Private Returns and Social Equity in the Financing of Higher Education*

GARY S. FIELDS

Yale University

INTRODUCTION

A widespread phenomenon in developing countries has been the rapid growth of schools and institutions of higher learning resulting in a so-called 'education explosion'. One possible explanation for the education explosion is that education is a profitable personal investment, as evidenced by high private rates of return. The high private returns are translated into demands on politicians for additional schooling spaces. To gain or maintain public favour, each politician uses his influence to try to increase the number of schools in his constituency. By this chain of events, growth of educational systems might be anticipated as long as private rates of return remain high. This would add to the already high fiscal burden of providing education and might prove to be a drain on the resources of the governments of many less developed countries.

In a recent paper Rogers calculates private rates of return to investment in post-secondary schooling based on 1966 Government salary scales and 1968 cost figures.[1] Three recent developments—large salary increases for Civil Servants with post-secondary schooling, growing unemployment and underemployment of secondary school leavers, and a decline in the average cost of higher levels of schooling— combine to raise substantially the private rates of return of higher levels of schooling. The purpose of this article is to analyze the effects of these changes on the private rates of return of higher levels of schooling and to assess the fiscal and equity implications of alternative loan programmes. The higher levels of education considered here are university, secondary teacher training, primary teacher training and higher secondary education.

The limitations should be clearly stated at the beginning. First, consideration is of necessity limited to the private returns of education. This is not to say that social rates of return are not of interest. Rather, the data needed to construct estimates of marginal social benefits— including aggregate production functions for the farm and non-farm sectors and demand for labour relationships by educational category— are simply not available for Kenya. Secondly, this paper relies on Government salary scales for the determination of private benefit streams. Since the overwhelming majority of students with post-secondary schooling are employed by the Government, the bias introduced by this procedure is likely to be relatively limited. However, since a much smaller percentage of persons with primary or secondary schooling are employed in the public sector and since there are reliable data from a household survey on the earnings and unemployment of these persons, a third limitation of this paper is that it is confined to consideration of returns to investment in post-secondary schooling.

CHANGES SINCE 1966

The average private rates of return to investment in different levels of higher education are found by solving

$$\sum_{i=0}^{T-I} \frac{B_i - C_i}{(1+r)^i} = 0$$

by iteration for r, where r is the internal rate of return, B_1 and C_1 are the expected benefits and costs in year i, and T is the time of retirement. The present is taken as time zero. It is assumed that students complete Form IV at age 19 and that retirement occurs at age 55. C_1 includes out-of-pocket costs plus expected earnings foregone while in school, allowing for unemployment of secondary school leavers. B_1 is the increment to income in year i due to education. It is the difference between expected income (allowing for unemployment) of persons with the higher level of schooling as compared with persons with the lower level. It is assumed somewhat arbitrarily that the entire salary differential is attributable to education alone.[2] Let us now look at the changes in salaries, unemployment rates, and costs since 1966.

1. **Salaries**

As a result of a detailed inquiry by the Ndegwa Commission into the terms and conditions of employment in the public service, a new public service salary schedule was put into effect as of 1 July 1971. (See Table 8.1.) Secondary school leavers received minimal pay increases. Teachers received moderate increases. Very large increases, on the order of 50 per cent, were granted to university graduates to try to attract more to Government service.

2. **Unemployment**

There seems to be little if any unemployment amongst persons with post-secondary education. Except for brief periods of frictional unemployment we may safely assume that university graduates, trained teachers, and Form V and VI leavers are and have until now been fully-employed. However, as the chapter by Kinyanjui makes clear, unemployment among secondary school leavers became a problem in 1968 and it is believed that the situation has worsened since then.

TABLE 8.1

Starting public service salaries, excluding housing and before taxes, for persons with different educational qualifications, 1966 and 1971

Educational qualification	1966	1971
University	£804	£1,212
S1	£582	£702
P1	£348	£447
Form VI	£348	£384
Form IV	£268	£276

Source: *Report of the Commission of Inquiry* (Nairobi: Government Printer, 1971).

The combined effect of the wider salary differentials and growing unemployment of secondary school leavers is to increase the gap between expected lifetime earnings of university graduates and secondary school leavers. The ratio of undiscounted expected lifetime earnings of university graduates relative to secondary school leavers rose from 2.1 in 1966 to 2.9 in 1971.[3] The demand for university education would be expected to increase even further beyond capacity as young people respond to the enlarged income differentials.

3. Costs

Under the existing system of financing higher levels of education in Kenya, all students at the teacher training colleges and most students at the University of Nairobi receive tuition, books, room and board, a clothing allowance, plus a small cash maintenance allowance. No fees are charged in Forms V and VI in the Government-maintained secondary schools. In the higher-cost Government-assisted secondary schools, each student receives a standard bursary of 450 shillings (£22.5) per year, but he may get more according to his parents' financial status. These fee policies are justified on the basis of selectivity— that those who qualify for higher education should not be discouraged by high fees. These policies, which determine the private out-of-pocket costs of higher levels of schooling, have been in effect without change since independence in 1963.**

To consider the private rates of return that would prevail under alternative loan schemes, we need to know the average budgetary cost of different levels of schooling. Table 8.2 (p. 191) shows that the average annual costs[4] of all types of higher education fell between 1968 and 1971. In the case of the University of Nairobi and the main secondary teachers' colleges this is the result of a rapid expansion of enrolments. With regard to the primary teachers' colleges, the Government is expanding some of the colleges while reducing the overall number.

4. The Effect on Rates of Return

The combined effect of the changes described in Sections 1 to 3 is of course to increase the private rates of return to investment in higher levels of education. Table 8.3 (p. 194) compares my calculations of internal private rates of return using 1971 data with Rogers' calculations based on earlier data. Columns la and Ib show the rates of return earned under the existing system of financing post-secondary education based respectively on 1966 and 1971 salaries and costs. The private rates of return to higher education under the existing full-subsidy system in Kenya are very high compared to rates earned in such countries as the U.S.[5] and U.K.[6] and in other countries.[7] The populace is well aware of the large private benefits received by the fortunate few who are able to continue their education beyond the secondary level. Even if a university graduate is unemployed 10 per cent of the time, the expected private rate of return is still about 28 per cent. Consequently, the demand for education is strong and persistent.

We note that consideration of promotion prospects has only a trivial effect on the rate of return to university education.

ALTERNATIVE SCHEMES FOR FINANCING HIGHER LEVELS OF SCHOOLING

The recent literature on the economics of education includes several proposals for educational finance which would help relieve the fiscal burden on governments. Calculations of the private rates of return to investment in higher levels of education in Kenya under three of these schemes are presented in Table 8.3, which compares results for 1966 and 1971.

Columns IIa and IIb compare the old and new rates of return under a pay-as-you-go system. Under this scheme, the student would pay the full costs of his education at the time he attends school.

Under the fixed-amount-payments scheme in columns IIIa and IIIb, the student would repay the total costs of his schooling without interest in fixed amount payments over his working life.[8]

Columns IVa and IVb present the returns under a percentage-of- earnings scheme. Under this plan, the student would repay a fixed percentage of his income such that if he earns the public service salary, the *undiscounted* value of his payments would just cover the costs of his schooling.[9] Graduates in higher-paying occupations would pay more than the average cost, those in low-paying occupations less.

Under any of the alternative financing schemes discussed above, the rates of return would remain high. The returns fall by only a couple of points under the fixed-amount-payment scheme and the percentage- of-earnings scheme. Even under the much more stringent pay-as-you-go plan, returns range from 15 per cent to 23 per cent, still a highly profitable personal investment.

A POLICY RECOMMENDATION

An educational finance policy should ideally be formulated simultaneously with the decision on the number of places offered at the different levels of schooling and in the context of an overall economic plan. Such an exercise is clearly beyond the scope of this paper. However, if we sub-optimize and take the size of the existing higher education system as given, we may ask how the proposed scheme for financing higher levels of education might help achieve national objectives.

Kenya's national goals are clearly stated in the Development Plan. While the Plan includes such goals as minimization of unemployment, greater relevance of the secondary curriculum, and progress toward free and universal primary education; economic growth and greater equity in the distribution of income received special emphasis. The central importance of the equity objective may be seen from the following quotation from the Plan:

> A fundamental objective of the Government... is to secure a just distribution of the national income. . . . There are at present inequalities of income between a small number of highly remunerated individuals on the one hand—large farmers, people in business, politics, the civil service, and certain professions— and the great mass of the people on the other. ... It will, however, continue to be the policy of the Government to ensure that the higher income groups in the population contribute increasingly, by way of taxation, towards the objective of reducing the income gap between rich and poor to a socially acceptable level within a reasonable period of time.[10]

Given the importance of the national objective of a more equitable distribution of income, either the fixed-amount-payment scheme (columns III of Table 8.3) or the percentage-of-earnings scheme (columns IV) would be preferable to the existing full-subsidy scheme. However, neither of these loan schemes charges students the full costs of their schooling, since interest charges are omitted. This is undefensible on equity grounds, since the greater the reliance on tax revenues to finance education and the less the reliance on tuition charges, the greater the transfer of income from poor to rich.

A more equitable distribution of income would be realized if Kenya were to finance its higher education system by means of a compulsory full-cost loan programme on a percentage-of-income basis. Such a full-cost policy would charge students all schooling costs including interest on their loans. A person earning at the public service salary scale would be liable for a fixed percentage of his income over his working lifetime[11] that would just repay the average cost of his schooling. Assuming a 5 per cent rate of interest, under the new salary schedule, university graduates would need to pay 10.6 per cent of their earnings, Si teachers 4.3 per cent, Pi teachers 2.5 per cent, and Form VI leavers 1.1 per cent. This would roughly double the direct tax burden of each group. As with other fixed percentage-of-income plans, the higher an individual's income, the greater the sum to be repaid.

Since the graduate would be required to repay full costs including interest, the total amount to be repaid would be equal in present value to the outlays under the pay-as-you-go plan. Thus, the rates of return earned under the proposed full-cost percentage-of-income plan are those given in column lib of Table 8.31[12] The fact that these rates are markedly lower than the rates under other loan programmes should reduce the demand for education somewhat. However, since the rates of return would still be quite high, demand would remain strong, particularly amongst the more able students who judge themselves likeliest to succeed. Provided the scheme is clearly explained and actively promoted by national leaders and school guidance counselors, it is likely that few highly-qualified students would be discouraged from continuing with higher education.

Economic growth is likely to be enhanced by the introduction of the proposed full-cost percentage-of-income loan scheme. At first, the proposed scheme would yield little. But in the longer run, repayment of loans (largely out of consumption, presumably) would add substantially to Government's revenues with no corresponding increase in

expenditures required. Given the crucial importance of taxes as a source for national savings and investment and the high opportunity cost of existing items in the Government budget, we would expect that the additional revenues would be invested in important and socially profitable public projects, resulting in more rapid economic growth.

TABLE 8.3 *Average private rates of return to higher education in Kenya under alternative financing schemes, 1966 and 1971*

From Form IV to	Existing full-subsidy system		Pay-as-you-go and full-cost percentage-of-earnings		Fixed-amount-payments		Percentage-of-earnings (undiscounted)	
	1966 Ia	1971e Ib	1966e IIa	1971e IIb	1966 IIIa	1971e IIIb	1966 IVa	1971e IVb
University[a]	21.4%	30.7–31.3%	10.2%	18.6–18.7%	17.0%	29.2–29.7%	17.9%	29.6–30.1%
University +[a]	—	30.9–31.5%	—	19.0–19.1%	—	29.5–30.0%	—	29.7–30.2%
University ++[a]	—	31.0–31.6%	—	19.2–19.3%	—	29.6–30.1%	—	29.7–30.2%
University Hyp[b]	—	27.8–28.3%	—	16.4–16.6%	—	26.2–26.6%	—	26.3–26.8%
SI[c]	20.5%	32.8–33.7%	10.6%	22.6–22.9%	15.5%	31.7–32.6%	17.1%	32.0–32.8%
PI	11.1%	27.9–29.1%	6.9%	20.9–21.5%	8.3%	27.1–28.3%	9.3%	27.5–28.6%
Form VI[d]	Negative	16.5–17.2%	Negative	14.7–15.2%	Negative	15.6–16.3%	Negative	15.7–16.4%

Notes:
(a) 'University' assumes that the graduate enters the public service in a university-level post and reaches the maximum salary level but is not promoted to a higher-graded position. 'University +' assumes that promotion to the next grade occurs the year after the maximum entry-level salary is reached. 'University ++' assumes another promotion the year after the maximum of 'University +' is reached. The super scale used by Rogers no longer exists as such.
(b) The Development Plan warns of the possibility of unemployment of university arts graduates in the near future. 'University Hyp' is a hypothetical earnings stream constructed on the assumption that there will be 10 per cent unemployment of university graduates in each year. Thus, the expected earnings are 90 per cent of 'University'.
(c) Form IV plus three years' secondary teacher training college.
(d) These are the returns to completion of Form VI alone assuming that the individual does not go on for further schooling. The expected rate of return is higher (by approximately half the difference between the return to University and the return to Form VI alone) if allowance is made for the probability (about 50 per cent at present) of a Form VI leaver being able to continue on for University.
(e) The higher figure is computed using Kenyanization of Personnel Bureau unemployment figures. The lower figure is calculated on the basis of K. Kinyanjui's 1968 figures. In both cases, zero labour turnover is assumed for simplicity, since no labour turnover estimates for Kenya exist. The higher the turnover rate, the greater would be the rate of return.

To summarize these points and mention some additional considerations, the recommended plan would be expected to have advantages over the existing full-subsidy system:

(a)   Less redistribution of income from poor to rich and from taxpayers to graduates and their families;

(b)   More rapid economic growth in the longer run;

(c)   Lower private rates of return to investment in education and thus less demand for education and less pressure on the educational system at all levels to expand;

(d)   More serious and committed students and workers who are aware of the debt owed their government;

(e)   An incentive for students to seek greater efficiency in the schools, since lower average costs would result in lower repayment rates. It would also have advantages over a fixed-amount loan scheme:

(f)   No disincentive effect on those who might choose to enter low- paying but worthy occupations;

(g)   A pooling of risks, so that the individual is not liable for a fixed amount in the event of personal disaster;

(h)   Constancy of payment in real terms (an advantage to the Government).

If a loan programme is politically feasible, I see no reason why the inclusion of interest charges would not also be. The initial unpopularity is unquestionable, particularly among current or prospective recipients of higher education, whose tax burdens would as much as double. But public support might well be enlisted if the people are informed that implementation of the proposed scheme would free budgetary resources which, in the absence of other financial constraints, would allow primary school fees to be eliminated. Alternatively, Kenya would educate 300,000 more primary students a year or have 2,000 new hospital beds or 4,000 kilometres of new roads. Yet higher education would continue to be a highly lucrative and rewarding personal investment. The charges and payments could readily be administered by the Tax Department, particularly if the tax system is streamlined to alleviate the double income taxation which now exists.

Another possibility is to finance higher education (and Government in general) by means of a more steeply progressive tax structure. This has strong appeal on a number of grounds:

(a)   The requisite tax increase per taxpayer would be substantially smaller than the doubling which graduates would have to pay under the full-cost percentage-of-income loan scheme. Less political opposition might therefore be expected.

(b)   All high income persons, regardless of where or when they were educated, would pay the costs. There would be no sharp division between graduates who received higher education prior to introduction of a loan scheme and those educated subsequently, or between those educated abroad at the expense of foreign governments or institutions.

(c)   It would be easier to administer, since uniform rates would apply to everyone. As part of an incomes policy of lowering wage differentials (and therefore private rates of return and demand for education) and redistributing income, an increase of income tax rates in the upper brackets has much to commend itself. But in a world of extremely high private rates of return, income redistribution in favour of the rich through

the educational system and runaway growth of secondary schooling, a loan policy would contribute sub-

stantially to alleviating the grosser inequities. Perhaps, a combination, such as exists in Tanzania, of loans

for higher education along with an incomes policy and more steeply progressive taxation would contribute

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** Editors 'note:
    Since this article was written the Government has decided to introduce a loan programme to cover student maintenance costs at the University. The minimum size of the loan p.a. will be £300. It will be made on concessionary terms with a   nominal service charge and will be repayable within a period of fifteen years from the commencement of studies.

[1] Daniel C. Rogers, 'Student Loan Programmes and the Returns to Investment in Higher Levels of Education in Kenya', Economic Development and Cultural Change (January 1972).

[2] This may be justified on the following grounds. In Kenya, investment in higher education is not a matter of personal choice, since schooling spaces at any one level are few relative to the number of completers of the previous level. Ability (as measured by examination scores) is the main criterion for selection. Thus, part of the educated/uneducated salary differential is a return to ability rather than education. However, families deciding whether they wish to invest in higher education for their children probably do not adjust for ability differences. Rather, it seems they perceive that educational attainment determines the jobs for which their children are hired and that salaries are a function of the job.
From this point of view, the educated/uneducated salary differential is the private benefit, since that is the gain their children would receive if they were educated.

[3] Earnings = Income + Housing Subsidy — Direct Taxes. The potential period in the labour force is assumed to be 36 years. Earnings for university graduates are calculated assuming that the graduate enters the public service in a university-level post, experiences no unemployment, reaches the maximum salary at entry level, but is not promoted to a higher-grade position. Earnings for secondary school leavers are the mathematically expected earnings assuming the current unemployment rate will prevail forever and assuming zero labour turnover.

[4] The items included in average annual costs are described in Footnote (a) of Table 8.3.

[5] For a review of the evidence, see Daniel C. Rogers, 'Private Rates of Return to Education in the United States: A Case Study', Yale Economic Essays (Spring 1969).

[6] See M. Blaug, 'The Rate of Return on Investment in Education in Great Britain', The Manchester School (September 1965).

[7] For a review of rate of return studies in 25 countries, see G. Psacharopoulos and K. Hinchliffe, 'Rates of Return: International Comparison' (London School of Economics, Higher Education Research Unit, 1970, Mimeo).

[8] The payment would be £90 per year for University, £25 for Si, £11 for Pi, and £4 for Form VI.

[9] These percentages would be 4.8 per cent for 'University', 4.4 per cent for 'University +'4.1 per cent for 'University ++', 5.3 per cent for 'University Hyp,' 1.8 per cent for Si, 1.0 per cent for Pi, and 0.5 per cent for Form VI.

[10] Republic of Kenya, Development Plan: 1970-1974, pp. 2-3.

[11] The possible psychological deterrent of incurring a lifetime obligation must be weighed against the increase in annual percentage which a shorter repayment period would necessitate.

[12] The advantage of the proposed scheme over the pay-as-you-go plan with identical rates of return is that the former provides access to capital markets for students who would otherwise have no chance of borrowing long-term funds to meet short-term schooling costs.