

RP174
JAN. 2008



**PRIVATE RETURNS TO EDUCATION
IN GHANA: IMPLICATIONS FOR
INVESTMENTS IN SCHOOLING
AND MIGRATION**

Harry A. Sackey

AFRICAN ECONOMIC RESEARCH CONSORTIUM

CONSORTIUM POUR LA RECHERCHE ECONOMIQUE EN AFRIQUE

Private Returns to Education in Ghana: Implications for Investments in Schooling and Migration

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AERC Research Paper 174
African Economic Research Consortium, Nairobi
January 2008

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THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

Printed by: Modern Lithographic (K) Ltd
P.O. Box 52810 - City Square
Nairobi 00200, Kenya

ISBN 9966-778-19-5

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Contents

List of tables

List of figures

Abstract

Acknowledgements

1. Introduction	1
2. Workers' educational attainment and earnings	5
3. Literature review	9
4. Measurement issues and methodology	12
5. Results from earnings models	16
6. Conclusion	26
Notes	28
References	29

List of tables

1. Restructuring the education system in Ghana	3
2. Estimated earnings coefficients for male and female workers, 1992 and 1999	16
3. Private rates of return to schooling in Ghana, 1992–1999	17
4. Test for difference in schooling coefficients for females and males	18
5. Estimated earnings coefficients for male and female workers with control for family background, 1992 and 1999	18
6. Private rates of return to schooling after controlling for family background (%)	19
7. School attendance rates for children in Ghana, 1992 and 1999	20
8. Estimated earnings coefficients for male and female workers in spatial labour markets, 1992	22
9. Employment probabilities for urban residents in Ghana who migrated within the last seven years and have at least middle school/junior secondary school level of education, 1999 (%)	24

List of figures

1. Average gross enrolments at the basic and secondary education levels in Ghana, 1993–2004	4
2. Gender gap in enrolments at the basic and secondary education levels in Ghana, 1993–2004	4
3. Percentage of workers with primary school attainment in Ghana, by age group	6
4. Percentage of workers with middle school attainment in Ghana, by age group	6
5. Percentage of workers with secondary school attainment in Ghana, by age group	6
6. Age-earnings profile for all workers in Ghana, 1999	7
7. Monthly earnings of workers based on educational attainment and expressed as ratios of national average monthly earning, 1999	7
8. Migrant earnings in urban Ghana vs. rural earnings, 1992	23
9. Returns to schooling in spatial labour markets in Ghana, 1992	23

Abstract

This study examines private returns to schooling in Ghana over a seven-year period, and the implications for school investments and migration. Using data from the 1992 and 1999 Ghana living standards surveys and ordinary least squares technique, we find that the private returns to schooling at higher levels of education have increased for both female and male workers. For female workers, the return to an additional year of secondary schooling increased from 7.3% in 1992 to 12.3% in 1999. In the case of tertiary education, the change is from 11.4% in 1992 to 18.4% in 1999. For male workers the return to an additional year of secondary education decreased from about 7% to 6%, while the return to tertiary education increased from about 13% to 19%. Generally, the rising rates of return at higher school levels have coincided with a similar trend in school attendance rates for female and male children. The spatial analysis implies a rural-urban gap in the returns to an additional year of tertiary education. Linking these results to migration, the data show a relatively low incidence of rural-to-urban migration, notwithstanding relatively higher earnings in urban areas. To sustain the gains realized in educational attainment, lingering issues of gender equity need to be addressed by policy makers so that females are not left behind in the intergenerational race for improvements in quality of life.

Acknowledgements

I am grateful to the African Economic Research Consortium (AERC) for financial support for this study, and to “Group A” researchers and resource persons at the AERC 2005 biannual workshops held in Nairobi and Johannesburg for their constructive comments and suggestions, notably John Strauss, Erik Thorbecke and Jean-Yves Duclos. I also wish to thank two anonymous reviewers for their comments.

1. Introduction

It is becoming increasingly clear to policy makers that productive employment with sustainable earnings is a key strategy for poverty reduction. Schooling is integral to this approach as it enhances the adaptability and efficiency of workers. Barro and Lee (2001) observed that a greater amount of educational attainment implies more skilled and productive workers, who in turn increase the output of goods and services. An abundant well-educated human resource also helps to facilitate the absorption of advanced technologies. Moreover, the level and distribution of educational attainment has a strong impact on social outcomes such as children's education, child mortality and income distribution.

The rate of return to schooling plays an important role in the determination of educational attainment and participation and ultimately on earnings received by workers in the labour market (Harmon and Walker, 1995). Increasingly, governments and other agencies are providing financial resources towards "studies on returns to education along with other research, to guide macro-policy decisions about the organization and financing of education reforms" (Psacharopoulos and Patrinos, 2004: 118). The rate of return to schooling also influences the regional allocation of human resources. In particular it is a core factor in the migration process. This paper examines the important subject of returns to schooling in Ghana.

The rest of the paper is structured as follows: The remainder of this section covers, first, the major research issues and specific objectives of the study, followed by a discussion of Ghana's education system. Data sources, educational attainment of workers and earnings are discussed in Section 2, and a brief examination of the theoretical and empirical literature on returns to schooling is carried out in Section 3. This is followed by discussions on measurement issues and methodology (Section 4) and a presentation of the results from the estimated models on earnings in Ghana and the resultant returns to schooling (Section 5), along with the implications of these returns to schooling for school attendance and migration. A review of conclusions and policy implications is in Section 6.

Research issues and objectives of study

The 1980s were a turbulent period of economic decline and adjustment in Ghana. Since then, economic growth rates have averaged about 4% per annum (i.e., 4.3% between 1990 and 1999 and 4.4% between 2000 and 2004). Ghana's per capita income (valued at constant 2000 prices) increased from about US\$216 in 1991 to US\$247 in

1999 and then to US\$275 in 2004 (World Bank, 2006). For the Ghanaian economy, the goal of moving from low income status to a middle income country cannot be attained without the commitment of resources to improve available human capital. The need for a strategy to provide broad-based school accessibility to narrow the schooling gap between males and females has been underscored in various circles. To this intent, education has undoubtedly become a priority area for the government. Like any commodity, supply of education needs to be compared with its demand. The demand for education is not an end in itself. Families tend to demand education for their children when they know the returns will be positive and can improve the standards of living of recipients and their families.

Recent evidence seems to suggest an increase in demand for schooling by Ghanaians, and at the tertiary level there are even concerns about supply constraints such as infrastructure problems and absorption capacities. What seems to be the force behind this drive for education? In particular, what are the returns to schooling for male and female workers in the Ghanaian economy? Have these returns changed over time? Does family background influence the returns to schooling? Are there spatial differences in the returns to school? Are the returns to schooling in urban labour markets higher than those in rural labour markets? If so, is there a tendency for migration to occur? What are the major implications for investments in schooling and for public policy? These are the major research issues addressed in this study.

The specific objectives of the study are tailored towards addressing the key research issues raised above. These objectives are to:

- Examine trends in the educational status of the labour force, from a gender perspective.
- Estimate the returns to schooling for male and female workers.
- Provide a spatial analysis on the returns to schooling and implications for migration.
- Discuss the implications of returns to schooling for investments in education.

Ghana's education system then and now

Prior to the implementation of the 1987 educational reform programme in Ghana, pre-university education involved 17 years of schooling, comprising six years of primary education; four years of middle school; five years of secondary school at the "ordinary level"; and two years of "advanced level" secondary schooling. This was the typical route pursued by students in the public school system. It was possible, however, for some students to "jump the queue" by taking and passing the entrance examinations necessary to obtain admission to a secondary school. Parallel to the public school system was the private school system, which typically allowed pupils to take seven years of primary education and then take the secondary school entrance examinations. For successful candidates the private school system reduced the total pre-university schooling years from 17 to 15 years. These private primary schools, as expected, were generally located in the major cities and urban areas of the country.

The implementation of the education reform programme in 1987 reduced the pre-tertiary years of schooling from 17 to 12. A summary of the steps involved in the reform programme is displayed in Table 1. On the one hand, the reform involved a phasing out

of the existing middle and secondary schooling (i.e., ordinary and advanced levels) components. On the other hand, the reform programme saw a phasing in of a three-year junior secondary schooling and a three-year senior secondary school component. This reform programme, in a way, synchronized the pre-tertiary years of schooling in both the public and private sectors of education. Irrespective of whether students attended a private or public school, they had a total of 12 years to move from basic through secondary to the tertiary level, holding other factors constant. However, school quality differences exist between publicly and privately provided education. The cost implications and general issues of accessibility also tend to differ for the two types of school providers.

Table 1: Restructuring the education system in Ghana

Educ. level	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95
Middle school	Last cohort admitted			Last cohort graduate	Middle schools closed				
JSS*	JSS not yet begun	First cohort admitted		First cohort take BE exam (end of year)					
SSS** (old system)				Last Form 1 cohort admitted				Last cohort complete Form 5	Old system finished
SSS (new system)	New SSS system not yet begun				First cohort admitted		First cohort complete (Dec 1993)		

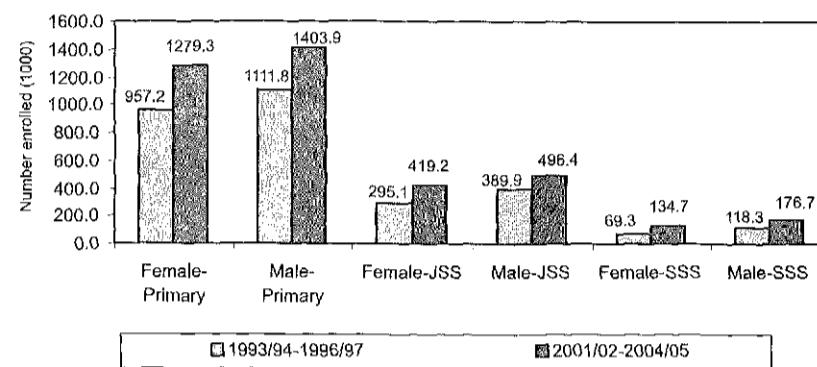
*Junior secondary school

**Senior secondary school

Source: Adapted from World Bank (2004: 9).

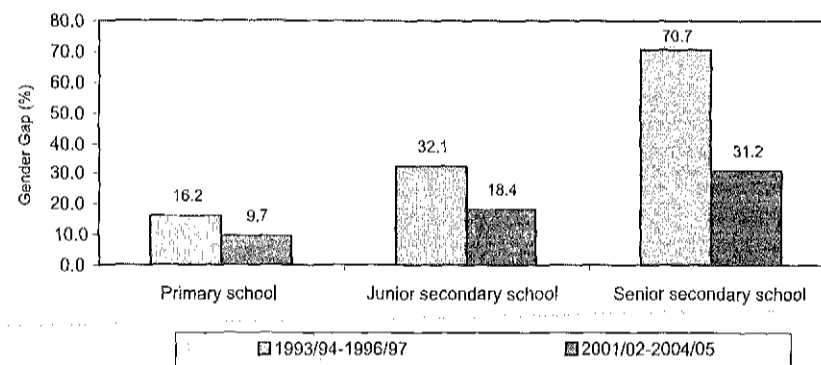
The Ghana government's policy of achieving free, compulsory and universal basic education for all (FCUBE) with an envisaged ten-year implementation period (1996–2005) gave rise to the Basic Education Sector Improvement Programme (BESIP), which was to support the first phase of the FCUBE (1996–2000).¹ A major motivation for the FCUBE was the recognition of unsatisfactory enrolment rates for children at the primary and junior secondary school levels (figures 1 and 2). In particular, the low enrolment rates for girls put them in a disadvantaged position – their chances of getting formal sector jobs are low, the potential to realize a steady stream of income is diminished, and in cases where they assume headship of their households, the ability to cater for the needs of their children is stifled. This tendency has a potential adverse implication for policy efforts geared towards reducing the incidence of poverty in the country. Against this backdrop and other considerations, the objectives of the FCUBE were to improve teaching processes and learning outcomes; build capacity to manage the basic education system; and improve access to basic education, particularly for girls and the poor in society as well as other vulnerable groups.²

Figure 1: Average gross enrolments at the basic and secondary education levels in Ghana, 1993–2004



Source: Author's calculations based on data from Ghana Statistical Service's *Quarterly Digest of Statistics* (2001) and the Ministry of Education and Sports (2005).

Figure 2: Gender gap in enrolments at the basic and secondary education levels in Ghana, 1993–2004



Note: The calculations for gender gap in enrolments are based on the actual number of enrolments and not the enrolment ratios.

Source: Author's calculations based on gender data in Figure 1.

The education system and the options it provides tend to affect future employment prospects for the graduates it produces. The Ghana Ministry of Education and Sports (2007) online resource on education reforms in Ghana gives an indication of the likely sectors of employment of graduates from the educational system. It notes that about 30% of graduates from the junior secondary enrol in senior secondary schools in the country, with about 15–20% entering technical and vocational institutes. As a result, “the vast majority are expected to work as apprentices in the informal sector or to become self-employed”.³ In general, the structure of earnings favours formal workers compared with informal sector workers. This tends to influence the returns to schooling.

2. Workers' educational attainment and earnings

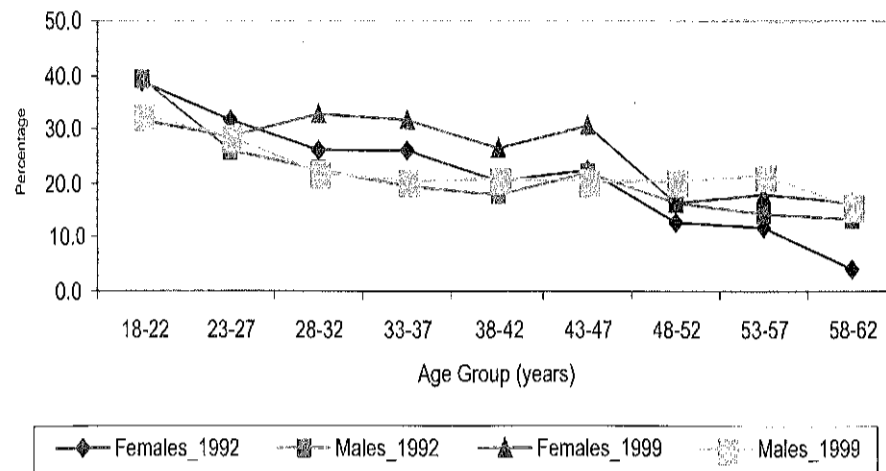
Micro-level data used in this study are sourced from the Ghana living standards surveys of 1991/92 (GLSS3) and 1998/99 (GLSS4) made available by the Ghana Statistical Service. Although not panel data, the survey instruments for GLSS3 and GLSS4 were quite similar. The surveys provide rich information on educational attainment of workers, parental educational attainment, earnings and labour market activities, among other information. The study uses a sample of 6,451 workers in 1992 and 3,945 workers in 1999 aged 18 years and above, to examine the private returns to schooling in Ghana.

A comparison of the data set for 1992 with that of 1999 indicates a reduction in the percentage of male and female workers who have never been to school. There are relatively fewer workers with secondary education attainment than there are workers with a basic level of schooling. There are both gender and age cohort effects in the education credentials of workers. In 1992 and 1999, there were more male than female workers with secondary education. This is consistent with schooling trends in sub-Saharan Africa. While there has been a tendency for the educational attainment of workers to increase during the seven-year period under consideration, there are gender gaps in education. There are more female than male workers having lower levels of education and more males than females at upper levels.

At the primary school level, female workers between 18 and 47 years of age show higher incidence of primary school attainment than male workers (Figure 3). Beyond the primary school level, more male workers had attained middle and secondary school in 1992 than had female workers in 1999 (figures 4 and 5). In other words, although improvements occurred for female workers by 1999, their higher levels of education had not yet caught up with the educational attainment of their male counterparts seven years earlier. Generally, there is an upward trend in the schooling attainment of both male and female workers in 1999 compared with 1992. Major implications of the rise in the educational status of workers are the potential impacts on productivity and earnings. Thus, not only is the Ghanaian economy likely to benefit from increased output, but also there is potential for a narrowing of the gender earnings gap.

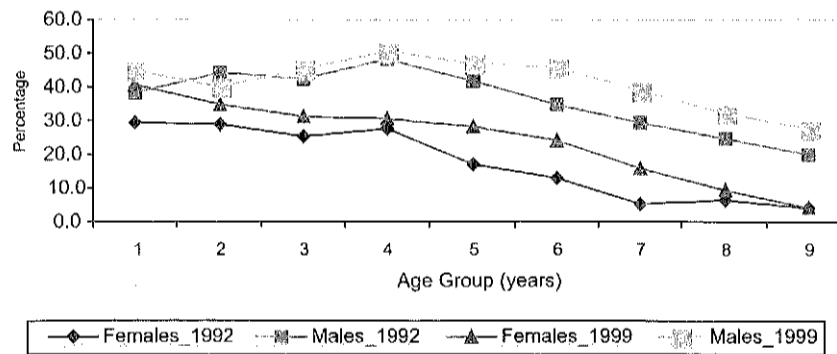
For both female and male workers, the age cohort effect is seen in terms of younger workers having higher educational attainment than older ones. Thus, at all levels of education, there is a tendency for school attainment to decline as people move from younger to older age cohorts. This trend is consistent with global patterns in educational attainment. Younger age cohorts tend to have more schooling than older people. What are the effects of these different levels of schooling on the earnings of workers? To answer this question, we provide an age-earnings profile for all workers.

Figure 3: Percentage of workers with primary school attainment in Ghana, by age group



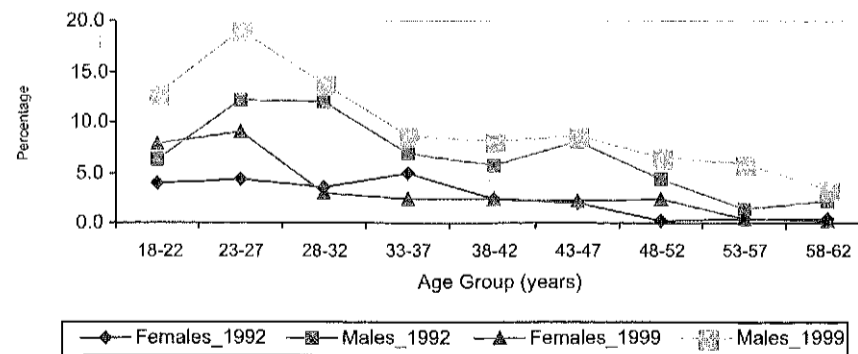
Source: Author's calculations based on GLSS3 and GLSS4 micro data sets.

Figure 4: Percentage of workers with middle school attainment in Ghana, by age group



Source: Author's calculations based on GLSS3 and GLSS4 micro data sets.

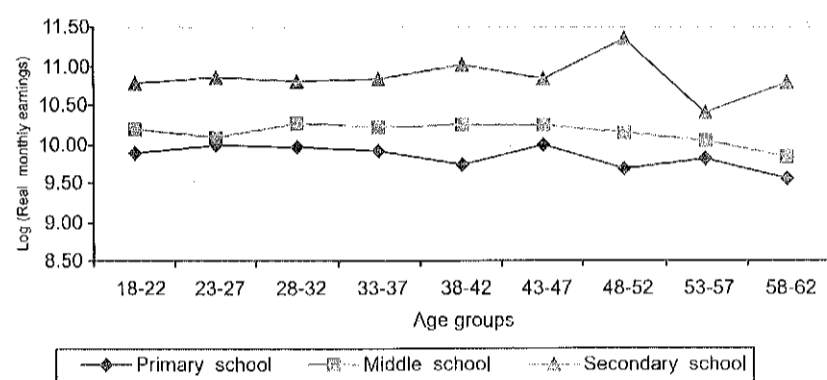
Figure 5: Percentage of workers with secondary school attainment in Ghana, by age group



Source: Author's calculations based on GLSS3 and GLSS4 micro data sets.

The age-earnings profile shown in Figure 6 attests to the fact that earnings are a function of schooling. Holding other factors constant, workers with higher levels of schooling receive higher rewards in the labour market in terms of earnings, compared with workers having lower levels of schooling. For the Ghanaian economy, evidence shows that on average, the earnings of those without schooling tend to be lower than those with schooling.

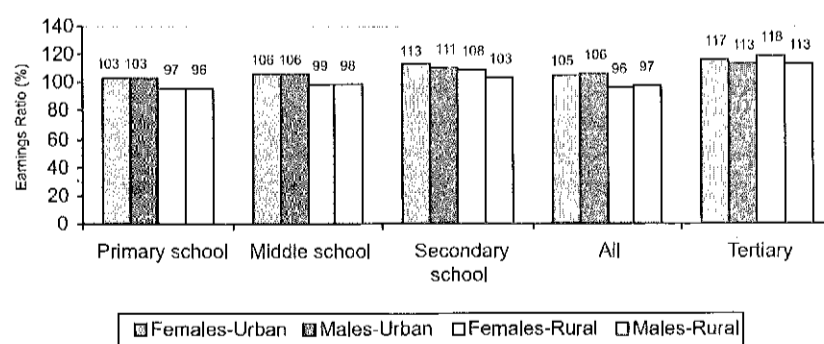
Figure 6: Age-earnings profile for all workers in Ghana, 1999



Note: Owing to the smaller number of observations for tertiary school attainment, we have not included this level of schooling in the age-earnings profile displayed.
Source: Author's calculations based on GLSS4 micro data sets.

In Figure 7, we show monthly earnings of workers based on their schooling status, expressed as shares of the national average. Both gender and locality perspectives are provided. It is clear that the average earnings ratio rises with school attainment. At the same time, average earnings in rural areas lag behind those realized in urban areas. This gap between urban and rural areas could be traced to the nature of economic activities undertaken in these different localities. Non-agricultural activities are the prime

Figure 7: Monthly earnings of workers based on educational attainment and expressed as ratios of national average monthly earnings, 1999



Note: "All" takes into account all levels of schooling, including tertiary education.
Source: Author's calculations based on GLSS4 micro data sets.

undertakings in urban areas, while agriculture is dominant in rural areas. Moreover, formal sector employment, which comes with stable and relatively higher income based on school attainment, is more common in urban than in rural areas.

Generally, employment activities of workers are influenced by their levels of schooling. Workers with no schooling whatsoever are predominantly found in the agriculture sector and in rural areas. An analysis of the employment characteristics of workers in the 1999 sample used for this study showed that about 75% of male and 66% of female workers with no schooling were employed in the agricultural sector. At the extreme end of the education spectrum, about 8% of male and female workers with tertiary education were engaged in agricultural activities; about one-third of the tertiary education graduates were self-employed; 36% were employed in the public sector; and 24% were in the private sector.

Compared with male workers, female workers with tertiary education appear to have had a higher probability of being employed in the public sector (31% versus 62%). This could be partly due to the fact that there were relatively fewer females than males with tertiary education; such women were more likely to be found in urban than rural areas. These factors were likely to have increased the observed probability of female employment in the public formal sector of the labour market. At the same time, the government's declared commitment to affirmative action and the promotion of gender equity in employment could have increased the chances of employment in the formal sector for the few female tertiary graduates.

3. Literature review

Human capital theory provides the foundation for empirical analysis on investments in education and the returns to schooling. Mincer and Polachek (1974), writing on family investments in human capital, note that the optimal investment in human capital of any family member calls for a consideration of not only the human and financial capacities in the family, but also the prospective utilization of the capital that is being accumulated. Consequently, the expectations regarding future family and market activities of individuals wield a great influence on the levels and forms of human capital investment. In other words, family investments in children's education and time allocations are linked, so that "while the current distribution of human capital influences the current allocation of time within the family, the prospective allocation of time influences current investments in human capital" (Mincer and Polachek, 1974: S77). To the extent that earnings in the labour market are determined by the stock of human capital accumulated by individuals, a sequence of positive net investments results in an earning power that grows over the life cycle.

Dougherty (2005) explains the difference in the male-female schooling coefficient in terms of job characteristics (i.e., composition effect) and occupation choice (i.e., occupation effect). With regard to the "composition effect", the difference is explained by the under-representation of females in jobs where schooling is a relatively unimportant factor in the determination of earnings. He cites the example of female under-representation among union workers, where schooling is subordinated to seniority as a determinant of earnings, or in self-employment where entrepreneurial skills are relatively highly valued. In terms of the "occupation effect", the tendency for women to be segregated in occupations with relatively low pay generates an earnings gap between men and women. Another plausible cause of earnings differential between male and female workers is the quality of educational attainment.

In his analysis of whether conventional patterns of rates of return to education prevail in sub-Saharan Africa, Bennell (1996) concluded that this is not the case. He noted that country case studies did not support the notion of consistently higher returns to primary education than either secondary or higher education. His findings were contrary to the broad picture provided on sub-Saharan Africa by Psacharopoulos (1994). Differences in data and methodology used were highlighted.

Recent empirical work on returns to schooling in sub-Saharan Africa includes analyses on South Africa by Keswell and Poswell (2004); Nigeria by Aromolan (2006, 2004) and Okuwa (2004); Kenya by Kimenyi et al. (2006); Zambia by Nielsen and Westergaard-Nielsen (2001); and Ghana and Côte d'Ivoire by Schultz (1999), Psacharopoulos and Patrinos (2004), and Bennell (1996).

Keswell and Poswell (2004), estimating the returns to schooling in South Africa for the periods 1995, 1997 and 2000, found that after accounting for censoring (via the use of tobit models) the range for the private returns to schooling was 15–26%. Their study showed a decline in the returns to an additional year of schooling from 23.2% in 1993 to 18.2% in 2000. The variables used in their analysis were the years of schooling, age and its quadratic terms. In their alternative uncensored models (based on OLS regression), the authors found the returns to an additional year of schooling to be between 17% and 26%. In this framework, the returns to schooling had fallen from 24.5% in 1993 to 20.2% in 2000. The authors noted, however, that controlling for race in their models altered the results remarkably: "... including race dummies, the estimated Mincerian rate of return in all years considered is less than half of that indicated ..." (Keswell and Poswell, 2004: 839).

Using household survey data from 1996/97 to 1998/99 for Nigeria and ordinary least squares method, Aromolan (2006, 2004) found the returns to an additional year of schooling at the post-secondary were 10.4% for male and 12.2% for female wage earners; and 13.7% for self-employed male and 15.4% for self-employed females. Generally, the wage returns to an additional year of post-secondary education were found to be between 10% and 15% for workers in the labour market in Nigeria. At the primary and secondary levels, however, these returns were quite low, ranging between 2% and 4%. On the basis of his empirical results, the author concludes that "increasing public investment to encourage increased attendance in basic education is not justifiable on grounds of private efficiency, unless investments to increase school quality have higher private returns" (Aromolan, 2004: 433).

In a different study on the Nigerian economy, Okuwa (2004) used data from the 1995 Nigerian labour market survey to examine the private returns to higher education. For all levels of education, the returns to schooling were higher for private sector workers than public sector workers. The returns to schooling also increased as higher levels of schooling are attained. The return to an additional year of secondary schooling was -0.5% for males and 3.5% for females. At the university level, schooling returns were 16.3% for males and 10.7% for females. In the private sector the returns to additional year of university education brought returns of 16.8%, while in the public sector this was 12.6%. On the bases of these findings, the author provides a policy recommendation that "the university, which attracts the highest magnitude of returns, should be properly funded and equipped with modern technology, especially the laboratory, library, information system and infrastructure" (Okuwa, 2004: 28).

Kimenyi et al. (2006) examined human capital externalities and private returns to education in Kenya using 1994 data sets from a national welfare monitoring survey. They found a positive relationship between the level of education and the associated returns. Taking into account human externalities, the returns to an additional year of schooling increased from about 8% for primary school to 23% for secondary school and then to 25% for university level of education. At the university level, the returns to schooling were higher in urban than rural areas (about 61% for urban females versus 21% for rural females, and 35% for urban males versus 17% for rural males). The authors conclude that: "... public policies that expand schooling opportunities for underprivileged social groups benefit the whole society via the externality effects of

education. The benefits are in terms of improved productivity and earnings” (Kimenyi et al., 2006: 510).

The case for Zambia is presented in the analysis by Nielsen and Westergard-Nielsen (2001). Providing an empirical analysis based on 1993 survey data, these authors found the return to schooling to be higher in rural than in urban areas. They associated this trend with the apparent low quality of schooling, noting that it was possible for people to complete primary schooling without being able to read and write. The implication of a rural-based economy with a relatively high illiterate rural population is that “having some education probably works as a signal for some underlying favourable unobservable characteristics” (Nielsen and Westergard-Nielsen, 2001: 374).

4. Measurement issues and methodology

Different types of bias have been associated with the measurement of the returns to schooling by the OLS method. The “ability bias” is driven by the presence of an unobservable factor that is correlated with both schooling and wages. This sort of correlation results in an upward bias in OLS estimates of the returns to schooling. Among the options for dealing with the ability bias is the use of family background as a proxy for ability. Parental education has often been used as a control variable for unobserved ability (e.g., Liu et al., 2000; Agnarsson and Carlin, 2002; Card, 1995; Ashenfelter and Zimmerman, 1997; and Li and Luo, 2004). Our study follows a similar approach by controlling for unobserved ability using the educational attainments of the workers’ parents.

Another potential source of bias relates to measurement errors, which tend to yield a downward bias in OLS estimates on returns to schooling (Harmon and Walker, 1995). Ashenfelter and Krueger (1994) and Ashenfelter et al. (1999) provide detailed discussions on schooling measurement errors. Such errors call for the use of instrumental variable approach in estimating the returns to schooling. In essence, such an approach involves searching for an instrument that is correlated with the true measure of schooling and uncorrelated with the measurement error (Dearden, 1999). Finding suitable instruments is not always easy.

Estimating returns to schooling for developing countries can be a daunting task for various reasons. First, there is the typical problem of accuracy of income data sets. The formal sector is small and comes with the implicit problem of poorly documented earnings. For informal sector workers, accuracy of information on reported earnings depends on the degree of willingness to disclose income, the person’s recall capabilities and what appears to be the “typical” average earnings of the person under consideration. The seasonal nature of employment activities could also influence the average earnings obtained. Income under-declaration or over-declaration is common.

The monthly earnings variable used in the determination of returns to schooling was obtained from the employment and time-use section of the survey instrument. Under the characteristics of main occupation, respondents were asked: (a) to indicate their industrial activity; (b) whether they had received or will receive money for the specific work they were undertaking; and (c) the specific amount to be obtained within various time units (e.g., weekly, biweekly, monthly, etc.). The income variable that we used in our paper is, therefore, for all economic activities and not just formal sector activities. We acknowledge seasonality or irregularity in earnings as far as informal sector activities are concerned. In the absence of any foolproof measure, however, we use data provided on the income

variable as proxy for monthly earnings capabilities of labour market participants and examine the impact of schooling on it.

Another issue has to do with the change in Ghana's educational system during the second half of the 1980s. In a way, the educational reform has changed the different levels of educational credentials of labour market participants. Younger age cohorts will be seen to possess educational credentials reflected in the reformed system (i.e., junior secondary school and senior secondary school graduates), while older ones will have qualifications associated with the old educational system (i.e., middle school, ordinary and advanced levels of secondary school). Estimating returns to schooling over time could therefore be problematic where levels of schooling as opposed to years of schooling are used because of data availability constraints. The issue of change in the educational system would be inconsequential if data on years of schooling as opposed to levels of schooling were available for the surveys being used. Unfortunately this was not the case in the 1999 data sets.

Our choice of levels of schooling rather than years of schooling is a survey-driven necessity. In the GLSS4, the sequence of questions asked under the general education section was: "(1) Have you ever attended school? (2) What was the highest level completed? (3) What was the highest educational qualification?" Although the same set of questions was asked in the GLSS3, the recording or coding of responses to question 2 differed in the sense that the specific grades/class for primary 1 through primary 6 (e.g., p1, p2, etc.) were indicated, so were the other educational levels. Therefore, it is possible to calculate the years of schooling without having to make any assumptions. This is not the case for the GLSS4. A consolidated approach for each schooling level was adopted without showing the specific class or grade attained. Such information is provided under education careers, which is of less relevance for our study. To provide a more consistent framework for the analysis of returns to schooling over time, we constructed school dummies for the two survey periods on the basis of question 3 (i.e., highest educational qualification). We used school attainment levels common to both the 1992 and 1999 survey data sets. Our focus is on general education, and therefore specific skills-oriented schooling such as vocational and teacher training are generally excluded from our analysis.

The earnings functions estimated follow Mincer (1974), with earnings being determined by schooling and labour market work experience. The major departure from the approach by Mincer is that the experience variable in our model is not "potential experience". In the absence of the actual years of schooling it is somewhat difficult to calculate potential experience using Mincer's approach (i.e., age minus years of schooling minus 6), in a precise manner. The use of experience as opposed to potential experience is common in the empirical literature on returns to schooling (see for example Hawley, 2004; Yang, 2005; Li and Luo, 2004; Patrinos and Sakellariou, 2006; Krueger, 1993, and Moore et al., 2007).

The "experience" variable we used for the 1992 sample was the number of years worked in the main occupation of the respondent. This variable was obtained from the characteristics of main occupation of the respondent found under the employment and time use section of the questionnaire. There was a slight modification in the set of questions asked in the employment and time use section of the 1999 survey. The question of years

of work in the current main occupation was absent from the set of questions asked on main occupations. However, this question was asked for parts C, D and E, which dealt with second, third and fourth occupations, respectively. Part H of the employment and time use section focused on employment history. Here respondents were asked about the job they did prior to the last 12 months of the survey administration date and how long they worked in that occupation. We have used the response to this question to construct the “experience” variable for the 1999 sample.

With these inherent problems on income data sets and other measurement issues in mind, we estimated earnings functions for Ghana and used the results as basis for computing the returns to schooling. However, these results should be seen as an approximation of the private returns to schooling in Ghana.

The methodology adopted is fairly standard and has been applied widely in the empirical literature on returns to schooling. In ascertaining the returns to schooling over time, we use the earnings function proposed by Mincer (1974). In place of years of schooling, we use schooling dummy variables in order to capture different levels of school attainment and how they affect earnings. As noted earlier this option is based on data availability. At any rate, using levels of schooling suits our purpose because our goal is to find out whether there is any justification for investments in various levels of schooling for children. Following Mincer (1974) we estimate a semi-logarithmic equation, with earnings being determined by schooling, experience and experience squared. Specifically, we estimate the following equation by ordinary least squares:

$$\begin{aligned} \ln(W_i) = & \gamma + \alpha_1 Prim + \alpha_2 Mid + \alpha_3 Sec + \alpha_4 Ter + \beta_1 Expe \\ & + \beta_2 Expe^2 + \lambda Z_i + \varepsilon_i \end{aligned} \quad (1)$$

where: W represents earnings, $Prim$ is primary school dummy variable; Mid is middle school dummy; Sec is secondary school dummy variable; Ter is tertiary level of education; $Expe$ is experience in the labour market and $Expe^2$ is experience-squared; Z is a vector of control variables such as regional dummy variables and family background using parental education as proxy; and μ is the error term. Our a priori expectations are that: $\alpha_1 > 0$; $\alpha_2 > 0$; $\alpha_3 > 0$; $\alpha_4 > 0$; $\beta_1 > 0$; and $\beta_2 < 0$.

To calculate the rate of returns to an additional year of schooling, we follow Patrinos and Sakellariou (2006), Kimenyi et al. (2006), Schultz (2003), and Cohen and House (1994) by dividing the difference between the coefficients of adjacent schooling levels by their differences in years of schooling. Letting R represent the rate of return and S the years of schooling, the rate of return to an additional year of schooling for a given level is measured as follows:

$$\begin{aligned} R_{(Prim)} &= \alpha_1 / S_{Prim} \\ R_{(Mid)} &= (\alpha_2 - \alpha_1) / (S_{Mid} - S_{Prim}) \\ R_{(Sec)} &= (\alpha_3 - \alpha_2) / (S_{Sec} - S_{Mid}) \end{aligned} \quad (2)$$

$$R_{(Ter)} = (\alpha_4 - \alpha_3) / (S_{Ter} - S_{Sec})$$

The number of years required to complete primary schooling is six; four more years are needed to complete middle schooling; and another five years to complete secondary school (ordinary level). An average of four years is needed to complete a bachelor's degree at the university level. Two more years are needed at the advanced level of secondary schooling, however, so that the difference in years of schooling between tertiary and secondary school is six years. Thus, our calculations of the private returns to an additional year of schooling at the primary, middle, secondary and tertiary levels involve a system of six, four, five and six years, respectively. It must be pointed out that the statutory number of years for the completion of any given level of schooling may differ from the actual number of years spent to attain a particular level. This may be due to the possibility of grade repetition, entry examination failures, temporary school dropout and re-entry, among other factors. Unfortunately, we are unable to account for these in our sample, and therefore we use the statutory number of years in our calculations.

5. Results from earnings models

Extending the discussion on the educational status of workers and their earnings, this section estimates earnings equations for male and female workers in Ghana for two time periods – 1992 and 1999. Table 2 provides the results from estimating earnings functions for females and males in Ghana for the two periods under consideration. In line with findings in the literature, our results show that earnings rise with higher levels of schooling. The various levels of schooling have to be interpreted in relation to the “no schooling” category. Irrespective of gender and year of analysis, the magnitude of impact rises with higher level of schooling and the statistical significance also becomes stronger. There is, however, a non-linearity to earnings that is reflected in the coefficient on the experience variable bearing a positive sign and the experience-squared variable having a negative sign.

Table 2: Estimated earnings coefficients for male and female workers, 1992 and 1999

Dependent variable: Log(real monthly earnings)								
Estimation technique: OLS								
	1992		1992		1999		1999	
	Female workers		Male workers		Female workers		Male workers	
	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
Primary school dummy	0.213*	4.12	0.024	0.48	0.300*	4.37	0.078	0.91
Middle school dummy	0.365*	6.66	0.193*	4.01	0.461*	6.68	0.301*	3.86
Secondary school dummy	0.729*	6.03	0.563*	6.66	1.075*	5.43	0.586*	4.28
Tertiary education dummy	1.413*	3.38	1.357*	5.93	2.176*	3.47	1.718*	4.65
Experience	0.011**	2.42	0.024*	6.86	0.005	0.93	0.010	1.49
Experience squared/100	-0.035*	-3.78	-0.037*	-5.88	-0.021***	-1.91	-0.030**	-2.30
Urban resident	0.559*	12.17	0.432*	10.39	0.519*	8.34	0.586*	9.04
Regional dummies	Yes		Yes		Yes		Yes	
Constant	9.154*		9.465*		9.250*		9.137*	
F statistic	53.42		45.57		34		33.43	
Adj. R-squared	0.201		0.1677		0.182		0.22	
No. of observations	3,132		3,319		2,223		1,722	
<i>F-tests on equality in school coefficients:</i>								
Ho: Primary – middle school = 0	6.86		13.36		4.9		9.73	
Prob > F	0.009		0.000		0.027		0.002	
Ho: Middle - secondary school = 0	9.04		21.92		9.64		5.08	
Prob > F	0.003		0.000		0.002		0.024	
Ho: secondary - tertiary ed. = 0	2.52		11.41		2.84		8.66	
Prob > F	0.112		0.001		0.092		0.003	

Note: *, ** and *** indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The private rates of return to schooling are shown in Table 3. For female workers, the returns to higher levels of schooling increased faster than those for lower levels of schooling. The return to an additional year of secondary schooling rose by 5 percentage points (i.e., from 7.3% in 1992 to 12.3% in 1999). In the case of tertiary education, a 7 percentage point increase occurred (i.e., from 11.4% in 1992 to 18.4% in 1999) for female workers. For male workers the return to an additional year of tertiary education increased from about 13% to 19%, while the return to secondary education decreased by 1.7 percentage points.

Table 3: Private rates of return to schooling in Ghana, 1992–1999

Schooling levels	Female workers		Male workers		Returns to schooling ratio	
	Rates of return (%)		Rates of return (%)		(Female workers /Male workers)	
	1992	1999	1992	1999	1992	1999
Primary school	3.5	5.0	0.4	1.3	8.8	3.8
Middle school	3.8	4.0	4.2	5.6	0.9	0.7
Secondary school	7.3	12.3	7.4	5.7	1.0	2.2
Tertiary	11.4	18.4	13.2	18.9	0.9	1.0

Source: Author's calculations based on Table 2.

Thus, the major patterns that emerge from these calculations are as follows:

- Upward trends have occurred for relatively higher levels of schooling.
- The returns to an additional year of female primary and secondary schooling are relatively higher than that of males.
- At the tertiary level the returns to female schooling have increased faster than have those for males.

The upward trend in the private returns to tertiary education appears to be driven in part by the increased demand for tertiary level graduates by employers in the formal sector of the labour market. In an economy with a formal sector labour market unable to grow at a fast enough pace to absorb the ever rising labour force, competition for the limited formal sector jobs is keen and higher educational attainments tend to be better rewarded than lower levels of education. This phenomenon is manifested in the returns to higher levels of education. A study by Boateng and Ofori-Sarpong (2002) on the labour market for tertiary graduates in Ghana found about 57% of advertised job vacancies in 1990–1994 required applicants to have a tertiary education qualification. The advertised jobs requiring tertiary level graduates increased to 64% in 1995–2000. In particular, the ratio for 2000 was 79%.⁴ In terms of advertised job composition, the dominant sectors for tertiary graduates were manufacturing, banking and finance, construction, public administration, education, research, and other services. We must point out that their analysis also showed there was an over-supply of graduates in certain disciplines/areas of study, especially in the arts and social sciences.

Are schooling effects on earnings different for women and men? In order to answer this question a z-test was conducted on the various models estimated. The results are

summarized in Table 4. It appears that in 1992 primary and middle schooling effects on earnings were significantly different for males and females. In 1999, there seems to have been a change – primary and secondary schooling effects on earnings are different for females and males. For both periods under consideration, however, the test results suggest that there is no gender difference in tertiary education effects on earnings, statistically speaking.

Table 4: Test for difference in schooling coefficients for females and males

	1992 female and male models		1999 female and male models	
	Difference in coefficients	z-test	Difference in coefficients	z-test
Primary school	0.188	2.60*	0.221	2.01*
Middle school	0.172	2.36*	0.160	1.53
Secondary school	0.166	1.12	0.489	2.03*
Tertiary	0.055	0.12	0.458	0.63

Note: * denotes the difference is statistically significant at the 5% level, and therefore the null hypothesis of equality of coefficients for female and males is rejected.

In order to account for family background effects on earnings, we included parental education variables and re-estimated the models. To separate the effects of father's and mother's education on their child's rate of return, we followed Liu et al. (2000) by including each parent's education background separately. The results are displayed in Table 5. Mother's and father's education effects on child's earnings are mostly insignificant, statistically speaking. However, in the few instances where parent's schooling effects were significant, they exerted a positive impact on the earnings of their children. Notwithstanding the dominance of statistical insignificance, the inclusion of mother's or father's education in the earnings models changes the magnitude of the returns to schooling, as shown in Table 6.

Table 5: Estimated earnings coefficients for male and female workers with control for family background, 1992 and 1999

	1992		1992		1999		1999	
	Female workers		Male workers		Female workers		Male workers	
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Primary school dummy	0.193*	0.202 [†]	0.017	0.023	0.299*	0.300*	0.008	0.033
	(3.67)	(3.88)	(0.34)	(0.45)	(4.24)	(4.33)	(0.09)	(0.38)
Middle school dummy	0.340*	0.346*	0.188*	0.193*	0.465*	0.462*	0.220*	0.255*
	(5.96)	(6.20)	(3.85)	(4.00)	(6.45)	(6.53)	(2.76)	(3.25)
Secondary school dummy	0.690*	0.693*	0.563*	0.559*	1.081*	1.080*	0.491*	0.540*
	(5.54)	(5.63)	(6.52)	(6.57)	(5.37)	(5.38)	(3.50)	(3.91)
Tertiary education dummy	1.367*	1.382*	1.367*	1.339*	2.187*	2.206*	1.571*	1.634*
	(3.26)	(3.31)	(5.95)	(5.82)	(3.47)	(3.48)	(4.24)	(4.43)
Experience	0.011**	0.011**	0.024*	0.024*	0.006	0.005	0.013***	0.011***
	(2.52)	(2.49)	(6.74)	(6.87)	(0.99)	(0.94)	(1.93)	(1.67)

Continued

Table 5, continued

Dependent variable: Log (Real monthly earnings)

Estimation technique: OLS

	1992		1992		1999		1999	
	Female workers Coef.	Coef.	Male workers Coef.	Coef.	Female workers Coef.	Coef.	Male workers Coef.	Coef.
Experience squared/100	-0.035*	-0.035*	-0.037*	-0.037*	-0.021**	-0.021***	-0.035*	-0.033**
	(-3.79)	(-3.82)	(-5.79)	(-5.88)	(-1.95)	(-1.91)	(-2.67)	(-2.50)
Urban resident	0.549*	0.556*	0.429*	0.428*	0.518*	0.514*	0.562*	0.563*
	(11.88)	(12.08)	(10.25)	(10.25)	(8.21)	(8.20)	(8.62)	(8.67)
Father's primary schooling	0.269**		0.052		0.027		0.273**	
	(2.35)		(0.59)		(0.19)		(2.00)	
Father's middle sch or above	0.084		-0.003		-0.010		0.212*	
	(1.55)		(-0.05)		(-0.14)		(2.80)	
Do not know father's ed.	0.161		0.279***		0.027		0.185	
	(1.26)		(1.77)		(0.22)		(1.17)	
Mother's primary schooling		0.082		0.080		0.063		0.106
		(0.73)		(0.64)		(0.45)		(0.69)
Mother's middle sch or above		0.134		0.068		-0.032		0.247**
		(1.56)		(0.78)		(-0.28)		(1.96)
Do not know mother's ed.		0.005		-0.061		0.193		0.295
		(0.02)		(-0.20)		(1.00)		(1.02)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	9.149*	9.149*	9.470*	9.464*	9.251*	9.255*	9.128*	9.141*
F statistic	44.96	44.67	37.69	37.72	28.19	28.36	28.8	28.58
Adj. R-squared	0.202	0.201	0.1665	0.1662	0.1815	0.182	0.2269	0.225
No. of observations	3124	3132	3307	3316	2209	2219	1706	1714

Note: t-values are in parentheses. *, ** and *** indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Table 6: Private rates of return to schooling after controlling for family background (%)

	Models with only father's education included				Models with only mother's education included			
	Female workers		Male workers		Female workers		Male workers	
	1992	1999	1992	1999	1992	1999	1992	1999
Primary school	3.2	5.0	0.3	0.1	3.4	5.0	0.4	0.5
Middle school	3.7	4.1	4.3	5.3	3.6	4.0	4.2	5.5
Secondary	7.0	12.3	7.5	5.4	6.9	12.4	7.3	5.7
Tertiary	11.3	18.4	13.4	18.0	11.5	18.8	13.0	18.2

Change in schooling returns: Models with parents' education minus models without parents' education (Percentage points)

	Models with only father's education included				Models with only mother's education included			
	Female workers		Male workers		Female workers		Male workers	
	1992	1999	1992	1999	1992	1999	1992	1999
Primary school	-0.32	-0.01	-0.12	-1.17	-0.17	0.01	-0.02	-0.76
Middle school	-0.12	0.11	0.07	-0.28	-0.20	0.02	0.03	-0.03
Secondary	-0.31	0.05	0.09	-0.28	-0.35	0.09	-0.09	0.02
Tertiary	-0.11	0.06	0.17	-0.86	0.09	0.41	-0.23	-0.63

Note: Negative percentage point change implies the inclusion of parent's education in the estimated models reduces the returns to schooling for that particular level of schooling. *, ** and *** indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Returns to schooling and school attendance

The increase in the returns to schooling could provide some basis for greater investments in schooling by private economic agents. In reality, it is the expected rate of return as opposed to current returns that will be taken into account in committing resources to school investments. While this study does not attempt to undertake such an analysis, an observation could be made to the effect that school attendance and attainment in Ghana are increasing, as shown Table 7. It seems parents are aware of the current rise and potential future increase in the private returns to higher levels of schooling, and are therefore investing in education accordingly. Even for uneducated parents, a learning process occurs that enables them to realize the benefits of education and ultimately propels them to correct for their own inability to attend school by investing in the education of their children.

Table 7: School attendance rates for children in Ghana, 1992 and 1999

Age	Quartile of expenditure per capita	1992		1999		Percentage change	
		Females (%)	Males (%)	Females (%)	Males (%)	Females (%)	Males (%)
6-11 years	Q1	60.0	66.3	72.8	77.0	21.4	13.9
	Q2	70.1	76.2	81.2	84.1	15.8	9.3
	Q3	78.9	79.7	85.4	88.4	8.2	9.8
	Q4	85.2	92.7	86.5	90.6	1.6	-2.4
12-14 years	Q1	65.5	77.6	76.0	84.1	15.9	7.7
	Q2	74.2	76.8	82.9	89.4	11.8	14.1
	Q3	70.7	87.4	87.7	88.9	23.9	1.7
	Q4	83.7	92.0	86.6	88.6	3.5	-3.8
15-17 years	Q1	47.5	60.3	60.8	69.0	27.9	12.6
	Q2	52.5	68.3	67.3	74.1	28.3	7.8
	Q3	60.6	70.7	67.0	75.1	10.5	5.8
	Q4	56.6	83.1	74.6	79.5	31.8	-4.5
18-19 years	Q1	23.1	43.7	30.8	45.3	33.3	3.6
	Q2	24.5	43.5	39.6	43.0	61.4	-1.2
	Q3	25.6	44.2	35.7	48.5	39.8	8.9
	Q4	29.7	43.4	37.0	50.0	24.6	13.2

Note: Percentage change as indicated in the last two columns represents percentage change in enrolment for girls and boys between 1992 and 1999. A negative value implies a decrease in enrolment, and vice versa. Source: Author's calculations based on the Ghana Living Standards Survey micro data.

Table 7 shows that school attendance rises with per capita expenditure quartiles. This is true for both girls and boys and for the two periods under consideration. On average, for children between 6 and 19 years of age, about 67% of girls and 74% of boys in households in the lowest per capita expenditure quartile attended school in 1999, while for those in the highest quartile these were 78% and 83%, respectively. Thus school attendance for girls in relatively rich households exceeded those in poor households by 11 percentage points, while for boys the attendance gap was 9 percentage points. The attendance rates for boys and girls in the second and third expenditure quartiles are higher than those in the first quartile, but lower than those in the fourth quartile. If

school attendance rate is a positive function of household resources, then these patterns are not unexpected.

The last two columns show the percentage change in school attendance between 1992 and 1999. For girls in all age cohorts and per capita expenditure quartiles, positive changes in school attendance have occurred. In the case of boys, there have been cases of decline. It must be noted that the relative decline in such cases occurred not among the first quartile households, but among fourth quartile households, which is somewhat ironical in light of the fact that such households are in a relatively better position financially to support the education of their children. It could be that the fall in attendance rates for boys in such relatively "rich" households is a result of more allocation of resources to the education of girls and therefore a move towards improved or near-equitable allocation of household resources towards the education of all children. Going beyond primary and secondary education, we observe that at the tertiary level and for children aged 18–19 years, females experienced a relatively higher percentage change in school attendance: 33% for the first quartile, 61% for second quartile, 40% for third quartile and 25% for the fourth quartile.

Improvement in the standards of living could be one of the factors behind the higher school attendance rates for male and female children in Ghana. For households in lower quartiles, the rise in the returns to schooling could be another factor behind the observed trend in school attendance and attainment. If the returns are expected to rise in future, then even poor households are likely to borrow to invest in the education of their children. For as long as the expected rate of return exceeds the cost of borrowing, parents – acting as rational agents – are likely to mobilize financial resources to support the education of their children. Moreover, with improvements in life expectancy, the survival of children is somewhat "guaranteed". Such investments could therefore be rationalized, not as investments in failure, but those with a net gain to be internalized not only by the recipients (i.e., the children) but also with beneficial externalities to the entire family.

Returns to schooling and migration

The results from estimated earnings models shown in tables 2 and 5 suggest that on average urban residents earn more than workers residing in rural areas, holding other factors constant. The coefficient for the urban worker dummy variable bears a positive sign and is statistically significant, irrespective of gender and time period under consideration. The question is, do these results suggest a tendency for females and males in rural areas to migrate to urban areas with the hope of realizing higher earnings? In particular, are the returns to schooling enough higher in urban than rural areas to motivate rural school graduates to move to urban areas? To answer this question, we introduced a migration component to the analysis by estimating earnings functions on the basis of locality (i.e., rural vs. urban). A dummy was created for migrants and added to the original variables found in Table 2. Our approach involved the following: estimate locality-based earnings models in 1992, calculate the returns to schooling and use this as basis to examine migration implications. The estimated results are shown in Table 8.

Table 8: Estimated earnings coefficients for male and female workers in spatial labour markets, 1992

Dependent variable: Log (Real monthly earnings in 1992)						
Estimation technique: OLS						
	Accra city		Other urban areas		Rural areas	
	Coef	t-value	Coef	t-value	Coef	t-value
Primary school	0.145	1.47	0.161**	2.40	0.118**	2.53
Middle school	0.224*	2.60	0.185*	3.07	0.306*	6.05
Secondary school	0.661*	6.05	0.503*	4.76	0.688*	5.02
Tertiary	1.436*	7.96	1.306*	4.70	1.432*	4.41
Experience	0.059*	5.46	0.038*	6.67	0.000	-0.06
Experience squared/100	-0.120*	-3.55	-0.066*	-4.82	-0.004	-0.62
Male	0.118***	1.87	0.126**	2.58	0.354*	9.49
Migrant	0.154**	2.50	0.064	1.32	0.077**	2.17
F statistic	19.67		13.16		41.44	
Adj. R-squared	0.188		0.097		0.141	
No. of observations	645		1,808		3,946	

Note: *, ** and *** indicate statistical significance at the 1%, 5% and 10% levels, respectively. The models were estimated with intercepts. Regional dummies were included in the models for "other urban areas" and "rural areas".

In all three localities, being a migrant as opposed to non-migrant increases the average earnings received, *ceteris paribus*. The strongest effect is felt in the capital city, Accra, and is two times higher than what pertains to migrants in rural areas. This finding is not unexpected. Empirical analysis on migration shows that better educated people are more likely to migrate than those with lower levels of education. The integration of migrants into their new localities may take time, but the human capital endowment they possess tends to be rewarded in terms of formal sector jobs, when available, and good earnings. From Figure 8 it is evident that urban migrant workers have higher earnings than rural workers. Although there is a gender gap in earnings, urban migrant women with at least a middle school qualification have a higher earnings ratio than the average for all urban migrants. The case for urban male migrants from rural areas is similar to that of their female counterparts. As noted by Rye (2006), migrants seem to do better than those staying behind because the migrants are the actors with the strongest drive towards success. They are also the most willing to accept the costs and risks associated with moving from their familiar environment, generally speaking (Coté, 1997).

The private returns to schooling are shown in Figure 9. From a spatial perspective, the return to an additional year of primary schooling ranges from 2% to 2.7%. In terms of middle schooling, the range is between 0.6% and 4.7%, with the highest return being realized in rural areas. The city of Accra registered the highest rate of return to an additional year of secondary schooling (8.7%), compared with other urban areas (6.4%) and rural areas (7.6%).

The return to an additional year of tertiary education tends to be relatively high in other urban areas (13.4%), followed by Accra city (12.9%) and then rural areas (12.4%). In rural areas educational levels tend to be low and the returns to schooling, particularly at the tertiary level, are comparably high. Generally, the spatial analysis implies a gap in tertiary education returns of about 8% between other urban areas and rural areas, and a

gap of 4% between the city of Accra and rural areas. Generally, the results suggest that workers with primary and middle school attainment are better off in rural areas, while those with secondary and tertiary education are better off in other urban areas. How do these results tie up with the empirics of migration in Ghana? Schultz (1999) noted that the decision to migrate and the type of labour market activity to engage in depends on the educational attainment of the individual under consideration. Moreover, the returns to education are realized, in part, through flexible labour markets that facilitate geographic and sectoral reallocations of labour (Schultz, 1988, cited in Schultz, 1999).

Figure 8: Migrant earnings in urban Ghana vs. rural earnings, 1992

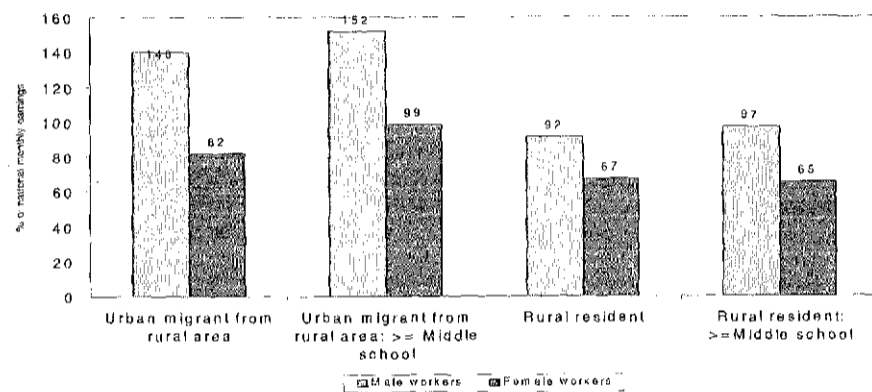
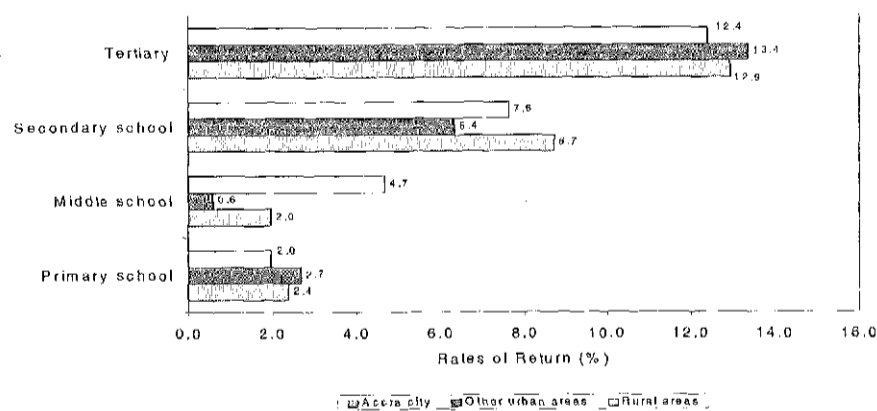


Figure 9: Returns to schooling in spatial labour markets in Ghana, 1992



The data show a relatively low incidence of rural-to-urban migration, notwithstanding the relatively high earnings in urban areas. In 1992, the incidence of rural-to-urban migration was 9.8%. Recent migrants in urban areas (i.e., defined in our context as migrants from rural localities who had taken residency in urban areas not more than five years ago) were 5.8% of the urban population. The low rural-urban migration in the early 1990s reflects the state of the Ghanaian economy at the time. With public sector

downsizing and divestiture of state-owned enterprises during the structural adjustment period of the late 1980s, there seems to have been very little motivation for rural folks to move to urban areas. In fact, with rising prices for cash crops, this was the period when more urban-rural migration occurred.

The Ghana Statistical Service (1995) report on living standards observed that social considerations (such as marriage and schooling) rather than employment needs were the dominant impetus for migration flows in the country. Among urban migrants, own-employment accounted for 29% of the reason to migrate. Has the pattern changed since then? The answer is yes, to some extent. Recent migrants from previous rural residence formed about 12% of urban population in 1999 (i.e., 7% females and 5% males). This represents an increase of about 6 percentage points between 1992 and 1999. With booming urban sector activities typically in the services sector, an increase in rural-urban migration has occurred.

In terms of schooling attainment of recent urban migrants from rural areas, the 1992 and 1999 data show that about 60% of female and 85% of male migrants had at least a middle school certificate. In 1999, 8% of female and 27% of male urban migrants who migrated from rural areas seven years earlier (i.e., in 1992) had at least a senior secondary education. What type of economic activity do these urban migrants engage in? Table 9 provides an answer to this question.

Table 9: Employment probabilities for urban residents in Ghana who migrated within the last seven years and have at least middle school/junior secondary school level of education, 1999 (%)

Employment sector	All urban migrants		Urban migrants from rural areas	
	Females	Males	Females	Males
Agriculture	21.8	21.1	22.7	17.7
Mining/Quarrying	0.6	1.9	0.0	0.0
Manufacturing/Processing	11.5	19.2	13.6	27.4
Construction/major repair or maintenance	0.6	6.1	2.3	8.1
Wholesale/Retail trade	33.9	23.5	22.7	24.2
Restaurants/Hotels and food sellers	5.5	2.8	6.8	3.2
Transport, storage and communication	3.6	4.2	9.1	3.2
Finance/insurance and business services	6.7	6.1	4.5	3.2
Community/social and personal services	14.5	15.0	18.2	12.9
Utilities	1.2	0.0	0.0	0.0
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Source: Author's calculations based on GLSS4 data.

The services sector appears to be the largest absorber of urban migrants in terms of employment outlets. This is dominated by the retail trade sector, which is largely an informal sector activity. This sector provides employment to about 34% of female and 23% of male urban migrants. This is followed by agriculture-related activities. The social, personal and community services sector employs about 15% of all urban migrants: Retail trade, community, social and personal services, and manufacturing or processing activities are the major non-agricultural activities pursued by male and female workers.

Manufacturing sector employment is more biased towards males, with the percentage of male migrants from rural areas being twice that of females. These employment possibility differences could be the result of educational differences between males and females, employer preferences, risk differentials, socio-cultural factors, economic and growth structures of the country, technological gaps, and financial prerequisites, among other factors.

6. Conclusion

This study examined the returns to schooling over a seven-year period between 1992 and 1999 for a country that has experienced relative stability both politically and economically, after turbulent periods of decline and adjustment in the 1980s. Ghana's education system has undergone major changes that have reduced the pre-university years of schooling from 17 years to 12 years. The pursuit of FCUBE policy by the government has been associated with increased enrolments for boys and girls at the basic level of education. The overall improvement in school attendance over the seven year period has been reflected in terms of a more-educated pool of workers.

In line with findings in the literature, our results show that earnings rise with higher levels of schooling. Irrespective of gender and year of analysis, the magnitude of impact rises with higher level of schooling and the statistical significance also becomes stronger. For female workers, the returns to higher levels of schooling have increased faster than those for lower levels. The return to an additional year of secondary schooling rose by 5 percentage points (i.e., from 7.3% in 1992 to 13.3% in 1999). In the case of tertiary education, a 7 percentage point increase occurred (i.e., from 11.4% in 1992 to 18.4% in 1999) for female workers. For male workers the return to an additional year of tertiary education increased from about 13% to 19%, while the return to secondary education decreased by 1.7 percentage points.

The increase in the returns to schooling could provide some rationale for greater investment in schooling by private economic agents. In reality, it is the expected rate of return as opposed to current returns that will be taken into account in committing resources to school investments. While this study does not undertake such an analysis, an observation could be made that school attendance and attainment in Ghana are increasing. Parents seem to be aware of the potential for future increase in the returns to their investment in their children's education. This appears to hold true even for uneducated parents, who are apparently making up for their own lack of education by educating their children.

The results also indicate differences between urban and rural areas in the rates of return to education, with the urban areas favoured. At the tertiary level, the gap is about 8%, while a gap of 4% exists between the city of Accra and rural areas. Linking these results to migration, the data show a relatively low incidence of rural-to-urban migration, notwithstanding the relatively high earnings in urban areas. Recent migrants from previous rural residence formed about 12% of urban population in 1999 (i.e., 7% females, and 5% males). This represents an increase of about 6 percentage points between 1992 and 1999. Better-educated rural folks are more likely to migrate from rural to urban

areas. The services sector appears to be the largest absorber of urban migrants in terms of employment outlets.

Our study shows that higher levels of education pay off. The returns to additional years of education are rising, more so for females. To the extent that schooling has beneficial externalities and other human capital effects, continuous investments in schooling by government cannot be downplayed. To sustain the gains realized in educational attainment, issues of gender equity – which are still somewhat problematic – need to be addressed by policy makers so that girls and women are not left behind in the intergenerational race for improvements in quality of life.

Notes

1. The basic education level in Ghana represents a primary education cycle of six years and junior secondary school cycle of three years.
2. This initiative is in response to Article 39(2) of the 1992 Constitution of the Fourth Republic of Ghana, which states: "The Government shall, within two years after parliament first meets after coming into force of this Constitution, draw up a program for implementation within the following ten years, for the provision of free, compulsory and universal basic education". See Ministry of Education (1996). In terms of schooling outcome associated with implementation of the free, compulsory and universal basic education policy, there seems to be an improvement in the enrolment ratios now compared with 1996. Gross enrolment ratios at the primary schooling level increased from 76.5% in 1996 to 80% in 2001. At the same time, girls' enrolment share rose from 46.6% to 47.5%. For junior secondary school accessibility, gross enrolment rose from 58.7% in 1996 to 63.9% in 2001. Here again, the enrolment share of girls increased from 43.1% to 45.4%.
3. See http://www.edughana.net/history_levels.htm for further elaboration.
4. The total number of jobs advertised in 1990–1994 was 8,409; in 1995–2000 this number increased to 19,216. The case for the year 2000 was 3,510. See Boateng and Ofori-Sarpong (2002) for further details.

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ISBN 9966-778-19-5

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