

ECONOMIC ANALYSIS OF PRIVATE RETURNS TO INVESTMENT IN EDUCATION IN CAMEROON

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Abstract: Since 1960, the Cameroon Government has invested very heavily in Cameroon's educational system –nursery through to higher education level. There has been pressure on the government to put more emphasis on the primary level rather than on tertiary level. The paper's findings strongly suggest that emphasis should be on all the educational levels, and more so, on the tertiary level. The conclusion is drawn from the earnings function model from which estimates are brought out on the average rate of return to education with the marginal return referring to additional year of education at the different levels.

1. Introduction

African governments invested heavily in education, immediately after the early 1960s with the conviction that education would generate rapid economic growth. In fact, education with investment in human capital was expected to contribute to growth by improving the productivity of the labour force, reduce income inequality and poverty. The human capital model (Becker, 1993), the endogenous growth models (Lucas, 1988) and the application of augmented Solow model (Mankiw, Romer and Weil, 1992) have stressed the important role of education with human capital in economic growth. Thus, the budget allocation for education became the largest category of state expenditure. Private returns to investment in education tended to be higher than investments in other sectors of the economy, as the labour force acquired more education and skills (Glewwe, 1999). Education, therefore, triggers regional mobility of labour. People with higher education move from lower paid jobs to higher paid ones as their productivity increased. According to a recent study, farmers who are educated produce on the average eight times more output than their non educated counterpart (World Bank, 1992). But education's contribution to growth can only be significantly important where the graduates are gainfully employed. With the decline in most Africa economies and the changing labour market conditions in many African countries, many graduates left unemployed calling to question the wisdom and nature of such investments in education.

Investment in education is evaluated in terms of returns to investment. The rate of returns can be estimated as the discount rate that equates the present value of economic costs and the benefits of an investment. Private rate of returns to education is calculated using after-tax earnings differentials and only those educational costs actually borne by the student or their family. Social rates of return are based on before tax earnings differentials or total earnings and the total resources the society incurred on education. The human capital model of Becker (1974) and Mincer (1975) has been the method used for such evaluation. The Mincerian earning functions have been well applied on individual countries' data, with the semi logarithm specification being very robust in empirical studies. But controversies exist as to the nature of investments in education in developing countries. Earlier studies reveal that returns to investments in education are positive and decrease the higher the level of education and as such investments in primary education should be emphasized at the expense of higher education (Psacharopoulos, 1994). Recent studies have produced results on the contrary. They reveal that returns to investments in education increase the higher the level of education (Manda and Bigsten, 1998; Liu, 1998). This is important, as it may underscore the role of education at all levels in the development process.

The aim of this paper is to evaluate private returns to investment in the different levels of education given the changing labour market conditions in Cameroon. According to

Psacharopoulos (1994) private returns to investments in education is an important factor in determining educational attainment, participation and ultimately wages/income. Education is critical in income distribution and economic development. This has lead many countries including Cameroon to prioritise public spending on education.

2. The Cameroon Education System

Education in Cameroon is based on the British and French educational systems. As such, there are two educational systems in the country. In the French speaking regions or areas, the French system of education dominates, while in the English speaking regions or areas, the English pattern of education prevails. The colonial background and the diversity of the Cameroonian society make the Cameroonian educational system unique in Africa. The dual structure of education creates structural constraints that have made the development of education complicated. For instance, primary education is six years in the Francophone system, while in the Anglophone system it is seven years. Secondary education is four years in the Francophone, while it is five years in the Anglophone system. However, at high school, before entry into University, it is three years for the Francophone and two years for the Anglophone student.

In Cameroon, education is provided by public and private sectors. The private sector includes religious and private lay institutions which are usually supported by the government through subvention. Currently, the aims of education in Cameroon are to:

- 1) rapidly eliminate regional disparities in terms of educational achievement through increase in equipment, teaching material, teaching staff;
- 2) increase the enrolment of primary and secondary schools
- 3) improve the training programmes for teachers
- 4) periodically reform the syllabuses
- 5) constantly improve the quality of education

From independence, the national budget for education ordinarily financed all the operating costs in public schools and 80 percent of the same costs in non public schools (Boyle, 1996). This shows the high priority accorded to education by the Cameroonian government. Since 1982, investment in nursery, primary, as well as general and technical secondary education has sharply increased. In 1983-84, investment in school infrastructure stood at 15,000 million francs CFA as compared to 9,000 million francs CFA the previous year. It increased every year such that by 1987 it stood at 78,000 million francs CFA as compared to a total investment of 20,000 million for the twenty-five year period (1958-1982 (Cameroon, 1990)).

Table 1: Enrolment by Educational Levels

Year	Nursery Education	Primary Education	Secondary General	Secondary Technical	Higher Education	Higher Education(WB)
1985	67 316	1 443 728	180 248	59 290	10 231	32,000 (1970)
1986	73 506	1 709 518	256 449	91 983	15 963	
1987	83 963	1 795 254	291 842	99 777	19 558	
1988	88 127	1 875 221	317 766	102 302	20 326	
1989	91 861	1 964 158	345 977	100 139	22 162	
1990	92 966	1 939 908	367 426	89 702	29 990	32,000
1991	93 771	1 963 671	409 729	90 051	36 491	
1992	93 944	1 932 916	441 118	100 768	37 300	50,000
1993	92 683	1 920 985	446 987	102 134	42 921	
1994	73 420	1 871 265	453 323	97 975	38 963	
1995	70 202	1 840 995	450 799	96 397	42 083	
1996	79 400	1 874 873	484 461	108 519	39 956	
1997	85 230	1 931 537	443 651	108 020	39 799	
1998	88 811	1 975 831	477 955	110 144	51 133	
1999	103 161	2 073 266	507 408	118 645	61 344	
2000	90 648	2 237 083	554 830	143 839	60 517	
2001	125 674	2 689 052	684 583	146 469	63 135	
2002						71,000

Source: National Institute of Statistics, Cameroon in Figures for various years, Cameroon Annual Statistical Yearbooks, 2001, 2002

Table 1a: Enrolment by Nursery, Primary and Secondary levels and by Gender

Year	Nursery		Primary		General Secondary		Technical Secondary	
	Male	Female	Male	Female	Male	Female	Male	Female
1990	46 869	46 097	1 020 965	918 943				
1991	47 553	46 218	1 034 619	929 052	240 216	169 517	52 689	37 362
1992	47 693	46 251	1 018 580	914 336	261 061	184 977	56 874	41 411
1993	47 126	45 557	1 013 760	907 225	261 365	190 051	58 277	40 851
1994	37 003	36 417	989 078	882 187	249 593	195 073	57 302	38 396
1995	35 453	34 749	972 879	868 116	241 547	200 484	58 935	39 444
1996	39 889	39 511	990 484	884 389	270 568	209 622	64 930	44 131
1997	42 354	42 876	1 039 372	891 757	242 517	201 134	65 246	42 774
1998	44 410	44 401	1 062 817	913 014	265 203	212 792	66 849	43 295
1999	52 327	50 834	1 122 381	950 885	273 279	234 129	70 803	47 842
2000	45 966	44 682	1 213 759	1 023 324	295 941	258 829	88 963	54 876
2001	63 010	62 664	1 447 881	1 241 171	365 763	315 820	90 493	55 976

Source: MINEDUC, NIS 2002. 1987 is given as 1986/87

Table 1b: Gross Nursery and Primary Enrolment rate (%) in 1997

Province	Nursery school			Primary school		
	Boys	Girls	Total	Boys	Girls	Total
Adamoua	2.58	2.9	2.74	61.16	44.61	53.27
Centre	20.28	20.16	20.23	116.14	113.52	114.24
East	8.79	9.35	9.06	92.83	80.10	86.78
Far North	1.84	1.20	1.52	104.12	48.91	76.78
Littoral	20.24	22.52	21.36	111.52	111.12	111.32
North	2.46	3.19	2.82	73.08	41.85	58.30
North West	2.63	2.88	2.75	73.08	72.94	73.00
West	7.95	8.10	8.00	105.21	105.29	105.25
South	13.69	16.00	14.83	130.71	129.86	130.30
South West	5.93	6.76	6.33	79.19	81.06	80.10
Cameroon	11.28	11.75	11.51	86.85	79.73	83.41

Source: MINEDUC (1998) Tableau de Bord Statistiques année scolaire 1996/97, Yaoundé

Until recently (1992), Cameroon had one State university - the University of Yaounde; This University had a campus in Yaounde and four specialized centres in Douala, Buea, Ngoundere, and Dschang. Whilst the facilities in the University centres were under-utilized, those at the University of Yaounde were over-stretched. This led to over crowding in the lecture halls and a decline in the quality of teaching. The 1993 University reforms created five new state universities, bringing the number of state owned Universities to six. Admission into these Universities depends on performance at the "Baccalaureate" for the Francophone system and the General Certificate of Education advanced level for the Anglophone system. Currently, there are more than 40,000 students registered in the country's six state owned Universities.

Education is free (no fees) at the primary level. Despite this, illiteracy level is still high at regions of the country. The UNESCO estimate was at 45% in 1990; this rate is below the national average. In 1990, two thirds of the male population aged 15 and more had some knowledge of reading and writing, while this figure was only two fifths for the female population.

According to government policy, secondary schools are created in all administrative units of the country, the district, the Sub-Division and the Division. Every District and Sub-Division has a secondary school, while at the Divisional level there are high schools, bilingual high school, Government technical high school and a Teachers Training College. In the 1980's, the number of primary schools increased from 4,971 to 6,328 or 27.3% for the period 1980/81 – 1987/88. Also, higher education establishment rose from 326 to 425 or 30.4% and vocational schools rose from 161 to 321 during the same time period. Student population also grew significantly. In primary schools, the population increased from 1,379 million to 2,107 million or 32.8% in secondary schools, it increased from 169,300 to 379,000 or 13.5% (Cameroon, 1992). Despite the impressive growth in school enrolment rate, a significant number of children of school going age are not enrolled in educational establishment. This is partly because educational expansion has not kept pace with population growth. But the national net primary school enrolment rate rose from 67% in 1979 to an impressive 84 per cent in 1990, the upturn has resulted sharply increased costs due to high drop out rates, repetition rates (Boyle, 1996).

The content of the educational curriculum does not seem to very relevant to the needs of the economy or society. Before the 1990 little amounts were incurred registration school uniform and books in public schools, while in the private and denominational schools students paid for tuition, registration, books, uniform and boarding fees. With the economic crisis, it became difficult for the government to continue providing subvention to non public schools. In 1989, subsidies to private schools were reduced, at the national level, from CFA franc 8,000 million to 6,000 million (Boyle, 1996). But this situation was worsened by delays in payments. As such, parents were called upon to continue making sacrifices for the education of their children in the form of increased in school fees. Parents/teacher associations (PTA) started taking part in the financing and management of schools. This includes building more classrooms and recruiting staff. In spite of these financial difficulties, the government has continued to open more schools in the country. The schools are regrettable poorly equipped and staffed.

3. Statement of the Problem

Initially, expansion of educational institutions led to an increase in the supply of educated and skilled labour force that was readily absorbed into the private and public sectors. This is because until recently, the Cameroonian economy was expanding. With the production of oil, starting 1979, GDP grew at a high rate of 8% per annum and the per capita income was about \$800. There was sharp increased employment in the public service even without any job description. As such, the public service expanded greatly. In 1986, Cameroon had about 180,000 civil servants, the third largest in Africa. The civil servants apart from being paid high wages were given generous benefits as incentives to improve their performance.

Besides the public sector, Cameroon had an underdeveloped private sector that also employed many educated and skilled labour. There was a minimum wage legislature and despite the fact that trade unions activity was controlled, salary increases were announced yearly for the public sector. It was more profitable to gain public sector employment.

By 1988, the Cameroonian economy was in crisis caused by changes in international economic environment and domestic poor economic management. This led to the implementation of Structural Adjustment Programme (SAP) to restore the economy on a growth path as recommended by the Britton Woods Institutions. Part of this programme involved a freeze in employment in the civil service and more than 60 per cent reduction in the salaries of civil servants in 1993. The reduction in nominal income and freeze in employment led to an increase in the rate of unemployment. In 1992, there over 76,500 job seekers in Cameroon (Derrick, 1992). Most school leavers are now seeking employment in the private sector or becoming self-employed. Thus, the informal sector is becoming a major source of employment and many parents are now questioning the wisdom of acquiring further education that may not be relevant in many self-employed activities. In such a case it is the lowly educated that are getting employment at the expense of the more educated. It has become a serious problem as the economy cannot absorb the highly educated.

Civil servants salaries have been slashed, private sector wages and salaries are freely negotiated between employers and employees. If education or human capital is not adequately rewarded by the current employment system, the economy might be failing to utilise fully its human capital, and more importantly long-run economic growth might be adversely affected because of a lack of relevant human capital accumulation. Thus, an analysis of the return to

education under the current employment environment is of great importance to the development of appropriate policies for growth and development. That is, it is important to estimate the rate of return to the different educational levels, and find out the benefits relative to the main economic sector and gender. Hence, the main objective is to analyse the returns to private investment in Cameroon's education, showing the relationship between years with levels of education and earnings.

4. Literature Review

In recent years, there has been an increase in the number of studies that have sought to analyse private returns to investments in education. Most of these studies have analysed the impact of length of schooling, labour market experience, innate ability, family background, and school quality on earnings. Psacharopoulos (1994) made an extensive survey of published studies on private returns to investments in education around the world, using the elaborate and the earnings function method. He found that private returns to education are generally higher than corresponding social returns. There is an observed declining pattern of the returns to education over time, while all social returns decline between two and eight percentage point over a 15-year period. Within a country, the rates of return generally decline the higher the level to which they refer. Most of these rates are substantially higher than conventional returns on alternative opportunities. Finally, the less developed the country, the higher the returns to investment in education. However, these results have been criticized as being irrelevant given the fact that they employed out dated cross sectional data and that the educational expansion over the decade since then must have decreased the returns to investment in education.

In the same direction, Tafah-Edokat (1998) studying private returns to investments in education in Cameroon reached the same conclusion like Psacharopoulos above. He found that returns to education are positive and in some cases higher than returns to investment in other sectors of the economy. Primary education gives the highest returns followed by secondary and tertiary education. Thus, he concludes like Psacharopoulos, the investment in primary education should be emphasized and that individuals willing to pursue further education should be made to bear a higher proportion of the cost of such education. This study was carried out when the Cameroon economy was buoyant and the respondents were mostly limited to civil servants. However, since 1986, the Cameroonian economy has experienced a crisis and the civil servants have suffered more than 60% salary reduction, while the numbers of unemployed people have increased. The study is restricted to primary level in a region of the country, in total neglect of the social benefits of higher education. In fact, the change in the supply of unemployed graduates calls to question the relevance of Tafah-Edokat's study. Furthermore, stress should not be only on the primary level, given the critical role of higher education in today's world.

In Kenya, there have been many studies on returns to education. Some of these studies have sought to analyse factors that have affected private returns to investment in education over time. In this light, Manda and Bigsten (1998) analysed the impact of educational expansion and returns to schooling in Kenya over a period. They found that private return to secondary and tertiary education is high, while it is close to zero for primary education. This result is different from the previous studies and may be due to the filtering process. At the primary level, substantial filtering down takes place and there are large differences in pay by occupation, whereas for the uneducated there is less scope for filtering down and wage differences by occupation is small. Returns to primary education for the recent cohorts of primary school

graduates fall substantially because they perform task for which their education is less valuable (Knight et al, 1992). This might have become more important as the level of unemployment was quite high.

The study of Appleton, Bigsten and Manda (1999) with a large data set is quite interesting as it shows the impact of the declining economic performance on the educational expansion. The returns to primary education remained unchanged and also the returns to tertiary education did not fall. Yet returns to secondary education declined. To some extent, the results confirmed the previous one.

Human capital theory has also been applied to former socialist countries to see the impact of labour market liberalisation on earnings. In the case of Slovenia, Orazem and Vidopivec (1995) analysed the winners and losers of the transition process by tracing out changes in returns to education, experience and gender, and changes in wage inequality from 1987 to 1991. Their main finding is that returns to human capital increased dramatically during the transition. Rising returns to education and experience contributed to rising wage inequality, but variance for wage increased for individuals with identical skills as well. Women gained over men, primarily because women occupied sector less adversely affected by the transition. Efforts to use pension policies to encourage early retirements have drastically reduced the labour supply of workers of pension age and work experience.

In the case of China, Liu (1998) found private returns to education to be between 3% and 6%. Earnings are higher in the pure public sector than in the collective sector, while the estimated rates of return to education are similar in these two sectors. An analysis of the direct effect of earnings and the rate of returns to education during labour market contract system and the floating wage scheme reveal positive and significant association between earnings and these two reforms measures. Moreover, the wage reform (floating wage scheme) is found to have raised the rate of return to education significantly.

The number of school leavers finding employment in the formal sector has been declining in relation to the number of uneducated people so employed. It has, therefore, become necessary to study the rates of returns for the self-employed. However, some critics maintain that it is ability, school quality and socio-economic background that determine earnings. John Carlyle Raven's progressive matrices have usually been used to test ability in forming perceptual relations and reasoning by analogy even independent of formal schooling and language. Applying Raven's test to Thailand's agricultural production function, Lau and Chou (1987) found a positive effect of education on farm productivity to be highly significant.

Glewve (1996) used data on cognitive skills, and a measure of innate ability to assess the impact of education on ranges. He found that cognitive skill acquired rather than accumulation of schooling credentials or innate ability that determine wages in the private sector in Ghana. Apart from ability, the quality of school is also said to determine earnings and returns to education in the case of Kenya. Armitage and Sobot (1989) measure quality in terms of pupil-student ratio. They found that private returns to investment in secondary education are markedly higher for children who attend government secondary schools than those of Harambe schools, which are self-helped schools. Government schools are of higher quality and thus their pupils have higher level of cognitive skills. This may not be true in some cases where public schools are over crowded with student-teacher ratios very high.

In the case of Ghana, Glewve (1996) determined school quality by putting dummy variables for three of four geographic regions in Ghana to control for regional variation in school

quality and by introducing an interaction term between age and years of schooling to capture variation in school quality over time. He found that regional dummy variables show strong variation in attainment of reading and mathematical skills across geographical regions in Ghana. On the average, one could probably state that the schools in the coastal areas are better than those in the east. Behrman et al (2002) examined the impact of school quality on earnings; and they found that the rural Pakistan has higher rates of returns in investing in primary school quality and quantity than in investing in middle school. Expanding low-quality schools for girls increased earning more than increasing the quality of existing schools. It may be the case since the girls might have been deprived of schooling than the boys who are already in schools. So initially, earning for girls would tend to increase sharply.

5. Methodology

Sources of Data

This study utilises labour market survey data collected in the urban and rural areas of Mfoundi, Mounjo, Mezam, Benoue, Nyong and Soo Divisions of Cameroon in 1994 by the Department of Economics, University of Laval and the central statistic office, Yaounde. Information was solicited from 5.5 respondents from five out of ten Cameroonian provinces. Of these respondents only 1.784 respondents were analysed. Information was solicited on the following variables: daily wage measure in CFA franc, age measure in years, level of education measure in years, experience measured as age minus schooling. Also, additional information was solicited on the nature of the respondents economic activity whether agricultural or non-agricultural, marital status, nationality.

Theoretical Model

We use descriptive statistics and the earnings functions. There are several analytical techniques used to estimate private returns to investments in education. Psacharopoulos (1994) identifies three such techniques, the elaborate method, the shortcut method, and the earnings equations method. According to Psacharopoulos, the elaborate method follows an algebraic definition of the rate of return which is the rate that equates a stream of benefit to a stream of costs for a given period. In this method of private rate of return calculation, the only cost of the education project under evaluation is the opportunity cost of staying on in school beyond the age of 18 instead of working in the labour market. The data requirement of this method is quite demanding and is usually not available for most developing countries.

The shortcut method estimates in an explicit way what the earnings method estimates does implicitly. In this method one can use tabulated earnings of workers to estimate private returns to education. Also, it is easy to add the resource cost of schooling to arrive at the social returns. Hence, it is of great advantage where earnings of individuals are not available. The basic earnings function is due to Mincer (1974) and involves the fitting of a semi-log ordinary square regression using the natural logarithm of earnings as the dependent variables, and then the years of schooling, potential years of labour market experience and its square as independent variables. In this semi-log earnings functions specification also used by Appleton et al (1999), the coefficient on years of schooling can be interpreted as the average private rate of return to one additional year of education regardless of the education level to which this year of schooling refers.

We can break down the standard earning functions into components relating to schooling, post-school or labour market experience (work), before schooling endowments. It can be

assumed that the log earnings Y_{ij} for the i th family member j is related to schooling S_{ij} , work experience ex_{ij} , heritable earnings H_{ij} , and orthogonal earnings u_{ij} . From this we have the following function:

$$Y_{ij} = aS_{ij} + bex_{ij} + cH_{ij} + u_{ij}$$

Where S , ex , H are vectors the relevant variables and a , b , c being the respective parameters.

In the Mincerian model the key determinant is the earnings, making it easier to fit data on years of schooling to estimate returns on education

Empirical Model

$$\text{Hence the earnings function can be specified as } \ln y = a + b.s + c.ex + d.ex^2 \quad (1)$$

where $\ln y$ is the natural logarithm of earnings

a = constant

s = individual's years of schooling or different levels of schooling

ex = work experience

ex^2 = work experience squared

a , b , c and d = parameters to be estimated

The above function can be modified to include regional dummies, sex, or different levels of educational attainment. For the purpose of this study, different levels of education attainment are used. Since we intend to calculate the private rate of returns to different levels of education, the basic earnings equation becomes:

$$\ln y = a + b \text{ prim} + c \text{ sec} + d \text{ univ.} + f \text{ ex} + g \text{ ex}^2 \quad (2)$$

where prim , sec , univ stand for primary, secondary and university levels of education respectively and ex is work experience.

From the above earnings function, one can calculate the rate of return of investment in education after acquiring an additional years of schooling. This is given as:

$$\ln dy/ds \quad (3)$$

which is additional earnings resulting from an extra year of schooling. The way to compute the returns to an extra level of education is taking the antilog and using the formula:

$$\text{Returns} = \{ \exp (\ln y_j - \ln y) - 1 \} \quad (4)$$

This rate can be divided by the numbers of years at each level to get annual returns.

The estimates from equation 2 provide consistent estimates; but there may be correlations between education and unobservable variables such as family characteristics, background. This is taken care of by adjusting the model to account for the observables or that may not necessarily has a significant effect.

Empirical Results

Table 2 presents the mean and standard deviation of the main variables. The mean age of males is higher than that of females. The mean age of the sample is 39.46, for males 40.59, for females 38.03, agricultural 41.38 and non-agricultural 37.95 for those working in these sectors. The means of experience is 23.01 for overall, 24.78 for males, 22.14 for females, 25.20 for agricultural sector and 22.53 for non-agricultural sector. The mean years of schooling is 9.84 for overall sample, 9.8 for males, 9.89 for females, 10.17 for agricultural and 9.42 for non-agricultural sectors. Therefore, females have spent slightly longer time at school than men. Females have a higher income than men, while agricultural earnings are

higher than those of non-agricultural. The mean income for the overall sample is 208.71 and 196.06 for males, with 224.59 for females, 203.78 for agricultural and 189.58 for non-agricultural. Note that the disparities in the different categories are significant.

TABLE 2: Mean and standard deviation of key variables

Variables	Overall		Male		Female		Agricultural		Non-Agricultural	
	Mean	St. D.	Mean	St. D.	Mean	St. D.	Mean	St. D.	Mean	St. D.
Age	39.46	13.2	40.59	13.02	38.03	13.13	41.38	13.99	37.95	12.12
Experience	23.61	14.69	24.78	14.16	22.14	15.21	25.20	15.84	22.53	13.49
Years of School	9.84	5.16	9.80	5.05	9.89	5.29	10.17	5.15	9.42	5.06
Earnings	208.71	490.23	196.06	475.20	224.59	508.34	203.78	516.48	189.58	435.43
Number of observations	1784		993		791		786		979	

Source: Survey Data on the labour market, 1994.

Table 3 shows the percentages: About 4.4 percent of the people in sample have no education, 51.1 percent have primary education, and 26.9 percent have secondary education, while 17.5 percent have university education. About 4.2 percent of males have no education, 50.7 percent have primary education, 29.1 percent have secondary education and 19.3 percent have university education. 4.6 percent of females have no education, 52 percent have primary education, 24.2 have secondary education, and 19.4 percent have university education. 7.7 percent of respondents in the agricultural sector have no education, 41.5 percent have primary education, 36.5 percent have secondary education, 14.2 percent have university education. In the non-agricultural sector 3.6 percent have no education, 58.3 percent have primary education, and 19.7 percent have secondary education, while 18.4 percent have university education. This means that more than half of the simple have only primary education, followed by secondary education, and then university education.

TABLE 3: Frequency of schooling of various categories in the sample

Variables	Overall (%)	Male (%)	Female (%)	Agricultural (%)	Non-Agricultural (%)
SCHOOLING					
No education	4.4	4.2	4.6	7.7	3.6
Primary	51.3	50.7	54.0	41.5	58.3
Secondary	26.9	29.1	24.2	36.5	19.7
University	17.5	16.0	19.3	14.2	18.4
Number of observations	1784	993	791	786	979

Source: Survey Data on the labour market, 1994/1995.

TABLE 4: Earnings equation

Independent Variables	DEPENDENT VARIABLE (y)				
	Overall	Male	Female	Agricultural	Non-Agricultural
Constant	1.215 (11.177)	1.276 (8.580)	1.108 (6.837)	1.619 (5.987)	.853 (9.979)
Primary	.113 (10.109)	.111 (7.274)	.117 (7.111)	.165 (10.011)	.069 (4.432)
Secondary	.480 (35.792)	.479 (7.271)	.475 (26.204)	.482 (27.571)	.461 (22.156)
University	.481 (38.936)	.481 (28.637)	.487 (26.204)	.516 (30.275)	.465 (23.244)
Experience	.026 (.850)	.014 (.325)	.040 (.885)	.122 (2.609)	-.032 (-.771)
Experience ²	-.039 (-1.230)	-.039 (-.894)	-.034 (-.720)	-.090 (1.892)	-.020 (-.456)
R ²	.827	.817	.73	.80	.810
Sample size	1784	993	791	786	979

Source: Survey Data, 1994. Author's estimates from survey data on the labour market, 1994/95. Note - Numbers in parentheses are t-statistics.

Table 4 gives the results of the specification of earnings equation taking into consideration the various levels of education (primary, secondary, university), the gender (males and females), as well as two sectors of the economy (agricultural and non-agricultural). The results show that the independent variables adequately explain the dependent variable. This is also reflected by a high R² throughout: 83 percent for overall, 82 percent for males, 73 percent for females, 80 percent for agricultural sector and 81 percent for non-agricultural sector. The difference between two successive levels of education gives the rate of returns to the higher level of the education category (Liu, 1998). According to this specification, rates of return are: 1 percent for university, 36.7 percent for secondary and 11.3 percent for the entire sample. For males, the rate of return is 2 percent for university, 36.8 percent for secondary and 11.1 percent for primary school. For females, 12 percent for university, 35.8 percent for secondary and 11.7 percent for primary schools.

For the agricultural categories, the rates are respectively 3.4 percent for university, 31.7 percent for secondary education and 16.5 percent for primary education. For non-agricultural sector, the rate of return on education is 4 percent for university, 39.2 percent for secondary education, 6.9 percent for primary education. In all the secondary education categories show greater earnings than the others. Our findings tend to confirm those of Teal (2001). His study brings out three main findings – i) the returns to education are less for non agricultural self employed than for wage earners; ii) the differences are due to their educational level; iii) the returns to education are non-linear. The returns increase with the level of education except with those of farmers.

TABLE 5: Percentage increment in earnings associated with one extra year of schooling dln/ds

	Primary	Secondary	University
Overall	.142	.255	.552
Males	.154	.242	.560
Females	.127	.275	.532
Agricultural	.148	.232	.645
Non-agricultural	.130	.271	.488

Source: Calculation from Survey Data on the labour market, 1994.

Table 5 presents the results of changes in earnings accruing after acquiring one extra year of schooling. The results show that for all groups, earnings increase as a result of an extra year of schooling. Female earnings increase more than male from primary to secondary education. While from the secondary education to university, males' earnings are more than females'. The non-agricultural sector has a higher increase associated with an extra year of schooling than the agricultural sector.

TABLE 6: Private rates of returns to education (%)

RATES OF RETURNS	Primary - Illiterates	Secondary - Primary	University - Secondary
Overall	05.2	26.3	27.2
Males	11.8	28.3	29.3
Females	01.9	01.9	21.8
Agricultural	07.3	21.2	33.4
Non-agricultural	06.3	28.0	20.5

Source: Calculation from Labour Market Survey Data, 1993/94.

Table 6 presents the private rate of returns to investment according to various levels of education, gender and sectors of the economy. For the whole sample, the return increases the higher level of education. The return to university is 27.2 percent, which is higher than 26.3 percent for secondary education and 5.2 percent for primary education. For males, return from university is 29.3 percent, which is higher than 28.3 percent for secondary education. For females, the picture is the same with returns to education increasing the higher the level of education. The same is true for the agricultural sector and the return to university education. But the results for non-agricultural sector tend to be slightly different. The overall results underscore the importance of higher education.

6. Conclusion

Based on the survey data collected from five provinces of Cameroon, we estimate percentage change of earnings associated with change in educational level as well as estimates of the rates of return to education on the three main educational levels, two main economic sectors and gender differences. Our focus was on the private rates of returns and marginal changes. It is interesting to note that different educational levels show increasing rates of return from lower to higher level. Also there are increases in earnings with an extra year of schooling. In the lower levels of schooling female earnings are higher but the situation is reversed at higher educational levels.

The main point drawn from this study is the importance of investment in education particularly in the tertiary level. Hence private investment in higher education is a worth while investment. The issue becomes that of financing education by individuals; since more of the benefits seem to accrue to the individuals. Given the level of Cameroon's development equity concerns become great importance. We can talk of cost recovery from tertiary education but in a very limited way. The state or society must still bear much of the cost because of the crucial importance of higher education and the externalities that it also generates. Initially, the World Bank tended to emphasise on the primary level of education to almost neglect of the tertiary level. Recently, the importance of tertiary level of education has been recognised. Thus policies designed to favour primary level must also take into consideration the greater spill over effects of the different educational levels and more so with the fact that the three educational levels form a whole system. The lower levels are inputs into the higher levels and equally the outputs of the higher educational levels are valuable inputs into the lower educational levels.

There is much evidence on the positive impact of education on productivity and development. Tertiary education should, therefore, be stressed particularly with the present world of information technology and globalisation. This is crucially critical with productivity growth being a key requirement to socio-economic development. There is a caveat deriving strong

policy implications from these results mainly because many non observables are not fully controlled, and therefore could greatly affect the results. Nevertheless, there is a clear indication on the expansion of education at all educational levels. This must also take into consideration the quality and relevance of such educational expansion to the economy and society.

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