Discussion Paper Series

The Role of Education and Training in Reducing Poverty and Unemployment in Kenya

Eldah N. Onsomu

Boaz O. Munga

DP/118/2010

THE KENYA INSTITUTE FOR PUBLIC POLICY RESEARCH AND ANALYSIS (KIPPRA)

The Role of Education and Training in Reducing Poverty and Unemployment in Kenya

Eldah N. Onsomu
Boaz O. Munga

Social Sector Division
Kenya Institute for Public Policy
Research and Analysis

KIPPRA Discussion Paper No. 118
2010

KIPPRA
The KENYA INSTITUTE for PUBLIC
POLICY RESEARCH and ANALYSIS

KIPPRA IN BRIEF

The Kenya Institute for Public Policy Research and Analysis (KIPPRA) is an autonomous institute whose primary mission is to conduct public policy research leading to policy advice. KIPPRA's mission is to produce consistently high quality analysis of key issues of public policy and to contribute to the achievement of national long term development objectives by positively influencing the decision-making process. These goals are met through effective dissemination of recommendations resulting from analysis and by training policy analysts in the public sector. KIPPRA therefore produces a body of well researched and documented information on public policy, and in the process assists in formulating long-term strategic perspectives. KIPPRA serves as a centralized source from which the Government and the private sector may obtain information and advice on public policy issues.

Published 2010

Bishops Garden Towers, Bishops Road
P.O. Box 56445, Nairobi, Kenya
Tel: +254 20 2719933/4; Fax: +254 20 2719951
Email: admin@kippra.or.ke
website: http://www.kippra.org
ISBN 9966 777 75 X

The Discussion Paper Series disseminates results and reflections from ongoing research activities of the Institute's programmes. The papers are internally refereed and are disseminated to inform and invoke debate on policy issues. Opinions expressed in the papers are entirely those of the authors and do not necessarily reflect the views of the Institute.

KIPPRA acknowledges generous support from the Government of Kenya (GoK), the African Capacity Building Foundation (ACBF), and the Think Tank Initiative of IDRC.

Abstract

Unemployment and poverty are major socio-economic challenges affecting most countries. They are associated with under-utilization of resources, while leading to low welfare status. In the past, the Kenya government has implemented various interventions aimed at reducing illiteracy, lowering unemployment and alleviating poverty, including expansion of education and training. Despite these efforts, unemployment and poverty continue to afflict a large segment of the Kenyan population. In 2005/6, for instance, Kenya's poverty and unemployment rates were estimated at 45.9 per cent and 12.7 per cent, respectively. This study analyses the effects of education and technical training on unemployment and poverty, using the most recent cross-sectional data (KIHBS, 2005/6) for Kenya. The study establishes that university education and technical training play critical roles in reducing the risk of being poor, and either being openly unemployed or under-employed through their effects in increasing individual earnings. Consequently, while increasing access to basic education is critical in laying the foundation for entry into higher education, improving access to post-primary education, especially secondary, technical training and university education is critical. There is need to improve investment and growth for effective creation of high quality jobs in both the formal and informal sectors to enable increased absorption of skilled and educated labour force and productivity.

Abbreviations and Acronyms

CBS	Central Bureau of Statistics
CTE	Career and Technical Education
FDSE	Free Day Secondary Education
GER	Gross Enrolment Rates
ILFS	Integrated Labour Force Survey
KCPE	Kenya Certificate of Primary Education
KNBS	Kenya National Bureau of Standards
LR	Likelihood Ratio
NER	net enrolment rate
OLS	Ordinary Least Squares
SAPs	Structural Adjustment Programmes
SSA	Sub-Saharan Africa
WMS	Welfare Monitoring Survey

Table of Contents

1. Introduction

1.1 Background

Unemployment and poverty are major socio-economic challenges with diverse effects. In sub-Saharan Africa (SSA), unemployment and poverty are major obstacles to full utilization of human resources (UNECA, 2005). High levels of unemployment and poverty are associated with large social costs, and this explains why reducing both unemployment and the incidence of poverty are important goals for development policy.

In Kenya, the government identified illiteracy, ignorance, and poverty as major socio-economic challenges facing the nation at independence in 1963 (Government of Kenya, 1965). In this respect, many policies, programmes and projects have been designed and implemented with the aim of reducing illiteracy, lowering unemployment and alleviating poverty. Expansion of education and training was seen as key to tackling unemployment and poverty.

The focus on education and training was supported by the fact that high unemployment and chronic poverty is an outcome of high illiteracy levels and lack of vocational skills (Godia, 1987). Consequently, with strong government support, the Kenyan education sector expanded rapidly through the years, with educated labour force increasing rapidly. School leaver unemployment was identified as a visible problem of Kenya's education system as far back as the mid 1980s. In 1985, for example, out of the 334,000 students who sat for the Kenya Certificate of Primary Education (KCPE), only 140,000 (42%) found vacancies in secondary schools. In 2008, out of the 701,900 pupils who sat for KCPE, only 59.6 per cent were admitted to secondary education (Godia, 1987; Government of Kenya, various). Godia (1987) observes that by the mid 1980s, graduates of primary and secondary school increasingly experienced difficulty in getting employment. Part of the problem was that the expansion of the labour force was way above the growth in demand for labour, thereby resulting in high levels of unemployment.

Even so, the education sector performance as measured by net enrolment rate (NER) has improved over time. At primary school level, NER increased from 80.4 per cent (80.8% for boys and 80% for girls) in 2003 to 92.5 per cent (94.6% for boys and 90.5% for girls) in 2008. At secondary school level, NER increased from 18.2 per cent to 28.9 per

cent between 2003 and 2008. Tertiary GER was 3.5 per cent in 2008 (Government of Kenya, various). In 2003, the government re-introduced Free Primary Education (FPE), and subsequently implemented the Free Day Secondary Education (FDSE) in 2008. Furthermore, the Government of Kenya continues to support vocational training centres and public tertiary institutions.

Despite these efforts by the government, unemployment and poverty continue to afflict a large segment of the Kenyan population. In 2005/6, for instance, 45.9 per cent of the population of about 35 million lived below the poverty line (Kenya National Bureau of Statistics, 2007a) and 12.7 percent of the total labour force were openly unemployed. Available data indicates that in the decade leading to 2003, unemployment and poverty exhibited upward trends in absolute numbers. It has also been observed that unemployment among the more educated graduates seems to be just as high as the rest of the population. As an example, unemployment rate among university graduates was 11.2 percent in 1998/99 relative to an overall unemployment rate of 9.8 per cent for primary school students who had completed standards 5 to 8 (Central Bureau of Statistics, 2003). This calls for an understanding of the role of education and training in reducing unemployment and poverty, an issue which this study attempts to address.

High levels of education and training are expected to confer benefits to households, communities, and countries. One of the recognized benefits is the reduced risk of the incidence and duration of unemployment at higher levels of education (Mincer, 1991). Unemployment and poverty are interconnected. Individuals and households are usually poor because they are unemployed or are employed in low productivity jobs. It is therefore expected that more educated individuals will have a reduced likelihood of being poor–given that education is expected to reduce the chances of being unemployed. Poverty, on the other hand, affects educational achievement and is usually associated with low quality education, hence low income and perpetuation of poverty.

Although labour market information in Kenya is limited across time, there is some evidence to suggest that higher educational attainment is not necessarily linked to lower levels of unemployment among the Kenyan labour force. Like many other developing countries, Kenya is experiencing high levels of graduate unemployment, under-employment, and skills shortages (Central Bureau of Statistics, 2003).

Some of the explanations that are provided for the unemployment of

school graduates (in Kenya and other countries) include: (i) deficiency in labour demand resulting from poor economic performance, which may dampen the creation of employment opportunities for school graduates; (ii) employers prefer experienced workers to new market entrants, hence locking out fresh graduates (Bae and Song, 2006); (iii) skills mismatch, which can result from structural changes in the economy, thereby making university and other graduates not to have the skills that employers are demanding (Dias and Posel, 2006; Godia, 1987); and (vi) reluctance by school graduates, especially university graduates, to work in the informal sector (Bae and Song, 2006) or queuing for better jobs (Serneels, 2007). To this end, this study attempts to examine the effect of education and training on poverty and unemployment reduction in the context of Kenya.

1.2 Objectives of the Study

The main objective of the study is to explore the role of education and training in reducing unemployment and poverty in Kenya. The specific objectives of the study are to:

(a) Examine the effects of education and training on unemployment and under-employment in Kenya; and

(b) Examine the effects of education and training on incidence of poverty in Kenya.

1.3 Outline of the Report

This report is organized as follows. Section 2 presents the Kenyan context by analyzing the trends of open unemployment, income poverty and education attainment in Kenya. In Section 3, previous research on the relationship between education, unemployment and poverty is reviewed. Section 4 formulates and estimates a relationship between education, training and unemployment, while Section 5 provides the results and discussions of the modelling. Section 6 provides the conclusions and policy recommendations for addressing poverty and unemployment through the development of education.

2. The Kenyan Context

2.1 Unemployment Trends

The rates of open unemployment estimated in various surveys in Kenya are presented in Table 2.1. The estimates suggest that open unemployment has generally been rising since 1978, but declined slightly in 2006 relative to its 1999 level. The table shows that based on labour force survey data, 6.7 per cent of the urban labour force was unemployed in 1978; 14.8 per cent in 1986; 25.1 per cent in 1998/99 and 19.9 per cent in 2005/06. The estimated overall open unemployment rate in 1998/99 was 14.6 per cent and 12.7 per cent in 2005/2006.

High unemployment levels in the late 1990s can be explained in part by Kenya's poor growth record in the period. It is also important to mention the role of Structural Adjustment Programmes (SAPs), ,which were instituted in Kenya in the early 1980s, and were largely implemented starting the early 1990s. Cuts in government spending, privatization, collapse of some private firms and retrenchment in others, and public sector downsizing led to increased unemployment (CBS, 2002; Manda, 2004; Oiro, Mwabu and Manda, 2003). As observed by Pollin *et al.* (2007), the period also experienced a shift in

Table 2.1: Unemployment rates in Kenya by age group in percentage (1978-2005/06)

Age	1978*	1986*	1998/99*	1998/99**	2005/06**
15–19	26.6	36.2	47.0	24.3	25.0
20–24	18.5	29.2	47.3	27.1	24.2
25–29	4.8	8.6	25.1	15.5	15.7
30–34	2.0	2.7	14.3	10.8	7.5
35–39	1.8	2.1	12.0	8.4	7.6
40–44	0.7	0.7	11.2	9.1	6.4
45–49	1.1	2.0	14.7	8.2	5.7
50–54	1.4	0.9	18.9	8.7	4.7
55–59	1.5	4.1	40.6	13.5	4.0
60–64	3.2	na	45.2	11.7	2.5
Urban	7.0	16.0	25.1	25.1	19.9
Total (rural and urban)	6.7	9.7	14.6	14.6	12.7

Source: Wambugu, Munga and Onsomu (2008)

* Urban unemployment rate; ** Total unemployment rates (urban + rural); n.a Data not available

labour demand in favour of highly skilled labour, and an increase in part time and casual workers at the expense of full time jobs.

Although the signs that improved economic performance (since 2003) may have reduced the incidence of open unemployment, there are indications that under-employment is on the rise. Slightly over half a million Kenyan workers (5% of the employed) were classified as under-employed in 1998/99). In 2005/06, the number was close to three million, or 21 per cent of the employed workers. The 2005/06 KIHBS data shows that open unemployment was higher among the youth. Open unemployment rate declined gradually as one moved up across the age cohorts.

2.2 Poverty Trends

Unemployment is closely associated with poverty, which has been a major social and economic concern in the country since independence (Mwabu *et al.*, 2000; Geda *et al.*, 2001). The period after 1963 and 1990 has little in form of survey data on measures of the incidence of poverty in Kenya. However, available data indicates that economic growth was high in this period – averaging about 6 per cent from 1966-1980 and 4.3 per cent between 1981 and 1990 (Government of Kenya, various). This was higher than the relatively high inter-censual population growth rate of 3.41 per cent between 1969 and 1979, and 3.34 per cent in 1979 and 1989. Therefore, it is likely that Kenya achieved a reduction in incidence of poverty between 1963 and 1990.

Several surveys and research work offer indicative poverty trends for Kenya for the period after 1990. A common source of poverty data in Kenya are the household level data from the Central Bureau of Statistics-CBS (now Kenya National Bureau of Statistics), including the Welfare Monitoring Surveys (WMS) of 1992, 1994 and 1997, and KIHBS 2005/6.

From the estimates given in Table 2.2, it can be inferred that the incidence of poverty is still high in Kenya, with nearly half (45.9%) of the population classified as poor in 2005/06. The 2005/06 measure of 45.9 per cent appears to suggest that there was a decline in the incidence of poverty especially after the year 2000 when more than half of Kenya's population (57%) was estimated to be poor (Mwabu *et al.*, 2003). However, this decline came in the wake of a possible steady rise in poverty levels throughout the 1990s as suggested by various

Table 2.2: Summary of poverty estimates for Kenya, 1990 to 2006

Author	Reference Year	Data source	Poverty incidence (%)
Mukui (1993)	1992	1992 WMSI	Rural: 46 for 1992 Urban: 29.3 for 1992
Government of Kenya (1998)	1994	1994 WMS I	46.8 rural population 29 urban population 40 national estimates
Mwabu *et al.* (2000)	1994	1994 WMS II	39.7 rural population 28.9 urban population 38.8 national population
Government of Kenya (2000) results for WMS III	1997	1997 WMS III	52.9 rural population 49.2 urban population 52.3 national population
Mwabu *et al.* (2002)	2000	Predictions based on GDP and Gini coefficients and poverty estimates for 1997 using WMS III	59.6 rural population 51.5 urban population 56.8 national population
KNBS (2007)	2005/2006	KIHBS	49.1% rural population 33.7% urban population 45.9% national population

Sources: Government of Kenya, various; Mwabu et al. (2000) and Kimalu et al. (2002)

measures using the Welfare Monitoring Survey (WMS) data for 1992, 1994, and 1997.

The reduction in the incidence of poverty as suggested by the 2005/06 measure is consistent with the strong growth recorded by Kenya after 2003 through 2007. However, it is expected that the post-election skirmishes in the early part of 2008, which undermined production and economic growth could have also worsened the incidence of poverty in Kenya.

2.3 Trends in Education Attainment in Kenya

Since independence in 1963, there has been a rapid expansion of education in Kenya. Gross enrolment rate (GER) and net enrolment rate (NER) in primary and secondary schools have improved with time. Similarly, enrolments in universities increased from 5,000 in 1963 to

27,000 in 1980 and 177,735 students in 2009 (Government of Kenya, various). Adult illiteracy fell steadily in the last 40 years from 50 per cent to 18 per cent of the population between 1963 and 2007. Although not yet closed, the illiteracy gender gap has reduced significantly from 30 per cent to 13 per cent.

2.3.1 Primary education

Kenya recorded improvements in primary school enrolment in the first two decades after independence, with gross enrolment rate (GER) increasing from 47 per cent in 1963 to 62 per cent in 1970 and 115 per cent in 1980. The gap in gender enrolment narrowed from 20 per cent in 1970 to 10 per cent in 1980 (Government of Kenya, various; Bedi *et al.*, 2002). The increased enrolment was attributed to population growth, rapid expansion of facilities, and subsidized education, among other factors (Government of Kenya, various).

The post-1980 trends are less impressive, especially in the 1990s. The country experienced its first negative enrolment shock between 1984 and 1985 when enrolment rates fell from 107 to 99 per cent, and again in 1989 when GER declined from 98 per cent to 92 percent. Bedi *et al.* (2002) report that the GER was stable between 1985 and 1989 but declined after 1989. The rest of the 1990s, i.e. the period after 1993, recorded a stable GER, which was about 88 per cent. Although there were large regional variations, the gender gap narrowed and ranged between 3 and 4 per cent points since 1989 through the 1990s.

The decline in primary school enrolment between 1984 and 1985 can be attributed to severe drought conditions and the introduction of a costly curriculum (Government of Kenya, 1988). The 1989 shock is likely to be a reaction to the introduction of the formal cost sharing system of education in 1988 (Bedi *et al.*, 2002). The relatively inferior GER observed throughout the 1990s was attributed to: (i) poor economic performance; (ii) adverse labour market conditions, particularly the rise in unemployment – which may have eroded expected benefits of education in Kenya given that there was no substantial difference in open unemployment rates of those without formal education and those with some formal education; and (iii) HIV/AIDS, which may have introduced household budgetary reallocation to health and increased cases of orphaned children; among other factors.

Enrolment rates did not change much until after 2003 when the government introduced Free Primary Education and supported the development of non-formal schools, especially those that cater for children in urban slums (among other policies). The GER rose steadily from 102.8 per cent in 2003 to 107.6 per cent in 2007. The NER also increased gradually from 82.2 per cent in 2003 to 91.6 per cent in 2007. Although primary school GER and NER improved after 2003, there are concerns that the large influx of students (without a commensurate increase in other resources such as teachers) may have undermined the quality of primary education.

2.3.2 Secondary education

There were consistent gains in secondary school enrolment prior to and including the early 1990s. Expansion of secondary schools prior to 1990 was partly as a result of establishment of 'Harambee' schools which, since the 1970s, comprised about two thirds of the schools. Gross enrolment in secondary schools grew from 2 per cent in 1960 to a peak of 28 per cent of secondary school-age children in 1991. The drop in enrolment since 1991 has been substantial and can be attributed to many factors, including: (i) rising costs of education in the wake of introduction of user fees; (ii) HIV & AIDS, and increasing urban poverty, which lowered living standards and left many school-going children orphaned and vulnerable; and (iii) poor growth and a lowering of employment opportunities amidst rising poverty levels (Bedi *et al.*, 2004; Oiro *et al.*, 2003).

After 2003, there was a deliberate government policy of expansion of secondary schools to respond to declining enrolment rates. Subsequently, the GER improved to 22.2 per cent and 29.3 per cent in 2004 and 2005, respectively, and further to 36.8 per cent in 2007. The total enrolment in 2005 represented a 19.2 per cent increase from the 2002 total enrolment figure of 778,601 students (Government of Kenya, 2006).

2.3.3 Tertiary education (university and vocational training)

Training in trade skills is offered after secondary education in the tertiary institutions, including teacher training colleges, technical institutes and universities. Tertiary institutions increased through establishment of polytechnics and additional universities in the late

Table 2.3: Unemployment rates in Kenya by education level, 1998/99 (%)

Unemployment rates			
Educational attainment	**Total**	**Males**	**Females**
Total	10.1	8.4	11.9
None	9.5	7.0	11.1
Pre-primary	13.9	12.4	15.2
Standard 1 complete	9.6	8.7	10.3
Standard 1-4	8.2	7.3	9.2
Standard 5-8	9.8	8.2	11.6
Form 1-4	12.0	10.2	14.5
Form 5-6	7.8	5.1	14.6
University	11.2	7.7	18.9

Source: Wambugu, Munga and Onsomu (2008)

1990s. To date, there are 7 private universities that have developed in a span of 10 years. There are various other private colleges mainly offering arts-based courses.

2.4 Education Attainment and Unemployment in Kenya

It may be expected that individuals/groups with higher education levels would have lower open unemployment rates (Verner, 2004). However, this may not be observed because, apart from educational attainment, many other factors influence unemployment.

The 1998/99 labour force survey data for Kenya provides evidence of this possibility, with university graduates having higher unemployment rates (Table 2.3) than graduates from all primary school levels (above pre-primary).

This may indicate that school leavers may not be equipped with necessary knowledge/skills, or that technological advances have occurred, rendering them unemployable, and making it necessary to ensure that education and training programmes are aligned with the skills demanded (entral Bureau of Statistics, 2002) in the labour market. It may also be possible that the relatively well educated individuals may be queuing for better jobs, and/or the relatively well educated individuals who take up informal jobs do so as a coping mechanism (Serneels, 2007; and Oiro *et al.*, 2003).

Although the government sought to solve the problem by introducing

a new system of education that stresses technical skills, the problem was not in the education system per se, but a manifestation of economic and social challenges, including high population growth and failure of the economic system to create ample job opportunities to absorb graduates of education and training programmes (Godia, 1987).

In the mid 1980s, for instance, the arguments for adopting a new educational system in Kenya criticized the former system for emphasizing white collar jobs and "causing elitism, unemployment, the drift to urban areas, and rural backwardness" (Godia, 1987). The possible skills mismatch could explain the observed high unemployment rates even among university graduates.

3. Related Literature

3.1 Relationship between Unemployment, Education and Training

Economic theory suggests that there is a relationship between education and earnings. The central idea is that education is an investment in the acquisition of skills and knowledge, which can increase earnings. This demand theory, commonly referred to as the human capital theory, therefore suggests that the level of education should be inversely related to the rate of unemployment. The human capital approach assumes that education and training can augment skills, and that returns to skills are determined by skills supply and demand (Mincer, 1972; Weisberg and Meltz, n.d).

Although the human capital theory is the dominant model used to explain the demand for education and its possible relationship with earnings, the theory is commonly contrasted with signaling models and screening models. In these latter models, education is assumed to act as a filter with successful completion of education or possession of education credentials signaling high levels of ability. According to signaling models, workers get educated in order to signal to employers that they are innately more productive than other workers. Such workers are therefore expected to be hired preferentially (Stiglitz, 1975; Fields, 2009).

The human capital model and the screening models suggest that education confers benefits to individuals in the form of lower levels of unemployment for more educated groups. However, it is not always the case that more education and training, or acquisition of skills by individuals, will translate into lower unemployment rates. One promising explanation as to why individuals may fail to have lower unemployment rates at higher levels of education and training is due to labour market segmentation. Segmented labour market models recognize that labour markets are differentiated and jobs differ in quality (Fields, 2009). There are “good jobs” and “bad jobs”, with access to “good jobs” not available to all who want better jobs. Those who fail to secure good jobs (also referred to as formal), must either take up an informal job or be engaged in agricultural activity or remain unemployed. Education and training may thus fail to protect one against unemployment.

3.2 Poverty, Education and Training

Education and its links with poverty is an area that has been researched on in detail. The human capital approach regards education as an important instrument for the reduction of poverty. According to the model, investment in education leads to formation of human capital, which is an important factor in economic growth and development. The human capital framework implies that education and training imparts skills and knowledge, which are positively associated with employment, productivity and earnings (Blaug, 1972; Mincer, 1972; World Bank, 2006; Fields, 2009).

Education is recognized as a basic need by the "basic needs approach" to development. This approach also recognizes that education helps fulfil other basic needs and improves the quality of life (ILO, 1976; Streeten, 1977). As an example, education has been shown to favourably influence women's decisions relating to fertility, health and family welfare. The relationship between poverty and education is thus strengthened by the fact that education and other basic needs reinforce each other (Noor, 1980).

Weaknesses in the concept of "income poverty" inherent in the above studies led to the wider definition of poverty; that is, human poverty. This approach, referred to as the human development perspective, recognizes education as more than just an instrument of development and a cause of poverty. Education is development and lack of it is poverty. The educational status of a population is thus a measure of its human poverty and human development.

The human development approach has also been expanded further. Notable studies include the works of Sen (1984 and 1999) in which poverty is identified in terms of capability deprivation. Capability poverty refers to deprivation of opportunities, choices and entitlements– and includes the notion of freedom. Freedom encompasses education, which enhances capabilities of people. Education has intrinsic value and constitutes a part of human capability. Deprivation of education is capability poverty, thus investing in education leads to reduction of capability poverty. This approach holds that education (basic education) has to be provided as a right and as an entitlement to all. The policy implication of these approaches to development is that education should be given high priority in development issues.

3.3 Empirical Literature Review

Most of the reviewed studies discussed in this section use household level data. Generally, in developed countries, a number of studies find the expected inverse relationship between unemployment and education as observed by Weisberg and Meltz (n.d). On the other hand, most of the studies for developing countries do not find the expected inverse relationship between unemployment and education.

For instance, Kuepie, Norman and Roubaud (2006) study the effects of education on urban labour market participation and earnings in the West African Economic and Monetary Union (WAEMU) countries. The study finds that unemployment levels generally increase with the level of education, at least until the end of the secondary level of education. In another study, Rama (1998) considers unemployment in Tunisia and finds that it is concentrated among the young and relatively well educated. This is reaffirmed by a World Bank (2003) study which reports that the Tunisian unemployment rate for youth with higher education was 1.6 times higher than for those with primary education.

Related findings are also reported for Cote d'Ivore, Ethiopia, Rwanda, Senegal, Tanzania and other low income countries (Cling *et al.*, 2007; World Bank, 2006; Serneels, 2004). A study by Cling *et al.* (2007) provides an extensive review of the empirical literature and reports that from the 2000/2001 Integrated Labour Force Survey (ILFS) of Tanzania, the incidence of employment among urban men with the highest level of education is estimated to be about 26 percentage points higher than among men with no education. For Cote d'Ivore, Rwanda, and Senegal in the late 1990s and early 2000s, the World Bank (2006) reports that the unemployment rate for those with post-secondary education was seven to eight times higher than for those with just primary education. Similar findings are reported by Serneels (2004), who uses 1994 household level data to conclude that unemployment in urban Ethiopia was concentrated among relatively well educated first time job seekers searching for well paid jobs.

The Republic of South Africa offers a rare departure to the developing country study findings. Dias and Posel (2006) looked at the relationship between unemployment and education, with special reference to the issue of skills constraints in the Republic of South Africa. The study explored the probability of gaining or finding employment for groups with varying educational attainment. Their

study demonstrated that unemployment rates in South African labour market decrease with educational attainment. However, this effect was observed to be significant if a labour force participant had completed at least grade 12 level of education. Another departure is the finding by Kiiru, Onsomu and Wamalwa (2009), who found that university education and training are important in addressing the unemployment related challenges experienced by educated youths in Kenya. They also find that the buffer level of education against unemployment is at least university level of education, implying that those with secondary level of education or below may have problems securing employment, especially in the urban areas.

Although the preceding review of literature relates to African countries, similar conclusions on unemployment rising with education attainment have been arrived at by studies in other developing countries outside Africa. They include Rama (1999) for Sri Lanka, and Tenjo (1990) for Colombia. For Sri Lanka, Rama (1999) notes that unemployment is largely voluntary, and the underlying problem is that there is a large gap between good jobs and bad jobs. However, Dickens and Lang (1996) find that unemployment in Sri Lanka is not related to the level of education. These developing country experiences suggest the need to not only create more jobs, but more jobs perceived as good jobs.

On the other hand, among the more developed countries, many studies find the expected negative relationship between education and unemployment. Isengard (2003) analyses unemployment among the youth in Germany and United Kingdom. The study finds that the level of education is the most influential individual characteristic, with the probability of unemployment falling as the level of education rises. The study observed that graduates with a vocational qualification have a lower likelihood of unemployment than those with only a general qualification. In addition, Brauns and Steinmann (1999), as cited by Isengard (2003), observe that Germany exhibits a strong link between vocational institutions and employers through “on-the-job-training”, which has resulted in the country having lower unemployment levels among its younger workers compared to other European countries (Isengard, 2003).

Even among the more developed countries, there are cases where the expected negative relationship between education and unemployment is violated. A well known case is the relationship between unemployment

and education in Israel, which has long been observed to be exhibiting an inverted u-shaped relationship (Weisburg and Meltz, n.d). In Israel, at least between 1976 and 1994, workers with 9 to 12 years of schooling experienced the highest level of unemployment compared to those with 0 to 8 years and 13 years of schooling. The authors largely attributed this observation to government policies intended to protect low-educated immigrants with large families.

3.4 Unemployment and Education Attainment

Attempts have been made to explain the unexpected observation of unemployment (or its probability) rising with the level of education. The explanations provided for these unexpected findings include: economic performance and labour market segmentation given the role of aspirations; queuing behaviour resulting from aspirations for better quality jobs; employment practices; lack of employability, educational systems and skills mismatch; information problems in the labour market; and government policies as in the case of Israel. The succeeding sub-sections expound on the suggested explanations for the seemingly ubiquitous observation—at least in developing countries—of an inverse relationship between education and unemployment.

3.4.1 Economic performance, labour market segmentation and queuing behaviour

In some cases, the rate of growth of certain groups of the labour force and the structure of economic growth has been isolated as a possible cause of higher unemployment among certain school graduates. In the Republic of South Africa, for example, Kingdon and Knight (1999; 2001) showed that the increase in the supply of labour with metric (grade 12) and tertiary education was greater than the increase in skilled and semi-skilled employment opportunities. This resulted in an increase in unemployment among those with metric and tertiary education between 1995 and 2003.

The underlying cause of higher unemployment rates for more educated individuals can also be explained by understanding the role of aspirations, given that labour markets are segmented. Economic theory suggests that labour markets are segmented in various ways, including the demarcation between “bad jobs” and “good jobs” (Fields, 2004;

2008). Generally, as rational agents, job seekers are expected to aspire for good jobs than bad jobs.

The role of labour market segmentation and aspirations has been studied in several contributions. Right from a very early age, students are usually conditioned to believe that formal education will lead to formal sector employment (good job). This is particularly the case for those who proceed to higher levels of education. The relatively well educated individuals will therefore be conditioned not to take up informal jobs and/or jobs with "lower status" even if they are available. The role of aspirations is perhaps what Bae and Song (2006) observe as the reluctance by South Korean university graduates to take up informal sector jobs. Similarly, Glewwe (1989) as cited by Serneels (2007) suggest that lack of social status for bad jobs in Sri Lanka stops young unemployed men from taking them up. Serneels (2007) finds that unemployment in Ethiopia is concentrated among relatively well educated job seekers who "aspire to be in a public sector job." The study finds evidence of queuing behaviour.

In Serneels (2007) study in Ethiopia, those aspiring for public sector jobs are contrasted with those aspiring for self-employment or casual work. It was found that the latter have a lower likelihood of becoming unemployed. The study proposes that many Ethiopian job seekers would find employment if they change (or perhaps lower) their preferences.

3.4.2 Lack of employability, educational systems and skills mismatch

One of the common forms of lack of employability is the presence of too many job seekers, particularly the youth who lack the necessary education and relevant training that can enable them get jobs. There are also cases of low paying jobs; this was observed by a number of studies including Ikiara and Ndung'u (1997) and United Republic of Tanzania (1997).

Bae and Song (2006) study various aspects of youth unemployment in the South Korean labour market, placing focus on how type and length of education are correlated with employability. The authors analyzed longitudinal education statistics to find educational attainment/ transition patterns of Korean youth and comparison on employment rates among four groups. In terms of getting job placements, high

school graduates without occupational skills have the highest risk among the youth groups. Two-year college graduates performed better than those with a four-year degree, and Career and Technical Education (CTE) graduates performed better than non-CTE graduates. Therefore, labour market advantage comes from occupational skills and not length of schooling. The study also suggests that some degree of youth joblessness is generated by supply weaknesses. Learners' preference for a four year degree rather than a two-year CTE programme in Korea is an example of supply weakness.

The role of skills is also analyzed by Kingdon and Knight (1999; 2001) for South Africa. Their study observes that unemployment is highest among the relatively low skilled, who come from a poorer than average background. Apart from skills limitations and expectations/ aspirations of job seekers, other constraints related to employability include employment practices. Generally, employment/recruitment practices that prefer experienced workers to new market entrants will lock out fresh graduates. This is cited as one of the reasons for high levels of unemployment among fresh school graduates in South Korea (Bae and Song, 2006).

3.4.3 Labour market information

The labour market may have inefficiencies in terms of information flow among employers, job seekers and students. Lack of information is usually cited as one of the causes of the apparent mismatch of job seekers qualifications with employer needs. In the case of Kenya, CBS (2003) contends that absence of active job placement bureaus is a potential explanation for unemployment in Kenya.

3.5 Role of Education in Reducing Unemployment

Education may not protect an individual from unemployment. In fact, it appears that, in developing countries, those individuals who are more educated are prone to higher levels of unemployment. Even so, evidence indicates that education is not in itself a futile exercise.

The literature provides evidence that education—even when it fails to have a protective effect against unemployment—may not be in vain. In the case of West Africa, Kuepie *et al.* (2006) show that generally, educational capital provides a substantial growth in earnings in the

informal sector. This observation implies that investments made in education are worthwhile (considering the unavailability of demanded jobs in the formal sector) particularly if the governments can support the growth of the informal sector through policies that make these jobs attractive. The study also finds that even though education does not guard against unemployment, "it does increase individual earnings by opening the doors for the most well educated to get into the most profitable niches, which are found in the formal private and public sectors." In a related finding, World Bank (2006) points out that, over time, as youth gain initial experience, higher education increases the employment incidence and enhances occupational mobility.

Another potential benefit of education is that it may reduce unemployment duration. Appleton *et al.* (2001) study on unemployment duration among retrenched workers in China found that time spent in unemployment is longer for the less educated and unhealthy.

3.6 Education and Poverty

The link between education and poverty is complex and has also been investigated in many studies. Both micro and macro level analysis seem to suggest that education is important for poverty reduction.

At the micro level, available literature from other parts of the globe reaffirm the negative relationship between education and poverty. Education broadens the range of available options for individuals and confers higher earning potential to the educated (UNESCO, 1997). Income poverty is found to decline consistently with increasing levels of education in developing countries (Tilak, 1994). Poverty can also be viewed as a constraint to educational achievement, and members of poor households usually receive less education.

Available household data for Kenya indicates that education reduces the incidence of poverty. Data for Kenya shows that poverty decreases as the level of education increases (Geda *et al.*, 2001). Households headed by individuals with primary school level of education are observed to be worse off than households headed by individuals with secondary school level of education and above. According to KNBS (2007b), using the 2005/06 integrated household budget survey data, in both urban and rural areas of Kenya, the level of education of the household head relates inversely to the incidence, depth and severity of poverty.

Evidence that education enhances poverty reduction efforts has been reported in some studies. Appleton *et al.* (2001) examined the relationship between poverty and education in Uganda in the 1990s and found that growth in living standards and poverty reduction was fastest for more educated persons. The study also reports that post-primary education generally increases the likelihood of receiving some wage earnings, at the expense of receiving any earnings from either agricultural or non-agricultural self-employment.

It is also recognized that poverty at household level can impact on education attainment. Tilak (2001) posits that income poverty does not allow households to meet the high direct costs of schooling, nor to bear the opportunity cost of schooling. Poor children are affected more by school dropout. The adverse relationship also holds at state level; economically poor states are usually not able to provide adequate schools for children, and guarantee good quality to make special provisions for poorer sections of society (Tilak, 2001).

At the macroeconomic level, education has always been considered a powerful instrument for reducing poverty and inequality through productivity enhancement. Recent growth equations have reported significant positive effects of education on growth (Barro, 1991). Education is known to impart knowledge and skills that are associated with higher wages/earnings, hence lower poverty levels (Fields, 1980; Tilak, 1986; 1994).

Some work has been done on the determinants of poverty in Kenya, including education as an explanatory variable. Geda *et al.* (2001) and Bigsten and Shimeles (2003) using a logit model and the 1994 Welfare Monitoring Survey data show that poverty status is highly correlated with the level of education, among other factors. Specifically, the studies conclude that educational attainment of the head of the household is the most important factor associated with less poverty. Similar findings are noted in the study by Oiro, Mwabu and Manda (2003) who associate a rise in the education level to a fall in the incidence of poverty.

3.7 Overview of the Literature Review

The above review suggests that education, under certain circumstances, may not have a protective effect against unemployment–a conclusion that has been arrived at by many contributors, including Cling *et al.* (2007). However, the seeming ineffectiveness of education has been

associated with certain socio-economic weaknesses, including the education system and the labour markets.

The literature provides evidence that education—even when it fails to have a protective effect against unemployment—may not be in vain. In the case of West Africa, Kuepie *et al.* (2006) show that generally, education provides a substantial growth in earnings in the informal sector. This observation implies that investments made in education are worthwhile (considering the unavailability of demanded jobs in the formal sector), particularly if the governments can support the growth of the informal sector through attractive policies. The study also finds that even though education does not guard against unemployment, it does increase individual earnings by enabling the best educated to get into the most profitable niches, which are found in the formal private and public sectors.

In a related finding, World Bank (2006) and Kiiru, Onsomu and Wamalwa (2009) established that, over time, as youth gain initial experience, higher education increases the employment incidence and enhances occupational mobility. Most empirical studies such as Kuepie, Nordman and Roubaud (2006); Kingdon and Knight (1999; 2001); Bigsten and Shimeles (2003); and Dias and Posel (2006) used binary probit and logit models as appropriate in the estimations. This current study seeks to establish the role of education in reducing poverty and unemployment among the entire labour force in Kenya.

4. Analytical Framework

The methodological approach used in this paper borrows from Kuepie (2006) and Manda, Mwabu and Kimenyi (2002). It involves estimating different models to evaluate the impact of education in its different forms (years of education; education type, that is, general versus vocational training; level reached) on: (i) the participation in the labour market (employment participation and sectors); and (ii) poverty reduction. In Kenya, the labour force constitutes the population aged 15 to 64 years, and unemployment consists of working age population who are not working, are available for work, and are actively seeking work during a specified reference period.

Two models are estimated in establishing (i) the link between poverty and education; and (ii) the link between unemployment and education. First, an ordered logit model is used to establish the probability of being poor given one's education attainment, controlling for other factors such as age, household head's education (proxy for family background), household head's employment status, and location, among other socio-economic factors. Next, a multinomial logit model is used to establish the probability of being under-employed, fully employed or openly unemployed given individual's education and training attainment and controlling for other variables such as age, household head's education (proxy for family background), gender, location (rural or urban) and other socio-economic factors. Individuals who did not indicate their employment status were excluded.

4.1 Modelling Effects of Education and Training on Poverty

To estimate the effects of education on poverty, we estimate an ordered logit model as in Bigsten and Shimeles (2003) and Geda *et al.* (2001). The dependent variable represents the poverty status of the individuals in a household. The poverty index of the household indicates whether a household is extremely poor, poor or non-poor during the survey period in 2005/6. The index takes a value of zero if the individual lives in a household that is not poor; 1 if (moderately) poor and 2 if extremely poor. An individual is categorized as being in a non-poor household if the household consumption expenditure per adult equivalent is more than the absolute poverty line; moderately poor if household consumption per adult equivalent is above food poverty line but below

absolute poverty line, and extremely poor if household consumption per adult equivalent is below the food poverty line. Since these categories have a natural ordering, ordered logit is the appropriate model to use (Greene, 1993) to compute the associated poverty probabilities.

Under the logit model, we assume that the probability of being in a particular poverty category is determined by an underlying response variable of individual characteristics (including education and training), whose disturbance term is normally distributed with mean zero and constant variance 1. The logit model has several advantages over the ordinary least squares (OLS) model, the most important of these being a specification that makes predicted probabilities to be well defined. The model we estimate takes the following form:

$$y^* = \beta' x + \varepsilon \quad \text{.....(1)}$$

where y^* is a dependent dummy variable taking value 0 if non-poor; 1 if moderately poor, and 2 if extremely poor. β is a vector of unknown parameters, and x is a vector of observed explanatory variables. The explanatory variables used in the application of this model include: education, training, household characteristics, access to assets and occupational status of household head, among others. In this estimation, our objective is to capture the effects of education and training on poverty and by extension their role in poverty reduction. Consequently, we control for all the other listed variables in order to avoid their effects being captured in the error term.

An individual's poverty status can be grouped into any of the three poverty categories depending on observable factors (x_s) and unobserved (ε) factors that determine the poverty status. Assuming three categories (0, 1 and 2) and associated probabilities (P_o, P_1 and P_2), an individual would fall in category 0 if $\varepsilon < \beta' x$, in category 1 if $\beta' x < \varepsilon \leq \beta' x + \alpha$, and in category 2 if $\varepsilon \geq \beta' x + \alpha$, where $\alpha > 0$, and is the error term in the underlining response model. These relationships may be formally presented in the following specification:

$$\begin{aligned} &\Pr ob(y=0) = \phi(-\beta' x) \\ &prob(y=1) = \phi(\mu_1 - \beta' x) - \phi(-\beta' x) \\ &prob(y=2) = 1 - \phi(\beta' x + \alpha) \end{aligned} \quad \text{.....(2)}$$

Where the distribution φ is logistic in the model. This can be generalized for m categories (Maddala, 1983). Given equation (2), the associated log-likelihood function and its derivatives can be obtained. To obtain the marginal effects of the regressors x, on the probabilities,

we take the derivative of the function at the probability of the occurrence of each category. For the two probabilities stated above, the marginal effects of changes in the regressors are given by:

$$\frac{\partial \Pr ob(y=0)}{\partial x} = -\phi(-\beta' x)\beta,$$

$$\frac{\partial \Pr ob(y=1)}{\partial x} = (\phi(-\beta' x) - \phi(\mu - \beta' x)\beta, \text{ and}$$

$$\frac{\partial \Pr ob(y=2)}{\partial x} = \phi(\mu - \beta' x)\beta. \quad \text{.....(3)}$$

Where φ (.) is the standard normal density function. Equation 2 can be intuitively estimated to obtain the marginal effects of various variables on poverty status, and by extension their roles in poverty reduction.

4.2 Model for Unemployment and Education and Training

A probability model is used to establish the effects of education and training on probability of persons aged 15-64 years being unemployed, while controlling for other socio-economic factors. The general model is given as:

$$y^* i = \beta_1' X_{i1} + \varepsilon_{i1} \text{ where, } \varepsilon_i \approx N(0,1) \text{.....(4)}$$

Where y^*_i is a dummy variable that takes the value of 1 if the individual aged 15-64 years is underemployed, 2 if fully employed and 3 if openly unemployed. β' is a vector of parameters for the various explanatory variables including education and training, X_{il} is a vector of exogenous factors, and ε_{il} is the error term which is normally distributed with the mean of zero and constant variance. We can then define the probability response model by transforming βX in equation 1 into a response probability function using a probit model of the form:

$$prob(y_i = 1 | x) = P(y = 1 | x_1, x_2 \text{.....}, x_k) \text{ .....(5)}$$

where x denotes the full set of explanatory variables and y denotes the discrete dependent variables, with outcomes 1, 2 and 3 as already described. We can then define the response probability model (Johnston and Dinardo, 1997) by transforming $X\beta$ into a probability such that:

$$prob(y_i = 1) = F(X_i \beta) \text{.....(6)}$$

By choosing F to be the standard normal, we get the probit model given by the cumulative density function of the standard normal distribution

$$prob(y_i = 1) = \Phi(X_i \beta) = \int_{-\infty}^{X_i \beta} \frac{1}{\sqrt{2\pi}} \exp(\frac{-z^2}{2}) dz \text{.....(7)}$$

The standard normal transformation $\Phi(.)$ constrains the probability to lie between zero and one. In order to estimate the above model, we use the likelihood function given as:

$$L = \prod_{i=1}^{m} \Phi(X_i\beta)^{y_i}[1-\Phi(X_i\beta)]^{1-y_i} \quad \text{.....(8)}$$

and a log likelihood function given as

$$Ln = \sum_i \{y_i.\ln[\Phi(X_i\beta)+(1-y_i)\ln[1-\Phi(X_i\beta)]\} \quad \text{.....(9)}$$

We then look for $\hat{\beta}$ that maximizes the above log likelihood function. However, we can only interpret the sign and the significance of the coefficients when we use the probit model. In order to interpret both the sign and the magnitude, we estimate the marginal effects and interpret them. From equation 3, we can derive the marginal effects for the probit model for continuous variables. Differentiating equation 3 with respect to the independent variables yields the following probability density function:

$$\partial P(Y=1/X)/\partial X_k = \beta_k f(X\beta) \quad \text{.....(10)}$$

Where $f(\bullet) = \dfrac{\partial F(\bullet)}{\partial F(X\beta)}$

The marginal effects for discrete variables are computed using the specification:

$$P(Y=1)/X_k=1)-P(Y=1/X_k=0) \ = F(X\beta/X_k=1)-F(XB/X_{\ k}=0) \quad \text{.....(11)}$$

Thus, the probability that an individual was unemployed equals the probability that this alternative occurs. The functional form of the probability function depends on that of the event (unemployment) occurring and on the distribution of stochastic variables. However, in most cases, the assumption that a probability model is linear in the independent variable is unrealistic (Onsomu *et al.*, 2006), implying that if the model is specified as linear, the statistical properties derived under the linear assumption may not hold. Thus, a generalized non-linear probability or logistic regression model is specified. This is a logit on the assumption of three exclusive choices, *inter alia*, individual i aged 15-64 years is underemployed (*k=1*), fully employed (*k=2*) and openly unemployed (*k=3*). The logistic distribution yields a logit model of the form:

$$prob(y_i=1) = \wedge(X_i\beta) = \frac{\exp X_i\beta}{1+\exp X_i\beta} \quad \text{.....(12)}$$

Where X_i denotes a set of predictors for a binary response Y and the probability that $Y_k=1$. But in our case, the alternatives are more than two and we use a multinomial logit. To test for the significance of the effect of X_i on the response probability, the null hypothesis is set as $H_o=0$; that is, the probability of success is independent of x. A Likelihood Ratio (LR) test is carried out, which compares well with Maximum Likelihood function, since the latter is normally distributed in large sample size.

In interpreting the results, we consider the sign of $\hat{\beta}$ that maximizes the maximum likelihood assumption. We can only interpret the sign and the significance of the parameters from the model. Thus, we further estimate marginal effects in order to estimate the magnitude of the parameters. From equation 9, we can derive the marginal effects for the model for continuous variables. The marginal effects for discrete variables are computed using the specification:

$$P(Y=1)/X_k=1)-P(Y=1/X_k=0)=F(X\beta/X_k=1)-F(XB/X_k=0) \quad \text{.....(13)}$$

The parameters of the estimates therefore represent the effect of a given characteristic on the chances of being under-employed, fully employed or openly unemployed. Thus, the multinomial logit model was based on the assumption of three exclusive choices (fully employed, under-employed, and openly unemployed).

4.3 Data, Variable Definitions and Measurement

The main data source for this investigation was the Kenya Integrated Household Budget Survey (KIHBS) 2005/06 data produced by the Kenya National Bureau of Statistics (KNBS). It contains information covering a variety of dimensions, including incomes and expenditures, education of all household members, labour supply, employment status, asset ownership, and land holdings. The study sample mainly constituted the labour force; that is, individuals aged 15-64 years and their characteristics. Following this classification, sample size consisted of 22,792 observations (18.4% unemployed, 63.6% fully employed and 17.9% openly unemployed).

The variables used in the analysis include education attainment or level of education and training completed—primary education (1=primary education), secondary education (1=secondary education), university education (1=university education), technical training (1=technical training) household characteristics (household size, age of household head, sex of household head); type of employment

(wage, non-wage, sector of employment); highest level of education attained by household member; physical capital (area of cultivated land owned, number of livestock); occupation (main income source such as manufacturing and agriculture, etc); and region of residence (urban=0 or rural=1). Sex (1=male), marital status (1=polygamous), and employment sectors (public, private, informal), are dummy variables taking the value of one, otherwise zero.

5. Results and Discussions

5.1 Descriptive Statistics

Table 5.1 presents the summary statistics. The mean household size is 6 members, and the means for consumption per adult equivalent and wage was Ksh 3,289 and Ksh 4,269, respectively. Average number of years of schooling in Kenya is 8.5 years, indicating that majority of Kenyans have only attained primary education.

5.2 Effects of Education and Training on Poverty

The results on the effects of education and technical training on poverty status, while controlling for other factors such as individual and household characteristics such as age, gender and physical capabilities are presented in Table 5.2. Educational status, especially technical training, secondary education and university education, significantly reduce the probability of household members being poor compared to attainment of only primary education. This suggests the critical role played by education in poverty reduction. Increasing the aggregate

Table 5.1: Summary statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Secondary education	22,499	0.218	0.413	0	1
University education	22,499	0.012	0.109	0	1
Technical training	22,488	0.223	0.416	0	1
Consumption per adult equivalent (Ksh)	28,411	3,289	5,632	16	191,734
Years of education	22,499	8.451	3.313	1	19
Age	28,533	33.285	12.440	15	64
Gender	28,533	0.526	0.499	0	1
Experience	21,577	9.600	3.486	0	12
Experience squared	21,577	104.308	52.153	0	144
Location	28,411	0.667	0.471	0	1
Household size	28,411	6	3	1	29
Monthly wages (Ksh)	21,577	4,269	20,439	0	775,000
Monthly public wages (Ksh)	1,283	20,024	32,095	0	775,000
Monthly private wages (Ksh)	1,094	24,021	62,432	0	640,000
Monthly informal wages	10,653	1,882	7,274	0	350,000

number of years of schooling, especially by promoting post-primary education, would decrease poverty probably because secondary education and tertiary education (university and technical education) are associated with acquisition of skills, hence higher earnings. This

Table 5.2: Marginal effects after ordered logit of education and training on poverty status

		Marginal effects after ordered logit-dy/dx	
		(z values in parentheses)	
Variables	**Poverty outcome for extremely poor (2)**	**Poverty outcome for moderately poor (1)**	**Poverty outcome for non-poor (0)**
Individual characteristics			
Secondary education	-0.078* (-10.48)	0.019* (12.25)	0.0597* (9.70)
University education	-0.282* (-20.81)	-0.079* (-4.34)	0.361* (11.47)
Technical training	-0.134 * (-17.99)	0.027 * (18.81)	0.108 * (15.71)
Age in years	0.0012* (3.60)	-0.0004* (-3.58)	-0.0085* (-3.60)
Gender of household head (1=male)	-0.030* (-4.66)	0.009* (4.62)	0.021* (4.65)
Marital status (1=married)	0.052* (6.33)	-0.016* (-6.20)	-0.036* (-6.33)
Location (1=rural)	-0.174* (-21.13)	0.595* (17.30)	-0.114* (22.02)
Household characteristics			
Household size	0.069* (51.38)	-0.0208* (-26.70)	0.048* (-51.92)
Employment in agriculture	0.024* (2.99)	-0.007* (-2.93)	-0.016* (-3.01)
Trade/business	-0.030* (-3.24)	0.0083* (3.58)	-0.022* (3.12)*
Wage employment	-0.040* (-5.29)	0.011* (5.69)*	0.029* (5.11)*
Provincial dummies (province=1)			
Central	0.117* (6.99)	-0.0451* (-5.82)	-0.0715* (-7.94)
Coast	0.156* (8.84)	-0.066 * (-7.10)	0.0902* (-10.61)
Eastern	0.175* (10.91)	-0.071* (-8.89)	-0.104* (-12.64)
North Eastern	0.258* (7.71)	-0.131* (-5.98)	-0.127* (-10.84)
Nyanza	0.201* (12.78)	-0.085* (-10.25)	-0.116* (-15.13)
Rift Valley	0.186* (12.12)	-0.073* (-10.00)	-0.113* (-13.67)
Western	0.229* (14.12)	-0.1032* (11.13)	-0.126* (-17.45)

dy/dx is for discrete change of dummy variable from 0 to 1
Dependent variable is poverty status, taking value 0=non-poor; 2=moderately poor and 2=extremely poor. z values in parenthesis; significant at 1 per cent (*), 5 per cent (**) and 10 per cent (***)

finding is consistent with Manda, Mwabu and Kimenyi (2002) who established that earnings for employed workers increase with level of education.

Effects on area of residence are captured through the location variables, which capture not only whether an individual resides in rural or urban areas, but also the province of residence. The results of marginal effects show that residing in rural areas significantly increases the probability of being extremely poor, and poverty rates are relatively higher in rural areas than in urban areas. This finding is consistent with Geda *et al*. (2001) who observed that although Kenya is mainly an agricultural economy, most of the poor people are mainly engaged in agricultural activities and live in rural areas. Households in rural areas have limited access to better paying economic opportunities, resulting into low welfare status. However, households in all provinces have high probability of being poor, hence interventions on poverty reduction should target all provinces in the country.

Demographic factors, as captured through marital status and household size, increase or reduce the risk of being extremely poor. This is perhaps due to the associated increase in dependency ratios, especially if the number of children and the elderly in a given household is higher than the number of working age population.

On the other hand, households headed by a married person depict low probabilities of being poor relative to their counterparts. Gender also plays a role in poverty status. Female-headed households have a higher probability of being extremely poor relative to male-headed households and married couples staying together. These demographic characteristics show the need to encourage strong social systems as one way of tackling poverty in an environment where strength of social networks is threatened.

Also, households with household head with full employment have a low risk of being extremely poor. Consequently, the problem of unemployment needs to be urgently addressed for the country to achieve meaningful reduction in poverty levels. The fact that household members who were engaged in the informal sector were earning low incomes relative to their counterparts in the formal public and private sector imply that besides targeting the sector in employment creation, issues of productivity need to be addressed. The informal sector employs the majority of the workforce (62%), but the average wage was about five times lower than for the formal sector (Table 5.1).

5.3 Effects of Education and Training on Unemployment

Estimation results on the effects of education and technical training (controlling for other observable variables) on reducing unemployment are presented in Table 5.3. The results show that higher education plays a critical role in reducing the risk of being unemployed, meaning that low education level increases the risk of being openly unemployed, and or under-employed. This finding is consistent with Kiiru, Onsomu and Wamalwa (2009), who established that university education and training are important buffers against youth unemployment in Kenya.

Attainment of university education and technical training, in particular, significantly reduces the probability of being under-employed and openly unemployed, while attainment of only primary education increases the risk of being either under-employed and or openly unemployed. This probably indicates low job aspirations of the less educated compared to the educated individuals. High probability of unemployment can also be associated with low and unsustainable economic growth, which has led to reduced job creation in the country. According to the descriptive statistics, 16 per cent of the total number of persons (about 2,371) employed in the formal public and private sectors had primary education; 57 per cent had technical training education; 20 per cent had secondary education; and 2 per cent had university education. Physical handicaps resulting to some form of incapacitation also increase the probability of being under-employed and openly unemployed.

These findings that under-employment is more pronounced in urban than rural areas depict the nature of structural employment pattern in Kenya. Much of the agricultural activities, which absorb majority of the labour force, are spread across all provinces except Nairobi Province, which is predominantly urban. Nairobi also attracts the majority of the graduates seeking for jobs from other provinces, causing higher incidences of open unemployment.

The result is consistent with Manda (2004), who established that open unemployment in Kenya is high in urban areas relative to the rural areas. This calls for policies that could reduce inequalities in regional development and open other urban centres and rural areas to modern economic activities that can attract potential job seekers and curb the rural-urban migration problem, especially to major town centres such as Nairobi. It would be interesting to assess the types of

Table 5.3: Marginal effects of education and training on unemployment (open and under-unemployment)

Variables individual characteristics	**Under-employed (1) Marginal effects - dy/dx (Standard errors in parentheses)**	**Open unemployment (3) Marginal effects - dy/dx (Standard errors in parentheses)**
Secondary education	-0.0071 (0.007)	0.036* (0.0065)
University education	-0.0343* (0.008)	-0.0076 (0.352)
Technical training	0.0303 (0.0355)	-0.0433 **(0.0199)
Age in years	-0.0109 (0.0017)*	-0.190 (0.0017)*
Age in years squared	0.00016 (0.00002)*	0.00013* (0.00002)
Gender (1=female)	0.0539 (0.006)*	0.085* (0.0052)
Marital status (1=married)	-0.0125 (0.0085)	0.0139** (0.0065)
Physically handicap? (1=no)	-0.028 (0.31)	0.105* (0.037)
Location (1=Urban)	0.0915 (0.007)*	-0.1074* (0.00696)
Household characteristics		
Middle economic status (1=middle)	-0.0086 (0.0072)	-0.029* (0.00598)
High economic status (1=high)	-0.051 (0.0085)*	-0.063(0.007)*
Household size	0.0017 (0.0012)	0.0049* (0.00084)
Provincial dummies (Province=1)		
Central Province	0.0026 (0.0209)	-0.0468* (0.0089)
Coast Province	-0.009 (0.0215)	0.029** (0.0136)
Eastern Province	0.321 (0.0219)	-0.0386* (0.126)
North Eastern Province	-0.0119 (0.044)	0.254* (0.044)
Nyanza Province	0.136* (0.027)	-0.0.0611* (0.008)
Rift Valley Province	0.0222 (0.0209)	-0.035* (0.0093)
Western Province	0.183* (0.029)	-0.0384* (0.0093)
No. of observations	18,020	18,020

dy/dx is for discrete change of dummy variable from 0 to 1
Dependent variable is Employ taking value 1=Underemployed; 2=Fully employed, Openly unemployed=3; Standard errors in parenthesis; significant at 1 per cent (*) and 5 per cent (**)

investments the Constituency Development Fund (CDF) is targeted at, and whether this could reduce inequalities, increase good quality jobs and productive job creation, and attract the highly educated and trained labour force. Ideally, this should be the main objective of decentralized funds, besides infrastructure and human capital development.

There appears to be an advantage for the male workers relative to potential female workers in the labour market. The finding reflects the general observation that in many developing countries, women and girls have low chances in the labour force due to lower education attainment levels compared to male counterparts. The female population also faces the challenge of balancing between reproductive and productive roles, which decreases the probability of receiving job offers in the formal labour market.

Another demographic factor that has implications on employment relates to physical handicaps. Persons with physical handicaps are more likely to be openly unemployed. Having no physical handicap reduces the probability of being openly unemployed and under-employed. This finding is consistent with Serneels (2007), who posits that employers use physical appearance as a screening device in offering jobs to their first time potential employees. This calls for targeted interventions for the physically handicapped population in order to attain some capabilities, such that they are able to earn some livelihood and to ensure that they are not trapped in poverty.

The effects of economic status are captured through the average monthly total household consumption expenditure per capita. Persons from medium and high income groups are less likely to be unemployed, compared to persons from low income groups. Perhaps this is because of the strong social networks that the high and middle income groups have in job seeking behaviour relative to the low income groups. Individuals from relatively high income groups have also attained higher levels of education and hence have lower risk of unemployment. This shows the importance of social capital and human capital in determining employment outcomes, and the contribution of ineffectiveness of the labour market in Kenya.

6. Conclusion and Policy Recommendations

This study analyses the effects of education and technical training on unemployment and poverty using the most recent micro data (KIHBS, 2005/6) for Kenya. The key finding from the study is that secondary education, university education and technical training play critical roles in reducing the risk of being poor, and either being openly unemployed or under-employed, through its effect in increasing individual earnings. Consequently, while increasing access to primary education is critical in laying the foundation for entry into higher education, stimulating access to primary education is effective in reducing poverty and unemployment if and only if individuals concerned take initiative to undertake post-primary education, and especially secondary, technical training and university education. This poses a delicate challenge in managing flow of children across all levels of education until attainment of higher education.

Although the informal sector provides substantial jobs especially in urban areas, the sector is associated with low wages, hence limiting its potential to assist the majority of the under-employed population to come out of poverty. In addition, for continued support to increase access to basic education, there is need to increase investment and growth for effective creation of high quality jobs, absorption of skilled and educated labour force and increased productivity.

The main policy recommendation emerging from the study is the importance of making post-primary education, especially secondary and university education and technical training, more accessible. This would be an important step in developing employable and skilled labour force. It is imperative that all sectors of the economy are stimulated to grow at a higher and sustainable rate so as to ensure creation of quality and productive jobs in the modern economy. This would greatly contribute towards reducing unemployment among the educated graduates from higher learning institutions and technical education graduates.

References

Appleton, Knight, Song and Xia (2001), Labour Retrenchment in China: Determinants and Consequences, mimeo.

Bae, H., S. and Song, H., J. (2006), "Youth Unemployment and the Role of Career and Technical Education: A Study of the Korean Labour Market", *Career and Technical Education Research*, Vol. 31, No. 1.

Barro, Robert J. (1991), "Economic Growth in a Cross-Section of Countries", *Quarterly Journal of Economics* 106 (2): 407-43.

Bedi, A., P.K. Kimalu, D.K. Manda, N. N. Nafula (2002), *The Decline in Primary School Enrolment in Kenya*, Kenya Institute for Public Policy Research and Analysis Discussion Paper No. 14, Nairobi: KIPPRA.

Bigsten, A. and Shimeles, A. (2003), "Growth and Poverty Reduction in Ethiopia: Evidence from Household Panel Surveys." *World Development* 31, 81-106.

Blaug, Mark (1972), "Correlation between Education and Earnings", *Higher Education* 1(1): 53-76.

Brauns, H. and Steinmann, S. (1999), "Educational Reform in France, West Germany and the United Kingdom: Updating the CASMIN Educational Classification", *ZUMA-Nachrichten* 23, 7-44.

Central Bureau of Statistics-CBS (2002), *Kenya 1999 Population and Housing Census: The Labour Force Monograph*, Analytical Report, Vol. IX, Nairobi: Central Bureau of Statistics, Ministry of Planning and National Development and Government of Kenya.

Central Bureau of Statistics-CBS (2003), *Report of the 1998/99 Labour Force Survey*, Nairobi.

Cling J-P., Gubert F., Nordman C.J., Robilliard A. S. (2007), *Youth and Labour Markets in Africa. A Critical Review of Literature*, Working Paper No. 49, Département de la Recherche, Agence Française de Développement.

Dias Rosa and Posel Dorrit (2006), *Unemployment, Education and Skills Constraints in Post-Apartheid South Africa*. Paper Presented at Accelerated and Shared Growth in South Africa:

Determinants, Constraints and Opportunities Conference", Johannesburg, 18-20 October.

Dickens W. T. and Lang, K. (1996), "An Analysis of the Nature of Unemployment in Sri Lanka," *Journal of Development Studies* 31(4): 620-636.

Fields, G.S. (1980), Poverty Inequality and Development, Cambridge: Cambridge University Press.

Fields, G.S. (2004), *A Guide to Multisector Labour Market Models*, Paper Prepared for the World Bank Labour Market Conference, Washington DC, 18-19 November.

Fields, G.S. (2009), "Segmented Labour Market Models in Developing Countries", in Don Ross and Harold Kincaid, *The Oxford Handbook of Philosophy of Economic Science*, Oxford University Press (Oxford Handbook Online).

Geda, A., N. De Jong, Mwabu, G. and Kimenyi, M. (2001), *Determinants of Poverty in Kenya: Household-Level Analysis*, Kenya Institute for Public Policy Research and Analysis Discussion Paper 9, Nairobi: KIPPRA.

Glewwe, P. (1989), "Unemployment in Developing Countries: Economist's Models in Light of Evidence from Sri Lanka," *International Economic Journal* 1(4): 1-17.

Godia, G. (1987), "Education and the Unemployment Problem in Kenya," *The Journal of Negro Education*, Vol. 56, No. 3: 356-367.

Government of Kenya (1965), *Sessional Paper No. 1 on African Socialism and its Application to Planning in Kenya,* Nairobi: Government Printer.

Government of Kenya (1988; 2006), Economic Survey, Nairobi: Central Bureau of Statistics: Government Printer.

Greene, William H. (1993), "Econometric Analysis, Second Edition", New York: MacMillian Publishing Company.

Ikiara G.K and Ndung'u, N.S. (1997), "Employment and Labour Market During Adjustment: The Case of Kenya", Geneva: ILO.

International Labour Organization-ILO (1976), Employment, Growth and Basic Needs: A One World Problem, Geneva: International Labour Office.

Isengard, B. (2003), Youth Unemployment: Individual Risk Factors and Institutional determinants. A Case Study of Germany and the United Kingdom.

Johnston, Jack and Dinardo, John (1997), *Econometric Methods*, 4th Edition, New York: McGraw-Hill.

Kenya National Bureau of Statistics (2007a), Kenya Integrated Household Budget Survey (2005/2006), Nairobi: Government Printer.

Kenya National Bureau of Statistics-KNBS (2007b), Basic Report on Well Being in Kenya: Based on Kenya Integrated Household Budget Survey (KIHBS) 2005/06, Nairobi.

Kiiru J., Onsomu E. and Wamalwa F. (2009), *Education, Training and Youth Unemployment in Kenya*, Working Paper, Global Development Network (GDN) and African Economic Research Consortium (AERC) Institutional Capacity Strengthening Project.

Kimalu, P., Nafula, N., Manda, D. K., Mwabu, G. and Kimenyi, M. S. (2002), *A Situational Analysis of Poverty in Kenya*, KIPPRA Working Paper No. 6, Nairobi: Kenya Institute for Public Policy Research and Analysis.

Kingdon G. and J. Knight, J. (1999), *Unemployment in South Africa: A Spatial Approach,* CSAE Working Paper 1999-12, Oxford: Centre for the Study of African Economies.

Kingdon, G. and Knight, J. (2001), *Unemployment in South Africa: The Nature of the Beast*, CSAE Working Paper, Centre for the Study of African Economies.

Kuepie M., Nordman, C. J. and Roubaud, F. (2006), *Education and Labour Market Outcomes in Sub-Saharan West Africa*, DIAL Working Paper 2006/16, Paris: DIAL.

Maddala, G. S. (1983), Limited Dependent and Qualitative Variables in Econometrics, New York: Cambridge University Press.

Manda, D. K. (2004), *Globalisation and the Labour Market in Kenya*, KIPPRA Discussion Paper No. 31, Nairobi: Kenya Institute for Public Policy Research and Analysis.

Manda D. K., Mwabu G. and Kimenyi M. S. (2002), *Human Capital Externalities and Returns to Education in Kenya*, KIPPRA

Discussion Paper No. 13, Nairobi: Kenya Institute for Public Policy Research and Analysis.

Mincer, J. (1972), Schooling, Experience and Earnings, New York: National Bureau of Economic Research (NBER).

Mincer, J. (1991), *Education and Unemployment*, National Bureau of Economic Research (NBER) Working Paper No. 3838, Cambridge.

Mwabu G., Kimenyi M., Kimalu P. K., Nafula N. N. and Manda D.K. (2003), "Predicting Household Poverty: A Methodological Note", African Development Revview, Vol. 15, No. 1.

Mwabu G., Masai, W. Gesami, R. Kirimi, K., Munene, F., Chemengich M. and Mariara, J. (2000), Poverty in Kenya: Profiles and Determinants, Department of Economics, University of Nairobi and Ministry of Finance and Planning, mimeo.

Noor, A. (1980), *Education and Basic Needs*, Staff Working Paper No. 450, Washington DC.

Oiro, M.W., Mwabu, G. and Manda D.K. (2003), *Poverty and Employment in Kenya*, KIPPRA Discussion Paper No. 33, Nairobi: Kenya Institute for Public Policy Research and Analysis.

Onsomu, E.N., Muthaka, D.I., Ngware M.W., and Manda, D.K. (2006), Determinants and Strategies for Expanding Secondary Education in Kenya, KIPPRA Discussion Paper No. 63, Nairobi: Kenya Institute for Public Policy Research and Analysis.

Pollin, R., Githinji, M. and Heintz, J. (2007), An Employment-Targeted Economic Programme for Kenya, Amherst, MA: Political Economy Research Institute (PERI).

Rama, M. (1998), "How Bad is Unemployment in Tunisia? Assessing Labour Market Efficiency in a Developing Country," *World Bank Observer* 13(1): 59-77.

Rama, M. (1999), "The Sri Lanka Unemployment Problem Revisited," Washington DC, World Bank Development Research Group: 45.

Government of Kenya (1965), *Sessional Paper No. 10 of 1965 African Socialism and its Application to Planning in Kenya*, Nairobi: Government Printer.

Sen, Amartya (1984), Resources, Values and Development, New Delhi: Oxford University Press.

Sen, Amartya (1999), Development as Freedom, New Delhi: Oxford University Press.

Serneels, P. (2004), *The Nature of Unemployment in Urban Ethiopia*, CSAE Working Paper 2004-18, Oxford: Centre for the Study of African Economies.

Serneels, P. (2007), "The Nature of Unemployment among Young Men in Urban Ethiopia," *Review of Development Economics*, 11(1), 170-186.

Stiglitz J. E. (1975), "The Theory of Screening, Education and the Distribution of Income," *American Economic Review*, 65(3), June, 283-300.

Streeten, P. (1977), "The Distinctive Features of a Basic Needs Approach to Development", *International Development Review* 3: 8-16.

Tenjo, (1990), "Opportunities, Aspirations, and Urban Unemployment of Youth: The Case of Colombia," *Economic Development and Cultural Change,* 733-761.

Tilak, J.B.G. (1986), "Education in an Unequal World", in M. Raza (ed) *Educational Planning: A Long Term Perspective*, New Delhi: Concept Publishing Company for National Institute of Educational Planning and Administration, 27-50.

Tilak, J.B.G. (1994), Education for Development in Asia, New Delhi: Sage Publications.

Tilak, J.B.G. (2001), *Education and Poverty,* Keynote Address Delivered at the Poverty Conference on "Education-A Road Out of Poverty?", at the Swedish International Development Agency and Uppsala University, 17-18 October.

UNECA (2005), "African Agricultural Performance in Perspective: Constraints, Achievements and the Impact of Multilateral Trade Reforms," in *Mutual Review of Development Effectiveness in the Context of NEPAD*, Addis Ababa.

UNESCO (1997), Adult Education in a Polarizing World, Paris: UNESCO.

United Republic of Tanzania (1997), The National Employment Policy, Dar es Salaam: Ministry of Labour, Youth Development and Sports.

Verner Dorte (2004), Education and its Poverty-Reducing Effects: The Case of Paraiba, Brazil, World Bank Policy Research Working Paper No. 3321, World Bank.

Wambugu A., Munga B. and Onsomu E. (2008), *Unemployment in Kenya: A Situational Analysis*, KIPPRA-NESC Paper.

Weisberg Y. J. and Meltz, N. M. (n.d), Education and Unemployment in Israel, 1976-1994: Reducing the Anomaly.

World Bank (2003), *Republic of Tunisia: Employment Strategy*, Report No. 25456-TUN, Washington DC: World Bank.

World Bank (2006), Development and the Next Generation, World Development Report.

Kenya Institute for Public Policy Research and Analysis
Bishops Garden Towers, Bishops Road
PO Box 56445, Nairobi, Kenya
tel: +254 20 2719933/4, 2714714/5, 2721654, 2721110
fax: +254 20 2719951
email: admin@kippra.or.ke
website: http://www.kippra.org

ISBN 9966 777 75 X