, data on public expenditure on education is well documented, both current and capital expenditures by level of education. The major problem with respect to public expenditure came from the treatment of the capital expenditure component. Capital expenditure on education was assumed to be consumed at a constant rate, such that there is a constant depreciation of educational capital stock throughout its stipulated life, after which the capital ceases to exist. Though this is not very realistic the absence of a comprehensive data makes it necessary to treat educational capital expenditure this way than to ignore it entirely.

The other direct cost components of boarding and lodging as well as textbook fees were not obtained from a well documented source but through informal communications with the Ghana Education Service and a representative secondary school. The major constraint that was encountered in this study therefore has to do with the availability and hence the quality of data. To a large degree this constraint of data quality tend to impose some limitations on the findings of the study. Other limitations are imposed by the assumptions and adjustments made, and the very nature of education as an investment good.

6.3   Other Limitations of the Study.

Another limitation has to do with adjustment in the benefit data. It does not really make sense to use salary scales that are not net of taxes as educational benefits to estimate the returns of educational investment to the individual, since what the individual finally earns is net of income tax. An adjustment for income tax is required to make private rates more meaningful. There is however, no need to adjust for income tax with respect to social rates since the tax revenue going to the government is assumed to constitute a benefit to society to the extent that it will be used one way or the other to improve the living conditions of the people. In a developing country like Ghana where life expectancy is low, it would have been proper to adjust earnings and for that matter educational benefits for the probability of survival at each age since chances that individuals may not necessarily live to the stipulated age in order to enjoy the earnings associated with that age is relatively high.

It is a fact that wastage and repetition especially among school children in the first level and students in the second level are very high. At the second level for instance the standard of education is now so low that only about 10 percent of secondary school candidates who write the Ordinary Level Examinations are able to qualify for sixth form. In most cases the failure is so absolute that the whole 5 years (or 3 years in SSS now) spent in secondary school becomes a total waste in the sense that most students do not even obtain the pass in English and Mathematics required to secure them jobs reserved for second level graduates. There are so many cases of second level examination resits, and the cost of these repetitions and

wastages not only to the individual but especially to society at large is likely to be substantial.

There is no doubt that if such wastage and repetition costs could be estimated or if data on them were available such that they could be reflected in the rates of return estimated in this study, these rates would be more meaningful for educational policy implications. One other limitation that cannot be overlooked in estimating private returns to education in Ghana is from whose perspective these private rates are estimated. At least up to 1980 all private direct costs of education in Ghana was borne by parents for their children. Hence there is an intergenerational problem since parents bore the costs of their children's education for the latter to reap the future benefits.

It must however be pointed out that to a very large extent parents see in their children's education, an investment not only for the children's future financial security but the parents' own security as well, beside the satisfaction from the realization that the investment they made in their children's education was worthwhile. It is therefore proper to perceive the parent and child as one unit for whom the private rates of return to investment in education are estimated.

Mention should also be made of the fact that earnings in Ghana are to a very large degree institutionally determined rather than being based on the market forces of demand and supply. Minimum wage is from time to time determined by the government based on economic and most especially political conditions prevailing at the time. Salary scales tend to be tied rigidly to 'paper qualification'

rather than contribution to total output. The whole idea of perfect competition in the factor market cannot be strongly defended, and to a very large extent it can be argued that in the public services, workers are not paid according to their marginal productivity. In this case the link between education and productivity is blurred, at least as far as social rates are concerned. To the educated workers, the higher lifetime earnings they receive represents direct benefits to them whether or not the education they receive is reflected in increases in their productivity. However, using higher lifetime earnings of educated workers as a surrogate for society's higher productivity may not be the best representation of educational benefits to Ghana.

The high volatility of the Ghanaian economy makes the use of cross-sectional data in predicting an individual's stream of future earnings over his or her lifetime highly debatable. This is evidenced by the fact that individuals' earnings by level of education for 1980 projected from 1974 were in sharp contrast to the actual earnings for 1980. This suggests that to be able to make accurate predictions of the returns to education in an economy like Ghana's, there is the need to know how earnings will increase or decrease at each educational level over the lifetime of an individual.

High private returns to education in Ghana depends, among other things, on the high level of government subsidy to education, especially at the third level where no private direct cost was allowed. Much in the same way the relatively lower social rates of return to education at various levels should be viewed in this context. What should be emphasized is that though public expenditure on education

is an investment, or education itself is an investment good, it is an investment of an entirely different form from say, investment in physical capital. Unlike the latter profit maximization is not necessarily the motive of public expenditure on education in a developing country like Ghana where there is relatively high illiteracy rate, ignorance, disease, and poverty. It may appear that the state provides education to protect the right of her citizens to enlightenment so that the high cost of ignorance, disease, poverty, and illiteracy could be averted, and not as a means of seeking a lucrative investment opportunity.

If that is the case then it will appear that the profitability of investment in education in developing countries like Ghana with these characteristics should be assessed in terms of the extent to which education is successful in mitigating or even eradicating these seemingly endemic problems. This tends to cast a lot of doubt on the rationale for attempting to estimate educational rates of return just like any other form of investment, as a means of ascertaining its profitability, and makes the whole concept of educational rates of return appear as a misnomer. In fact these rates in themselves may be of little or no use to the government when making investment decisions with respect to education which may involve a combination of political, social-cultural, ethical and economic factors, since such decisions are much more complex than the investment decisions of individuals where profit maximization is the main driving force.

Yet another limitation that readily comes to mind is the fact that all earning differentials were attributed to further education. No provision was made for the other wage earning factors apart from

education, which could be grouped under socio-economic factors. The 'alpha coefficient' which adjusts earning differentials for the 'other than education factors' and which is very popular in the literature on educational rate of return estimation was thus not used. Neither was the 'earning standardization' method through regression analysis which is another technique for solving the same problem employed. It may therefore appear that attributing all the earning differentials to formal education is tantamount to attributing too much to education, and thereby introducing an upward bias in the resulting rates of return estimated.

Against this it may be said that the benefits of education in Ghana, just like all developing countries, do not manifest themselves only in increased wages. For example educated women, even where their impact are not felt in the labour market, makes substantial contribution to the Ghanaian economy through lower fertility and their greater tendency to maintain not only their health but also those of their children, and the likelihood that they will understand and to a large extent adopt the modern birth control systems to help check the population explosion that has been a headache not only for Ghana but most developing countries. As more women receive formal education the impact of this in checking the ever increasing population of the country cannot be overemphasized. There is therefore substantial external or non-monetary benefits to investment in education, especially if such investments are geared towards improving the quality and expanding the provision of educational services to cover as many people as possible in a relatively large illiterate society as Ghana.

The fact that these non-monetary benefits are not reflected in the rates of return estimated in this study suggests that the social rates especially are underestimated. However, to suggest that this underestimation will, to a very large extent, offset the upward bias introduced by attributing all earning differential to education in Ghana will be based more on supposition than facts since no empirical studies have been done to determine their relative magnitudes. In spite of these limitations imposed on the results of this study, some conclusions seem to emerge for policy recommendations.

6.4   Policy Implications.

Social rates of return to investment in education tend to have far-reaching implications for educational planning policy, and attention is therefore focussed on them for that purpose.

1.   The implication of the social rates by level of education on allocation of resources among the various levels is of great importance. Social rates for both 1974 and 1980 were highest at the first level, followed by the third level, with the second level having the lowest rates. The first implication that comes to mind is that since the first level represents the most socially profitable level in terms of returns to public resources invested in it, it should always receive top priority in terms of public resource allocation. This should be followed by the third level, with the second level receiving the least priority. This is the conclusion that seem to be arrived at by all educational rates of return studies with respect to developing

countries. This is not however to suggest that investment at the other levels should be sacrificed on the altar of the first level.

Increased investment at the first level will ensure that basic education can be given to as many children of school going age as possible. Universal primary education which has been a major policy issue since independence, but which continue to be an utopia so to speak, as far as Ghana is concerned, can then be realized to a very large extent. The significance of universal primary education to the economic, social, and political development of Ghana cannot be overemphasized. The actual enrollment at the second and third levels expressed as a percentage of that at the first level in 1974 were 6.2 percent and 0.5 percent respectively. By 1980 these were only 7.3 percent and 0.5 percent respectively. Assuming away the enrollment of foreign students at the third level, if these figures are taken to indicate that for every 200 pupils who started primary school only one of them was able to make it through to the university level for both years of reference, then increased investment at the first level will ensure that the vast majority who for some reasons cannot enter secondary institutions, let alone university, can at least receive basic education.

Again social rates at almost all levels of education as well as the overall social rates for both 1974 and 1980 have been found to exceed the social opportunity cost of physical capital, suggesting that there is underinvestment in education. This calls for reallocation of public resources devoted to human and physical capital until an equilibrium rate of return is established to eliminate this underinvestment in education. This suggests that investment in

education would have to increase at the expense of that in physical capital. There is therefore the tendency to suggest that investment in education should receive priority over investment in physical capital.

What should be emphasized at this point is that the investment decision here is not one of a choice between investing in one level of education rather than the other, or investing in human capital rather than physical capital. Results like this should provide some information to the educational policy maker to the extent that investment in education is socially profitable. Strict adherence to them as the sole yardstick in allocating resources among various levels and between education and physical capital can be detrimental to the developmental process. For example a substantial increase in investment at the first level relative to the other levels will eventually result in a substantial pressure being exerted especially on the second level for expansion of school places to accommodate the increased number of first level graduates seeking further education. Similarly, substantial increase in investment in human capital not matched by increased investment in physical capital may result in increased educated unemployment since there might not be enough physical capital for educated manpower to work with.

Granted that education is a socially profitable proposition, it should be perceived more as an organic whole. Investment in various levels should be planned and coordinated such that one level might not expand too much and thereby create problems for the others. This requires that investment is planned to bring about balanced development that cuts across all levels in the education

spectrum. Much in the same way the opportunity cost of physical capital should only serve as a measuring rod to determine the profitability of investment in education. Once investment in education has been found to be socially profitable, the two should not be perceived as strictly competing for society's scarce resources, since the motives for undertaking each of them are not the same to warrant such competition.

2. It has already been pointed out that investment in the first level of education in Ghana should receive top priority, followed by that in the third level, with the second level receiving the least priority. The nature of such investments should also be our concern. In most developing countries quantitative expansion of the school system was undertaken at the expense of school quality. Either the school system expanded faster than the training of teachers to man it, or economic hardships at home brought in its trail mass exodus of trained teachers to countries with better working conditions once the massive quantitative expansion had already taken place.

To a very large extent Ghana's case fit into the latter scenario, especially with the mass exodus of highly trained Ghanaian teachers from all levels of education to neighbouring Nigeria where there was an oil boom in the mid-1970s. With mediocre teachers trained under ad hoc programs to fill the gap created by such exodus the quality of education was, to a very large degree, adversely affected, and this deterioration in educational quality has become more pronounced since then. There were instances where parents refused to enroll their children in schools for lack of confidence in the school system because of its poor quality. The motivation was simply not there for

those teachers who did not join the bandwagon to give off their full work potential. What became commonplace was the tendency for them to make more money by organizing part-time classes. Students who were very serious about passing their examinations had to register for these part-time classes where teachers preferred to give off their best because of the extra income they were making.

Another reason for the seemingly lack of confidence in the school system has been the poor performance of the Ghanaian economy itself. The fact is that, the higher the level of education attained, the greater the tendency of being employed in the government sector. With the poor economic performance, working conditions are far from satisfactory and people tend to drop out of school either to engage in trading, something that became commonplace in the 1980s, or to learn other skills. To most people education did not seem to offer the kind of future economic security they anticipated so there was no motivation for them to waste so much time in school.

In situations like this the problem becomes not one of lack of school places since there may be cases of under-utilized capacity, but enrollment stagnation due either to low school quality or poor working conditions of educated manpower. Government investment in education in this case should not necessarily be geared towards providing more school places based on the rates of return by level of education, but to improve the quality of the existing ones since increased investment to expand a poor quality school system is in itself a poor investment. In developing countries like Ghana, the emphasis should be on 'quality' education. It is, however, always

very difficult not only to account for quality factors within education but especially to measure the effects of investment in educational quality on economic productivity.

Educational quality improvement, it should be noted, is a function of several factors; availability of textbooks and other supporting materials such as decent classrooms and availability of furniture, how students spend their time both in and out of school. For example a great deal of school time in countries like Ghana are used by school children to cut grass, weed school gardens and teachers' farms, and do other manual works on school compound. Students are therefore normally exhausted even before the actual classroom work begins. Other factors include availability of other learning modes at home and in the community at large, teachers' educational experience and the frequency of in-service training programs for teachers, teacher-pupil ratio, conditions of service for teachers which will determine whether or not they will give off their full work potential. These are some of the issues that should be addressed if any meaningful improvements are to be effected in the educational quality in Ghana. Quality improvement will also result in a shorter duration as benefits derived from low quality schooling requiring a relatively longer period can now be achieved faster.

Perhaps it might be proper to perceive social rates by level of education as giving a different signal especially if they are taken to give some indication about the relative quality of existing levels of education, so that the lower the returns for a particular level, the lower the quality. In this regard the writer agrees with the conclusion arrived at by Glewwe (1990). The relatively low social

rates at the second level for example should not necessarily be interpreted to mean that investment should be directed away from that level in favour of the other levels but that increased investments may very much be needed there to raise the relatively low quality and thereby raise the social rate of return to investment in education at that level.

The relatively low quality of education at this level in recent times has been manifesting itself in very dismal performances in both the Ordinary and Advance Level General Certificate of Education examinations. It may appear that this interpretation of social rates by linking them with the quality of education seem to have more substance than the traditional interpretation, at least in the case of Ghana and for that matter developing countries so long as the quality of education remains very low and cannot be taken for granted like in the developed countries.

3. Private rates of return to investment in education also tend to have an important implication for educational finance in Ghana. Relatively high private return rates for a particular level as is the case for the first and third levels in this study tend to suggest that it should be possible at those levels for the government to shift an increasing part of the burden of the cost of providing educational services to the individual without substantially reducing the private returns. This is especially important at this time when there is increased competition for the country's scarce resources from other sectors of the economy beside the enormous pressure being exerted by the need to service Ghana's domestic and foreign debt.

It has to be pointed out that the need to pass on some of the high cost of education at the third level to students has long been realized by the government. Its implementation has however always met with fierce resistance from students especially at the university level. Notwithstanding, the government seem bent on pushing some of the cost at the university level to students with the introduction since the 1989/90 academic year of a loan scheme intended to help students feed themselves as well as meet their requirement of textbook and other academic supplies. It will be interesting to investigate how these developments in educational finance at the third level will affect their returns.

4.   In view of the increasing, not decreasing returns on education in Ghana as shown by the comparison of the results for the two years of reference, there is an incentive to increase the pace of educational development through increased investment until the educational system is operating in the decreasing returns range since in the present circumstances, increased returns can be achieved with further investment. However, as has already been noted increased investment should not be geared so much to quantitative expansion as to improving the quality of the existing school system. In our desire to reach stage II the quality of education should not be compromised.

6.5   Contribution Made by this Study.

This study has provided an update to the profitability of educational investment in Ghana based on the internal rates of return technique. The previous work done by Hinchliffe which

provides a basis of comparison with the current study dates back to 1967. Economic conditions have since changed considerably, but if educational rates of return do play any role in forming Ghana's educational policy decisions then such policy decisions continue to be based on rates estimated some 24 years ago. Although the 1980 rates I have estimated in this study are 11 years old they are the most recent estimates possible in this study because of lack of very recent data.

This thesis departs from the previous work in other ways as well. From the point of view of the individual the most dominant element of private direct cost of education at least up to 1980 was boarding and lodging fees. These, it has been pointed out, were absent at the first level where all schools were day schools, and at the third level where students enjoyed full government scholarships. The second level has been perceived as the most costly from the individuals' viewpoint because of the presence of boarding and lodging fees. In the earlier work done by Hinchcliffe the only element of private direct cost used to compute private rates was textbook fees. In this thesis boarding and lodging fees are included where possible to give a true picture of the cost of education to the individual.

Mention should also be made of the fact that by estimating returns to investment in education for the two years of reference 1974 and 1980 this thesis has not only provided educational rates of return that are reflective of the Ghanaian educational structure as it persisted from colonial days up to 1990 but has also provided results that are appropriate for purposes of international comparison. In the

earlier work done for Ghana the various levels of education were the primary, secondary, comprising the general secondary and middle school systems, and higher, comprising the universities and other third level institutions. Of course this is the structure that has existed in most countries for a very long time, and so classifying the Ghanaian educational system this way was very much the result of trying to evolve rates of return that could readily be compared with those estimated for other countries.

By putting the primary and middle school systems together (the traditional elementary school system) the 1974 results of this study provide rates that are true reflection of returns to education based on the actual structure of the Ghanaian system, at least up to 1990 when the middle school system was completely phased out in an educational restructuring program undertaken by the government. To the extent that the middle school system was put in the same category as the the second level institutions after 1974 but only for purposes of public expenditure allocation, the 1980 rates in this study serves more for international comparison than a true reflection of returns to the Ghanaian educational system based on its structure at that time.

Computation of returns for the two survey years in this study has also given an indication of the level of educational development in Ghana. The findings suggest that Ghana's educational development is still in stage I where increasing returns to educational investment obtains. This calls for increased investment not necessarily to expand the school system but to upgrade the quality since poor quality education in itself is poor investment.

The low quality of education in Ghana, just like most developing countries, suggests that the traditional interpretation of educational rates that more resources should be allocated to that level with the highest social rate of return cannot be strongly defended since this traditional interpretation takes the quality of education for granted. This thesis to a very large extent tends to depart from the earlier work in interpreting the rates of return so long as the quality of education in Ghana cannot be taken for granted in any educational profitability study. To the extent that educational investments in Ghana are not geared towards expansion in school places in the present school system but to raise the quality, low social rate for a particular level should not necessarily be seen as a signal to make that level a victim of resource cut in favour of those levels with a relatively high social rates. It may signify the need for increased resources to raise the quality and hence the returns at that level.

The problems encountered in this study and the constraints imposed on the results by the numerous limitations have been outlined together with the policy implications emanating from the findings. The contributions made by this thesis is also highlighted. A summary of the work and recommendations for further investigation is the theme of the next chapter.

CHAPTER SEVEN

CONCLUSION

7.1 Summary

The major objective of this study was to assess the profitability of investment in education to the individual as well as society as a whole through the estimation of private and social rates of return to investment in the various levels of education and the overall social rates for the years 1974 and 1980 and comparing these rates with the returns on physical capital. In estimating these rates the relationship between education and economic growth was analyzed. On the one hand education is viewed as a consumption good, and on the other as an investment good. As an investment good it is a key ingredient for economic development, and as is the case for all forms of investment, it lends itself to profitability studies.

Since Ghana's educational system was used as the case study there was the need to highlight certain aspects of the country. Areas that were touched on include population and its breakdown into broad age groups, the performance of the economy over the years as well as the educational system as it existed by 1980 and the restructuring that has taken place since the early 1980s. Expansion in the educational system as manifested by the growth in enrollment and public expenditure on education is also reviewed. Of major importance is the large part of GDP and total public expenditure claimed by education. In spite of this it was realized that illiteracy rates continue to be relatively high especially among females. The

disturbing aspect of this is the realization that illiteracy among the very young age group (6-16 years) is greater than among the relatively older age group (17-35 years) because of the seemingly poor quality since the late 1970s, although the gap between both sexes seem to have narrowed considerably. Major shortcomings inherent in the Ghanaian educational system are also identified.

The theoretical framework underlying the computation of internal rates of return to education is also discussed. Educational benefits have conventionally been represented by earning differentials though there are some non-monetary net benefits which accrue to society but are excluded from social rates because they do not lend themselves to quantitative analysis. Social rates therefore tend to be at a lower bound. This might however be offset in part by the fact that all earning differentials are assumed to be attributable to further education.

Educational costs to the individual and society are also outlined. Private direct costs for purposes of rates of return computation consist of textbook fees, boarding and lodging fees, while the social direct costs consist of public expenditure both current and capital, on education. Indirect costs for both the individual and society are represented by foregone earnings. The limitations in using earnings as a measure of educational benefits and also with regard to educational costs in estimating educational rates of return are also discussed. The models used to estimate the private and social rates of return as well as the overall social rates of return to investment in education are also presented.

Ghanaian data on the various elements of educational cost and the benefits used in estimating the rates of return are presented as well as the various assumptions and adjustments made to these data. Ghana government salary scales were used to determine the earning differentials while textbook and boarding and lodging fees which constituted the main private direct costs were obtained through informal communications with the Ghana Education Service and a representative secondary school. Expenditures on teachers' emoluments and teaching materials as well as public capital expenditure on education formed the main elements of social direct costs. Based on this information and the enrollment figures private and social unit costs by level of education for 1974 and 1980 were computed.

The results of the study indicate that educational development in Ghana is still in its early stage since there are increasing returns to resources invested in it. This calls for increased investment at all levels of education. This observation is in conformity with the fact that there is significant underinvestment in education since the educational social rates of return, both by level and the overall picture are higher than the social opportunity cost allowed for physical capital. However the nature of this increased investments should also be a matter of concern. For the most part they are required to raise the quality of existing schools and not just to expand school places.

The marked difference between rates for 1974 and 1980 can be explained in part by the fact that the middle school system that had until 1974 been classified under the first level was after that

year put under the second level but only for purposes of public expenditure allocation. Therefore in principle the middle school system became part of the second level, in practise it continued to be an integral part of the first level until it was finally phased out at the end of the 1990 academic year.

The 1980 results for this study also compared favourably with those for an earlier work done for Ghana, probably because of the fact that in that earlier work the middle school system was put together with the general secondary schools under the second level. The 1980 results were also used for purposes of comparison with rates estimated for other countries, since studies for all countries classify educational systems into primary, secondary and higher levels, and my 1980 results seem to be closer to this classification than that for 1974. This comparison also proved favourable.

Conclusions from the study and their policy implications are examined in the light of the problems associated especially with data acquisition as well as other limitations on the results. The contribution made by this thesis is also outlined.

7.2   Recommendations for Further Investigation

In view of the increasing, not decreasing returns on education noted earlier on, and the fact that the results of this study suggest that returns are higher on education than on physical capital, investment in education in Ghana is a profitable proposition from both the individual and society's point of view. However to make these findings more meaningful and effective as a tool for informing educational policy decisions in Ghana further research is required.

Specifically it should be possible to adjust social rates in a developing country like Ghana for the probability of brain drain since this has become a major social and economic problem to the country especially since the mid-1970s. It is doubtful whether it is in the best interest of Ghana to continue financing or heavily subsidizing an elite education since the massive brain drain especially of university graduates has meant that for the most part the country invests in education for the increased productivity of educated manpower to be reaped by other countries. This situation is exacerbated by the fact that there is no arrangement in operation to track these people down for purposes of taxing their earnings and forwarding some percentage to Ghana which will reflect in the net factor income from abroad. Therefore using the higher lifetime earnings of all these people which will reflect in increased output in other countries to represent educational benefits in Ghana results in a serious anomaly and overestimation that needs to be researched further.

Secondly overall social rates only give guidance on aggregate scale of educational spending while social rates by level of education give guidance on the relative scale. Neither of these gives any information about types of courses. Granted that education is a socially profitable investment it is not so much the relative magnitude of social rates 'by level of education' but 'by field of study' that is very much needed to inform educational policy decisions in Ghana. Allocating public resources to education by field of study will prove more effective than by level of education since the former can normally cut across levels.

Even within a particular level say, the third level, there is a great disparity in allocation of resources among various fields, with the sciences such as engineering benefiting at the expense of the social sciences. This is not based on their relative returns from any profitability studies but probably on a misguided notion that engineers are needed more in the developmental process than social scientists. If investment in say, agricultural economics prove to have very high returns within the framework of an appreciable quality of education then a strong foundation can be laid for that right from the primary level which could be built on at the subsequent levels. Further research is therefore needed to assess the profitability of investment in various fields of study.

Thirdly returns to education tend to be restricted to formal schooling. In a developing country like Ghana informal schooling in the form of apprenticeship and on-the-job training has always played a significant role in manpower training. The contribution of such workers, most of whom have never had any formal schooling is quite high. This is evidenced in such industries as auto mechanics, carpentry, masonry, and welding where they dominate. Since a large proportion of the working population are found in these areas further research in educational returns which will broaden the scope of education to include such apprenticeships and on-the-job trainings will be in the right direction.

Fourthly it has been pointed out that in countries like Ghana wages are not a true reflection of the marginal productivity of labour since they are institutionally determined for the most part. Coupled with this there is the fact that a large proportion of the working

population are self-employed and do not normally disclose their actual earnings for fear of being taxed. In a situation like this instead of using wages as a measure of increased productivity attributable to education further research in the direction of measuring the effect of education on the physical measures of output for Ghana as has been done for some countries[1] will make more sense.

Lastly, the Ghanaian educational system has undergone massive restructuring through the 1980s. The structure has changed to a large degree with the introduction of the JSS and SSS concepts, and the subsequent phasing out of the middle school system, the cancellation of the Common Entrance Examinations which brought in its trail the redundancy of the private preparatory school system, all these resulting in a reduction in the unusually long duration. It will be interesting to investigate the effect of these changes on rates of return to investment in education in Ghana.

The vital importance of education as an investment in any program of economic and social development in a developing country like Ghana makes it essential to bring educational work in line with the demands of such programs. Rates of return to such educational investments have been found to be very high, making education a socially profitable proposition. However, the link between such high returns on the one hand, and economic and social development of the country on the other, is not very clear, because of the poor quality of education. In spite of these high rates of return, poor quality education cannot fulfil the vital role of education as a key ingridient in the process of economic and social development.

1   Lockheed, Jamison, and Lau (1980) have explored the relation between education and agricultural efficiency or productivity measured in terms of crop production among farmers in some low-income countries.

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APPENDIX A

Estimation of Private and Social Rates of Return by Level
of Education for 1974 and 1980.

First Level Private Rate of Return (1974).	First Level Social Rate of Return (1974).	Second Level Private Rate of Return (1974).	Second Level Social Rate of Return (1974).
-3	-21	-871	-1050
-3	-22	-864	-1026
-3	-24	-856	-1001
-3	-25	-846	-939
-4	-27	-834	-912
-4	-27	-656	-884
-5	-29	-638	-696
-4	-31	472	472
-4	-32	500	500
-4	-57	530	530
47	47	562	562
50	50	596	596
53	53	632	632
56	56	670	670
59	59	710	710
63	63	752	752
67	67	797	797
71	71	845	845
75	75	896	896
79	79	950	950
84	84	1007	1007
89	89	1067	1067
95	95	1131	1131
100	100	1199	1199
106	106	1271	1271
113	113	1347	1347
119	119	1428	1428
127	127	1514	1514
134	134	1605	1605
142	142	1701	1701
151	151	1803	1803
160	160	1911	1911
169	169	2026	2026

APPENDIX A (CONT.)

First Level Private Rate (1974) cont.	First Level Social Rate (1974) cont.	Second Level Private Rate (1974) cont.	Second Level Social Rate (1974) cont.
180	180	2147	2147
190	190	2276	2276
202	202	2413	2413
214	214	2557	2557
227	227	2711	2711
240	240	2874	2874
255	255	3046	3046
270	270	3229	3229
286	286	3422	3422
303	303	3628	3628
322	322	3846	3846
341	341	4076	4076
361	361	0.108945816	0.09942508
383	383		
406	406		
430	430		
456	456		
483	483		
512	512		
543	543		
575	575		
0.336925321	0.14538405		

Third Level Private Rate of Return (1974).	Third Level Social Rate of Return (1974).
-1131	-4519
-1106	-3668
-1079	-4499
1246	1246
1321	1321
1400	1400
1484	1484
1573	1573
1667	1667
1767	1767
1874	1874
1986	1986
2105	2105
2231	2231
2365	2365
2507	2507
2658	2658
2817	2817
2986	2986
3165	3165
3355	3355
3557	3557
3770	3770
3996	3996
4236	4236
4490	4490
4759	4759
5045	5045
5348	5348
5669	5669
6009	6009
6369	6369
6751	6751

APPENDIX A (CONT.)

Third Level Private Rate (1974) cont.	Third Level Social Rate (1974) cont.
7156	7156
7586	7586
8041	8041
8523	8523
9035	9035
0.332982881	0.138736524

APPENDIX A (CONT.)

First Level Private Rate of Return (1980).	First Level Social Rate of Return (1980).	Second Level Private Rate of Return (1980).	Second Level Social Rate of Return (1980).
-7	-72	-3617	-3771
-7	-73	-3304	-3539
-7	-71	-3015	-3231
-8	-122	-2749	-3002
-8	-92	-2503	-2829
-8	-99	-1967	-2443
-8	-111	-1774	-2198
-8	-119	1196	1196
-8	-165	1357	1357
-8	-147	1541	1541
128	128	1749	1749
145	145	1985	1985
165	165	2253	2253
187	187	2557	2557
212	212	2902	2902
241	241	3294	3294
274	274	3738	3738
311	311	4243	4243
353	353	4816	4816
400	400	5466	5466
454	454	6204	6204
515	515	7042	7042
585	585	7992	7992
664	664	9071	9071
754	754	10296	10296
855	855	11686	11686
971	971	13263	13263
1102	1102	15054	15054
1251	1251	17086	17086
1419	1419	19393	19393
1611	1611	22011	22011
1829	1829	24982	24982
2075	2075	28355	28355

APPENDIX A (CONT.)

First Level Private Rate (1980) cont.	First Level Social Rate (1980) cont.	Second Level Private Rate (1980) cont.	Second Level Social Rate (1980) cont.
2356	2356	32183	32183
2674	2674	36527	36527
3035	3035	41459	41459
3444	3444	47056	47056
3909	3909	53408	53408
4437	4437	60618	60618
5036	5036	68802	68802
5716	5716	78090	78090
6488	6488	88632	88632
7363	7363	100597	100597
8357	8357	114178	114178
9485	9485	129592	129592
10766	10766	0.149182717	0.14451379
12220	12220		
13869	13869		
15742	15742		
17867	17867		
20279	20279		
23017	23017		
26124	26124		
29650	29650		
0.393078034	0.182129613		

APPENDIX A (CONT.)

Third Level Private Rate of Return (1980).	Third Level Social Rate of Return (1980).
-3503	-15126
-3162	-15927
-2851	-15078
2141	2141
2430	2430
2758	2758
3130	3130
3553	3553
4033	4033
4577	4577
5195	5195
5896	5896
6692	6692
7596	7596
8621	8621
9785	9785
11106	11106
12605	12605
14307	14307
16239	16239
18431	18431
20919	20919
23743	23743
26948	26948
30586	30586
34716	34716
39402	39402
44722	44722
50759	50759
57611	57611
65389	65389
74217	74217
84236	84236

APPENDIX A (CONT.)

Third Level Private Rate (1980) cont.	Third Level Social Rate (1980) cont.
95608	95608
108515	108515
123164	123164
139791	139791
158663	158663
0.299789561	0.149008704

APPENDIX B

OVERALL SOCIAL RATES OF RETURN ESTIMATION.

The formula for the estimation of the overall social rate of return has been given as:

$$r_H = \frac{\sum_{t=1}^{3} r_i C_i}{\sum_{t=1}^{3} C_i},$$

and r_i and C_i have been defined as the social rate of return and total annual social costs of education at level i respectively, with i denoting the number of levels, three in this case.

For 1974, the overall social rate is estimated using the above formula, to be:

$$r_H = \frac{5035784538}{466246998} = 10.8,$$

For 1980, it is estimated to be:

$$r_H = \frac{26688469314}{1784925186} = 14.95.$$