Intergenerational Persistence in Education and Rate of Return to Education in Kenya

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Intergenerational Persistence in Education and Rate of Return to Education in Kenya

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ABSTRACT

This study examines the role of schooling in intergenerational persistence in Kenya. Previous literature usually uses wage or income as a measurement of the intergenerational persistence. The intergenerational persistence refers to the relationship between the socio-economic status of the parents and that of their children in adulthood. Degree of the intergenerational persistence can be used to assess social openness. If the intergenerational persistence is tight, it means that an individual's outcomes (wage, occupation or education) tend to be determined by their parental backgrounds. In order to discuss the role of schooling in the intergenerational persistence in Kenya, this study applies an analytical framework of intergenerational mobility research and concentrates on the intergenerational persistence in education. As mentioned above, studies on the intergenerational persistence in resources mainly use parent-child pairs of income as measurement(Pekkarinen, Uusitalo, & Kerr, 2009). However, one of the issues is that parent's income information is usually not available in developing countries. As an alternative to the parent's income information, education has been used for the intergenerational mobility research.

The importance of studying the intergenerational mobility comes from one's preference of more egalitarian system in a society. Particular attention is paid to the role of schooling, because education is regarded as a "career ladder" to get ahead (intergenerational upward mobility) in a society. Though people believe that equal learning opportunities should be ensured for all, however, economic development last decades apparently open the career ladder for limited social groups. Kenya is no exception: After the independence of Kenya in 1963, educational opportunities were expanded and open for African origins with major structural changes align with a global initiative of educational development. Nevertheless, it is not clear whether these interventions benefited children from poor families for breaking a poverty cycle. Thus,

this study aims at examining whether the expansion of public education contributes to reducing inequality of opportunity in Kenya. Accumulating the evidence as well as enriching the analytical framework of the intergenerational mobility studies will contribute toward planning an equity-based public policy to narrow the gap between poor and rich. Moreover, this is the first study of estimating the intergenerational persistence in Kenya and one of very few cases in SSA, except for some previous literature (Lambert, Ravallion, & van de Walle, 2014; Bossuroy & Cogneau, 2013; and Piraino, 2014). It is well known that child's education is highly associated with parent's education (e.g., Black & Devereux, 2011; Causa & Johansson, 2010) and that the child's educational outcomes are to some extent influenced by parental socio-economic backgrounds (Buchmann, 2000). However, further studies are needed on (1) how the intergenerational linkage changes due to the expansion of the educational opportunities over time; and (2) the underlying mechanism of transmitted inequality from one generation to the next.

This study has two research questions: (1) how has the intergenerational persistence in education changed over time; and (2) to what extent does the rate of return to education influence intergenerational persistence in education? Using the restricted sample aged 25-34 from Kenyan population and housing census 1989, 1999, and 2009, the first research question aims at assessing changes of the intergenerational persistence in education over time. In addition to OLS estimations (both non-standardized and standardized ways), transition matrices are applied for understanding various patterns of the intergenerational mobility from 1950s to 1980s. The standardized estimation controls for variation of years of education of parents so that the estimated results from different birth cohorts are comparable. The parent-child pairs of educational attainment of the young cohorts extracted from a series of the population and housing censuses enable to minimize the cohort effects such as population growth, lifecycle bias, and parent's survival rate. In addition, this study also

examines influence of own schooling on intergenerational upward mobility. This study defines child's working in non-farm sector for farmer's sons/daughters as intergenerational upward mobility and examines how own schooling influences individual's employability at non-farm sector with probit estimations. This analysis restricts the latest population and housing census and investigates the relative strength of own schooling and origin effects (parent's education and occupation).

The second research question is to estimate causal effect of education on wage, introducing instrument variable (IV) approach. The estimated results show the causal effect of education on individual's wage. Using the 2005-2006 Kenya Integrated Household and Budget Survey, this study estimates the difference of private returns to education by parental background (mother's education) and the difference of return to education for a group who benefited from 1st Free Primary Education (FPE) policy and who did not. The FPE group is identified with following criteria: (1) those who were born in 1965-75; and (2) who enrolled in grade 1-4 between 1974 and 1979. The additionally joined group is supposed to come from poor family and they would have been out-of-school or dropout, if the 1st FPE policy was not implemented.

This study has four significance of the study. First of all, findings will be expected to accumulate empirical evidence of education and inequality of opportunities in developing countries. Using Kenya which experienced late development effect as an example, these findings would provide policy implication to deal with issues of equality especially in sub-Sahara African countries. Second, this study estimates the change of intergenerational persistence in education over 30 years. This provides us with insight and analytical framework of assessing educational policies in a mid-longer term. In addition, this study investigates the relationship between the return to education and the intergenerational persistence in Kenya. Finally, this study also analyzes the effect of the fee abolition policy from a mid-longer term perspective. Previous literature examined the effect of the FPE policy on access to schooling and academic achievement (within

education cycle). However, this study provides empirical evidence of the effect of the FPE policy on individual's wage observed in adulthood. Findings will be expected to show whether financial assistance at their early stage of life contributes to improving their future well-being.

Findings show that the degree of the intergenerational persistence in education is on average 0.3, which is not much tight as other countries. This implies Kenya has a certain degree of social fluidity. Considering the fact that most of the people in Kenya had no education before, the fluidity of the intergenerational persistence during the period (1950s-1980s) makes sense. The intergenerational persistence in education by birth cohort (1955-64, 1965-74, 1975-84) indicate that the middle cohort (1965-74) shows the weakest intergenerational persistence among them. The reduction of the intergenerational persistence in the middle cohort could be due to specific factors during the period which the 1st FPE policy was introduced. On the contrary, the intergenerational persistence becomes tight in the latest cohort (1975-84). It is also observed that the share of no-educated intergenerational persistence (both parents and children have no education) doubled between 1965-74 and 1974-85 (e.g. share of the no-educated intergenerational persistence is 15.6% in the middle cohort, but it is 30.7% in the latest cohort). This implies that the increase of the intergenerational persistence is due to the reduction of intergenerational mobility at the bottom level (no educated parent-child pairs). Findings of the intergenerational upward mobility also indicate that attainment of Tertiary education is important to work in non-farm sector for farmer's sons/daughters. Whereas own schooling is generally statistically significant and positive, mother's working in non-farm (origin) is also relatively strong determinant.

Findings of the return to education analyses show that the different effect of additional year of schooling on wage exist by parental background and those who benefited the 1st FPE policy. Those who have more educated mother shows 50% or higher return to schooling, probably due to the intergenerational effect. The lower return

to schooling shown by the FPE treatment group (those who experienced the 1st FPE) implies that the FPE group could increase their wage, but the increase rate is not sufficient to improve their socio-economic status. This is because the incrementally joined individuals might not obtain well-paid jobs. Their average year of schooling is almost equivalent to completion of primary education (9.94, and 9.5 years for males, and females) but a chance to get well-paid jobs is limited for primary school graduates. Moreover, the FPE group might have less ability of learning at their early stage of life. Poor family cannot provide enough early childhood development and supplementary learning. The resource gap between poor and rich creates academic achievement gaps, hence poor children cannot perform well in the national examination at the end of primary education cycle. Thus, findings indicate that poor children partially benefited from the fee abolition policy, but it can be not enough for them to enhance their intergenerational upward mobility.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ASALs	Arid and Semi-Arid Lands
CBA	Cost-Benefit Analysis
CF	Control Function
DZ twins	Dizygotic twins
EFA	Education for All
FPE	Free Primary Education
FDSE	Free Day Secondary Education
GDP	Gross Domestic Product
GER	Gross Enrollment Ratio
GSICS	Graduate School of International Cooperation Studies
IMF	International Monetary Fund
IPUMS	Integrated Public Use of Micro Data Series
IV	Instrument Variable
JICA	Japan International Cooperation Agency
KCPE	Kenya Certificate of Primary Education
KIHBS	Kenya Integrated Household Budget Survey
KNBS	Kenya National Bureau of Statistics
KPHS	Kenya Population and Housing Census
LSMS	Living Standard Measurement Surveys
MSLA	Minimum Schooling Leaving Age
MDGs	Millennium Development Goals
MZ twins	Monozygotic twins
NER	Net Enrollment Rate
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Lest Squares
OOSC	Out of School Children
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SAPs	Structural Adjustment Policies
SD	Standard Deviation
SES	Socio-economic status
SSA	Sub-Sahara Africa
TSTSLS	Two-sample two-stage least squares
UIS	UNESCO Institute of Statistics
UNESCO-IBE	The International Bureau of Education
UPE	Universal Primary Education
2SLS	Two-Stage Least Squares

1. INTRODUCTION

1.1 Background of the Study

This study examines the role of schooling in intergenerational persistence in resources in Kenya. Previous literature usually uses wage or income as a measurement of the intergenerational persistence. The intergenerational persistence refers to the relationship between socio-economic status of parents and that of their children in adulthood. Degree of the intergenerational persistence can be used to assess social openness. If the intergenerational persistence is tighter, it means that an individual's outcomes (wage, occupation or education) are determined by their parental backgrounds. The society which has tight intergenerational persistence is a relatively immobile. Whether a society is mobile or immobile is determined by various factors. Inherited traits, social norms and public policies might influence one's decision making for achieving economic success in his/her life(Causa & Johansson, 2010). It is difficult to separate the influence of these factors from intergenerational persistence; nevertheless, it is important to assess the degree of the intergenerational persistence and to find out the way to weaken intergenerational persistence especially at the bottom level.

Weakening the intergenerational persistence (or promoting intergenerational social mobility) is expected to offer the same starting line of economic success in one's life. Of course, it does not mean that everyone should acquire outcomes at the same level. However, we believe that one's chance to get ahead should not be related to ascribed characteristics such as race, sex, and social class(Breen & Jonsson, 2005). While an equity-oriented policy to enhance the intergenerational social mobility is important in terms of ensuring equity and optimally allocating human resources, there exists a tradeoff. That is, removing obstacles to social mobility does not necessarily the best way to drive an economic growth of a society. Furthermore, it is not realistic that a

society holds perfect equality, (or zero intergenerational persistence). Because the transmission of resources to the next generation itself is one of the fundamental aspects of social system, it is reasonable to assume that children of wealthier parents benefit from their parental backgrounds to some extent. What we need to understand is how and to what extent carry-over of resources is occurred between generations and to find out the ways to ensure greater equality especially for disadvantaged social groups(Black & Devereux, 2011).

There are several ways to explain mechanism of the intergenerational transmission of socio-economic status (Becker & Tomes, 1979; Björklund & Salvanes, 2010). One of the possible channels is education. Intergenerational transmission via education closely relates to inheritance of their parent's ability, some unobservable factors (parent's value on education at home), and parent's financial capacity to invest in human capital. Recent research has attempted to figure out the causal linkage between parent's education and child's education. While it is not easy to differentiate the direct effect of schooling from other factors, it is obvious that labor productivity of a child is, to a large extent, determined by parent's investment in education as well as children's ability of learning(Causa & Johansson, 2010). Therefore, it is important to examine the role of schooling in the intergenerational persistence in resources.

In order to discuss the role of schooling in the intergenerational persistence in resources, this study applies an analytical framework of intergenerational mobility research and concentrates on the intergenerational persistence in education. As mentioned above, studies on the intergenerational persistence in resources mainly use parent-child pairs of income as measurement(Pekkarinen, Uusitalo, & Kerr, 2009). However, one of the issues is that parent's income information is usually not available in developing countries. As an alternative to the parent's income information, education has been used for the intergenerational mobility research. There are several advantages in using education to estimate the intergenerational persistence in a developing country

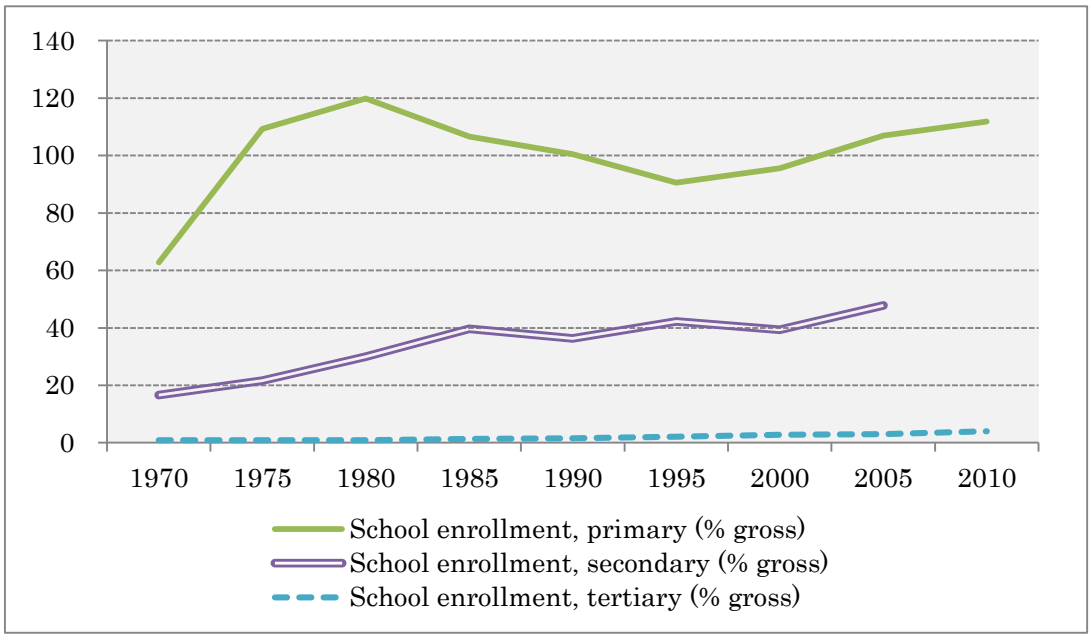
context(Azam & Bhatt, 2012). First, compared to income, less measurement error is occurred. Second, completion of one's education by mid-twenties enables to obtain unbiased estimation, compared to income. Third, much literature proves high association between education and income or other economic status.

This study investigates intergenerational persistence in Kenya for following reasons. First, an expansion of public education service as well as industrialization, hence greater prominence of middle class have stimulated more attention to inequality of opportunities caused by economic disparity in Kenya. While a large share of the population suffers from chronical poverty in most of developing countries, economic development during the past decades changes the situation. The gap between the rich and the poor has also become more evident in Kenya(Omwami & Omwami, 2010). Second, less-developed societies like Kenya have shown different conditions of social stratification in contrast to developed ones(Buchmann & Hannum, 2001; Buchmann, 1999). Different wage, and occupational structure as well as rapidly introduced modern education system would generate the differences and the findings from the different context can be a source of generating new perspectives of the intergenerational mobility studies. Third, educational performance gaps between the rich and the poor have been proved by previous literature(Bagaka's, 2010; Sawamura, 2004) It is a need of investigating its reason behind and provide equal learning opportunities for all. Against this background, this study examines the intergenerational persistence in Kenya and particular attention paid to the role of schooling in the intergenerational persistence in resources.

1.2 Problem Statement

After the independence of Kenya in 1963, educational opportunities of Kenya have been expanded with major structural educational reforms. However, it is not clear whether these educational reforms reached socio-economically disadvantaged children. Major educational reform includes the introduction of fee abolition policies in primary education in 1975, comprehensive educational reform, which was the shift from a 7-4-2-3 educational system to an 8-4-4 structure extended primary schooling by one year in order to implement a more practical, vocational curriculum in 1985, and a recent introduction of Free Primary Education (FPE) and Free Day Secondary Education (FDSE) policies in 2003 and 2008 align with a global Education for All (EFA) campaign. As seen in Figure 1-1 Gross Enrollment Rate by Level of Education from 1970 to 2010, the gross enrollment ratio (GER) in primary achieved almost 100% in 1975. Nevertheless, GER in secondary are far behind; around 20% in 1975. While the GER in secondary reached around 50% in 2005, the constant low transition from primary to secondary education implies that many children could not complete their primary education or were not be able to continue their post primary level of education. The completion ratio in primary remains low. It was 48% in 1970 and even after a few decades later, the completion ratio in primary was 81% in 2007(World Bank., 2015; Republic of Kenya., 2008).

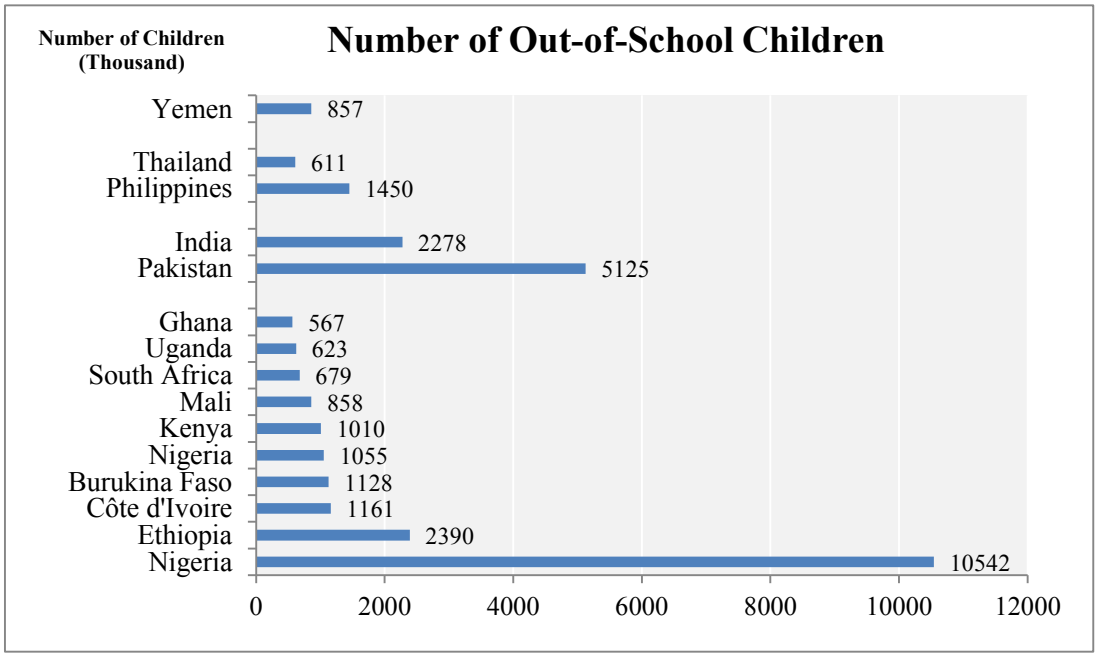
Figure 1-1 Gross Enrollment Rate by Level of Education from 1970 to 2010



Source: World Bank (2015)

In accordance with the Education for All (EFA) global campaign, which aimed at providing basic education for all children, youth and adults, many children in Kenya have successfully been enrolled in school in the last decade. However, in spite of the significant improvement of access to education, there remains one million of Out of School Children (OOSC) in Kenya, which is the third-largest country of having OOSC in Sub-Sahara Africa (SSA) (Figure 1-2 Numbers of Out-of-School Children in Sub-Sahara Africa Countries in 2010). In order to achieve EFA goal 2, "Ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to, and complete, free and compulsory primary education of good quality", Government of Kenya needs to find ways to reduce the number of OOSC in Kenya.

Figure 1-2 Numbers of Out-of-School Children in Sub-Sahara Africa Countries in 2010



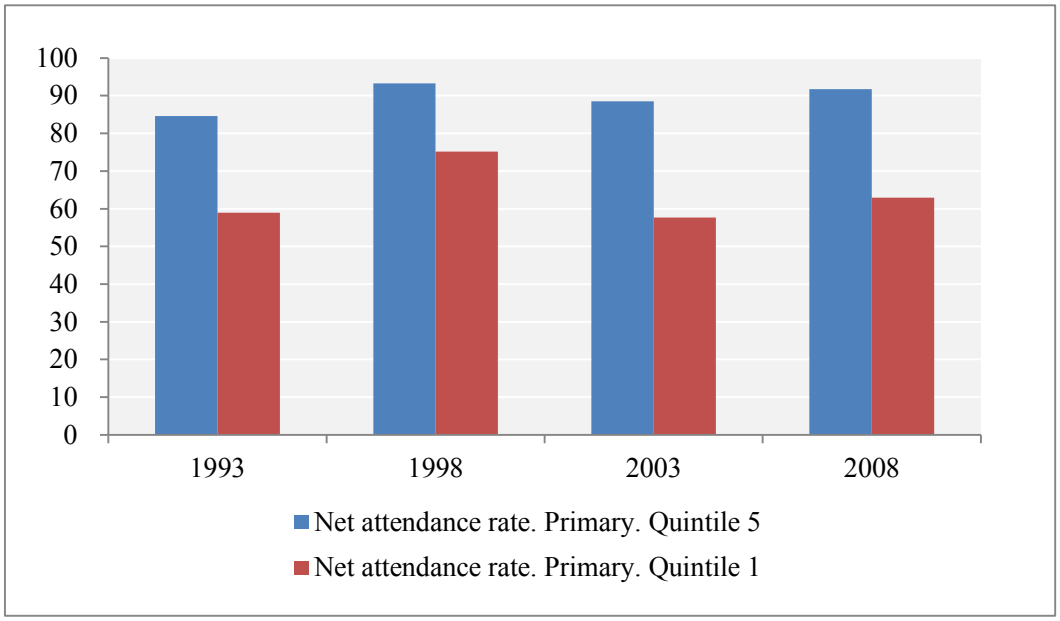
Source: UIS, (2012)

The OOSC in Kenya are disproportionately distributed in the nation, and most of them are in socio-economically disadvantaged areas called Arid and Semi-Arid Lands (ASALs). Therefore, the issue of OOSC is not only due to the supply side, but also the demand side (parents). The gap of access to education is evident in Net Enrollment Rate (NER) in Primary education. While the national average of NER in Primary is 77.2%, the NERs in Primary in ASALs are far behind i.e., 48.4% in Marsabit, 34.6% in Wajir, and 34.1% in Garissa (Republic of Kenya, 2010). The low NER in ASALs region can be explained by cultural and socio-economic reasons including cattle rustling, negative attitudes toward (girl's) education, early marriage, and child labor. Pastoral communities mainly lived in the ASALs is one of the major unreached group in Kenya. Due to the traditional practices by pastoral communities, schooling is not appreciated by the parents. Circumcision, early marriage, and nomad lifestyle itself make their children (especially girls) difficult to keep participating school activity. Further to that, dropouts

or many jobless workers who went to school discourage parents to send their children to school, because schooling sometime de-track their children from traditional lifestyle (Little, Aboud, & Lenachuru, 2009).

To make matters worse, the source of the gap of access to education is not only originally from traditional cultural practices, but also from economic reasons. Children from a poor family have less chance to attend schools than those from rich family (See Figure 1-3 Net Attendance Rate in Primary, Richest and Poorest Quintile in Kenya). In addition, the child's educational outcomes are to some extent influenced by parental socio-economic backgrounds. Using an international student assessment called Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) II project, a multilevel analysis on primary school pupil's Mathematics and Reading performance found that most of key determinants were not purely determined by school factors but also influenced by family or individual related factors. In addition to pupil's age, sex, pupil's behavior problems in school and pupil-teacher ratio, average Socio-economic status (SES) at class-level, and SES at individual level explained 12% and 10% of student's performance in the standardized estimations, respectively (Hungi & Thuku, 2010). The constant effect of SES variable both at individual's level and at classroom level, which was composed of parent' education and possessions at home, implies that parenthood at home has impact on their child's school performance to some extent. Indeed, while Kenya expanded educational opportunities with the major structural changes, the poverty and inequality have been more prominent due to poor governance, corruption, and mismanagement of public resources and youth unemployment, proved by the fact that almost half of the population is in the status of "multi-dimensional poverty" and 20% in "severe" poverty(Lelei, Wideman, & Sakaue, 2015).

Figure 1-3 Net Attendance Rate in Primary, Richest and Poorest Quintile in Kenya



Source: World Bank (2015)

Note: 5th Wealth Quintile is the richest; and the 1st Quintile is the poorest

Recent introduction of the FPE policy in 2003 aimed at reaching these socio-economically disadvantaged children. Many studies have evaluated the impact of FPE policies from different angles recently(Nishimura & Ogawa, 2015; Nishimura & Yamano, 2013; Oketch, Mutisya, Ngware, & Ezeh, 2010; Oketch, Mutisya, Ngware, Ezeh, & Epari, 2011; Omwami & Omwami, 2010; Sawamura, 2004; Somerset, 2009). These studies proved that due to the overcrowded classrooms, reduced funds and hence lowered teacher's motivation at primary level of education in Kenya, the quality of public education was questioned by parents. For the sake of providing better education for their children, some parents make a decision to send kids to private school: "wealthy families utilize the actual school choice more than poor families, and this choice is more open for boys than for girls" (Nishimura & Yamano, 2013, p. 274).

However, their concern is mainly the effect of the fee abolition policies on child's educational outcomes, and relatively in the short-term. That is because the 2nd FPE

policy was implemented in recent years. In addition, the recent literature which evaluated the FPE policies suggests a need of further investigations of the influence of the parental backgrounds on child's educational outcomes after completing their education cycle.

The negative effects of the FPE policies on quality of education are impossible to overlook. Being in school itself is not enough; rather, we should make children learn in school. Cognitive skills and knowledge are critical for individual's well-being in their future and the distribution of income and economic growth in a society as well (Hanushek & Woessmann, 2012). While the fee abolition policy has been advocated in order to ensure equal access to primary education for all children, it is not sure that the financial assistance actually benefits poor and the disadvantaged children. As long as children from wealthier families enjoy better quality of learning in private or prestigious national schools, chances to attain higher education and to get well-paid jobs are limited for them, and socio-economically disadvantaged children constantly suffer from low quality school, hence they would have less chance to go for higher education and to get well-paid jobs. In order to provide generous supports to poor and socially disadvantaged children, what kinds of policy interventions are needed?

1.3 Research Question

Against the background of the study and the problem statement, this study examines the intergenerational persistence in Kenya, focusing on the role of schooling. In order to find out the way to ensure equal opportunities for the socio-economically disadvantaged children, this study aims at understanding the situation on inequality of opportunities in Kenya. Preference toward an egalitarian, meritocratic society itself needs to be discussed from various aspects; however the purpose of this study is not to judge which

society is better than the other. Rather, this study aims at investigating why the inequality of opportunities occurs and what kind of a particular policy intervention helps the inequality of opportunities mitigate in a society. In other words, this study confirms whether one's schooling ensures the intergenerational upward mobility for poor children.

The analyses of this study deal with following two research questions: (1) How does the intergenerational transmission of education function in a society in Kenya? ; and (2) How does the rate of return to education influence the intergenerational persistence in Kenya? The first research question is to examine the trend of society's openness of Kenya. This research question aims at describing changes of the intergenerational persistence in education in Kenya using both calculation of the parent-child correlation with ordinary least square estimation (OLS) and educational transition matrices. This analysis also attempts to examine the role of own schooling in the intergenerational upward mobility. By doing so, these analyses enable us to understand how Kenya has been a mobile or immobile society.

In the second research question, this study examines the private rate of return to education in Kenya with Mincerian earning function introducing two instruments, mother's education and the First FPE policy implemented in 1974-79. Findings from the analyses will be expected to find out the difference of parental backgrounds on decision making to invest in education. In this analysis, well-documented both endogenous and sample selection bias are simultaneously corrected. In addition, this study examines the difference of the rate of return to education between the FPE treatment group and the non-FPE group. Some evidence supports that government spending on education enhances intergenerational upward mobility(Causa & Johansson, 2010; Solon, 2004). Through the fee abolition policy which can offset sub-optimal investment in education by parents, the children of liquidity-constrained parents might benefit relatively more. In sum, this study sets two main research questions together with several sub-research

questions, respectively:

Research Question 1: How does the intergenerational transmission of education function in a society in Kenyan?

1. **How has the intergenerational persistence in education changed over time?**
2. **How much does own schooling influence one's probability of obtaining a job in non-farm sector?**

Research Question 2: To what extent does the rate of return to education influence the intergenerational persistence in education?

1. **To what extent does the rate of return to education differ by mother's level of education?**
2. **To what extent does the rate of return to education differ between FPE treatment group and non-FPE treatment groups?**

1.4 Objectives of the Study

The first objective of the study is to describe the intergenerational transmission of education in a quantitative manner. Using three consecutive birth cohorts (1955-64, 1965-74, and 1975-84), this study reveals changes of the magnitude of intergenerational persistence over time in order for assessing the degree of social openness in Kenya. Examining the mid-long term changes of the intergenerational persistence during the era of temporal development, this study attempts to uncover how the expansion of

education and inequality of opportunities in a society relate over time. This study also explores the role of own schooling in the intergenerational upward mobility. Tight intergenerational persistence implies that chances to get a job in non-farm sector are limited to children whose parents have more education or a job in non-farm sector. Thus, parental background promises an important determinant than other factors. However, as Human capital theory explains, it is believed that education could enhance the intergenerational upward mobility. Purpose of this analysis is to investigate the relative strength of own schooling in terms of occupational attainments.

The second objective of this study is to examine the difference of the rate of return to education by parental background and between the FPE and the non-FPE group. Examining the difference of return to education by these groups tells us how different parental investments in education relate to the intergenerational persistence. This analyses use two instrument variables (IV). One is mother's education. As for the parental background, this study uses mother's education (a dummy variable, which is one if mothers attain post-primary level of education) as an instrument. The other is the 1st FPE policy implemented in 1974-79. To introduce the educational financial policy instruments could test the influence of credit constraint at the early stage of life on one's welfare of adulthood. These findings are expected to contribute to both enriching the evidence on the intergenerational mobility studies in SSA, and providing useful insight on designing effective equity-oriented policies for policy makers.

1.5 Significance of the Study

The significance of the study lies in enriching empirical evidence on intergenerational mobility in developing countries. Accumulating the evidence as well as enriching the analytical framework of the intergenerational mobility studies will contribute to

planning an equity-based public policy to narrow the gap between the poor and the rich. Moreover, this study is the first study of estimating intergenerational persistence and the role of own schooling in intergenerational mobility in Kenya and one of the few studies in Sub-Sahara Africa (Lambert, Ravallion & van de Walle, 2014; Bossuroy & Cogneau, 2013; and Piraino, 2015). These findings would provide policy implication to deal with issues of equality especially in sub-Sahara African countries. Third, to estimate the change of intergenerational persistence in education over 30 years is also significance of this study. This provides us with insight and analytical framework of assessing educational policies in a mid-longer term. In addition, it is important to examine how own schooling influences intergenerational upward mobility. Findings will be expected to provide some political implication to mitigate inequality of opportunities. Finally, this study analyzes the difference of the rate of return to education by parental background and between the FPE and the non-FPE group. Findings will be expected to show the relationship between different parental investments in education and the intergenerational persistence. In addition, introducing instrumental variable approach with simultaneous correction of sample selection bias enables to treat endogenous bias in the estimation of the rate of return to education.

The reminder of this paper is organized as follows. Section 2 provides a brief summary of: (1) current situation and historical development of education in Kenya, particularly focusing on the effect of the introduction of fee abolition polices; (2) theoretical backgrounds and recent empirical evidence on the intergenerational mobility studies in developing countries and; (3) identification issues and recent evidence on the rate of return to education in SSA. Section 3 explains the methodology of this study, covering the analytical framework, hypotheses, models, and datasets used in the OLS analyses and measures of intergenerational mobility such as transition probability matrices, some mobility indices in addition to Mincerian earning function and simultaneous correction of the endogenous bias and the sample selection bias. Section 4

indicates findings of the intergenerational persistence and the rate of return to education. Section 5 gives discussion on the results with some concluding remarks.

2. LITERATURE REVIEW

2.1 Education and Development in Kenya

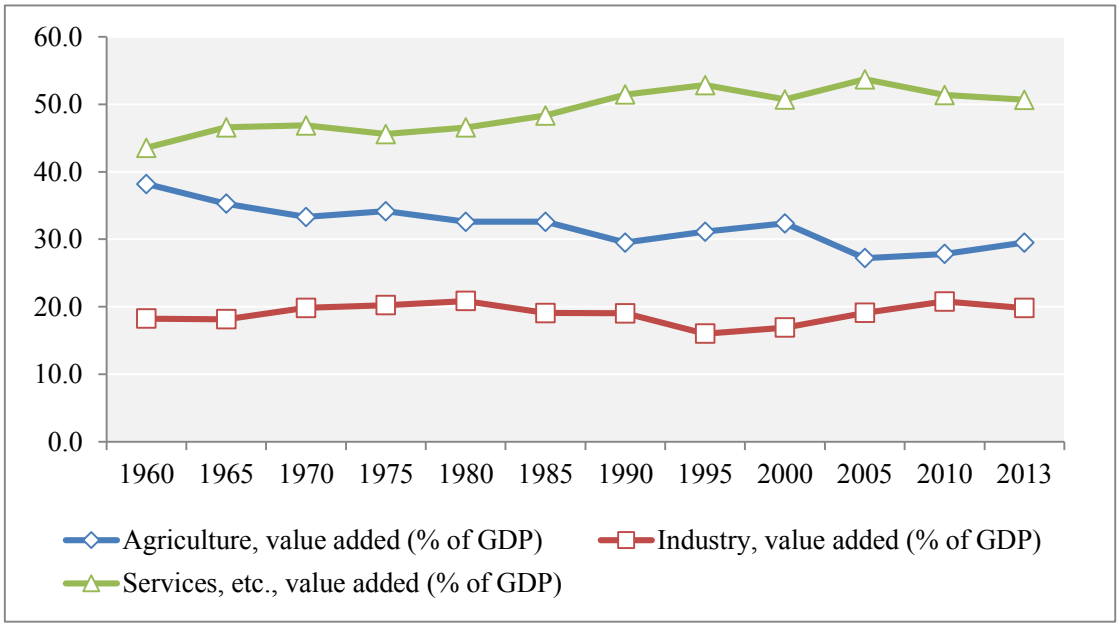
This section briefly overviews: (1) inequality of opportunities in Kenya; (2) current situation of education; and (3) educational development in Kenya from a historical point of view with a particular emphasis on FPE policies.

2.1.1 Inequality of opportunities in Kenya

Kenya became a lower middle country in 2014 with GDP per capita of 1,280 USD and dominant economic sector is service, 50.7%, followed by agriculture, 29.5% (See Figure 2-1 Values Added by Industry (% of GDP) from 1960 to 2013). Kenya plays a leading role of growing economies in SSA, supported by lower energy costs, investment in infrastructure, agriculture, manufacturing and other industries(World Bank, 2015a). According to the World Bank's factsheet (World Bank, 2015a), the current population of Kenya is 45.5 million and more than 40% of the population is under the age of 15 years. Almost 70% of the population lives in rural areas. The current president, Uhuru Kenyatta, who was inaugurated in 2013, has been focused on implementing new constitution formulated in 2010[1]. Some of the key agenda by the government is to deepen the implementation of devolution and to strengthen governance institutions to improve accountability and public service delivery at national and local levels.

[1] The first president of Kenya is Jomo Kenyatta who is the father of Uhuru Kenyatta. This is a good example of hereditary in Kenya which this study discusses.

Figure 2-1 Values Added by Industry (% of GDP) from 1960 to 2013



Source: (World Bank, 2015b)

In terms of human and social development, Kenya has successfully achieved some of the Millennium Development Goals (MDGs). Commitments made by the government include more efficient and effective interventions and increased spending on health and education sector which reduced child mortality, and the reduced enrollment gap of gender in education. Nevertheless, the issues of poverty and inequality of Kenya have been more evident due to poor governance, corruption and mismanagement of public resources and youth unemployment.

The economic disparity of Kenya, which was developed by ethnic lines together with regional difference of natural resources, can be explained by dramatic changes in Kenyan economy during the last century. Almost all of the people in Kenya were engaged in agriculture or related activities a century ago, however more than half of them work in formal or informal non-agricultural activities at the present time. This structural change has affected distribution of resources. Bigsten, Manda, Mwabu, & Wambugu (2014) briefly described how income inequality emerged from a historical

perspective. Summarizing their paper, followings highlight some turning points to explain origin of current inequality of opportunity in Kenya. First turning point of the difference in welfare level was the construction of railways in 1901. It enlarged economic activities and trade and settlements. By then, colonialists from UK arrived at Kenya and gave some impacts on its economy. Nevertheless, except for the coast area where there were trading with other countries via the Indian ocean, dominant activities of the inland were pastoral practices, settled farm activity, small craftsmanship or traders. The living standard level was not much different among the people at that time. However, the construction of the railways changed the situation. As transportation was improved due to the railways, Asians and Europeans as well as Kenyans could engage in commercial activities. At this stage, those who succeeded in their business were emerged among African-origin Kenyans. The transportation drove the differentiation of economic activities and this was the beginning of the inequality of welfare level among Kenyans from the indigenous African origin.

Access to fertile land was also another important factor for generating inequality of income. In the early 20th century, which started to be stratified by racial line in Kenya, African farmers who had fertile land took advantage of their resource and succeeded to improve welfare level around the bottom level of the income distribution. On the top of the European who occupied high rank position in society (administrative posts, professions), followed by the Asians who dealt with trade, commerce, and took position in the middle level of bureaucracy, some African elevated their social position, doing business and trading. Having the fertile land was one of key determinants for beginning relative large scale of business. Thus, noticeable progress was made by the farmers in Central and Nyanza provinces, because these provinces had fertile grounds. Origin of the regional differences and the rural-urban differences in income began to widen at this stage (Ibid.).

Moreover, the independence of Kenya in 1963 opened more chance for Africans

to climb up from the bottom of the racially-developed hierarchy. The independence implied that the high rank positions occupied by the colonialists were no longer for them, but for Kenyans. It was also an urgent need to fulfill the demand for qualified officers in public sector. There existed a certain income gaps between Foreigners and Kenyans, but those who took advantage of this political change succeeded their social position upward. In other word, the gap between farm sector and non-farm sector became further enlarged among Kenyans. Dominant ethnic group in politics and economy utilized their fertile lands and a geographical advantage. Thus, it is inevitable to consider ethnic lines and regional differences when we think how inequality of opportunities was generated in Kenya.

2.1.2 Current situation of education in Kenya

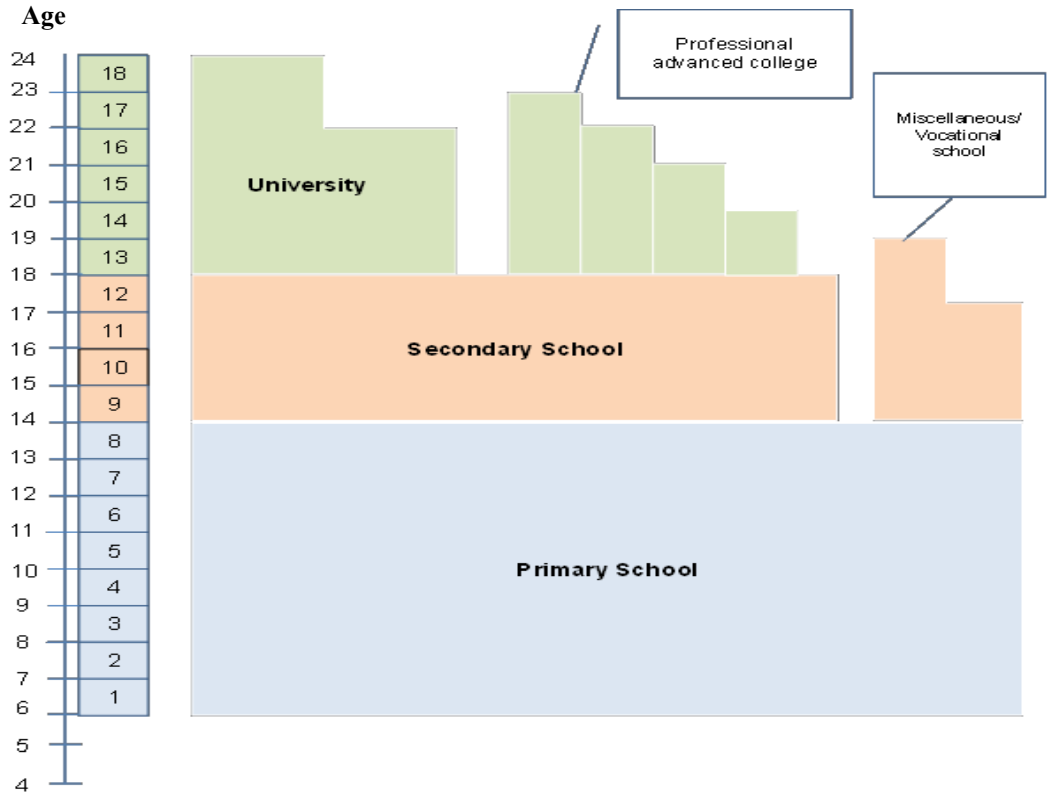
Current 8-4-4 education system in Kenya was replaced in 1985 from 7-4-2-3 education system, which influenced by the former British style (See Figure 2-2 Education System in Kenya)[2]. The renewed system of education aimed at providing more practical subjects such as business, crafts, home science, and agriculture for pupils (Sawamura, 2004). One of the unique characteristics in Kenya is that almost 50% of the children aged 3 to 5 attend pre-primary school, which is not common in SSA (Republic of Kenya, 2010). Mostly the pre-primary school is affiliated with primary school and pupils learn alphabets and very basic calculations. This is called nursery classes or schools in Kenya. Purpose of providing the pre-primary education seems to develop reediness of learning.

The curriculum of primary education covers both academic and vocational subjects such as Mathematics, History, Geography, Science, Crafts, and religious studies.

[2] 8 years for primary, 4 years for secondary and 4 years for tertiary. In the former 7-4-2-3 system, Secondary education level was separated into two: lower and upper level of secondary education

After the end of compulsory primary education cycle, students take exams for the certification of the Kenya Certificate of Primary Education (KCPE). They are assessed in five subjects such as Kiswahili, English, Mathematics, Science and Agriculture, and Social Studies. Language of instruction is usually English. School year of Kenya starts from January to December and students of primary and secondary education have 3 to 4 holiday weeks in April and August, while the academic year of university starts from September to June(UNESCO-IBE, 2006).

Figure 2-2 Education System in Kenya



Source: Created by Author Based on UNESCO-IBE (2006)

Reviewing current key issues facing basic education helps understand why the investigation of the intergenerational linkages is important in Kenya. As mentioned above, the commitments made by Government of Kenya increased enrollments,

especially children from poor families. However, cost of education is still an obstacle of attending primary school for disadvantaged children (Sawamura & Sifuna, 2008). Moreover, the issue of quality of education has been more prominent(Sifuna, Sawamura, Shimada & Malenya, 2015). The fact that children appeared in classroom but not learning is well known among the people in Kenya (Uwezo, 2012). High achievers of KCPE are constantly from private school and disparity in quality between public and private school is the greatest cause for economic disparity in future(Glennerster, Kremer, Mbiti & Takavarasha, 2011). Unless some solutions to deal with the achievement gap at primary education level are found and implemented, children from poor families continuously take less advantage within their education cycle and even after they enter the labor market.

Furthermore, cost of education is more problematic at Secondary education level. The free secondary education polices introduced recently are also expected to improve access to secondary education, but as shown in Figure 1-1 Gross Enrollment Rate by Level of Education from 1970 to 2010, the transition from primary to secondary is limited(Republic of Kenya, 2010). Quality of education is also an issue. The public-private disparity is a potential bottleneck of social stratification in Kenya. Higher percentage of students in private primary school get more than 250 scores for KCPE 2004, which is the border line of secondary school admission (77 percent for private; but 45 percent for public school)(Glennerster et al., 2011). As a result of the FPE policies, it is expected that many primary school graduates seek chances to enroll secondary school so that it is a need to identify the bottleneck and plan adequate policy interventions.

The impact of projects on educational development has been assessed by researchers, governments and international organizations, but they are usually in the short-run projects because of its nature. The assessment of educational development in a quantitative manner is extremely scarce from a long-run perspective. Much action

research or randomization trial has been implemented in Kenya to improve access and quality of Education with collaboration with the Abdul Latif Poverty Action Lab at Massachusetts Institute of Technology (MIT) (J-PAL). Evidence from the experimental evaluation indicates some effective key interventions such as de-worming programs, provision of textbooks, remedial education programs, merit-based scholarships, hiring female teachers, and so on (e.g. Duflo, Dupas & Kremer, 2011; Glewwe, Kremer, & Moulin, 2009). What the impact evaluation studies are lacking in is to examine and identify educational issues with a relation to holistic education system and bottlenecks of the issues behind. It is very important to see the impact of school inputs on the intermediate outcomes such as attendance or achievement of children's test score but it is also inevitable to understand the underlying mechanism and bottlenecks of the issues of educational activities in a school, considering education system and social stratification.

2.1.3 Educational development in Kenya from a historical point of view

As mentioned before, the independence of Kenya in 1963 was a turning point of the history of educational development. Education was mainly for non-African in the pre-colonial period of Kenya, but after the independence, the segregated system was abolished in response to the gain of momentum of the independence. The former 7-4-3-2 education system was expected to meet the urgent need for the expansion of opportunities to include the participation of all children in schooling and promote equal opportunity for African-origin Kenyan (Muricho & Changách Koskey, 2013). The inequality of schooling by ethnicity was clear at the early stage of the independence in Kenya. Despite the school age population of European was small (8,900 for primary school age; and 3,300 for secondary), 74.6% of them were enrolled in primary school

and 98.9% of them in secondary school. On the other hand, Africans were just 34.7% (840,677 out of 2,412,300) in primary and only 1.3% for secondary (10,593 out of 829,700). Therefore, a key priority of the government of Kenya was to ensure learning opportunities for native Kenyans.

Involvement of community, called Harambee (Swahili for "pulling together") was one of the inevitable aspects of educational development in Kenya. The first president Jomo Kenyatta gave his efforts to expand educational opportunities as an engine of human development and the improvement of social well-being. "Community-based independent school[3]" together with the spirit of "Harambee", as a form of fundraising, was established by the call of the president, Kenyatta(Amutabi, 2003; Mwiria, 1990). Because the administration and service were oriented for the British people in the colonial period, Kenya had limited capable teachers and education staff in order to provide public education for native Kenyans. The Harambee schools successfully accommodated children especially from poor families. According to Lelei et al., (2015), the evidence is clear: the number of primary school became double from 20,000 in 1963 to 40,000 in 1973 and it reached to 80,000 schools in 1980.

The first president, Kenyatta set up the first education commission of Kenya, called the Omiende Commission for evaluating the education system and obtaining policy implication(Republic of Kenya., 1964). In the Omiende report, there were following recommendations: (1) abolishing segregated schools; (2) expanding opportunities for African children; and (3) changing the curriculum to suit the needs of a newly independent nation. Based on the fact that the educational distribution was uneven among ethnic backgrounds, the government prioritized ensuring educational opportunities for marginalized groups. This was the springboard of providing free primary education as a form of fee abolition in marginalized areas such as the districts

[3] Independent school is controlled primarily by community groups outside of the colonial government that were established to serve the specific interests of native Kenyans (Lelei, et al. 2015; Ssekamwa & Lugumba, 2001).

of Marsabit, Isiolo, and Samburu in the North Eastern Province; Turkana, West Pokot, Baringo, Narok, Elgeyo Marakwet, and Olkejuando in the Rift Valley Province; and Tana River and Lamu in the Coast Province in 1971 (Lelei et al., 2015). The financial support was to encourage people lived in the areas who could not build a sufficient number of the community-based schools.

In 1973, the free primary education policy was expanded for the whole country. The implementation occurred in January 1974 at the beginning of the school year for children in grades from one to four. This policy increased from 1.8 million of the students enrolled in grade 1-6 in 1973 to more than 2.8 million in January 1974 (Eshiwani, 1993). However, the assessment conducted by the second commission, called Gachati report indicated that the cost of education was a major burden to parents, leading them to dropout their children from school in accordance with the insufficient number of skilled teachers. This was probably due to the fact that the first FPE policy made primary education even more expensive and increased dropouts, because the cost of "building levies" spontaneously introduced after the FPE policy was higher than the school fees charged before the FPE policy (Lelei et al., 2015).

The first free primary education policy was forced to be abolished in the late 1970s because of the Structural Adjustment Policies (SAPs) imposed on developing countries by the World Bank and International Monetary Fund (IMF) as a condition for receipt of loans. The purpose of SAPs was to encourage privatization of public services and cost recovery, among other things. Kenya adopted the SAPs in 1980 and instituted cost-sharing policies promoted by the World Bank and the IMF (Omwami & Omwami, 2010). The cost-sharing policies and budget cut in the education sector reduced educational opportunities for Kenyan children from poor families.

The cost sharing policies continued until the second free primary education policies were launched in January of 2003. The third president, Mwai Kibaki abolished the cost-sharing policies and made entirely free for grades 1-8. Except with the

authorization of the district administration, school management committees were prohibited from collecting parental contributions of any kind (Lelei et al., 2015). Again, the introduction of the FPE policies caused administrative problems in the process of implementation; however, the response to the initiative was devastating. Large number of out-of-school children came back to school, especially children from poor families. The enrollments increased by almost 2 million children between 2003 and 2010 (Republic of Kenya, 2010).

Although Kenya showed remarkable growth of enrollments in education, it still has many things to improve toward ensuring equal educational opportunity for all. The 2nd FPE policy paid particular emphasis for providing a socioeconomic equity to narrow down the access gap of education, but, in reality, children from poor families were unable to meet schooling costs and thus the government tried to overcome this hurdle by meeting operational development costs in addition to supplying instructional materials to all public primary schools (Nishimura & Ogawa, 2015). Another negative influence of the FPE policies was that as a result of high enrollments in school, there were overcrowding in classes and the insufficient supply of teaching and learning materials (lowering quality of learning in school). Weak transportation and distribution system also made difficult to dispatch the necessary materials and equipment to most of the primary schools (Sifuna, Sawamura, Shimada, & Malenya, Likoye, 2015; Sifuna & Sawamura, 2015).

In sum, the institutional change of educational system such as the first and second FPE policies is likely to change the intergenerational correlation of education especially at the bottom level. While absolute level of education has increased over time, it does not mean that the secular rise of schooling ensure greater equality. Unless children from poor family receive more and better education than those of rich family, the relative gap comes from parental background would be transferred to the next generation. In addition, the SAPs period is highly likely to reverse the situation due to the abolition of

the first FPE policies. Thus, overviewing educational development in Kenya implies that (1) the expansion of the public education would weaken the intergenerational persistence in education in absolute term, however, would remain (or even strengthen) the intergenerational persistence in education in relative term.

2.2 Intergenerational Persistence in Education

2.2.1 Theoretical background on the intergenerational persistence in education

The educational opportunities in Kenya have been open for children from poor families, but it is not clear whether they could acquire sufficient knowledge and are ready to study in post-primary education level and elevate their socio-economic status in their later life. Unlike the case of primary education, secondary education and tertiary education have not much expanded during the last decades. Indeed, Dore's "Diploma Disease" implies that less credit constraints in poor family does not necessarily reduce the intergenerational persistence in education (Dore, 1976). Even if educational opportunities are open for disadvantaged groups, unless economy grows continuously, the over-supplied post-primary graduates could not elevate their welfare and well-being status. Thus, the overall intergenerational persistence would not change. The cancelling out mechanism is reported in some other countries (Breen & Jonsson, 2005). This happens because while the average mean years of schooling increases in total (absolute change), the relative income gaps enlarge between rich and poor families within a society.

The reason of causing the canceling-out mechanism is still inconclusive. At least, the educational system plays an important role to change in social fluidity and

differences between countries as the driving force. While literature on comparative social fluidity by Treiman & Yip, (1989), and Warren, Sheridan, & Hauser (2002) found that education mediates the large parts of the origin-destination association. Intergenerational occupational mobility studies, for example, Ishida, Muller, & Ridge, (1995) found stronger remaining "origin effects". According to Breen & Jonsson (2005) a hypothesis is that compositional change affects the intergenerational persistence pattern: if educational system in s society functions as mediating the intergenerational persistence (or enhance intergenerational social mobility), and if the share of the population with higher levels of education expands, then this compositional change (e.g. increased share of the degree holders against other levels of education) can be expected to lead to an overall reduction in the gross association between origins and destinations. On the other hand, if the educational system reproduces the intergenerational persistence (or immobilize the intergenerational social mobility), then even if the share of the population with higher level of education increases, this compositional effect might be cancel-out due to the strengthened intergenerational persistence at the group of the higher level of education.

A change of the intergenerational persistence in education is usually performed by a univariate regression which is estimated by each birth cohort separately:

$$c_i = \alpha + \rho f_i + \varepsilon_i \qquad (2.1)$$

where c_i and f_i are child's years of schooling divided by their corresponding standard deviation, respectively. ε_i is an error term and ρ is the correlation coefficient. The coefficient ρ could be interpreted as a measure of the inequality of opportunities due to family circumstances, which are independent of a child's effort(Checchi, Fiorio, & Leonardi, 2013). Use of the normalized variables is important, because it factors out the difference in the variance of educational attainment across generations. In contrast,

non-normalized regression coefficient is affected by the relative variance of education across generations(Black & Devereux, 2011). Large increases in educational attainment in developing countries for the last decades are highly likely to cause a secular increase in the variance of education. Thus, if the standard deviation of parent's generation is lower than that of child's generation, the regression coefficient would exceed the correlation coefficient. According to Black & Devereux (2011), it is recommended to report both the regression coefficient (absolute measure) and the correlation coefficient (relative measure).

Unlike developed countries, Kenya has introduced modern education system relatively recently. The rapid expansion of educational opportunities might vary the pattern of the intergenerational persistence in education. As Dore (1976) describes in his study, the late development effect, which implies that educational credentials proved by selection mechanisms such as a high-stake examination system, influences the intergenerational mobility pattern. At the early stage of introducing modern schooling system, the intergenerational social mobility ratio is expected to be high due to the merit-based selection mechanism of schooling. However, the intergenerational social mobility ratio might diminish at the later phase because of the increase of middle class which was composed of a successor of the first generation. As far as almost all people have no education, studying in school is a fair competition for all. However, as the succeeded middle class can invest in their children strategically, there is a possibility that a society gradually becomes more stratified. Some studies have investigated a changing pattern of the intergenerational mobility over time across countries, but the evidence is still inclusive (For a comprehensive review, see Breen & Jonsson, 2005)

Possible channel of intergenerational transmission of education

Education is regarded as a primary determinant of the long-term economic success and upward social mobility (Huang, 2012). However, at the same time, it is not negligible that children's educational outcomes are influenced by family background factors such as parental education and socio-economic backgrounds (Buchmann & Hannum, 2001). It is still in a debate whether schooling enhances the intergenerational social mobility or immobilizes it, transmitting values and behaviors through schooling experiences from parents to children (social reproduction). According to a comprehensive cross-national study conducted by Ganzeboom, Treiman, & Ultee (1991), schooling plays a contradicting role:

> The answer to the question of the extent to which educational attainment promotes social mobility thus turned out to be compound: Respondent's occupational status is more related to [own] education than to father's occupation, and most of the effect of education is independent of social origins, so the main role of education is to promote social mobility; but at the same time a majority of what social reproduction there is transmitted through education, so education is also the main vehicle of social reproduction, so education is also the main vehicle of social reproduction (Hertz, 2007, p.4; Ganzeboom, Treiman, and Ultee 1991, p.284).

The process of immobilizing intergenerational social mobility can be explained by Bourdieu's concept of social reproduction (Bourdieu, 1986). In his theory of cultural reproduction, children from upper class have advantage in gaining higher educational performance because of their possession of form of knowledge, called cultural capital. The concept of cultural capital refers to the way of life that a community establishes,

especially distinguishing power relationships among social class. The original idea comes from the work of the French sociologist Bourdieu (1986), who explained that the cultural capital indicates one of the many forms of capital such as human capital, and social capital that people can have for their lives. There are three types of cultural capital: (1) cultural artifacts; (2) institutions; and (3) embodied capital(Light, 2005). Because the cultural capital determines how human being engages with people and resources, it influences one's behavior and lifestyle. It is highly likely that children are transmitted parent's value, belief and preference not only by interacting with parents directly, but also by getting influences from other family environments and even from schools where they enroll. Through this socialization process, children internalize a sense of what they are natural and contended, called "habitus"(Tramonte & Willms, 2010). Thus, children who have more cultural capital appreciate or understand the importance of schooling more than those who do not have it.

The cultural capital theory explains the mechanism of the interaction between children and parents well. It is no doubt that the family backgrounds influence child's educational outcomes; however an issue is that it is difficult to observe it. Usually, the cultural capital is regarded as unobservable factors in econometric model. Borrowing the theory explained by Becker & Tomes (1979), there is a possible explanation of transferring mechanism of resources from one generation to the next as follows (Björklund & Salvanes, 2010):

1. Carry-over of human capital (direct effect of parent's educational choice on child's educational choice)
2. Passing on unobserved genetic cognitive abilities along with other genetic traits
3. Transfer of families' cultural background including unobserved factors such as preference, value, etc.

4. Endowments such as wealth or financial resources in general
5. Public resources influencing parental education and choice

The five possible channels of the intergenerational transmission imply different policy intervention to solve inequality of opportunities. The cultural capital theory mentioned above, which refer to the third point (unobserved family factors) has not been in central concern in Economics because findings driven by this factor can be less room for economic policy; thus, most of the studies have focused on the investigation of carry-over of human capital, the effect of financial resources, and the effect of public policies. Above all, much literature has studied on the relationship between the first factor, carry-over of human capital and the second factor, transfer of genetic traits(e.g. Holmlund, Lindahl, & Plug, 2011) in order to reveal causal effect of parent's education. It is natural to think that children of more educated parents can attain higher education due to the effect of carrying over of human capital; however, at the same time, their offspring's performance can be determined by the inheritance of parent's genetic traits (endogenous bias). To separate the direct and indirect effect of parental education has been expected to contribute to providing evidence on the debate on "nature" vs. "nurture"(Chevalier, 2004).

In order to explain the intergenerational linkages in resources, it is a need to find other hypothesis to explain it. The resource gap between highly educated and less educated parents, called credit constraints is worth investigating (Chevalier, 2004). While highly educated parents can afford to invest in their children's education, less educated parents cannot. The concept of credit constraints is the basis of Solon model (Solon, 2004). Families have to reduce current consumption to invest in child human capital due to credit constraint. If there are no credit constraints, and thus parents are able to borrow from their children's future earnings, each family will optimally invest in the human capital of their children (Black & Devereux, 2011). Poor families need to

reduce current consumption to invest in children's education. Practically, it is assumed that the educational choice of children depends on the cost of education, the return to education and family income (Ibid.). This implies that children of highly educated parents tend to benefit from the higher average income of highly educated parents. In this regard, recent conditional cash transfer programs that prove the liquidity constraint is an important determinant of the heterogeneity of the intergenerational link of educational attainment. For example, Baird, McIntosh, & Özler (2011)'s study on the impact of conditional cash transfer conducted in Malawi showed that financial supports for poor households improved children's educational outcomes.

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Theory on intergenerational mobility

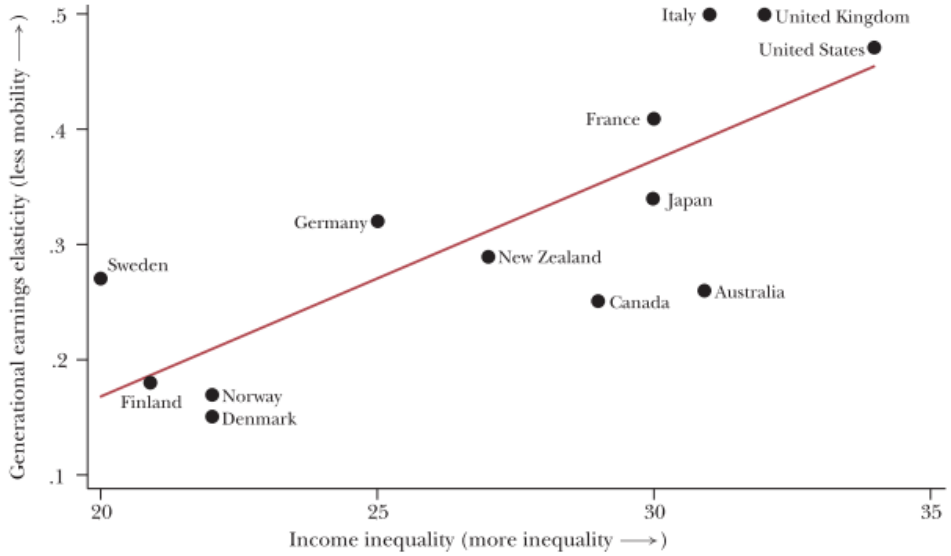
Much of the literature on inequality dealt with inequality of outcomes (typically the distribution of incomes) and less attention has been paid to inequality of opportunities in Economics. While a conceptual framework of analyzing the inequality in resources in multiple generations (called intergenerational social mobility) has been developed in Sociology, studies in Economics mainly concerned with inequality within a generation. The reason of neglecting the intergenerational effect in Economics is partly due to the fact that the influence originated from family backgrounds and parents is regarded as something that an individual cannot control by oneself called "circumstances" (Brunori, Ferreira, & Peragine, 2013, p.3)[4]. This might be one of the driving forces of inequality, however even if we confirm that the circumstance determines "advantages" (that is, defined as outcomes such as income, wealth, and health status), there is little room to deal with the inequality. In contrast, if we confirm that "efforts" determines the

[4] These terminologies (advantages, circumstances, and efforts) are still an inconclusive and a topic to debate in the philosophical literature.

outcomes, it will be more acceptable.

In fact, research and policy design should be focused on something changeable. However, much evidence implies that “more inequality of incomes in the present is likely to make family backgrounds play a stronger role in determining the adult outcomes of young people, with their own hard work playing a commensurately weaker role” (Corak, 2013, p.79). Thus, it is crucial to investigate why the influence of family circumstance is constantly strong to determine child’s outcome. There is evidence that the emerging income inequality diminishes upward social mobility, making talented and hard-working people difficult to acquire the rewards they deserve. Following Figure 2-3 Great Gatsby Curve shows that countries where have wide income disparity also tend to be less intergenerational social mobility (greater transmission of economic disadvantage between generations).The horizontal axis in the figure indicates income inequality in a country as measured by the Gini coefficient from a generation ago. The vertical axis is a measure of intergenerational economic mobility. The elasticity is calculated based on birth cohort of children born during the early to mid-1960s and extracted adult outcomes in the mid to late 1990s. As can be seen, Finland, Norway and Denmark indicate the weak linkage between parental economic status and the adult earnings of children is weakest, while Italy, the United Kingdom, and the United States are more tight: about a half of any advantage or disadvantage would be passed on the second generation.

Figure 2-3 Great Gatsby Curve: More Inequality is Associated with Less Mobility across the Generations



Source: Corak (2013, p.82)

Note: The Gini coefficient for measuring income inequality uses disposal household income for about 1985 as provided by the OECD. Intergenerational economic mobility is measured as the elasticity between parental earnings and a son's adult earnings using birth cohort of children. For more detail calculation method, see Corak (2013).

The Y-axis of the great Gatsby curve, called the intergenerational earning elasticity, which is regarded as the indicator of inequality opportunity (or social openness) and the original concept comes from the intergenerational mobility study (Becker & Tomes, 1979). Their model of the intergenerational transmission of the socioeconomic status and the related concept is based on a simplified assumption that a family only consists of one individual at each generation. Individual permanent income is assumed to derive from two components: (1) individual endowment of human capital; and (2) individual ability. In their model, a child's endowment of human capital is a result of his father's optimal allocation of his permanent income, where the father's utility depends on his own consumption and the child's permanent income.

$$\boldsymbol{Y_c = \emptyset Y_p + \vartheta A_c} \quad (2.1)$$

The equation above represents that the father's permanent income (Y_p) has a positive causal effect on the child's income (Y_c). The coefficient of father's permanent income (φ), called the intergenerational elasticity (IGE) can be interpreted as a summary measure of the degree of earnings persistence across generations. Another source of the child-parent linkage can be expected with transmission of the father's ability (A_c). The parameter of the ability (θ) can be interpreted as a causal influence from the previous generation to the next, and this is assumed to be independent from the father's investment decisions and financial constraints, including other aspects of determinants of the earnings such as innate abilities, preference or access to social networks (Núñez & Miranda, 2011).

Based on the previous model, given that permanent income can be observed, the following relationship between the permanent income of the father and that of the child is explained as this:

$$Y_i^c = \beta_0 + \beta_1 Y_i^p + \varepsilon_i \quad (2.2)$$

Where Y_i^c denotes the logarithm form of permanent income of a child in family *i* and Y_i^p denotes that of parent's permanent income, and ε_i is an error term, which is independent from Y_i^p and assumed to be distributed as N (0, σ^2). The intergenerational income elasticity (β_1) indicates following two situations: (1) if the parameter is equal to zero, it is the case of full intergenerational mobility (there is zero intergenerational transmission between generations); and (2) if the parameter, β_1 is equal to one, this represents absolute immobility, which means that a child born from a parent with a certain income level are fully reflected in the income level of the second generation. The parameter, β_1

(the elasticity) represents the percent difference in child's earnings observed for a 1% difference across the earnings of parents and 1 - β_1 indicates a measure of intergenerational mobility(Piano, 2015).

In practice, however, it is difficult to observe the permanent income. Thus, empirical literature uses current incomes or earnings observed in datasets. As pioneer work done by Solon (1992) and Zimmerman (1992) demonstrated, the use of earning information of a single year underestimate the intergenerational effect due to the presence of transitory components in current income, especially in combination with the use of a homogenous sample (Núñez & Miranda, 2011). Alternative approach is to average over more years of data to allow for persistent transitory shocks and to pay more attention to the ages of both fathers and sons at the time earning are measured(Black & Devereux, 2011).

2.2.2 Recent evidence of the intergenerational persistence in education

Compared to the intergenerational income mobility studies, using the measure of education for the intergenerational mobility has advantages in terms of controlling this lifecycle bias. Unlike with lifetime earnings, completion of education usually occurs at the relatively early stage of people's life[5]. Thus, the issue of lifecycle bias is occurred much less than using earnings. However, there is another issue: the secular increases of educational attainment among generation cause upward bias of the regression coefficient (Hertz et al., 2008). Typical approach to solve this issue is to estimate

[5] Black & Devereux, (2011) also pointed out (1) that non-employment does not matter for estimating the intergenerational educational mobility; (2) that the issue of measurement error is relatively low as completion of education is easy to remember; and (3) that extensive literature shows higher association between education and labor market outcomes.

standardized child-parent correlation making use of the standard deviation of the education variables. This is particularly important for estimating the intergenerational persistence in education in developing countries, because the rapid expansion of educational opportunities is highly likely to change enrolling patterns (especially at the bottom level) over time.

In order to factoring out the cohort effects(Checchi et al., 2013), Hertz et al. (2008) estimated the coefficient of the education variable with child's years of education with parent's education by each five-year birth cohort at first, then the estimated coefficients are averaged across cohorts. Finally, the averaged coefficients are multiplied by cohort weight, which means the standard deviation of the children divided by the standard deviation of the parents. This approach has advantage to account for population growth, change in fertility, and survivors-to-date as representative of their birth cohort. This treatment also corrects both for the smaller sample of older cohorts due to mortality, and the gap of shares between cohorts and the population of the sample due to sample design, or sampling error.

Review of the recent intergenerational mobility studies conducted by Black & Devereux, (2011) provided empirical evidence of the intergenerational mobility with its methodological issues. A particular concern should be paid for controlling lifecycle bias, which is an important problem in practice. Due to data limitation, parental income are measured relatively late in their lifecycle while those of children are usually measured at quite young ages. Therefore, ideal income measure is long-run permanent disposable income (Haider & Solon, 2006). Because studies based on current wages tend to be lower elasticity estimates than studies measuring permanent income, it is usual to average both parental and children's wages over several years or measure offspring's wages after a few years' experience in the labor market as mentioned above(Causa & Johansson, 2010).

Much literature has been accumulated in developed countries, however, recent

literature has also started to accumulate evidence in developing countries (Asadullah, 2012; Azam & Bhatt, 2012; Behrman, Gaviria, & Székely, 2001; Gong, Leigh, & Meng, 2012; Louw, Berg, & Yu, 2006; Magnani & Zhu, 2015; Smith & Piraino, 2007). These studies have dealt with countries where various aspect of inequality is more evident than SSA countries such as China (economic disparity), countries in Latin America (ethnic disparity), India (caste-oriented disparity) and Bangladesh (gender disparity). Except for South Africa, which experienced Apartheid, very few studies have investigated SSA countries: probably due to the fact that economic disparity is less evident than other countries; chronic and absolute poverty are more important issue to solve. Following literature is some of the few intergenerational mobility studies in SSA countries.

Bossuroy & Cogneau (2013) investigated occupational and educational mobility in five African countries (Cote d'Ivoire, Ghana, Guinea, Madagascar, and Uganda) using Living Standard Measurement Surveys (LSMS) conducted between 1985 and 2006. Their ordered logit estimation by level of education indicated the probability of being low level of education is higher for fathers who had no education than fathers who completed primary education (i.e., 3.2 point difference of odds ratio in Uganda)[6]. Introducing the father's education in the logit model with son's occupation (0, if son is non-famer; and 1, if son is farmer), their findings proved that father's level of education did play a critical role in determining the son's occupation. While the probability of being farmer is 4.1 (odds-ratio) for sons whose father was farmer for Uganda, the probability reduced by 1.4 points after taking respondent's level of education (from 4.1 to 2.7). In their model, the son's level of education dummies such as "never reached primary", "primary", and "middle school level" were introduced. These results applied to other countries. Their findings would provide following implications: (1) parental

[6] The ordered logit models for son's education are coded as follows: 0, if son never went to school; 1, if only reached primary; 2, if only reached secondary level; and 3, if reached tertiary level. Higher odds-ratio implies that the probability of having low level of education is high for sons. It is noted that they only investigated son-father relationships.

education influences children's education in African context as well; and (2) education helps them exit from farm sector. In other words, education can be a driving force of upward social mobility.

Lambert, Ravallion, & van de Walle (2014) in Senegal investigated economic inequality focusing the effect of bequest. Utilizing the unique dataset, they found that bequests of land and housing (a long-term financial resource) played little role in explaining inequality of educational attainments between generations. Their implication was that non-land assets and the education and occupation of parents, and their choices about children's education were more important than property inheritance. In addition, their study proved gender difference of the intergenerational linkages and strong influence of mother on children's adult welfare.

So far, a comparative study conducted by Hertz et al., (2008) shows the most comprehensive evidence on the intergenerational correlation of education. They estimated 50 year trends in the intergenerational persistence of educational attainment for a sample of 42 nations including Africa regions and concluded that the global average correlation between parent's and child's schooling has steady at about 0.4 for the past fifty years (See Figure 2-4 Average Parent-Child Correlation of Schooling, Ages 20-69 by Country for the ranking of the country). Among Africa region, the child-parent correlation of education was estimated in five countries: 0.50 for Egypt; 0.44 for South Africa (KwaZulu-Natal); 0.39 for Ghana; and 0.10 for Rural Ethiopia. The regional average was 0.36, which was much lower than that of Latin America (0.60) where showed the highest intergenerational persistence in education in the world.

It is noted that the intergenerational mobility studies are usually not able to distinguish a concerning parental attribute and transmission mechanism. Many efforts have been made by Economists to estimate the pure causal effect of parental attributes on child's outcomes from the upward biased estimates of OLS, however, "quantifying how much is nature versus nurture is still an open question"(Black & Devereux, 2011,

p.1507). It is critical to understand the determinants of the intergenerational persistence as mentioned above. While knowing the underlying mechanism is important, it is difficult to identify the pure effect of any particular parental backgrounds, because they are correlated with a variety of other parental characteristics, and which are usually not able to be observed. Within the context of the intergenerational studies, much literature proved the child-parent correlation among countries in the world. The interaction with parents obviously has an effect on child's educational attainment by transmitting their genetic traits and also by taking care of them, including any arrangements of child's schooling (e.g. choosing a school and assisting their school activity and so on). A debate on "Nature" (inheritance of genetic ability) and "Nurture" (influence of parenthoods), is a fundamental question that many researchers are interested in. In the quantitative approach, the common approach uses correlations among relatives with different genetic and environmental factors to examine the relative magnitude of nature and nurture for the outcome of the interest:

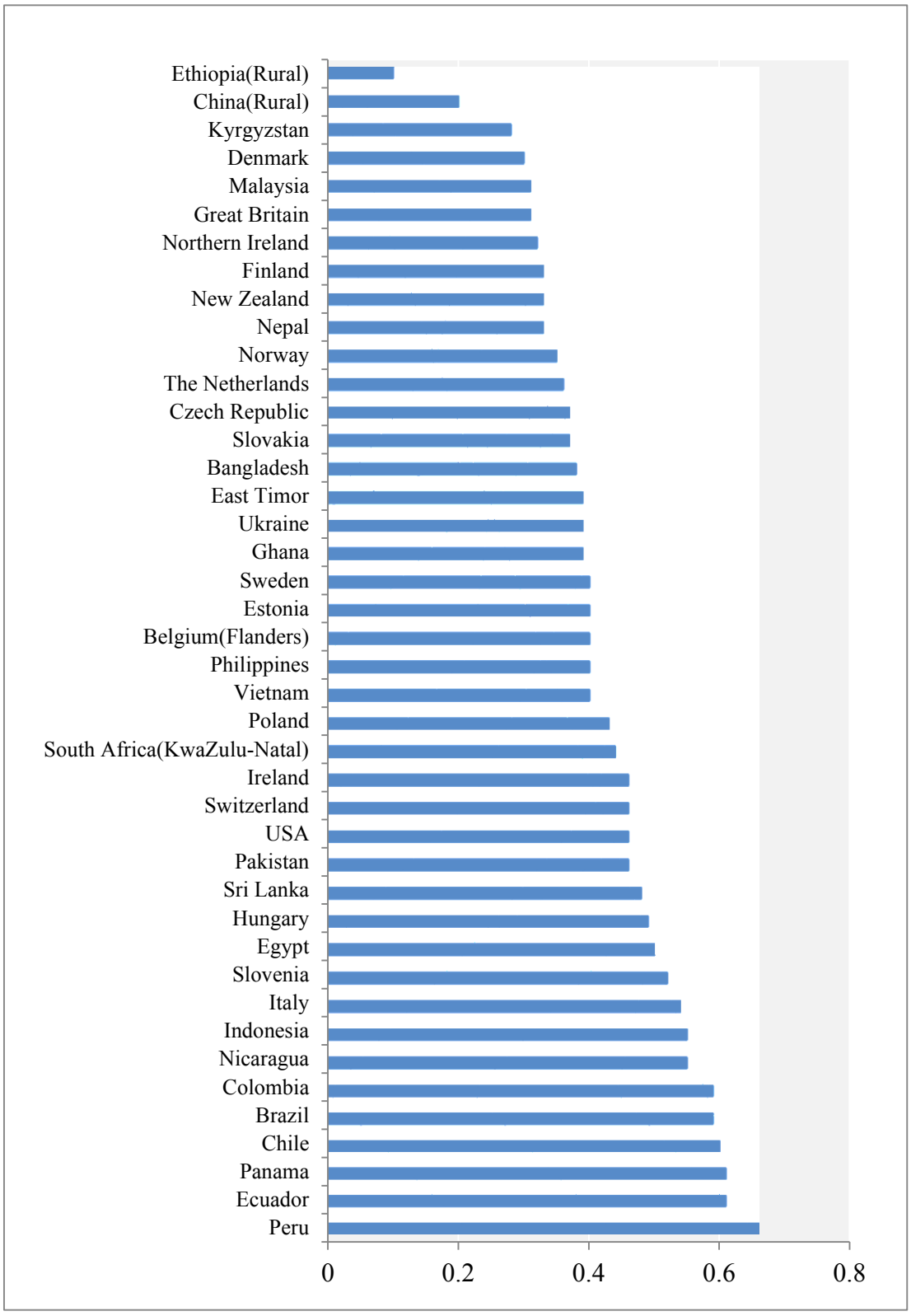
$$S = gG + eE + uU \tag{2.3}$$

Where *S* denotes years of schooling, *G* denotes genetic factors, *E* denotes shared environments between siblings, and *U* denotes individual factors which are not shared by siblings and not correlated to other factors. This needs strong assumption that the genetic traits (*G*) and the shared environments (*E*) are independent but this formula explains how to estimate the decomposition of the variation in years of schooling (*S*) into nature and nurture components. This decomposition becomes more transparent when *S*, *G*, *E*, and *U* are standardized to have a mean of zero and a variance of one(Björklund & Salvanes, 2010) By doing so, we can compare and examine the relative magnitude of the child-parent correlation among family members. If data is available, using monozygotic (MZ) twins or dizygotic (DZ) twins is a good approach to

investigate this nature vs. nurture debate. For instance, MZ and DZ twin study conducted in Australia implied that 60% is for genetic trait; 10% is shared environment; and 30% is individual factors whereas the similar study conducted in Sweden showed that 42% is for genetic trait; 34% for shared environment; and 24% for individual factors. Due to the data constraint, this study is not able to estimate causal effect of parent's education. Thus, following findings on the intergenerational mobility analyses are child-parent correlation in resources.

Whereas it is not possible to estimate the causal effect of parent's education, this study could successfully estimates the causal effect of "child's (own) schooling", a potential factor which influence the intergenerational linkages in resources. If schooling increases their earning (especially for poor children), it is thought to be a driving force of upward social mobility. Using a private rate of return to education analysis, this study investigates whether the incrementally joined group by 1st FPE implemented in 1974-79 increased their earnings. They are regarded as children from poor household (and who would not start or continue learning, otherwise). Following section explains theoretical backgrounds of return to education analysis and recent evidence on the return to education in developing countries.

Figure 2-4 Average Parent-Child Correlation of Schooling, Ages 20-69 by Country



Source: Hertz et al. (2008)

2.3 Recent Development of Rate of Return to Education in Developing Countries

Previous section reviewed theoretical backgrounds and the recent evidence of the intergenerational mobility studies. In this section, literature on the private rate of return to education is reviewed, particularly focusing on the literature in developing countries.

2.3.1 Theoretical background on rate of return to education

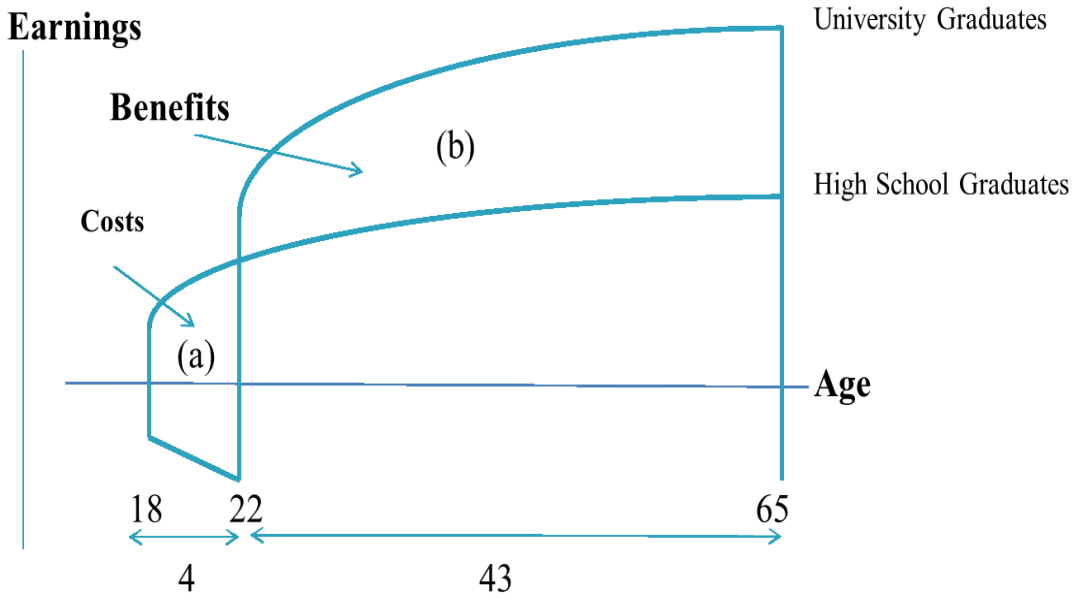
How much additional year of schooling improves one's productivity as an indication of earnings is commonly explored to explain patterns of educational demand, and the incentive for household to invest in human capital. The rate of return to education is one of the best ways to make a decision for allocating financial resources. According to Human Capital Theory, education is regarded as a tool of poverty reduction and empowering individual's productivity(Becker, 1993). The basic concept behind the theory is that an individual would invest in one's human capital (knowledge or skill gained in school) as a form of additional year of schooling. In order to compare the impact of educational investment with alternatives, Cost-Benefit Analysis (CBA) has been applied in empirical literature and rate of return to education studies have been developed as a particular type of cost-benefit analyses on education (Jimenez, Patrinos, 2008).

The return to education at the individual level is called the private return to education. It is also possible to estimate the social rate of return to education, where the benefits include not only private benefits such as the wage differentials, but also the social benefits such as higher literacy rate, healthier populations, less government expenditures for social assistance (Psacharopoulos, 1995). Ideally, the benefit of education does not include only monetary benefit but also other intangible benefits and

externality of education at individual's level such as increase of self-esteem, health improvements, and social networks created in school as well as social benefits (Dickson & Harmon, 2011). Most of studies on the rate of return to education, however, have focused on the private return to education using observable monetary return to education for a preference of simplicity.

Figure 2-5 explains the concept of rate of return to education. This is an example of earning difference between university graduates and high school graduates. It is assumed that both university graduates and high school graduates work until 65 years old. Because university graduates spend additional four years of education between 18 and 22 years old in this case, area (a) indicates costs of education including direct costs (e.g. tuition) and foregone earnings which would be gained if they start working immediately after graduating from high school. Area (b) is the earning differential between university graduates and high school graduates over years.

Figure 2-5 Concept of Rate of Return to Education



Source: Psacharopoulos (1995)

Based on the example of calculating rate of return to education, it is also possible to estimate rate of return to education between different levels of education. Psacharopoulos (1995) pointed out that we have to be careful if primary education is concerned for rate of return to education analysis. Practically, he suggests that it seems like a logical fit that there is no foregone earnings in the first three years of primary education (for example, if primary cycle is 8 years starting from age 6, we assume that pupils from 6 years old to 8 years old would not earn money). Of course, it depends on the context of each country which age should be the beginning age of foregone earnings. The discounting net age-earning profile called full or elaborate method can illustrate accurate rate of return to education given that comprehensive data is available. However, in order to get a clear shape of the age-earning profile, data should contain enough number of observations in each age and education level. This issue is particularly critical when we use data in developing countries.

The elaborate method is the most appropriate method but it requires rich data. Because of the trade-offs, probably a most widely used way to estimate rate of return to education is the earning function introduced by Mincer (1974). The earning function can be estimated as a following form:

$$\mathrm{Y} = \mathrm{f}(\mathrm{S}, \mathrm{X}) \qquad (2.4)$$

Where Y denotes respondent's income and it is a function of S, which denotes year of schooling and X, which is other explanatory variables. This can be estimated using a multiple regression equation, specified in semi-logarithmic form:

$$LnY_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + \beta_3 X_i^2 + \mu_i \qquad (2.5)$$

Where LnY_i is the natural log of hourly earnings for i_{th} individual; S_i is years of schooling (as a continuous variable); X_i is labor market potential experience (estimated as $age_i - S_i - 6$); X_i^2 is potential experience-squared; and μ_i is a random disturbance term reflecting unobserved abilities. Therefore, β_1 can be viewed as the average private return to years of schooling to wage employment (Montenegro & Patrinos, 2013).

The earning function method can be used to estimate returns at different schooling levels by converting the continuous years of schooling (S) into a series of dummy variables, for example, S_p(primary education), S_s (secondary education), S_t (tertiary education) to denote the fact that a person has achieved that level of education. The baseline is those who have no schooling experience. The estimation equation is of the following form:

$$LnY_i = \beta_0 + \beta_p S_{pi} + \beta_s S_{si} + \beta_t S_{ti} + \beta_1 X_i + \beta_2 X_i^2 + \mu_i \qquad (2.6)$$

Where S_{pi} is a dummy variable of primary education; S_{si} is a dummy variable of secondary education; and S_{ti} is a dummy variable of Tertiary education. After fitting this extended version of the earning equation, the private rate of return to different level of education can be derived from the following formulas:

$$r_p = \frac{\beta_p}{S_p} \qquad (2.7)$$

$$r_s = \frac{(\beta_s - \beta_p)}{(S_s - S_p)} \qquad (2.8)$$

$$r_t = \frac{(\beta_t - \beta_s)}{(S_t - S_s)} \qquad (2.9)$$

Where $\beta_p, \beta_s,$ and $\beta_t,$ denote for coefficients of each level of education; and S_p, Ss, and S_t denote the total number of years of education for each successive level of education.

In order to apply the private rate of return to education analysis in Kenya, there are several methodological concerns to overcome. First of all, the variation of entry or exits of schooling in SSA (due to dropouts, grade repetition and so forth) needs to re-consider the use of potential experience variable. Instead of using the variable, this study uses age and its square for estimating the rate of return to education. Second, it is critical for considering the risk of unemployment especially in the context of SSA because nearly three-quarters of the working age population are facing that risk(Barouni & Broecke, 2014). One way is to introduce the risk of unemployment(Blondal, Field, & Girouard, 2002). Barouni & Broecke (2014) estimated age-employment profile using a logit regression and weight the predicted earnings in the Mincerian equation by the predicted probability of being employed at age. However, as Psacharopoulos (1995) mentioned, it is not correct to use the average rate of unemployment for the return to education to take the risk of joblessness, because it is too strong assumption that unemployment as measured at the younger stage continue the rest of their lives. More common way is to add Heckman's selectivity term (Heckman, 1979). Instead of accounting for the risk of unemployment separately, this study uses Heckman's two-step procedure, which estimates probit model at the first stage and the selectivity term (or inverse mill's ratio) is introduced at the second stage. This method also accounts for the labor market skewness (less participation of female workers).

Previous studies on rate of return to education raised an issue of omitted ability bias. Years of education or level of education variables used to indicate human capital acquisition could be a false association of ability with wage. It is assumed in Human Capital Theory that knowledge or skills are acquired in school, which is expected to be a proxy of their productivity enhanced by these skills. However, there is a possibility that higher achievement or attainment might be because of their innate ability. It would

imply that those who go to upper level of education might be a group of highly motivated or having more interests in studying (self-selection bias). In this case, education variable itself sorts samples by these ability factors. This endogeneity bias arises due to the systematic correlation between unobserved traits such as ability, which is in error term, and other independent variables.

A common method to address this issue is to use instrument variable (IV) method which include variables which are uncorrelated with the individual's unobserved heterogeneity but correlated with their education (Angrist & Krueger, 2001). As useful instruments, supply side factors have been thought as a good candidate of instruments. One possible source of instruments could be differences in costs due to loan policies or other subsidies that vary independently of ability or earnings potential, and second source can be institutional constraints. Angrist and Krueger, (1991) applied "quarter of birth" variable for making use of compulsory education low and school start age. Regarding the school start age as a function of date of birth, this kind of combination offers a natural experiment setting in which children are induced to attend school for different lengths of time depending on their birthdays.

There have been fewer studies for dealing with this endogeneity issues by IV method in developing countries. As some exception, for instance, Duflo (2000) used an institutional change to create exogenous variation in education attainment from the school construction program in Indonesia. Patrinos & Sakellariou (2006) used changes in the compulsory schooling lows. The result of IV estimates tended to be generally higher than the result of OLS estimation. This result was puzzling because if an instrument controls ability, the result should be downward. Card (1999) interpreted that the return to education varied across population and the treatment effect worked for a sub-group in the population. IV methods estimate the causal effect of the instrument for those who would change their behavior if they were assigned to a treatment group in a random experiment (Local Average Treatment Effect: LATE) (Angrist & Krueger, 2001).

For example, in the case of quarter of birth, a higher coefficient of education variable in IV method would imply that the effect of schooling is large among those who would have relatively less reediness on learning.

Since the use of IV method to create natural experiments requires experimental data, alternative approaches have been used in studies on rate of return to education in developing countries. Comparative studies in west Africa by Kuepie, Nordman, & Roubaud (2009) and return to education with manufacturing firm survey in Kenya by Söderbom et al. (2005) used family background factors such as parent's education for non-experimental IV. They also tested Control Function (CF) approach, which adds the residuals of a reduced form as exogenous variable in 2SLS. Aslam, Bari, & Kingdon (2012) directly added cognitive achievement in the wage equation as a proxy of ability in Pakistan. They also applied within-family fixed effect to control individual's ability with a panel survey.

2.3.2 Recent evidence of return to education

Global empirical evidence suggests that the private return to education is constantly higher in developing regions compared to the world average, and the return to education decreases as level of education increases (Psacharopoulos & Patrinos, 2004; Psacharopoulos, 1985, 1994). The highest return to education is shown at primary education level so that this finding have collected attention from international societies and created a flow of donor money for ensuring basic education for developing regions.

However, the latest update provided by Montenegro & Patrinos (2013) indicated the global average of the return to education is highest at the tertiary level (16.8%), which is higher than that of primary education (10.3%), implying that the high return to tertiary education implies that high skills are scarce supply. Returns to both an

additional year of schooling and discrete levels of education have been estimated for many developing countries using the semi logarithmic earnings function (Mincer, 1974). As the recent evidence suggests the classic patterns of the diminishing rates of return to education by level of education, it may no longer hold true for the majority of developing countries. Using the surveys from the 1990s and early 2000s, Colclough, Kingdon, & Patrinos (2010) also implied that earnings function have begun shifting from being concave, starting steeply and flattening out, to becoming convex, where conversely, the slope of the earnings function increases with education level. Estimating return to education in Kenya at this moment is expected to provide further evidence for this shifting trends, which has major implications for the efficiency and distributive consequences of future educational and donor policy in Africa as a whole(Schultz, 2004).

Economic literature suggests that estimating rate of return needs to deal with the endogenous bias of education and sample selection bias. The issue of endogeneity arises due to systematic correlation between unobserved traits such as ability and other observed characteristics. People who can go to upper level of education might be a group of highly motivated or having more interests in studying (self-selection). In order to deal with biased estimates, instrument variable (IV) approach is commonly used in most studies. Using a well-behaved IV, created natural experiment design enables us to see the causal effect of education on wage. A classical study conducted in United States applied quarter of birth variable as an IV for making use of the minimum schooling leaving age (MSLA) of compulsory schooling law(Angrist & Krueger, 2001; 1991). Regarding the official school entry age as an indication of date of birth, the difference of schooling experience are created exogenously, hence the marginal difference of schooling is expected to indicate “pure” effect of schooling separated from ability. Generally, the IV estimates, which would be lower than OLS estimates, are upward biased (Card, 1999).

A comparative study in West Africa used father's education and his working status as instruments applying Control Function (CF) approach to deal with both endogeneity and the sample-selection bias (Kuepie et al., 2009). Kahyarara & Teal (2008) applied the rate of return to education in Tanzania. Their instrument was also family background variables such as parent's education and their main occupation as instruments. It is noted that these instruments would violate the requirement that they are uncorrelated with earning, probably due to the intergenerational effects.

In addition, the sample selection bias occurs due to the restriction of the wage-earners, which may not be selected from the population randomly. This condition violates the assumption of the OLS estimates (Kingdon & Söderbom, 2008). Unlike developed countries, large share of the population work in informal sector, self-employed, or agriculture in SSA. The risk of jobless is also high; nearly one-third of the working age population is in the situation (Barouni & Broecke, 2014). In this study, the Heckman's two-step procedure is applied for dealing with the sample selection issues.

Since probably, the first empirical study on return to education conducted by Thias & Carnoy (1972), private and social rate of return to education in Kenya have been variously estimated to additional years of schooling, and also to discrete level of primary, secondary and tertiary education. While it is not easy to compare rate of return to education studies due to various ways of the methodology and data coverage, reviewing the related literature would be helpful in order to grasp how the previous results and empirical strategy. A World Bank cost-benefit analysis in 1972 estimated returns to levels of education using cross-sectional urban earnings data collected in a 1968(Labor Force Survey of private and public sector employees in the cities of Nairobi, Mombasa, and Nakuru). Their findings indicated that overall returns to education for urban males to be high: 32.7% for primary, 36.1% for secondary, 23.8% to higher secondary, and 27.4% to university education, respectively. For urban females, the

returns to primary education were much lower, at 9.5 %, but returns to secondary education were comparable to that of males (33.6%), controlling the discounted time value of education costs equal to stream of its benefits.

Johnson (1972) used an earnings function of log hourly wages on metric years of education in quadratic form on data from a survey of 18,970 wage activity for low- to middle-income African households in Nairobi. Adding following variables such as potential working experience proxied by linear and quadratic terms of age, and age arrived in Nairobi, union membership and/or government employment, self-employment, gender, and major tribal variables (Kikuyu, Kamba, Luo, and Luhya), he found that increasing marginal returns to education, with a base return of 1% and each additional year of schooling adding a further 2.2%.

Fields, (1975) reported similarly high returns to tertiary education in 1971, with the private internal rate of return to graduating from a primary or secondary teacher-training college, or the University of Nairobi, to average 31%, over simply completing secondary (Form4) schooling. In contrast, using 1980 data on wage-workers in Nairobi, Armitage & Sabot (1987) estimated far lower private returns to the completion of secondary education of 14.5% for government-supported institutions and just 9.5% for the community-origin schools.

Appleton, Bigsten, & Manda (1999) found fairly high private returns in 1978; 24% for primary, 23% for secondary, 28% for higher secondary, 13% for university education, respectively, using data from three labor force surveys implemented in 1978, 1986, and 1995. In 1986, the returns to education had declined somewhat for secondary schooling, with returns to 22%, 17%, 20%, and 31% for the same four levels of education. Returns to primary and tertiary education remained high according to the 1995 data at 25% and 35%, but returns to secondary education had declined to just 7%.

Table 2-1 Recent Evidence of Return to Education in Kenya

Study	Data		Method	Returns to Education			
	Year	Coverage		Sex	Primary	Secondary	Tertiary
Thias and Carnoy (1969)	LFS(1968)	Nairobi, Mombasa, and Nakuru	OLS and CBA	Male	32.7%	LSec: 36.1% USec: 23.8%	27.4%
				Female	9.5%	LSec: 33.6%	n.a.
Johnson (1972)	Original survey(1971)	Nairobi	OLS	Overall	Various percentage increments are calculated (e.g., 8.5% from 0 years to 2 years of education).		
					Marginal effect of additional year of education is a convex function of year of education (i.e., 1.0% + 2.2%*year of education)		
Knight and Sabot (1987)	Original survey(1980)	Nairobi	OLS and CBA	Overall	n.a.	16%	n.a.
Armitage and Sabot (1987)	KSWEE(1980)	Nairobi	OLS and CBA	Overall	n.a.	Government: 14.5% Harambee: 9.5%	n.a.
Appleton, Bigsten and Manda (1999)	LFS(1978), ULFS(1986), RPEDS(1995)	National (1978 & 1986); and Nairobi, Mombasa, Nakuru, and Eldoret (1995)	OLS and CBA	Overall	**Mincerian**		
					1978: 8%	42%	15%
					1986: 9%	26%	30%
					1995: 2%	12%	69%
					Cost-Benefit		
					1978:24%	LSec:23%, USec: 28%	13%
					1986: 22%	LSec:17%, USec:20%	31%
					1995: 25%	LSec:7%, USec:n.a.	35%
Manda, Mwabu & Kimenyi (2002)	WMS(1994)	National	OLS	Overall	7.9%	17.2%	32.5%
				Male	11.0%	17.8%	35.2%
				Female	5.7%	15.8%	32.2%

Note: LSec: Lower secondary education; USec: Upper secondary education; LFS: Labor Force Survey; KSWEE: Kenya Survey of Wage Employment and Education; ULFS: Urban Labor Force Survey: RPEDS: Regional Programme on Enterprise Development Survey; WMS; Welfare Monitoring Survey

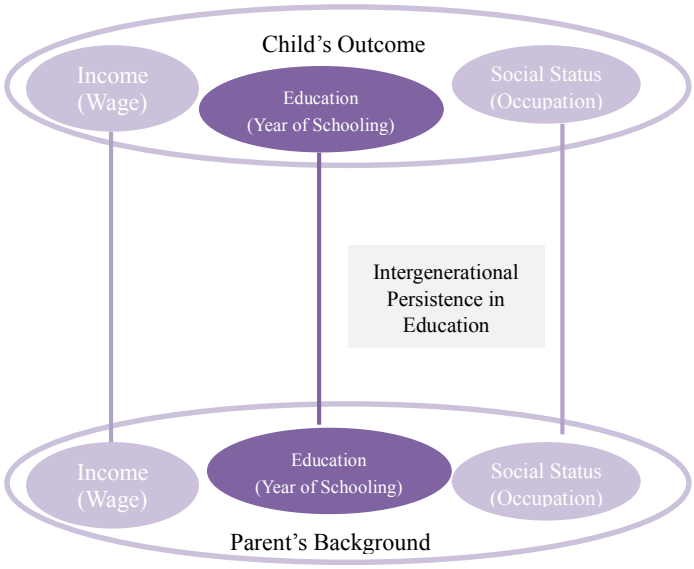
3. METHODOLOGY

3.1 Analytical Framework

This chapter indicates the methods adopted for examining the intergenerational transmission of education. The first research question aims at examining the trends and feature of the intergenerational persistence in education in Kenya (Figure 3-1 Analytical Framework of the Intergenerational Persistence in Education). The degree of the intergenerational persistence is estimated by OLS with a dependent variable of child's years of schooling. There are some potential factors that influence on the intergenerational persistence: (a) cultural capital; (b) ability (genetic traits); and (c) financial capacity of parents. If these factors are properly eliminated, it is possible to estimate causal effect of parental background on child's outcomes. If these factors which might bias the estimates are time invariant, changes in intergenerational transmission of education overtime would be still meaningful(Kwenda, Ntuli, & Gwatidzo 2015).

Another important point to mention from the Figure is potential macro structural factors. They are the change of economic structure (industrialization), the expansion of public education, and demographic changes. Because this study needs to distinguish pure parent-child correlation in education and some other factors that influence the intergenerational persistence over time, a particular attention should be paid for developing a methodological framework. Using normalized regression and young adults from three consecutive population census, this study attempt to minimize the bias comes from the cohorts.

Figure 3-1 Analytical Framework of the Intergenerational Persistence in Education



OLS for Intergenerational Persistence in Education (IPE)

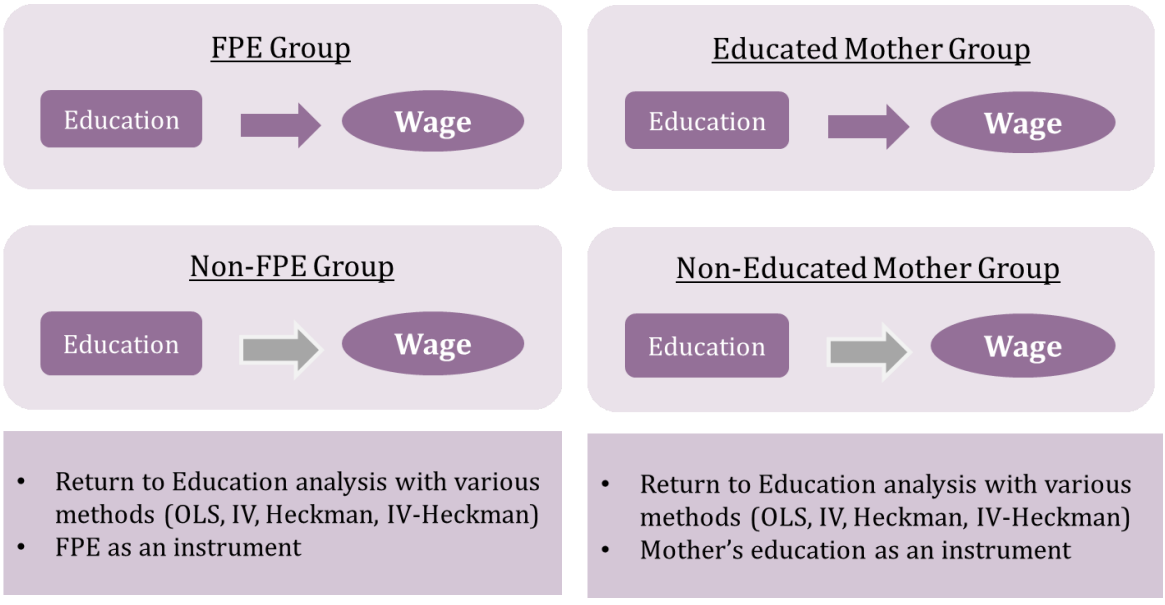
- Estimate IPE and changes of IPE between 1950s and 1980s in Kenya
- Estimate IPE by birth cohort, gender, place of birth

Education Transition Matrices

- Estimate mobility patterns for parent-child pairs
- Compare the mobility patterns among the birth cohorts
- Calculate educational mobility index

Source: Created by Author based on Causa & Johansson (2010)

Figure 3-2 Analytical Framework of Rate of Return to Education in Kenya



Source: Created by Author

While the first research question aims at investigating the intergenerational

transmission of education, the second research question focuses on the relationship between return to schooling and the intergenerational persistence in Kenya. To understand parent's decision making of investment in education and its influence on the intergenerational persistence have some policy implication. In addition, this study investigates the effect of financial assistance of primary education on the rate of return to education. Introducing the 1st FPE policy implemented in 1974-79 as an instrument, this study uses Two-stage least squares (2SLS) estimation. In addition to controlling for the endogeneity bias, the Heckman's selectivity term is added in the model as well. This is for dealing with the sample selection bias.

3.2 Hypotheses

This section shows hypotheses in this study. The first hypothesis aims at assessing the effect of educational expansion on inequality of opportunities. Seeing difference over years in Kenya, the function of schooling is investigated whether it has played a role of enhancing intergenerational upward mobility or reproducing social inequality. Corresponding to the two research questions that this study investigates, following hypotheses are set out respectively (See Table 3-1 Research Questions and Hypotheses). The first research question is for assessing the degree of the intergenerational persistence in Kenya. This study uses "education" as a measurement of the persistence. First hypothesis is that Kenya has modest intergenerational persistence. This is based on the assumption that Kenya is relatively less stratified society, compared to other countries such as India, South Africa, and Latin American countries. Because of the late development effect, middle class might have increased in the recent cohorts. However, it is possible to think that the effect of parental background is weaker than other stratified countries.

Another hypothesis of the first research question is that the trend analysis postulates the intergenerational persistence to be tight over years especially at higher level of education. It is possible to assume that if more people have chance to obtain degrees, those who successfully elevated their education level than parents, they would try to keep the same level of education for their children. In terms of the social group, it is possible to assume that regional characteristics influence the intergenerational persistence patterns. Dominant ethnic group in terms of politics and business might utilize their various resources to make their next generation enjoy better social well-being.

The second research question investigates the private rate of return to education in Kenya. The hypotheses are: (1) higher return to education for those who have more educated mother, implying that there exists intergenerational effect on one's earnings; and (2) higher return to education for incrementally joined groups due to the FPE policy, implying that educational financial assistance at one's early stage of life improves one's earnings in their later life. Regarding the effect of FPE policy on one's wage, this study expects higher return to education for the incrementally joined groups by the 1st FPE policy, implying that the financial assistance at their early stage of life is important for their future well-being. Using the 1st FPE policy as an instrument, this study estimates the private rate of return to education. A preferable approach is to estimate the intergenerational persistence in income, but due to the lack of rigorous parental income information in the data sets, this study cannot distinguish parent's level of economic status using income. The analytical sample is restricted to adults aged 30-40, but most of the parent's information are missing.

Table 3-1 Research Questions and Hypotheses

	Research Question 1: **How does the intergenerational transmission of education function in a society in Kenyan?**	
1-1	**How has the intergenerational persistence in education changed over time?**	• Modest intergenerational persistence compared to developed countries • Different persistence by place of birth, implying that ethno-geographic factors influence the intergenerational linkage • Tight persistence in the later period due to strong parental educational opportunities, implying that Kenya reproduces inequality of opportunity
1-2	**How much does own schooling influence one's probability of obtaining a job in non-farm sector?**	• Own schooling have relative high marginal effect on child's probability of working in non-farm sector for both farm and non-farm origin, implying that schooling enhance one's upward intergenerational mobility
	Research Question 2: **To what extent does the rate of return to education influence the intergenerational persistence in education?**	
2-1	**To what extent does the rate of return to education differ by mother's level of education?**	• Higher return to education for those who have more educated mother, implying that there exists intergenerational effect on one's earnings
2-2	**To what extent does the rate of return to education differ between FPE treatment group and non-FPE treatment groups?**	• Higher return to education for incrementally joined groups due to the FPE policy, implying that educational financial assistance at one's early stage of life improves one's earnings in their later life

Source: Created by Author

3.3 Model

3.3.1 Intergenerational persistence in education in Kenya

In order to explore the changes of the child-parent correlation of educational attainments, this study uses following an empirical analysis based on the analytical framework explained in the above section. This study begins to measure the child-parent correlation in educational attainment. The purpose of the first research question is to grasp the changes of the association over time and how the expanded educational opportunities influence the intergenerational persistence pattern. Empirical methodology of this study uses the intergenerational mobility function, following previous literature (Azam & Bhatt, 2012; Daouli, Demoussis, & Giannakopoulos, 2010; Hertz et al., 2008). The intergenerational correlation of education is confirmed by OLS estimates with intergenerational education mobility function (Black & Devereux, 2011). The equation is following:

$$y_i = \alpha + \beta_1 MS_i + \beta_2 FS_i + e_i \quad (3.1)$$

where y_i is the educational outcome (years of schooling) for children i, MS_i and FS_i measure the educational attainment (years of schooling) of the father and mother, respectively. Years of schooling correspond to the required number of schooling years for the completion of 17 distinct educational categories (from Grade 1 in primary to advanced degrees). The OLS model estimates the child-parent correlation with biological children aged 25-34 by children's birth cohort from the pooled cross-section data. Other exogenous factors such as household and individual characteristics are also included. It is important to introduce both father's and mother's education variables in the equation simultaneously. This is for dealing with assortative mating. Assortative

mating implies that women from high socio economic class are likely to marry men who have similar characteristics so that they might share similar preference and genetic traits(Black & Devereux, 2011).

It is also common to show the intergenerational correlation coefficient, ρ_c which is given by the following equation:

$$\rho_c = \beta_c \frac{\sigma_c^0}{\sigma_c^1} \tag{3.2}$$

where σ_c^0 and σ_c^1 are the standard deviation of educational attainment of each generation (σ_c^0 for parents, σ_c^1 for children) for cohort, c. The correlation coefficients cancel out the cross-sectional dispersion of educational attainment in the two generations, called a standardized measure of the intergenerational persistence. Unlike the regression coefficient which is influenced by the relative variance of education across generations, the coefficient correlation can account for the variance of education caused by cohort effects such as population growth, changes in fertility, and the samples which is missing due to passing away. Following Kwenda et al. (2015), this study shows both absolute and relative measure of the intergenerational persistence in education.

After the OLS estimation is conducted, this study uses educational transition matrices to see the trend of the intergenerational educational mobility. Education is also measured by a discrete variable. The calculation of the transition probability matrices is based on the five categories of educational attainments for parents (generation *t*) and children (generation *t+1*). Let p_{ij} be the probability that educational outcomes move from education level *i* in *t* to education level *j* in *t+1* where $i, j=1,\ldots,5$ stand for the five distinct educational outcomes (Checchi et al., 2013). The observed transition probability distribution is represented by a 5 multiplies 5 transition matrix P with p_{ij} as its elements. Based on the highest grade completed variables, following five categories are generated:

"No Education", "Some Primary" "Completion of Primary Education", "Completion of Secondary Education", and "Completion of Tertiary Education". The "No education" category includes those who have not attended or not completed primary education. The "Primary" and "Secondary" categories include those with completed primary and secondary school, respectively. The "Tertiary" category pertains to those who have completed at least post-secondary education.

In addition to the transition matrices, other mobility indicators are estimated: educational mobility index (Heineck & Riphahn, 2009). The educational mobility indicators are summary measure of the upward-downward mobility, and immobility ratio of education. The upward/downward mobility indicators are calculated as the average values of the four entries below/above the diagonal of the intergenerational education transition matrices. The immobility ratio is calculated as the average values of the four entries on the main diagonal of the intergenerational education transition matrices.

In order to account for the secular increase of parent's level of education, decomposition technique is applied (Alejandra, Sandra, & Rainer, 2007; Daouli et al., 2010). In formal terms, the probability that children belonging in cohort *t* will be observed in educational category *j*, can be decomposed as follows:

$$\Pr(y_j)_t = \sum_{j=1}^{J} \left[\Pr(y_j | y_j^p) \times \Pr(y_j^p)_t \right] \qquad (3.3)$$

where y_j^p indicates parental educational attainment, with j=1, …, J denoting the alternative educational outcomes (i.e. "Tertiary", "Secondary", "Primary", "No Education"). The first term measures the conditional transition rates ($\Pr(y_j | y_j^p)_t$) and the second term measures the marginal distribution of parental education ($\Pr(y_j^p)_t$). Using the two cohorts (t-1: 1955/1964 and t: 1975/1984), the change in the proportion of

individuals in j that can result from a change either in the conditional distribution $Pr(y_j \mid y_j^p)$ or in the marginal distribution of parental education $Pr(y_j^p)$. The cohort change in probabilities can be decomposed as follows:

$$\Delta \Pr(y_j) \equiv \Pr(y_j)_t - \Pr(y_j)_{t-1} = \lambda + \eta \qquad (3.4)$$

where $\lambda = \sum_{j=1}^{J} \left[\Delta \Pr\left(y_j \middle| y_j^p\right)_t \times \Pr\left(y_j^p\right)_t\right]$ measures educational expansion independently of parental education. This term contains information about the general trend in educational attainment *j* and thus, changes in mobility. The second term, $\eta = \sum_{j=1}^{J} \left[\Delta \Pr\left(y_j \middle| y_j^p\right)_{t-1} \times \Delta \Pr\left(y_j^p\right)_t\right]$ measures the change in educational attainment *j* between cohorts, caused by changes in parental background effects. The term $Pr(y_j^p)_t$ and $Pr(y_j^p)_{t-1}$ in λ and η respectively are used as weights.

Based on the equation 3.1 (intergenerational mobility function), this study adds child's education on the right side of the equation. Instead of continuous years of education as a dependent variable, "working in public/private modern sector (called Non-Farm in later section)" dummy is used for probit estimation. It is noted that the effect of own education on their occupational attainment is not causal, rather association. This study applies a probit model for the only census 2009 data (1975-84 birth cohorts) Variables used in this model include a variety of parental and family circumstance factors for observed intergenerational upward mobility. The econometric specification is following:

$$Occ_i = CS_i\beta + MS_i\gamma + FS_i\delta + X_i\theta + \varepsilon_i \qquad (3.5)$$

where Occ_i is the occupational attainment of the indicator of the i^{th} children (1=child's working in non-farm sector, 0 otherwise), CS_i MS_i, and FS_i are child's discrete level of

education variables for children, mother and father, respectively, X_i is a vector of other exogenous factors capturing the one's socio-economic backgrounds(Daouli et al., 2010).

3.3.2 Rate of return to education in Kenya

Main concern of this analysis is to examine the effect of own education on respondent's educational outcomes in labor market. The second analysis uses child's wage as a dependent variable so that this is the Mincer-type semi-logarithmic basic earnings function (Mincer, 1974),

$$\ln W_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + \mu_i \qquad (3.3)$$

Where lnW_i is the natural logarithm of the hourly wage reported by each individual i; β_0 is a constant; S_i is years of schooling; X_i includes other exogenous variables such as: Age; and Squared age for a measure of working experience; and X_i indicating other exogenous variables; and μ_i is an error term. The wage-earning specification is examined for males and females separately. The coefficient is interpreted as the private rate of return to education, that is, the relative change in wages for each additional year of schooling, averaged across the sampled individuals and levels of education[7].

It is well known that the returns obtained from simple ordinary least squares (OLS) estimation of the Mincerian earnings function may be biased due to endogeneity of the educational variables. Specifically, if years of schooling are positively correlated with an unobserved or otherwise omitted ability factor which also affects earnings in a positive way, OLS will tend to overestimate the return to education, because high-ability

[7] Researchers are tempted to add many additional independent variables to the right-hand side of the equation. However, Becker (1964), and Psacharopoulos (1994) mention that adding many variables artificially lower the returns to education. This is particularly evident when variables included are endogenous (i.e., sector of employment, marital status, number of children, and region of residence). Considering this point, this study follow this advice because it makes our Mincer estimates more consistent with those obtained with the other methods and models used in this study (neither of which control for other factors).

individuals not only complete more years of schooling but also earn higher wages in the labor market. As mentioned in the literature, the potential endogeneity of schooling is addressed by adopting a conventional IV approach, where an observable covariate that affects schooling but not earnings is used to instrument for schooling in the following two-equation model:

$$S_i = \vartheta Z_i + \varepsilon_i \tag{3.4}$$

$$\ln W_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + v_i \tag{3.5}$$

Where Z_i is a vector of the instrument and other observed exogenous explanatory variables; and ε_i and v_i are error terms.

This study applies the popularly-used instrument of mother's education and change of educational policy. Valid instrument should be correlated with schooling variables, but uncorrelated with error terms (unexplained variation of the earnings) (Card, 1999). Past literature used family background variables such as spouse, education, maternal education and so on. This is common especially in the context of developing countries. However, these variables might violate the requirement of the good instrument, because they are uncorrelated with own earnings, possibly due to the intergenerational effect. Then, cost of schooling and educational reforms have been considered as instruments. In this regard, the FPE policy meets the requirements.

In practice, IV estimates of returns to education in the literature typically exceed those obtained from OLS results by a degree of 20% or more. Measurement error may bias returns to education downwards, opposing the effect of ability bias, if the overall effect of the measurement error is additive, causing observed schooling is greater than true schooling. Nonetheless, Card (2001) estimates the impact of measurement bias to be relatively small (only on the order of 10%), and suggests rather that the large gap

reflects downward bias in the OLS estimates due to heterogeneous returns to education, where individuals with high discount rates choose to complete less schooling(Card, 1999).

OLS estimates of returns to education might be biased due to sample selectivity, if the wage-working sample is not fully representative of the working population. The issue of sample selectivity arises when estimating returns to education for women as the probability of female employment in many countries increases with educational level, and better-educated individuals earn higher salaries, returns to education for females are expected be biased upwards. However, as there is distinct labor market heterogeneity in Kenya, the wage information of even male workers might be missing; especially those who are in the informal or small-scale agricultural sectors and who generally earn less than their formally-employed counterparts (Nyaga, 2010). If they do not report their official wage, then the OLS estimation for male is highly likely biased upwards. Using following specification of the Heckman's two-step procedure (Heckman, 1979), this study corrects the sample selection bias:

$$D_w = 1[\vartheta T_i + \delta_i > 0] \tag{3.6}$$

Where D_w denotes the dummy variable of selection (1 if they are engaged in wage-earning activity, (W_i >0), and 0 otherwise); T_i is a vector of additional observed exogenous explanatory variables for participation. In addition to the same independent variables used in the earning function, this study also includes as selectivity variables the natural logarithm of the individual's household expenditure, *lnHHE*; and household size, disaggregated into the number of children in the household aged below 6 years (primary-school age), *HHChildren6-*, and the number of elderly in the household aged over 65 (above the working-age threshold), *HHAdults65+* ; and dummy variables indicating whether an individuals is household head, *Headship* ; and the household

owns its present dwelling, *OwnedHouse* ; and δ_i is an error term.

Using the estimated parameter($\hat{\theta}$) from the probit $P(D_{wi}=1|T_i)=\Phi(\theta T_i)$ over the entire working-age subsample, the inverse Mills ratio is computed for each observation and included as an additional exogenous explanatory variable in the selectivity-corrected Mincerian:

$$\ln W_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + \tau\lambda_i\,(\vartheta T_i) + v'_i \tag{3.7}$$

Where the coefficient τ measures the covariance of the residuals in the selection and earning equations $\sigma_{\eta_i\varepsilon_i}$, and its statistical significance and sign indicates the existence and, if so, direction of the sample selectivity bias, which is expected to be negative.

In order to combine the Heckman two-step procedure and the IV approach to adjust for both endogeneity of education and sample selectivity simultaneously, this study uses following three step procedure (Wooldridge, 2002), T_i' in the joint Heckman-IV first-stage selection probit $P(D_{wi}=1|\ T_i')= \Phi(\theta' T'_i)$ estimated over the entire working-age subsample incorporates all exogenous explanatory variables, i.e., the instrument and those already in T_i, omitting S_i. Similarly, Z'_i in the second-stage IV equation for S_i is a vector of the newly estimated $\lambda_i\left(\hat{\vartheta}T_i\right)$ and T_i' for all observations in the selected subsamples:

$$D_w = 1[\vartheta' T'_i + \delta_i > 0] \tag{3.8}$$

$$S_i = \vartheta Z'_i + \varepsilon_i \tag{3.9}$$

$$\ln W_i = \beta_0 + \beta_1 S_i + \beta_2 X_i + \tau\lambda'_i\,(\widehat{\vartheta}' T'_i) + v_i \tag{3.10}$$

OLS, IV, Heckman-corrected, and joint IV-Heckman correction of the return to

education are initially estimated on the entire sample of wage-workers. This overall sample is then disaggregated into subsamples of wage-workers whose highest grade was bounded by primary (i.e., those born in or before 1971 who had completed up to Grade 7, or born in or after 1972 and had completed up to Grade 8), secondary (those who had completed from Grade 8 in primary to Grade 4 in secondary), and tertiary education (those who had completed Grade 4 in secondary or higher). Doing so permits the slope of the earnings function (the rate of return to education) to vary across the three levels of education. Advantage of estimating three different regression for basic, upper and tertiary education on the appropriate age ranges for each level of education respectively is that the variable instrument (in this case, year of education) appears one in each regression model. Much literature estimates the return to qualification introducing dummies of education variables in a single equation simultaneously. The discrete education model has an important implication because it allows non-linear relationship between education and wage; however, this model requires much advanced technique when the IV and Heckman adjustment is applied for. Instead of introducing additional instrument for each level of education dummies, this study follows the method applied by Barouni & Broecke (2014)

3.4 Data

This study uses a series of population housing censes and a national representative household survey for investigating the above research questions. Following section explains data used for this study and its description. One is Kenya Population and Housing Census 1989, 1999 and 2009 provided by Integrated Public Use of Micro Data Series (IPUMS)-International(Minnesota Population Center, 2014) [8] . The major advantage of the IPUMS-Kenya is its sample size: 5-10% of the series of

[8] Original data comes from Kenya National Bureau of Statistics (KNBS)

IPUMS-Kenya, which is the extensive pooled cross-section datasets containing information on parental education for surveyed individuals have substantial numbers of observation. Although the analytical samples are restricted to co-residential child-parent pairs, this large size of the samples allows to estimate child-parent correlation in education and further disaggregation of the child-parent sets in various aspects of sub-samples. The IPUMS-Kenya dataset is used for examining the change of the intergenerational correlation in education.

In addition to that, this study estimates probit models to examine how owns schooling improves one's probability of working in non-farm sector. This analysis uses the latest census data (IPUMS-Kenya, 2009) only. Table 3-2 Descriptive Statistics for Parent-Son Persistence in Education and Table 3-4 Descriptive Statistics for Probit Estimation show descriptive statistics for the intergenerational persistence and mobility analysis.

3.4.1 Intergenerational persistence in education in Kenya

The IPMUS-Kenya datasets include demographic characteristics, employment sector, education, marital status, fertility, etc. The multivariate analysis focuses on biological children aged 25-34 for the OLS. The OLS estimation focuses on young adults because they are old enough to complete education and it is reasonable to assume that most of their parents are alive. However, it is noted that the restriction of the child-parent pairs of the co-residential sample might cause downward bias of the child-parent correlation, because young household heads separately staying with their parents have more education and well-paid job living in urban areas.

Because this study can use the pooled cross-section data, it is possible to extract the young adults with parent's information from the three series of census data (1989, 1999, and 2009). The analytical samples for the pooled OLS consist of 25,603 for son,

and 14,968 for female (1975-84 cohort extracted from the 2009 census); 7,959 for son, 4,704 for daughter (1965-74 cohort extracted from the 1999 census); and 5,735 for son, 2,922 for daughter (1955-64 cohort extracted from the 1989 census), respectively. The advantage of extracting young cohorts from the three datasets is to minimize cohort effects. That is, older cohorts have smaller samples due to mortality, or other related issues of sampling design and sample errors.

The education variable used in this section represents children's completed educational outcomes, regardless of their activity status (i.e., being school, having dropped out or being in the labor market). The highest completed grade of education is used for constructing years of education variable. Individuals are allocated to Grade 1 in primary to Degree holders or advanced graduate education (Grade 17). Those with missing observations on educational outcomes were excluded. For the educational transition matrices, discrete level of education is generated. The level of education variable is 1 if the individual completed at a given level of education (No Education, Primary, Secondary, and Tertiary) and 0 otherwise.

Following tables show descriptive statistics for the OLS estimation: Table 3-2 Descriptive Statistics for Parent-Son Persistence in Education and Table 3-3 Mean Year of Schooling by Place of Birth Province. The mean years of schooling of children (Respondent) do not change much among the three cohorts for male (around 7.6 years), while that of female slightly increases by 1.76 years of schooling from 6.63 to 8.19 between the 1955-64 birth cohort and the 1974-85 birth cohort. Secular rise of mean years of schooling can be seen for their mother and father's education. For both the son's and daughter's samples, mean years of schooling increased around three years for both mother's and father's education (i.e. the mean years of schooling for mother increased by about 3 years for both the son's sample (from 1.20 to 4.15) and the daughter's sample (from 1.31 to 4.56)). Mean number of siblings is around three for both son's and daughter's samples in each birth cohort. About 30-20% of the sample is

in married status.

Table 3-2 Descriptive Statistics for Parent-Son Persistence in Education

	Son (Age 25-34)						Daughter (Age 25-34)					
	Census 1989 Birth Cohort 1955-64 (N= 5735)		Census 1999 Birth Cohort 1965-74 (N= 7959)		Census 2009 Birth Cohort 1975-84 (N=25603)		Census 1989 Birth Cohort 1955-64 (N= 2922)		Census 1999 Birth Cohort 1965-74 (N= 4704)		Census 2009 Birth Cohort 1975-84 (N= 14968)	
Variables	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Own Schooling	7.64	4.32	8.12	4.12	7.86	4.65	6.63	4.61	7.67	4.01	8.19	4.70
Mother's Education	1.20	2.50	2.63	3.49	4.15	4.41	1.31	2.61	2.73	3.62	4.56	4.66
Father's Education	2.64	3.52	4.27	4.17	5.59	4.96	2.78	3.56	4.36	4.21	6.01	5.10
Age	27.73	2.53	27.67	2.54	27.91	2.60	27.73	2.52	27.76	2.57	27.99	2.64
Age2	775.59	145.57	772.02	145.93	785.60	150.01	775.51	144.47	777.47	147.55	790.55	152.10
No. Siblings	3.43	2.66	3.17	2.46	3.09	2.60	3.52	2.86	3.03	2.36	2.89	2.55
Firstborn	0.05	0.21	0.06	0.23	0.07	0.26	0.02	0.14	0.03	0.17	0.04	0.18
Married	0.30	0.46	0.24	0.42	0.20	0.40	0.19	0.39	0.17	0.37	0.20	0.40
Married Polygamous	0.01	0.11	0.01	0.07	0.00	0.07	0.05	0.21	0.02	0.14	0.01	0.11
Separated/divorced/widowed	0.02	0.15	0.04	0.19	0.04	0.19	0.15	0.36	0.16	0.36	0.14	0.35
Family Size	8.68	3.80	7.93	3.33	7.61	3.26	9.31	3.79	8.39	3.14	8.07	3.12
Extended family	0.55	0.50	0.55	0.50	0.52	0.50	0.69	0.46	0.69	0.46	0.68	0.47
Owned house	0.95	0.22	0.93	0.26	0.94	0.24	0.94	0.23	0.92	0.27	0.92	0.27
Access Sewage	0.05	0.22	0.06	0.24	0.06	0.23	0.05	0.22	0.06	0.24	0.08	0.27
Access Electricity	0.05	0.22	0.10	0.30	0.13	0.34	0.06	0.23	0.11	0.32	0.18	0.38
Urban	0.08	0.28	0.16	0.36	0.23	0.42	0.09	0.29	0.16	0.37	0.26	0.44
Central born	0.16	0.36	0.19	0.40	0.15	0.36	0.21	0.41	0.24	0.43	0.17	0.38
Coast born	0.11	0.31	0.10	0.29	0.08	0.27	0.10	0.31	0.09	0.28	0.08	0.27
Eastern born	0.23	0.42	0.20	0.40	0.19	0.40	0.22	0.41	0.19	0.39	0.17	0.38
North Eastern born	0.02	0.12	0.03	0.18	0.08	0.26	0.01	0.11	0.02	0.14	0.06	0.23
Nyanza born	0.18	0.39	0.14	0.34	0.12	0.33	0.13	0.34	0.11	0.31	0.11	0.32
Rift Valley born	0.14	0.35	0.19	0.39	0.25	0.43	0.17	0.37	0.20	0.40	0.25	0.43
Western born	0.13	0.34	0.10	0.30	0.09	0.29	0.13	0.34	0.11	0.31	0.10	0.30
Foreign born	0.00	0.07	0.02	0.13	0.01	0.09	0.00	0.07	0.02	0.13	0.01	0.08

Source: IMPUS-Kenya (1989; 1999; and 2009)

Note: Education variables are all continuous (own schooling, mother's education, and father's education); Extend family: 1, if they stay with other relative/non-relatives; Provincial dummies are 1, if born in those provinces.

Table 3-3 Mean Year of Schooling by Place of Birth Province

Son	**Birth Cohort 1955-64 (Census 1989)**			**Birth Cohort 1965-74 (Census 1999)**			**Birth Cohort 1975-84 (Census 2009)**		
	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling
Nairobi	10.799	3.984	7.094	11.664	7.538	10.068	12.367	10.195	11.794
	(3.686)	(4.356)	(4.681)	(3.154)	(4.790)	(4.374)	(3.378)	(4.517)	(4.013)
Central	8.586	1.482	3.638	8.693	3.114	5.532	8.820	5.337	7.285
	(3.738)	(2.532)	(3.765)	(3.467)	(3.512)	(4.060)	(3.640)	(4.246)	(4.194)
Coast	5.640	0.608	1.788	7.357	1.499	3.083	7.507	2.654	4.652
	(4.609)	(1.893)	(3.285)	(3.900)	(3.118)	(4.172)	(4.199)	(4.143)	(4.946)
Eastern	7.316	0.753	2.171	7.895	1.871	3.688	7.542	3.658	5.533
	(4.092)	(1.929)	(3.063)	(3.766)	(2.916)	(3.688)	(4.016)	(4.048)	(4.604)
North Eastern	1.116	0.000	0.096	1.836	0.121	0.369	2.779	0.229	0.310
	(2.945)	(0.000)	(0.704)	(3.951)	(1.031)	(1.765)	(4.692)	(1.461)	(1.791)
Nyanza	7.667	0.702	2.490	8.561	2.379	4.687	9.096	4.381	6.932
	(4.017)	(1.867)	(3.377)	(3.489)	(3.131)	(3.912)	(3.622)	(4.137)	(4.590)
Rift Valley	6.518	0.617	1.879	7.003	1.610	3.274	6.710	2.739	4.354
	(4.812)	(1.769)	(3.125)	(4.523)	(2.816)	(3.846)	(4.946)	(3.818)	(4.731)
Western	7.501	1.428	3.384	7.987	2.626	4.821	8.407	4.707	7.151
	(4.303)	(2.617)	(3.690)	(3.775)	(3.230)	(3.842)	(4.063)	(4.272)	(4.660)
Foreign-born	8.930	2.250	4.172	7.777	2.915	5.066	6.747	2.763	4.846
	(3.959)	(3.608)	(4.972)	(4.464)	(4.274)	(5.259)	(5.341)	(4.721)	(5.946)
Total	7.288	0.959	2.621	7.843	2.299	4.274	7.666	3.755	5.579
	(4.380)	(2.223)	(3.530)	(4.095)	(3.348)	(4.185)	(4.558)	(4.323)	(4.964)
Daughter	**Birth Cohort 1955-64 (Census 1989)**			**Birth Cohort 1965-74 (Census 1999)**			**Birth Cohort 1975-84 (Census 2009)**		
	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling	Child's Year of Schooling	Mother's Year of Schooling	Father's Year of Schooling
Nairobi	10.331	4.726	7.849	11.284	7.796	9.859	12.622	10.053	11.787
	(3.805)	(4.392)	(5.082)	(3.350)	(4.963)	(4.669)	(3.409)	(4.664)	(4.225)
Central	7.905	1.464	3.414	8.499	3.014	5.290	9.487	5.683	7.511
	(3.987)	(2.540)	(3.479)	(3.295)	(3.445)	(4.055)	(3.641)	(4.432)	(4.410)
Coast	3.928	0.728	1.961	5.702	1.759	3.161	6.951	2.977	5.152
	(4.711)	(2.009)	(3.310)	(4.636)	(3.297)	(4.142)	(4.805)	(4.521)	(5.268)
Eastern	6.424	0.858	2.203	7.509	1.845	3.485	7.985	3.770	5.652
	(4.371)	(2.134)	(3.087)	(3.695)	(2.951)	(3.750)	(4.064)	(4.219)	(4.794)
North Eastern	1.221	0.160	0.368	1.711	0.189	0.660	1.952	0.370	0.687
	(2.871)	(1.386)	(2.271)	(3.709)	(1.285)	(2.437)	(4.037)	(1.973)	(2.733)
Nyanza	5.804	0.930	3.140	7.203	2.231	4.790	8.683	4.383	6.976
	(4.202)	(2.205)	(3.571)	(3.533)	(3.169)	(3.973)	(3.774)	(4.359)	(4.704)
Rift Valley	5.072	0.537	1.874	6.660	1.607	3.447	6.795	2.925	4.537
	(4.684)	(1.696)	(3.172)	(4.277)	(2.871)	(3.928)	(4.905)	(3.999)	(4.824)
Western	5.933	1.451	3.351	7.835	2.697	5.009	8.301	4.789	7.261
	(4.451)	(2.662)	(3.752)	(3.590)	(3.409)	(4.153)	(3.943)	(4.409)	(4.679)
Foreign-born	7.067	2.042	4.133	7.466	2.811	5.494	5.940	2.863	5.659
	(5.413)	(3.210)	(4.068)	(4.712)	(4.514)	(4.976)	(5.883)	(4.995)	(6.225)
Total	6.085	1.067	2.762	7.410	2.381	4.373	7.849	4.108	5.987
	(4.579)	(2.371)	(3.565)	(4.044)	(3.464)	(4.252)	(4.661)	(4.586)	(5.112)

Source: IMPUS-Kenya (1989; 1999; and 2009) Note: Standard Deviation is in parentheses

Table 3-4 Descriptive Statistics for Probit Estimation

	Born in 1975-84 (Age 25-34) from Census 2009							
	Son				**Daughter**			
	Non-Farm Origin N=4249		Farm Origin N=20685		Non-Farm Origin N=2670		Farm Origin N=11809	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Child: Work in Non-Farm	0.41	0.49	0.32	0.00	0.34	0.48	0.11	0.31
Child: Primary education	0.18	0.38	0.19	0.39	0.16	0.36	0.20	0.40
Child: Secondary education	0.38	0.48	0.29	0.45	0.37	0.48	0.29	0.46
Child: Tertiary education	0.17	0.38	0.08	0.28	0.21	0.41	0.09	0.29
Father: Primary education	0.13	0.33	0.13	0.33	0.12	0.32	0.13	0.33
Father: Secondary education	0.29	0.45	0.23	0.42	0.31	0.46	0.23	0.42
Father: Tertiary education	0.21	0.41	0.06	0.23	0.23	0.42	0.07	0.25
Mother: Primary education	0.11	0.31	0.10	0.30	0.11	0.31	0.10	0.30
Mother: Secondary education	0.22	0.42	0.12	0.33	0.25	0.43	0.13	0.34
Mother: Tertiary education	0.09	0.28	0.02	0.15	0.11	0.31	0.03	0.17
Mother: Work in Non-Farm	0.30	0.46	0.03	0.17	0.32	0.47	0.03	0.18
Mother: Work in Farm	0.35	0.48	0.73	0.45	0.35	0.48	0.73	0.44
Mother: Work in Other	0.01	0.10	0.00	0.06	0.01	0.08	0.00	0.06
Age	27.55	2.43	27.92	2.61	27.64	2.51	28.08	2.67
Age2	764.78	138.81	786.40	150.55	770.21	144.05	795.82	154.26
Number of siblings	2.88	2.31	3.03	2.62	2.77	2.32	2.86	2.56
Firstborn	0.10	0.30	0.09	0.28	0.05	0.21	0.04	0.19
Married	0.21	0.41	0.21	0.41	0.17	0.38	0.20	0.40
Married Polygamous	0.00	0.06	0.01	0.07	0.01	0.11	0.02	0.12
Separated/divorced/widowed	0.03	0.16	0.04	0.19	0.11	0.31	0.15	0.36
Family Size	7.07	3.07	7.40	3.29	7.53	3.13	7.96	3.13
Extended family	0.46	0.50	0.51	0.50	0.60	0.49	0.68	0.46
Owned house	0.82	0.38	0.95	0.22	0.80	0.40	0.94	0.23
Access Sewage	0.17	0.37	0.04	0.19	0.22	0.41	0.05	0.21
Access Electricity	0.29	0.45	0.10	0.30	0.37	0.48	0.13	0.34
Urban	0.41	0.49	0.18	0.39	0.46	0.50	0.20	0.40
Central born	0.15	0.36	0.15	0.36	0.18	0.38	0.18	0.38
Coast born	0.11	0.31	0.07	0.25	0.09	0.29	0.07	0.25
Eastern born	0.18	0.38	0.19	0.39	0.16	0.36	0.17	0.38
North Eastern	0.03	0.16	0.08	0.27	0.03	0.16	0.06	0.24
Nyanza born	0.12	0.33	0.13	0.33	0.11	0.32	0.12	0.32
Rift Valley born	0.22	0.41	0.25	0.43	0.22	0.41	0.26	0.44
Western born	0.10	0.30	0.10	0.29	0.10	0.30	0.10	0.31
Foreign born	0.01	0.11	0.01	0.08	0.01	0.10	0.01	0.07

Source: IMPUS-Kenya (2009)

Note: Origin status of children is based on father's occupation.

3.4.2 Rate of return to education in Kenya

The data used in this study is taken from the 2005-2006 Kenya Integrated Household Budget Survey (KIHBS), which beginning the data collection in May 2005 and over the course of a year. It collected information from a nationally representative sample of 13.430 households on a wide range of socioeconomic indicators relating to demographics, education, employment, expenditure, and consumption. The labor module in the KIHBS household questionnaire asked household members their average daily working hours and earnings for the previous month. Assuming 20 working days per month, this information is used to calculate each wage-worker's hourly wage. Age is substituted as a proxy for potential work experience, primarily because years of prior working experience or job tenure were not directly surveyed, although as noted by Barouni & Broecke (2014), Mincer's traditional expression for potential working experience, which is age minus schooling minus primary entry age, is less relevant in African countries where late primary matriculation, repetition, and dropping out are relatively commonplace.

This study has two analytical samples. For mother's education instrument, the analysis is restricted to wage-earners aged 15-65, which is common for usual return to education analysis. In contrast, for FPE policy instrument analysis, the analysis is restricted to wage-earners born in 1965-75(30 to 40 years-old). They are those who reported a non-zero monthly wage of working-age at the time of the survey, excluding full-time students.

The variable of education was recorded as the highest grade completed, from which the continuous variable for years of schooling was computed, adjusted for the different systems pre- and post-1985 educational reform. The year of schooling is subsequently used to define subsample of wage-workers by highest participatory education level (See Table 3-5 Descriptive Statistics for Rate of Return to Education,

FPE policy Instrument and Table 3-6 Descriptive Statistics for Rate of Return to Education, Mother's Education Instrument). Mean years of schooling is 9.24 for male, and 8.17 for female. This is almost equivalent to completion of primary but incompletion of secondary education. About a half of the sample live in urban (0.56 for male, 0.40 for female).

Table 3-5 Descriptive Statistics for Rate of Return to Education, FPE policy Instrument

Age 30-40	**OLS, IV, Joint IV-Heckman**		**Heckman**		**Probit**		**OLS, IV, Joint IV-Heckman**		**Heckman**		**Probit**	
	Male (N=1801)		Male (N=3620)		Male (N=3695)		Female (N=991)		Female (N=3896)		Female (N=3996)	
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
LnW	3.51	1.20	3.51	1.20			3.12	1.41	3.12	1.41		
Eduyear	9.24	3.89	8.17	4.17			8.67	4.07	6.67	4.32		
Married	0.83	0.37	0.81	0.39	0.82	0.39	0.64	0.48	0.76	0.43	0.76	0.43
Age	34.49	3.14	34.49	3.21	34.51	3.21	34.55	3.13	34.60	3.25	34.59	3.25
Age2	1199	219	1200	224	1201	224	1204	218	1208	227	1207	227
Urban	0.56	0.50	0.40	0.49	0.40	0.49	0.55	0.50	0.34	0.48	0.35	0.48
Embu	0.02	0.14	0.02	0.15	0.02	0.15	0.01	0.11	0.02	0.15	0.02	0.15
Kalenjin	0.06	0.24	0.09	0.29	0.09	0.29	0.06	0.23	0.10	0.30	0.10	0.30
Kamba	0.06	0.25	0.06	0.23	0.06	0.23	0.07	0.26	0.06	0.23	0.06	0.23
Kikuyu	0.11	0.32	0.11	0.31	0.11	0.31	0.13	0.33	0.11	0.32	0.11	0.31
Kisii	0.02	0.16	0.04	0.19	0.04	0.19	0.02	0.13	0.03	0.18	0.03	0.18
Luhya	0.02	0.13	0.02	0.14	0.02	0.14	0.01	0.11	0.02	0.15	0.02	0.15
Luo	0.09	0.28	0.07	0.26	0.07	0.25	0.13	0.33	0.08	0.27	0.08	0.27
Maasai	0.01	0.12	0.02	0.15	0.02	0.16	0.02	0.14	0.02	0.15	0.02	0.15
Meru	0.03	0.18	0.05	0.22	0.05	0.22	0.03	0.18	0.05	0.22	0.05	0.22
Mijikenda	0.01	0.12	0.01	0.10	0.01	0.10	0.02	0.12	0.01	0.12	0.01	0.12
Somali	0.03	0.16	0.04	0.21	0.04	0.21	0.01	0.11	0.05	0.21	0.05	0.21
English	0.09	0.29	0.07	0.25	0.07	0.25	0.12	0.32	0.06	0.24	0.07	0.25
Central	0.13	0.34	0.11	0.32	0.11	0.32	0.14	0.35	0.11	0.32	0.11	0.31
Coast	0.12	0.33	0.10	0.30	0.10	0.30	0.11	0.31	0.10	0.30	0.10	0.30
Eastern	0.14	0.35	0.18	0.38	0.18	0.38	0.16	0.36	0.19	0.39	0.19	0.39
Northeastern	0.03	0.17	0.04	0.21	0.04	0.21			0.05	0.21	0.05	0.21
Nyanza	0.15	0.35	0.14	0.34	0.14	0.34	0.17	0.38	0.14	0.35	0.14	0.35
Rift valley	0.24	0.43	0.27	0.44	0.27	0.44	0.22	0.41	0.25	0.43	0.25	0.43
Western	0.08	0.28	0.10	0.30	0.10	0.30	0.08	0.27	0.11	0.31	0.11	0.31
FPE Policy	0.46	0.50			0.43	0.49	0.48	0.50			0.39	0.49
WageW			0.50	0.50	0.50	0.50			0.25	0.44	0.26	0.44
Ln HHExp	10.20	1.32	9.95	1.21	9.96	1.21	10.05	1.18	9.71	1.06	9.72	1.06
Headship	0.85	0.36	0.80	0.40	0.80	0.40	0.34	0.48	0.25	0.43	0.25	0.43
HHChildren6-	1.17	1.08	1.34	1.17	1.34	1.17	1.04	1.01	1.31	1.14	1.31	1.15
HHAdults65+	0.08	0.31	0.10	0.36	0.11	0.36	0.10	0.35	0.12	0.38	0.12	0.38
Owned House	0.59	0.49	0.60	0.49	0.59	0.49	0.56	0.50	0.60	0.49	0.60	0.49

Source: KIHBS (2005)

Note: LnW: Log Hourly Wage; Eduyear: Year of education; WageW: Wage Worker; LnHHExp: Log household total expenditure; Headship: Household head; HHChildren6-: having children under 6 years old; HHAdults65+: Having adults over 65 years old; Owned House: Ownership of house; Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table 3-6 Descriptive Statistics for Rate of Return to Education, Mother's Education Instrument

Age 30-40	OLS, IV, Joint IV-Heckman Male (N=5406)		Heckman Male (N=17110)		Probit Male (N=17444)		OLS, IV, Joint IV-Heckman Female (N=3146)		Heckman Female (N=17849)		Probit Female N=18210)	
Variable	**Mean**	**SD.**	**Mean**	**SD**	**Mean**	**SD.**	**Mean**	**SD.**	**Mean**	**SD.**	**Mean**	**SD.**
LnW	3.29	1.24	3.29	1.24			2.90	1.30	2.90	1.30		
Eduyear	8.27	4.04	7.27	3.97			7.80	4.22	6.25	4.15		
Married	0.68	0.47	0.47	0.50	0.47	0.50	0.52	0.50	0.52	0.50	0.52	0.50
Age	34.76	11.07	30.76	13.19	30.78	13.20	33.44	10.85	30.98	13.01	30.98	13.00
Age2	1331.11	841.56	1120.26	960.72	1121.70	961.09	1236.22	804.37	1129.30	952.83	1128.85	951.72
Urban	0.50	0.50	0.32	0.47	0.32	0.47	0.53	0.50	0.31	0.46	0.32	0.47
Embu	0.02	0.14	0.02	0.15	0.02	0.15	0.01	0.12	0.02	0.15	0.02	0.15
Kalenjin	0.07	0.25	0.10	0.30	0.10	0.30	0.06	0.23	0.10	0.30	0.10	0.29
Kamba	0.06	0.24	0.06	0.24	0.06	0.24	0.07	0.26	0.07	0.25	0.07	0.25
Kikuyu	0.11	0.32	0.10	0.30	0.10	0.30	0.13	0.34	0.11	0.31	0.11	0.31
Kisii	0.03	0.16	0.03	0.18	0.04	0.18	0.02	0.15	0.04	0.19	0.04	0.19
Luhya	0.02	0.14	0.03	0.17	0.03	0.17	0.01	0.12	0.03	0.17	0.03	0.17
Luo	0.11	0.31	0.09	0.28	0.09	0.28	0.13	0.33	0.09	0.29	0.09	0.29
Maasai	0.02	0.13	0.02	0.14	0.02	0.15	0.02	0.14	0.02	0.15	0.02	0.15
Meru	0.04	0.20	0.05	0.22	0.05	0.22	0.03	0.18	0.05	0.22	0.05	0.22
Mijikenda	0.02	0.13	0.01	0.12	0.01	0.12	0.02	0.14	0.02	0.12	0.02	0.12
Somali	0.02	0.14	0.04	0.20	0.04	0.20	0.01	0.10	0.04	0.19	0.04	0.19
English	0.08	0.27	0.05	0.23	0.06	0.23	0.11	0.32	0.06	0.23	0.06	0.23
Central	0.12	0.33	0.10	0.30	0.10	0.30	0.15	0.36	0.11	0.31	0.11	0.31
Coast	0.12	0.33	0.10	0.30	0.10	0.30	0.11	0.32	0.10	0.30	0.10	0.30
Eastern	0.16	0.37	0.19	0.39	0.19	0.39	0.16	0.37	0.19	0.39	0.19	0.39
Northeastern	0.02	0.14	0.04	0.20	0.04	0.20	0.01	0.10	0.04	0.19	0.04	0.19
Nyanza	0.16	0.37	0.15	0.36	0.15	0.35	0.18	0.39	0.15	0.36	0.15	0.36
Rift valley	0.24	0.43	0.26	0.44	0.26	0.44	0.21	0.41	0.24	0.43	0.24	0.43
Western	0.09	0.29	0.12	0.32	0.12	0.32	0.08	0.26	0.12	0.33	0.12	0.33
Mother: Post-Primary Education	0.02	0.12			0.07	0.25	0.02	0.15			0.05	0.23
Wageworker			0.32	0.46	0.32	0.47			0.18	0.38	0.18	0.38
LnHHExp	10.12	1.37	9.75	1.15	0.48	0.50	10.05	1.27	9.71	1.06	9.72	1.06
Headship	0.72	0.45	0.47	0.50	1.02	1.15	0.31	0.46	0.18	0.39	0.18	0.39
HHChildren6-	0.95	1.08	1.01	1.14	0.16	0.42	0.99	1.06	1.17	1.17	1.17	1.18
HHAdults65+	0.11	0.35	0.16	0.42	0.62	0.49	0.12	0.37	0.17	0.43	0.17	0.43
Owned House	0.60	0.49	0.62	0.49	0.07	0.25	0.57	0.50	0.61	0.49	0.61	0.49

Source: KIHBS (2005)

Note: LnW: Log Hourly Wage; Eduyear: Year of education; WageW: Wage Worker; LnHHExp: Log household total expenditure; Headship: Household head; HHChildren6-: having children under 6 years old; HHAdults65+: Having adults over 65 years old; Owned House: Ownership of house; Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

The FPE treatment group is identified as following: (1) first, the analytical sample is restricted to adults aged 30-40; (2) assuming that they are born in 1965-75, those who started schooling during 1974-79 are identified with a question asking "age started schooling"; and (3) partially affected samples are excluded. For example, those who are born in 1965 and joined school in 1971 would be expected to benefit the fee abolition at the 4th grade (Note that the 1st FPE policy only covers Grade 1-4). It is also noted that those who started school before 5 years-old during 1965-1973 are also excluded. They were probably in nursery school (pre-school) and their learning ability would be higher than the average (and probably were from wealthier families). Eventually, the FPE treatment group is 825 for males (out of 1801) and 475 for females (out of 991).

Following tables shows difference of mean years of schooling and hourly wage between the FPE and non-FPE groups. Mean years of schooling of the FPE group is 1.3 and 1.6 years higher than the non-FPE group and mean hourly wage of the FPE groups (80.3 for males; 65.8 for females) is higher than non-FPE group (63.0 for males; and 51.9 for females).

Table 3-7 Mean Year of Schooling and Hourly Wage between FPE and Non-FPE Group

	Year of Schooling (Year)		***Hourly Wage (Kenya shilling)***	
	Non-FPE	**FPE**	**Non-FPE**	**FPE**
Male	8.64	9.94	63.03	80.30
Female	7.87	9.50	51.84	65.81

Source: KIHBS (2005)

4. RESULTS

4.1 Intergenerational Persistence in Kenya

This section reviews results of the intergenerational persistence in education: (1) change of the intergenerational persistence in education over time; (2) educational transition matrices by gender, birth cohort and place of birth; (3) decomposition method; and (4) intergenerational upward mobility in Kenya.

4.1.1 Intergenerational persistence in Kenya

Change of the intergenerational educational persistence over time

Table 4-1 indicate summary of the child-parent persistence in education by birth cohort and gender. Detail results are presented in Appendix G. Purpose of this estimation is to show the change of social openness in Kenya. If the parent-child persistence in education is tight, it implies the probability of attaining Tertiary education tends to be limited to those who have more educated parents. That is, Kenyan society would provide less chance to get ahead for socio-economically disadvantaged children. There are absolute measure and relative measure in the table. While the former results use years of schooling for child, and parents, the later uses normalized educational variables, which means they are divided by their corresponding standard deviations, respectively (Kwenda et al., 2015).

Table 4-1 Summary of Changes of Intergenerational Persistence in Education

	Absolute Measure				Relative Measure			
Birth Cohort	$\hat{\beta}_{mother}$	S.E.	$\hat{\beta}_{father}$	S.E.	$\hat{\rho}_{mother}$	S.E.	$\hat{\rho}_{father}$	S.E.
Panel A: Son								
1955-64	0.188	[0.026]***	0.296	[0.019]***	0.096	[0.013]***	0.233	[0.015]***
1965-74	0.152	[0.016]***	0.266	[0.013]***	0.126	[0.013]***	0.275	[0.014]***
1975-84	0.203	[0.008]***	0.335	[0.007]***	0.181	[0.008]***	0.329	[0.008]***
Panel B: Daughter								
1955-64	0.247	[0.036]***	0.333	[0.027]***	0.125	[0.018]***	0.263	[0.021]***
1965-74	0.178	[0.019]***	0.236	[0.016]***	0.148	[0.016]***	0.244	[0.017]***
1975-84	0.223	[0.010]***	0.313	[0.009]***	0.200	[0.009]***	0.310	[0.009]***

Source: IPUMS-Kenya (1989; 1999; 2009)

Note: * p<0.05, ** p<0.01, *** p<0.001; Robust standard errors in parentheses; Controls of personal factors include: Age, Age squared, whether a respondent is the first born among siblings, number of siblings, marital status (Married, Polygamy, and Separated/Divorced/Widowed). Controls of family factors include: family size, whether a respondent live in extended family, socio-economic status (living in Owned house, having access to sewage, having access to electricity), Location of residence (urban dummy). Controls of place of birth include place of birth province dummies (Nairobi is reference, Central, Coast, Eastern, North Eastern, Nyanza, Rift Valley, Western, and Being born in Foreign countries). For the definition of variables used in the estimation and the results, please see Appendix.

The results confirm that both son's and daughter's educational attainment have positive and statistically significant association with both mother's and father's education. $\hat{\beta}_j$ is an absolute measure of intergenerational transmission, while $\hat{\rho}_j$ is the relative measure of the coefficient. The absolute measure indicates that the correlation between parent's and child's started at a low level for both mother-sons (0.188), and mother-daughters (0.247) for the oldest cohort (1955-64). The same trend holds for Father-child pairs. Over the past three decades, the intergenerational link increased by 8% for sons, but declined by 10% for daughters. The mixed trend in parent-child transmission of education suggests a different trend of educational mobility by gender.

It would appear that the reduction of the parent-daughter persistence in education comes from the relative higher increase of daughter's education, compared to that of son's sample (see, Table 3-2 Descriptive Statistics for Parent-Son Persistence in Education). The intergenerational persistence is different between mother-child and father-child pairs and father's education tends to be stronger than mother's education on determining child's educational attainment. Notably, the intergenerational persistence is not evenly distributed across cohorts. The decrease of the intergenerational persistence in the middle cohort (1965-74) is probably due to the transition period from pre-colonial government to the new one. It was also the time of the introduction of the 1st FPE policy. When they become school entry age, their primary school fee was partially abolished. Nevertheless, their average years of schooling are around 8 years for both sons and daughters (see Table 3-2), implying that their highest level of education completed is primary education.

The overall changes in intergenerational persistence in education disclosed by the absolute measure might be solely due to changes in the dispersion of education between parents and children across cohorts. The relative measure shows the coefficients which factor out the changes. When this is factored out, the parent-child correlation in education decreased for all pairs. The rate of decrease is more evident in mother-son, mother-daughter pairs in the oldest cohorts (from 0.188 to 0.096; and from 0.247 to 0.125, respectively). The absolute measure and relative measure are somewhat quantitatively different, and findings a bit changed for daughter's sample. The intergenerational persistence in education is still not so tight in the oldest cohort, but it modestly increased in the later period.

Pertaining to paternal/maternal differences in influencing child's educational attainments, previous studies reported that mother-child correlation is generally higher than father-child correlation (Black & Devereux, 2011; Kwenda et al., 2015; Lambert et al., 2014). As a possible explanation, they explained that the relative importance of

mother's education comes from mother's spending more time on child-rearing activities than fathers; hence greater maternal schooling increases the efficiency of time investments in children. Another explanation is that education might change the balance of power in the household so that more educated mothers can play a better role in directing investment in education than less educated mothers. Unlike previous studies, the relative importance of father's education in Kenya could be due to the sample restriction to the co-residential parent-child pairs. It is assumed that well educated and economically independent young adults live apart. They are out of the analytical sample. Thus, there is a possibility that parent-child pairs who chose co-residential lifestyle can be patriarchal households and children living in the households might get influence from father's decision making in investment in education or child-development activities.

Finally, Kenya's position in terms of educational mobility in a global context is mobile enough. So far, except for several studies (Hertz et al., 2008), the intergenerational persistence or mobility in developing countries has been not investigated in a comparative manner. This might be due to variation in data and methodology across studies (Kwenda et al., 2015). However, if it is compared to the global average of 0.42 (Hertz et al., 2008), Kenya is a mobile society.

Change of the intergenerational persistence in education by place of birth

Much literature indicates inequality of resources by ethnic group in Kenya as shown in the previous chapter. Unfortunately, the data used in this study cannot distinguish the intergenerational persistence in education by ethnic group due to data constraints. However, making use of the place of birth district at a proxy of ethnicity, this study

attempts to estimate intergenerational persistence in education by place of birth province in Kenya. Based on the administrative units provided by Census 2009, the place of birth province variable is constructed. Considering the ethnic composition in provinces in Appendix F enables us to which ethnic group dominantly live in each province. For example, 99.4 % of "Luhya" lives in Western province, 92.3% of "Kikuyu" lives in Central province. Some overlaps are in Rift Valley: Karenjin (97.2%) and Maasai (98.9%). Majority of "Somali" live in North Eastern province (97.5%). Swahili speakers are distributed in all provinces (the largest share in Rift Valley, 36%). However, the dominant share of English speakers lives in Nairobi province (61.2%) and Western province (11.2%).

Table 4-2 presents the intergenerational persistence in education by place of birth, son's sample. The absolute measure of the strongest intergenerational persistence in education can be observed for those born in North Eastern province (e.g. 0.527, 0.543 for father-son's pairs in the middle cohort). It is noted that a mother-son pair is missing in North Eastern province for the oldest cohort, because mean mother's year of schooling is zero (see Table 3-3 Mean Year of Schooling by Place of Birth Province). Both child's and parent's educational attainments in North Eastern province are far behind compared to other provinces. The different degree of the intergenerational persistence in education by place of birth implies that region-specific factors or ethnic characteristics influence on child's educational attainment. In addition to the inter-personal differences and intra-household differences observed in the previous analysis, there might be some factors which are generated by inter-geographical or ethnic differences. Further arguments will be discussed in the next chapter, but inequality of opportunities and inequality of outcomes come from ethnicity do matter in Kenya.

Table 4-2 Son's Intergenerational Persistence in Education by Place of Birth

	Absolute Measure				Relative Measure			
Birth Cohort	$\hat{\beta}_{mother}$	S.E.	$\hat{\beta}_{father}$	S.E.	$\hat{\rho}_{mother}$	S.E.	$\hat{\rho}_{father}$	S.E.
Panel A: Son								
1955-64								
Nairobi	0.255	[0.090]**	0.244	[0.042]***	0.129	[0.046]**	0.180	[0.073]*
Central	0.142	[0.052]**	0.211	[0.038]***	0.072	[0.027]**	0.167	[0.030]***
Coast	0.434	[0.111]***	0.377	[0.069]***	0.220	[0.056]***	0.297	[0.054]***
Eastern	0.135	[0.061]*	0.244	[0.042]***	0.068	[0.031]*	0.193	[0.033]***
North Eastern	omitted		0.590	[0.661]	omitted		0.465	[0.522]
Nyanza	0.226	[0.066]***	0.229	[0.041]***	0.115	[0.034]***	0.181	[0.033]***
Rift Valley	0.330	[0.093]***	0.386	[0.064]***	0.167	[0.047]***	0.305	[0.050]***
Western	0.146	[0.060]*	0.355	[0.047]***	0.074	[0.030]*	0.280	[0.037]***
1965-74								
Nairobi	0.110	[0.054]*	0.201	[0.061]**	0.091	[0.045]*	0.207	[0.063]**
Central	0.098	[0.030]***	0.235	[0.026]***	0.082	[0.025]***	0.242	[0.027]***
Coast	0.183	[0.057]**	0.234	[0.047]***	0.152	[0.048]**	0.241	[0.048]***
Eastern	0.117	[0.039]**	0.230	[0.031]***	0.098	[0.032]**	0.237	[0.032]***
North Eastern	-0.140	[0.217]	0.527	[0.159]**	-0.116	[0.181]	0.543	[0.164]**
Nyanza	0.217	[0.039]***	0.168	[0.032]***	0.180	[0.033]***	0.173	[0.033]***
Rift Valley	0.211	[0.043]***	0.363	[0.034]***	0.175	[0.035]***	0.374	[0.035]***
Western	0.177	[0.046]***	0.294	[0.039]***	0.148	[0.038]***	0.303	[0.041]***
1975-84								
Nairobi	0.165	[0.030]***	0.244	[0.031]***	0.159	[0.029]***	0.253	[0.033]***
Central	0.175	[0.016]***	0.211	[0.015]***	0.169	[0.015]***	0.219	[0.016]***
Coast	0.175	[0.027]***	0.246	[0.022]***	0.169	[0.026]***	0.255	[0.023]***
Eastern	0.190	[0.017]***	0.258	[0.015]***	0.183	[0.017]***	0.269	[0.016]***
North Eastern	0.445	[0.079]***	0.332	[0.065]***	0.429	[0.076]***	0.345	[0.067]***
Nyanza	0.116	[0.019]***	0.239	[0.017]***	0.112	[0.018]***	0.248	[0.018]***
Rift Valley	0.230	[0.019]***	0.401	[0.016]***	0.222	[0.018]***	0.417	[0.016]***
Western	0.204	[0.023]***	0.270	[0.021]***	0.196	[0.022]***	0.281	[0.021]***

Source: IPUMS-Kenya (1989; 1999; 2009)

Note: * p<0.05, ** p<0.01, *** p<0.001; Robust standard errors in parentheses; Controls of personal factors include: Age, Age squared, whether a respondent is the first born among siblings, number of siblings, marital status (Married, Polygamy, and Separated/Divorced/Widowed). Controls of family factors include: family size, whether a respondent live in extended family, socio-economic status (living in Owned house, having access to sewage, having access to electricity), Location of residence (urban dummy). For the definition of variables used in the estimation and the results, please see Appendix. Mother's education for North Eastern is omitted.

Table 4-3 Daughter's Intergenerational Persistence in Education by Place of Birth

	Absolute Measure				Relative Measure			
	$\hat{\beta}_{mother}$	S.E.	$\hat{\beta}_{father}$	S.E.	$\hat{\rho}_{mother}$	S.E.	$\hat{\rho}_{father}$	S.E.
Panel B: Daughter								
1955-64								
Nairobi	0.166	[0.130]	0.395	[0.111]***	0.084	[0.066]	0.312	[0.088]***
Central	0.225	[0.069]**	0.176	[0.052]***	0.114	[0.035]**	0.139	[0.041]***
Coast	0.530	[0.127]***	0.466	[0.061]***	0.269	[0.064]***	0.368	[0.070]***
Eastern	0.227	[0.078]**	0.361	[0.061]***	0.115	[0.039]**	0.285	[0.048]***
North Eastern			0.245	[0.177]	0.145	[0.105]		
Nyanza	0.155	[0.091]	0.308	[0.065]***	0.078	[0.046]	0.243	[0.052]***
Rift Valley	0.272	[0.134]*	0.500	[0.083]***	0.138	[0.068]*	0.394	[0.066]***
Western	0.364	[0.097]***	0.191	[0.074]*	0.185	[0.049]***	0.151	[0.059]*
1965-74								
Nairobi	0.186	[0.104]	0.140	[0.094]	0.155	[0.086]	0.144	[0.097]
Central	0.187	[0.034]***	0.114	[0.029]***	0.155	[0.028]***	0.118	[0.030]***
Coast	0.215	[0.079]**	0.340	[0.071]***	0.178	[0.065]**	0.351	[0.073]***
Eastern	0.146	[0.049]**	0.254	[0.039]***	0.121	[0.040]**	0.262	[0.040]***
North Eastern[9]	1.914	[0.606]**	-0.293	[0.229]	1.591	[0.504]**	-0.302	[0.237]
Nyanza	0.163	[0.055]**	0.185	[0.048]***	0.135	[0.045]**	0.191	[0.050]***
Rift Valley	0.173	[0.050]***	0.341	[0.039]***	0.144	[0.042]***	0.352	[0.040]***
Western	0.164	[0.052]**	0.245	[0.044]***	0.136	[0.043]**	0.253	[0.046]***
1975-84								
Nairobi	0.168	[0.034]***	0.212	[0.033]***	0.162	[0.033]***	0.221	[0.035]***
Central	0.184	[0.019]***	0.145	[0.018]***	0.178	[0.018]***	0.151	[0.019]***
Coast	0.268	[0.035]***	0.276	[0.030]***	0.259	[0.034]***	0.286	[0.031]***
Eastern	0.154	[0.023]***	0.291	[0.020]***	0.149	[0.022]***	0.302	[0.021]***
North Eastern	0.346	[0.074]***	0.258	[0.062]***	0.333	[0.072]***	0.268	[0.064]***
Nyanza	0.160	[0.026]***	0.199	[0.023]***	0.155	[0.025]***	0.206	[0.024]***
Rift Valley	0.249	[0.022]***	0.365	[0.019]***	0.240	[0.021]***	0.379	[0.020]***
Western	0.203	[0.027]***	0.244	[0.025]***	0.195	[0.026]***	0.253	[0.026]***

Source: IPUMS-Kenya (1989; 1999; 2009)
Note: * p<0.05, ** p<0.01, *** p<0.001; Robust standard errors in parentheses; Controls of personal factors include: Age, Age squared, whether a respondent is the first born among siblings, number of siblings, marital status (Married, Polygamy, and Separated/Divorced/Widowed). Controls of family factors include: family size, whether a respondent live in extended family, socio-economic status (living in Owned house, having access to sewage, having access to electricity), Location of residence (urban dummy). For the definition of variables used in the estimation and the results, please see Appendix. Mother's education for North Eastern is omitted.

[9] Large increases in educational attainment in developing countries for the last decades are highly likely to cause a secular increase in the variance of education. Thus, if the standard deviation of parent's generation is lower than that of child's generation, the regression coefficient would exceed the correlation coefficient (See Chapter 2: Literature Review, p27).

Educational transition matrices, mobility index and decomposition method

The previous section reviewed the intergenerational persistence in education using OLS estimation. It is a good way of analyzing a linear trend and of understanding overall changes during the periods, but disadvantage is that we cannot see difference of the intergenerational persistence by level of education. Educational transition matrices analysis allows us to grasp further decomposed changes of the educational mobility. Table 4-4 and Table 4-5 indicate educational transition matrices for mother-son, father-son pairs by birth cohort. One of the features is that the higher level of education mother and father has, the higher level of education children have. This is evident in Tertiary education. For instance, the probability of son with tertiary education is 80.0 percent for mother-son pairs and 62.5 for father-son pairs in the oldest birth cohort (1955-64). The results also show that the strong intergenerational persistence in education has weakened in the latest cohort (from 0.800 to 0.584 for mother-son pairs; and from 0.625 to 0.458 for father-son pairs).

The intergenerational persistence in education becomes tighter over years at the bottom level of education. For example, the probability of son's attaining no education is 0.180 for mother-son pairs in the oldest cohort, but it becomes 0.307 in the latest cohort. The tight intergenerational persistence in education at lower level of education implies that sons of the less educated parents tend to attain less level of education. This is also an indication of less social openness, hence beginning to reproduce inequality of opportunities in Kenya. The same trends apply to daughter's sample. If parents have higher level of education, the intergenerational persistence in education is tight. In sum, the persistence becomes weak at high level of education, but strong at lower level of education. This implies that the degree of the intergenerational mobility becomes quiescent over years. In other words, it would appear that a society of Kenya becomes steady.

Table 4-4 Educational Transition Matrices by Birth Cohort, Son's Sample

Age 25-34				**Mother-Son Pairs**				
	NE	SomePri	Pri	Sec	Ter	Total	N	(%)
Mother-Son (Born in 1955-1964: Census 1989)								
No Education (NE)	**0.180**	0.238	0.236	0.311	0.035	1.000	8,334	0.800
Some Primary (SomePri)	0.041	**0.155**	0.186	0.527	0.092	1.000	1,611	0.155
Primary (Pri)	0.032	0.071	**0.135**	0.587	0.175	1.000	126	0.012
Secondary (Sec)	0.024	0.042	0.080	**0.527**	0.327	1.000	336	0.032
Tertiary (Ter)	0.000	0.000	0.000	0.200	**0.800**	1.000	10	0.001
Total	0.152	0.216	0.222	0.355	0.055	**1.000**	10,417	1.000
Mother-Son (Born in 1965-1974: Census 1999)								
No Education (NE)	**0.156**	0.331	0.162	0.328	0.023	1.000	8,432	0.573
Some Primary (SomePri)	0.019	**0.279**	0.171	0.487	0.044	1.000	4,094	0.278
Primary (Pri)	0.013	0.158	**0.169**	0.601	0.060	1.000	924	0.063
Secondary (Sec)	0.015	0.100	0.089	**0.632**	0.164	1.000	1,175	0.080
Tertiary (Ter)	0.031	0.051	0.000	0.439	**0.480**	1.000	98	0.007
Total	0.097	0.286	0.158	0.414	0.046	**1.000**	14,723	1.000
Mother-Son (Born in 1975-1984: Census 2009)								
No Education (NE)	**0.307**	0.323	0.164	0.170	0.036	1.000	20,206	0.437
Some Primary (SomePri)	0.019	**0.380**	0.226	0.312	0.064	1.000	13,072	0.283
Primary (Pri)	0.014	0.217	**0.272**	0.403	0.095	1.000	4,783	0.103
Secondary (Sec)	0.012	0.119	0.168	**0.519**	0.182	1.000	6,575	0.142
Tertiary (Ter)	0.007	0.024	0.038	0.347	**0.584**	1.000	1,606	0.035
Total	0.143	0.289	0.189	0.290	0.090	**1.000**	46,242	1.000
Age25-34				**Father-Son Pairs**				
	NE	SomePri	Pri	Sec	Ter	Total	N	(%)
Father-Son (Born in 1955-1964: Census 1989)								
No Education (NE)	**0.209**	0.256	0.239	0.272	0.025	1.000	3,453	0.530
Some Primary (SomePri)	0.055	**0.197**	0.228	0.466	0.055	1.000	2,060	0.316
Primary (Pri)	0.041	0.130	**0.247**	0.521	0.062	1.000	146	0.022
Secondary (Sec)	0.027	0.065	0.130	**0.603**	0.176	1.000	790	0.121
Tertiary (Ter)	0.014	0.000	0.042	0.319	**0.625**	1.000	72	0.011
Total	0.133	0.208	0.220	0.379	0.060	**1.000**	6,521	1.000
Father- on (Born in 1965-1974: Census 1999)								
No Education (NE)	**0.211**	0.328	0.155	0.288	0.018	1.000	3,068	0.335
Some Primary (SomePri)	0.025	**0.341**	0.178	0.423	0.033	1.000	3,128	0.342
Primary (Pri)	0.023	0.240	**0.189**	0.510	0.038	1.000	708	0.077
Secondary (Sec)	0.021	0.116	0.133	**0.625**	0.105	1.000	2,025	0.221
Tertiary (Ter)	0.009	0.041	0.032	0.443	**0.475**	1.000	221	0.024
Total	0.086	0.272	0.158	0.430	0.055	**1.000**	9,150	1.000
Father-Son (Born in 1975-1984: Census 2009)								
No Education (NE)	**0.426**	0.275	0.130	0.141	0.028	1.000	8,610	0.295
Some Primary (SomePri)	0.033	**0.430**	0.228	0.262	0.047	1.000	7,480	0.256
Primary (Pri)	0.014	0.277	**0.287**	0.356	0.066	1.000	3,602	0.123
Secondary (Sec)	0.011	0.169	0.199	**0.483**	0.138	1.000	6,974	0.239
Tertiary (Ter)	0.010	0.046	0.052	0.435	**0.458**	1.000	2,518	0.086
Total	0.140	0.270	0.184	0.306	0.101	**1.000**	29,184	1.000

Source: IPUMS-Kenya (1989, 1999, 2009)

Note: NE: No Education; SomePri: Some Primary; Pri: Primary; Sec: Secondary; Ter: Tertiary. Each birth cohort (Sons and Daughters aged 25-34) is extracted from IPUMS-Kenya 1989; 1999; and 2009 data respectively.

Table 4-5 Educational Transition Matrices by Birth Cohort, Daughter's Sample

Age 25-34	Mother-Daughter Pairs							
	NE	SomePri	Pri	Sec	Ter	Total	N	(%)
Daughter (Born in 1955-1964: Census 1989)								
No Education (NE)	**0.312**	0.236	0.207	0.235	0.009	1.000	4,403	0.783
Some Primary (SomePri)	0.043	**0.167**	0.200	0.538	0.052	1.000	905	0.161
Primary (Pri)	0.056	0.146	**0.157**	0.472	0.169	1.000	89	0.016
Secondary (Sec)	0.028	0.042	0.060	**0.667**	0.204	1.000	216	0.038
Tertiary (Ter)	0.000	0.111	0.000	0.111	**0.778**	1.000	9	0.002
Total	0.253	0.216	0.199	0.304	0.027	**1.000**	5,622	1.000
Daughter (Born in 1965-1974: Census 1999)								
No Education (NE)	**0.177**	0.354	0.167	0.297	0.004	1.000	5,185	0.569
Some Primary (SomePri)	0.034	**0.290**	0.184	0.478	0.014	1.000	2,447	0.269
Primary (Pri)	0.020	0.191	**0.153**	0.597	0.039	1.000	588	0.065
Secondary (Sec)	0.018	0.075	0.088	**0.697**	0.122	1.000	819	0.090
Tertiary (Ter)	0.000	0.027	0.000	0.507	**0.466**	1.000	73	0.008
Total	0.113	0.298	0.163	0.403	0.024	**1.000**	9,112	1.000
Daughter (Born in 1975-1984: Census 2009)								
No Education (NE)	**0.324**	0.306	0.175	0.167	0.029	1.000	12,077	0.421
Some Primary (SomePri)	0.026	**0.344**	0.255	0.312	0.063	1.000	7,621	0.266
Primary (Pri)	0.016	0.184	**0.266**	0.421	0.113	1.000	3,014	0.105
Secondary (Sec)	0.012	0.085	0.155	**0.535**	0.212	1.000	4,623	0.161
Tertiary (Ter)	0.008	0.017	0.029	0.268	**0.678**	1.000	1,320	0.046
Total	0.147	0.255	0.196	0.296	0.106	**1.000**	28,655	1.000
Age 25-34	**Father-Daughter's Pairs**							
	NE	SomePri	Pri	Sec	Ter	Total	N	(%)
Daughter (Born in 1955-1964: Census 1989)								
No Education (NE)	**0.375**	0.234	0.178	0.206	0.008	1.000	1,730	0.517
Some Primary (SomePri)	0.108	**0.220**	0.223	0.424	0.026	1.000	1,048	0.313
Primary (Pri)	0.141	0.174	**0.185**	0.457	0.044	1.000	92	0.028
Secondary (Sec)	0.032	0.103	0.123	**0.624**	0.119	1.000	439	0.131
Tertiary (Ter)	0.029	0.000	0.059	0.382	**0.529**	1.000	34	0.010
Total	0.236	0.208	0.184	0.338	0.034	**1.000**	3,343	1.000
Daughter (Born in 1965-1974: Census 1999)								
No Education (NE)	**0.256**	0.351	0.147	0.241	0.005	1.000	1,790	0.333
Some Primary (SomePri)	0.052	**0.318**	0.195	0.428	0.008	1.000	1,782	0.332
Primary (Pri)	0.048	0.261	**0.201**	0.483	0.007	1.000	437	0.081
Secondary (Sec)	0.022	0.166	0.133	**0.629**	0.051	1.000	1,212	0.226
Tertiary (Ter)	0.020	0.094	0.020	0.483	**0.383**	1.000	149	0.028
Total	0.112	0.284	0.161	0.417	0.027	**1.000**	5,370	1.000
Daughter (Born in 1975-1984: Census 2009)								
No Education (NE)	**0.443**	0.254	0.141	0.137	0.026	1.000	4,672	0.275
Some Primary (SomePri)	0.037	**0.400**	0.245	0.266	0.052	1.000	4,151	0.245
Primary (Pri)	0.034	0.225	**0.304**	0.360	0.077	1.000	2,093	0.123
Secondary (Sec)	0.017	0.146	0.200	**0.493**	0.144	1.000	4,300	0.253
Tertiary (Ter)	0.010	0.042	0.045	0.353	**0.550**	1.000	1,760	0.104
Total	0.141	0.237	0.191	0.308	0.123	**1.000**	16,976	1.000

Source: IPUMS-Kenya (1989, 1999, 2009)

Note: NE: No Education; SomePri: Some Primary; Pri: Primary; Sec: Secondary; Ter: Tertiary. Each birth cohort (Sons and Daughters aged 25-34) is extracted from IPUMS-Kenya 1989; 1999; and 2009 data respectively

The detail analyses of the education transition matrices above is useful for describing the intergenerational mobility pattern between generations, however at the same time, it is unfitted to understand a whole picture of the mobility pattern at once and to compare magnitude of the overall intergenerational mobility. Following mobility index summarizes it and enables us to compare with other countries and sub-groups. The upward and downward mobility indicators are calculated as the average values of the four entries below/above the diagonal of the child-parent educational transition matrix (Table 4-6 Educational Mobility Index by Parent-Child Pair, Birth Cohort). The immobility ratio is calculated as the average value of the four entries on the matrices.

The probability of upward mobility for the child-parent pairs has decreased. For example, the mother-son pairs decreases from 0.40 (the oldest cohort) to 0.28 (the latest cohort) and the father-daughter pairs from 0.28 to 0.24, respectively. The reduction of upward mobility implies less chance to get ahead in Kenya. In a response to the less upward mobility, downward mobility and immobility index are generally increased. Especially, the immobility index remains high or increases among the birth cohorts. The composition of immobility index is generally more than 0.5 (e.g. 0.59 for father-son, 0.61 for father-daughter pairs).

In sum, it would appear that the reduction of upward mobility in concert with increases of downward mobility and immobility can be a proof of inequality of opportunities in Kenya. Even if educational opportunities are expanded, schooling does not necessarily open their future career paths (at least within the education cycle). The probability of attaining tertiary education is limited for children from more educated parents and the intergenerational persistence has become evident in the recent cohorts.

Table 4-6 Educational Mobility Index by Parent-Child Pair, Birth Cohort

	Upward Mobility	Downward Mobility	Immobility	Total
Mother-son				
1955-64	0.399	0.072	0.529	1.000
1965-74	0.353	0.136	0.511	1.000
1975-84	0.280	0.137	0.584	1.000
Father-son				
1955-64	0.334	0.120	0.547	1.000
1965-74	0.303	0.158	0.538	1.000
1975-84	0.236	0.176	0.588	1.000
Mother-Daughter				
1955-64	0.328	0.084	0.588	1.000
1965-74	0.333	0.141	0.526	1.000
1975-84	0.287	0.112	0.601	1.000
Father-Daughter				
1955-64	0.276	0.166	0.557	1.000
1965-74	0.282	0.191	0.527	1.000
1975-84	0.237	0.154	0.609	1.000

Source: IPUMS-Kenya (1989, 1999, 2009)

Note: The upward (downward) mobility indicators are calculated as the average of the four entries below (above) the diagonal. The Immobility ratio is the average of the main diagonal elements (Heineck & Riphahn, 2007, p.28).

Given the large proportion between parental and own education, the long-term trends in education must be self-perpetuating to some degree: if more educated parents tend to have more educated children, then an exogenous increase in parental education will lead to more educated children, who will tend to have more educated children, and so forth. This automatic increase of education can be referred to parental background effects(Daouli et al., 2010). Applying the decomposition method, this study attempts to examine how much of the observed changes of the intergenerational persistence in education depend on parental education and how much on the other general expansion effect in Kenya. This decomposition method applies information from the previous educational transition matrices. Using the equation 3.3 and 3.4 above, the results of the decomposition method for both paternal and maternal effects and for Secondary and Tertiary education are presented in Table 4-7 and Table 4-8.

Table 4-7 Decomposition of Child's Tertiary Educational Attainment, by Parent Level of Education

		Probability of Child's Educational Attainment by Level of Parent's Education			Probability of Parent's Education (PE) by Level of Education			Decomposition of the between cohort changes			Percentage Explained	
		[a] 1955-64: $P_t(Ter\|ME_j)$	[b] 1975-84 $P_{t-1}(Ter\|ME_j)$	[b-a] Difference	[c] 1955-64: $P_t(ME_j)$	[d] 1975-84: $P_{t-1}(ME_j)$	[d-c] Difference	[λ] General Expansion	[η] Growth of PE	[ΔTer] Between cohort change	General Expansion	Growth of PE
Child Attained Tertiary Education												
	Son											
	No Education	0.035	0.036	0.001	0.800	0.437	-0.363	0.001	-0.013	-0.012	0.06	0.94
	Primary	0.092	0.064	-0.028	0.155	0.283	0.128	-0.004	0.012	0.007	0.27	0.73
Mother	Some Primary	0.175	0.095	-0.080	0.012	0.103	0.091	-0.001	0.016	0.015	0.06	0.94
	Secondary	0.327	0.182	-0.145	0.032	0.142	0.110	-0.005	0.036	0.031	0.12	0.88
	Tertiary	0.800	0.584	-0.216	0.001	0.035	0.034	0.000	0.027	0.027	0.01	0.99
	Total							**-0.009**	**0.078**	**0.069**	**0.10**	**0.90**
	Daughter											
	No Education	0.009	0.029	0.020	0.783	0.421	-0.362	0.016	-0.010	0.005	0.60	0.40
	Primary	0.052	0.063	0.011	0.161	0.266	0.105	0.002	0.007	0.008	0.21	0.79
Mother	Some Primary	0.169	0.113	-0.056	0.016	0.105	0.089	-0.001	0.010	0.009	0.08	0.92
	Secondary	0.204	0.212	0.008	0.038	0.161	0.123	0.000	0.026	0.026	0.01	0.99
	Tertiary	0.778	0.678	-0.100	0.002	0.046	0.044	0.000	0.030	0.030	0.01	0.99
	Total							**0.017**	**0.062**	**0.079**	**0.18**	**0.82**
Child Attained Tertiary Education												
	Son											
	No Education	0.025	0.028	0.003	0.530	0.295	-0.234	0.002	-0.006	-0.004	0.21	0.79
	Primary	0.055	0.047	-0.008	0.316	0.256	-0.060	-0.003	-0.003	-0.006	0.44	0.56
Father	Some Primary	0.062	0.066	0.004	0.022	0.123	0.101	0.000	0.006	0.006	0.01	0.99
	Secondary	0.176	0.138	-0.038	0.121	0.239	0.118	-0.005	0.021	0.016	0.18	0.82
	Tertiary	0.625	0.458	-0.167	0.011	0.086	0.075	-0.002	0.047	0.045	0.04	0.96
	Total							**-0.007**	**0.065**	**0.058**	**0.18**	**0.82**
	Daughter											
	No Education	0.008	0.026	0.018	0.517	0.275	-0.242	0.009	-0.006	0.003	0.60	0.40
	Primary	0.026	0.052	0.026	0.313	0.245	-0.069	0.008	-0.004	0.005	0.69	0.31
Father	Some Primary	0.044	0.077	0.033	0.028	0.123	0.096	0.001	0.007	0.008	0.11	0.89
	Secondary	0.119	0.144	0.025	0.131	0.253	0.122	0.003	0.018	0.021	0.16	0.84
	Tertiary	0.529	0.550	0.021	0.010	0.104	0.094	0.000	0.051	0.052	0.00	1.00
	Total							**0.022**	**0.066**	**0.088**	**0.31**	**0.69**

Source: Table 4-5, 4-6

Table 4-8 Decomposition of Child's Secondary Educational Attainment by Parental Level of Education

		Probability of Child's Educational Attainment by Level of Parent's Education			Probability of Parent's Education (PE) by Level of Education			Decomposition of the between cohort changes			Percentage Explained	
		[a] 1955-64: $P_t(Ter\|ME_j)$	[b] 1975-84 $P_{t-1}(Ter\|ME_j)$	[b-a] Difference	[c] 1955-64: $P_t(ME_j)$	[d] 1975-84: $P_{t-1}(ME_j)$	[d-c] Difference	[λ] General Expansion	[η] Growth of PE	[ΔTer] Between cohort change	General Expansion	Growth of PE
Child Attained Secondary Education												
	Son											
	No Education	0.311	0.170	-0.141	0.800	0.437	-0.363	-0.113	-0.113	-0.226	0.50	0.50
	Primary	0.527	0.312	-0.215	0.155	0.283	0.128	-0.033	0.067	0.034	0.33	0.67
Mother	Some Primary	0.587	0.403	-0.184	0.012	0.103	0.091	-0.002	0.054	0.051	0.04	0.96
	Secondary	0.527	0.519	-0.008	0.032	0.142	0.110	0.000	0.058	0.058	0.00	1.00
	Tertiary	0.200	0.347	0.147	0.001	0.035	0.034	0.000	0.007	0.007	0.02	0.98
	Total							**-0.148**	**0.073**	**-0.076**	**0.18**	**0.82**
	Daughter											
	No Education	0.235	0.167	-0.068	0.783	0.421	-0.362	-0.053	-0.060	-0.114	0.47	0.53
	Primary	0.538	0.312	-0.226	0.161	0.266	0.105	-0.036	0.033	-0.004	0.53	0.47
Mother	Some Primary	0.472	0.421	-0.051	0.016	0.105	0.089	-0.001	0.038	0.037	0.02	0.98
	Secondary	0.667	0.535	-0.132	0.038	0.161	0.123	-0.005	0.066	0.061	0.07	0.93
	Tertiary	0.111	0.268	0.157	0.002	0.046	0.044	0.000	0.012	0.012	0.02	0.98
	Total							**-0.095**	**0.088**	**-0.008**	**0.22**	**0.78**
Child Attained Secondary Education												
	Son											
	No Education	0.235	0.167	-0.068	0.530	0.295	-0.234	-0.036	-0.055	-0.091	0.40	0.60
Father	Primary	0.538	0.312	-0.226	0.316	0.256	-0.060	-0.071	-0.032	-0.103	0.69	0.31
	Some Primary	0.472	0.421	-0.051	0.022	0.123	0.101	-0.001	0.048	0.047	0.02	0.98
	Secondary	0.667	0.535	-0.132	0.121	0.239	0.118	-0.016	0.079	0.063	0.17	0.83
	Tertiary	0.111	0.268	0.157	0.011	0.086	0.075	0.002	0.008	0.010	0.17	0.83
	Total							**-0.123**	**0.047**	**-0.075**	**0.29**	**0.71**
	Daughter											
	No Education	0.206	0.137	-0.030	0.517	0.275	-0.242	-0.016	-0.033	-0.049	0.32	0.68
Father	Primary	0.424	0.266	-0.158	0.313	0.245	-0.069	-0.050	-0.018	-0.068	0.73	0.27
	Some Primary	0.457	0.360	-0.097	0.028	0.123	0.096	-0.003	0.034	0.032	0.07	0.93
	Secondary	0.624	0.493	-0.131	0.131	0.253	0.122	-0.017	0.060	0.043	0.22	0.78
	Tertiary	0.382	0.353	-0.029	0.010	0.104	0.094	0.000	0.033	0.033	0.01	0.99
	Total							**-0.085**	**0.076**	**-0.009**	**0.27**	**0.73**

Source: Table 4-5, 4-6

Observed total 6.9% growth in Tertiary educational attainment of mother-son pairs between two cohorts is decomposed into a paternal effect (90%) and a general expansion effect (10%). The similar trend holds for other parent-child pairs and Secondary level of education categories. A total 0.9 percentage point decrease indicates the net expansion effect of a given level of education, while the remaining 7.8 percentage point (or 90 percent of the overall increase) is due to the improvement in the parental education. Overall cohort change can be cancel out is partly offset by a decline of the general expansion effect, meaning that the rate of increase in child's educational attainment is not much as fast as parent's educational attainment.

The large share of the parental background (both maternal and paternal pairs) effects implies that weak overall intergenerational persistence in education is originally from the secular increase of parental education. While there was a small but some expansion effects for both sons and daughters, this does not prove that all education strata benefited equally from it(Alejandra et al., 2007). For example, academic degree holders may increase faster for the bottom groups (those who have less educated parents), while all groups benefit equally; or even the case that increased polarization due to higher increase rate of degree holders from more educated parents than those from less educated parents. Distribution of the expansion effect and parental effects tell us that child's Tertiary and Secondary educational attainments tend to be tight intergenerational linkage for more educated parents.

4.1.2 Intergenerational upward mobility in Kenya

Previous section shows that changes of the intergenerational persistence in education and findings indicate that Kenya is a fairly mobile society and the secular increase of parental education is a source of weak intergenerational linkage. As seen in the later section, attaining Tertiary education does not guarantee obtaining a job in non-farm sector. In order to confirm how the intergenerational persistence in education relates to child's labor market outcome, this section examines the role of schooling in intergenerational upward mobility in Kenya. Instead of income information, which is not available in the population census, this analysis uses occupation. There are four categories of occupation: (1) Inactive; (2) Non-Farm (Public/Private Modern sector); (3) Farm; and (4) Others. Inactive includes full-time students, job seekers, and those who are already retired. Non-Farm sector is generally composed of those who earn wages. Farm sector is agriculture, pastoralists, and other primary industry. The rest is categorized as other sector, including those who work in informal sector.

Purpose of this analysis is to investigate how own schooling improves chance to work in non-farm sector. Before multivariate analyses are conducted, occupational transition matrices by level of parent's education are constructed. It is noted that this analysis uses the latest birth cohort (born in 1975-84) from IPUMS-Kenya, 2009. Table 4-9 shows occupational transition matrices for both mother-child and father-child pairs. One of the trends is that farmer's sons and daughters are highly likely to be farmers. For example, the probability of being a farmer is 0.680 for mother-son pairs and 0.693 for father-son pairs, respectively. This tight intergenerational persistence of farmers between the two generations can be true for all parent-child pairs. In terms of non-farmers, the intergenerational persistence is relatively weak in non-farm sector (0.412, 0.473 for mother-son, father-son pairs).

Table 4-9 Occupational Transition Matrices

Age 25-34	Son (Born in 1975-84: Census 2009)						
	Inactive	Others	Farm	Non-Farm	Total	N	(%)
Mother							
Inactive	**0.286**	0.011	0.552	0.151	1.000	26,251	0.509
Others	0.320	**0.113**	0.391	0.177	1.000	391	0.008
Farm	0.193	0.010	**0.680**	0.118	1.000	20,685	0.401
Non-Farm	0.263	0.015	0.310	**0.412**	1.000	4,249	0.082
Total	0.247	0.012	0.582	0.159	**1.000**	51,576	1.000
Father							
Inactive	**0.398**	0.012	0.436	0.154	1.000	15,298	0.297
Others	0.265	**0.177**	0.323	0.235	1.000	328	0.006
Farm	0.175	0.009	**0.693**	0.123	1.000	32,035	0.621
Non-Farm	0.251	0.013	0.263	**0.473**	1.000	3,915	0.076
Total	0.247	0.012	0.582	0.159	**1.000**	51,576	1.000
Age 25-34	Daughter (Born in 1975-84: Census 2009)						
	Inactive	Others	Farm	Non-Farm	Total	N	(%)
Mother							
Inactive	**0.327**	0.012	0.519	0.142	1.000	18,051	0.550
Others	0.430	**0.106**	0.276	0.189	1.000	265	0.008
Farm	0.244	0.009	**0.640**	0.106	1.000	11,809	0.360
Non-Farm	0.324	0.019	0.312	**0.344**	1.000	2,670	0.081
Total	0.298	0.012	0.544	0.146	**1.000**	32,795	1.000
Father							
Inactive	**0.509**	0.011	0.342	0.138	1.000	10,065	0.307
Others	0.323	**0.193**	0.332	0.153	1.000	223	0.007
Farm	0.191	0.010	**0.695**	0.104	1.000	19,680	0.600
Non-Farm	0.285	0.021	0.229	**0.466**	1.000	2,827	0.086
Total	0.298	0.012	0.544	0.146	**1.000**	32,795	1.000

Source: IPUMS-Kenya (2009)

Note: Inactive: Unemployment (i.e. full-time students, job seekers, those who are retired); Non-Farm: Public/Private Company; Farm: Agriculture and individual business; Others: Other sectors. Parental occupation is separated by level of parent's education.

The above occupational transition matrices show that there exists the intergenerational occupational linkage in Kenya to some extent. Paying more attention to the relative effect of child's own schooling on the probability of working in Non-Farm sector, following probit estimations are applied in this study.

Table 4-10 indicates results of the probit estimation by their origin. Primary concern is the coefficient of own schooling in Farm-origin sons and daughters. Both farm-origin son's and daughter's marginal effects of own schooling are all positive and statistically significant. Probability of working in non-farm sector is generally higher for those who completed Tertiary education than any other level of education. Both sons and daughters in farm-origin indicate that paternal level of education and maternal level of education are not statistically significant. Mother's working in non-farm sector is exceptionally positive and significant, compared to other sectors.

On the other hand, child's probability of working in non-farm sector is less likely to be determined by own schooling. Child's educational attainment at Tertiary level of education is positive and statistically significant for both sons and daughters (0.170, 0.242, respectively). It would appear that parental backgrounds are more important for children in non-farm origin than children in farm-origin.

Table 4-10 Marginal Effect of Own Schooling on One's Work in Non-Farm by Father's Level of Education

Census 2009	Son		Daughter	
Born 1975-84 (Age25-34)	Non-Farm Origin	Farm Origin	Non-Farm Origin	Farm Origin
	[1]	[2]	[3]	[4]
	Work in Non-Farm		**Work in Non-Farm**	
Child: Primary Education	0.076	0.042	0.006	0.042
	[0.025]**	[0.007]***	[0.032]	[0.010]***
Child: Secondary Education	0.008	0.058	0.044	0.099
	[0.023]	[0.007]***	[0.029]	[0.009]***
Child: Tertiary Education	0.170	0.282	0.242	0.323
	[0.030]***	[0.015]***	[0.039]***	[0.021]***
Father: Primary Education	-0.005	-0.003	0.000	0.010
	[0.027]	[0.007]	[0.034]	[0.009]
Father: Secondary Education	-0.066	-0.002	-0.016	0.008
	[0.023]**	[0.006]	[0.029]	[0.007]
Father: Tertiary Education	-0.131	-0.014	-0.069	0.010
	[0.028]***	[0.010]	[0.034]*	[0.012]
Mother: Primary Education	-0.025	0.009	0.009	0.001
	[0.027]	[0.008]	[0.034]	[0.009]
Mother: Secondary Education	-0.075	-0.009	-0.043	0.005
	[0.023]**	[0.007]	[0.027]	[0.008]
Mother: Tertiary Education	-0.117	-0.015	-0.151	-0.014
	[0.034]***	[0.013]	[0.034]***	[0.013]
Mother: Work in Non-farm	0.227	0.131	0.278	0.090
	[0.021]***	[0.019]***	[0.026]***	[0.020]***
Mother: Work in Farm	-0.059	0.005	-0.064	-0.022
	[0.020]**	[0.005]	[0.025]**	[0.007]**
Mother: Work in Other	0.038	0.093	-0.068	0.036
	[0.083]	[0.051]	[0.114]	[0.043]
Age	0.118	0.034	0.104	0.036
	[0.071]	[0.018]	[0.084]	[0.021]
Age^2	-0.002	-0.001	-0.002	-0.001
	[0.001]	[0.000]	[0.001]	[0.000]
Number of siblings	0.001	-0.001	-0.005	-0.001
	[0.006]	[0.002]	[0.007]	[0.002]
Firstborn	0.090	0.013	0.115	0.021
	[0.030]**	[0.009]	[0.051]*	[0.015]
Married	0.109	0.025	-0.017	-0.016
	[0.021]***	[0.006]***	[0.027]	[0.006]*
Married Polygamous	0.034	0.015	-0.024	-0.045
	[0.129]	[0.034]	[0.089]	[0.017]**
Separated/Divorced/Widowed	0.005	-0.007	0.109	-0.010
	[0.048]	[0.011]	[0.035]**	[0.007]
Family size	-0.003	0.001	-0.001	0.000
	[0.005]	[0.001]	[0.006]	[0.001]
Extended family	0.019	0.005	-0.006	-0.003
	[0.020]	[0.005]	[0.023]	[0.006]
Owned House	-0.013	0.002	0.039	-0.006
	[0.024]	[0.010]	[0.027]	[0.011]
Access Sewage	0.059	0.009	0.091	0.017
	[0.030]	[0.013]	[0.034]**	[0.014]

Access Electricity	0.000	-0.009	-0.013	0.009
	[0.027]	[0.008]	[0.030]	[0.009]
Urban	0.029	0.021	0.004	0.018
	[0.021]	[0.006]**	[0.026]	[0.008]*
Central born	0.049	0.046	0.024	0.026
	[0.029]	[0.010]***	[0.032]	[0.010]**
Coast born	0.021	0.059	-0.030	0.016
	[0.031]	[0.013]***	[0.038]	[0.013]
Eastern born	-0.033	0.029	-0.033	0.003
	[0.027]	[0.009]***	[0.032]	[0.009]
North Eastern born	-0.137	-0.052	-0.076	-0.016
	[0.048]**	[0.009]***	[0.064]	[0.014]
Nyanza born	-0.066	-0.011	-0.029	-0.019
	[0.029]*	[0.008]	[0.035]	[0.009]*
Rift Valley born	-0.009	0.010	0.024	0.018
	[0.026]	[0.008]	[0.031]	[0.009]
Pseudo R2	0.081	0.071	0.098	0.131
N	4249	20685	2670	11809
Log Likelihood	-2645.334	-6957.625	-1549.781	-3468.632

Source: IPUMS-Kenya (2009) Note: Standard error in parentheses.

4.2 Rate of Return to Education in Kenya

The above intergenerational persistence in education and the intergenerational persistence analyses indicate the secular rise of parent's schooling weaken the intergenerational persistence in education and own schooling increase probability of working in non-farm sector for farm-origin children. Paying more attention to the role of own schooling in the intergenerational persistence in Kenya, this study applies private rate of return to education analysis. Following findings compare rate of return to education by different parent's level of education and by treatment group created by fee abolition policies.

4.2.1 Return to schooling with mother's education as instrument

Table 4-11 and Table 4-12 show results of the private rate of return to education for both male and female sample (See Appendix I and J for detailed findings). This study applies four different Mincerian earning functions: (1) OLS; (2) IV; (3) Heckman two-step procedure; and (4) Joint IV-Heckman estimation. Unlike the intergenerational persistence analyses above, the analytical sample is restricted to adults aged from 15 to 65. As the first instrument applied here is mother's education (1=mother attained post primary level of education, 0 otherwise). Average returns to an additional year of schooling for the overall sample of wage-workers in Kenya are statistically significant at the 1% level for both sexes and across the various methods. An additional year of schooling would increase wages by 11.8% for males and 12.2% for females in the OLS estimation (Table 4-11 and Table 4-12). These results are fair, compared to previous literature. Global average of the rate of return to another year of schooling is 10.4% from a large database of existing national household surveys and if their dataset is restricted to the recent one only, the average rate of return to additional year of

schooling is 9.9% (Montenegro & Patrinos, 2013).

An additional year of schooling increase wages by 17.9% for males and 22.2% for females in the IV estimations, which is 50% or more than the results of the OLS estimate. While typical results of the IV studies reported a 10-20% increase, these findings are unexpectedly high. Although they are not consistent with previous results for returns to schooling in the literature, the Cragg-Donald F-statistic (First stage F-statistics in the tables) and Shea's Partial R-square confirm mother's education to be a fair instrument. The difference of the OLS and the IV estimation would come from difference of the characteristics of the treatment group (wage earners whose mothers have completed post-primary education) and the control group. The unexpectedly higher return to schooling can be explained by the intergenerational effect, which is examined in the previous section.

In contrast, another year of schooling decreases wages by 11.7% for males and 11.4% for females in the Heckman's estimates. Reduced return to schooling is consistent with previous literature, however, the selectivity term (Lambda) indicate mixed results. It is statistically significant and negative for males, but not statistically significant for females. When this study tests a set of models which is a combination of controls for individual factors, provincial dummies, and ethnicity dummies (language of use), the selectivity term is statistically significant for females in the model which excludes provincial dummies.

Finally, an additional year of schooling increases wages by 20.0% for males and 18.1% for females in the joint IV-Heckman estimation. Mother's education in the first stage is statistically significant for males and females, but the selectivity term is not, implying that there is not much difference of the return to education for observed and unobserved wage-earners for the treatment group.

Table 4-11 Return to Schooling with Mother's Education, Male Sample

Male(Age 30-40)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	IV		Heckman		Joint IV-Heckman		
VARIABLES	LnW	LnW	Eduyear	LnW	WageW	LnW	Eduyear	WageW
Year of Schooling	0.118***	0.179***		0.117***	0.006*	0.200***		
	(0.004)	(0.039)		(0.004)	(0.003)	(0.024)		
Married	0.160***	0.117***	0.780***	0.135***	0.039	0.101**	0.490***	0.032
	(0.035)	(0.045)	(0.128)	(0.037)	(0.039)	(0.040)	(0.146)	(0.039)
Age	0.081***	0.053***	0.462***	0.058***	0.158***	0.042***	0.251*	0.155***
	(0.008)	(0.019)	(0.029)	(0.014)	(0.006)	(0.015)	(0.131)	(0.006)
Age^2	-0.001***	-0.000	-0.006***	-0.000***	-0.002***	-0.000	-0.004**	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
Urban	0.292***	0.177**	1.891***	0.216***	0.520***	0.131**	1.062**	0.542***
	(0.030)	(0.079)	(0.106)	(0.046)	(0.027)	(0.058)	(0.423)	(0.026)
Post-Primary mom			2.790***				4.061***	-0.752***
			(0.382)				(0.756)	(0.062)
LnHHExp					0.081***		-0.049	0.080***
					(0.011)		(0.072)	(0.010)
Headship					0.484***		0.572	0.423***
					(0.039)		(0.369)	(0.039)
HHChild6-					-0.043***		-0.209***	-0.045***
					(0.011)		(0.060)	(0.011)
HHAdult65+					0.065**		-0.207	0.043
					(0.029)		(0.145)	(0.028)
Owned House					-0.011		-0.248**	-0.016
					(0.023)		(0.098)	(0.023)
Embu	-0.076	-0.219	2.313***	-0.101	0.258***	-0.270**	2.018***	0.283***
	(0.110)	(0.144)	(0.399)	(0.111)	(0.088)	(0.126)	(0.447)	(0.087)
Kalenjin	-0.196***	-0.204***	0.117	-0.168***	-0.153***	-0.205***	0.395	-0.165***
	(0.059)	(0.061)	(0.214)	(0.060)	(0.046)	(0.063)	(0.258)	(0.046)
Kamba	0.065	-0.036	1.610***	0.027	0.390***	-0.074	1.291***	0.431***
	(0.084)	(0.107)	(0.305)	(0.086)	(0.069)	(0.096)	(0.443)	(0.068)
Kikuyu	0.036	0.017	0.260	0.043	-0.004	0.011	0.334	0.037
	(0.079)	(0.082)	(0.288)	(0.080)	(0.078)	(0.083)	(0.288)	(0.078)
Kisii	-0.153	-0.184	0.472	-0.123	-0.185**	-0.192*	0.670	-0.187**
	(0.110)	(0.114)	(0.400)	(0.111)	(0.092)	(0.117)	(0.425)	(0.091)
Luhya	-0.345***	-0.342***	-0.201	-0.355***	0.053	-0.341***	-0.246	0.081
	(0.104)	(0.107)	(0.379)	(0.105)	(0.079)	(0.109)	(0.381)	(0.079)
Luo	-0.024	-0.030	0.089	-0.068	0.415***	-0.035	-0.271	0.404***
	(0.085)	(0.087)	(0.308)	(0.088)	(0.076)	(0.091)	(0.429)	(0.076)
Maasai	0.576***	0.829***	-4.174***	0.583***	0.018	0.917***	-3.844***	-0.017
	(0.105)	(0.192)	(0.376)	(0.105)	(0.081)	(0.146)	(0.375)	(0.078)
Meru	-0.168*	-0.257**	1.385***	-0.181**	0.147**	-0.288***	1.188***	0.190***
	(0.092)	(0.109)	(0.332)	(0.092)	(0.072)	(0.101)	(0.355)	(0.071)
Mijikenda	0.211*	0.306**	-1.536***	0.176	0.288***	0.336***	-1.754***	0.307***
	(0.110)	(0.127)	(0.397)	(0.111)	(0.098)	(0.123)	(0.463)	(0.097)
Somali	0.648*	0.815**	-2.696**	0.664*	-0.049	0.874**	-2.353*	-0.135
	(0.361)	(0.384)	(1.309)	(0.363)	(0.403)	(0.381)	(1.302)	(0.403)
English	0.662***	0.483***	2.846***	0.654***	0.183***	0.420***	2.683***	0.270***
	(0.057)	(0.127)	(0.202)	(0.057)	(0.056)	(0.090)	(0.266)	(0.055)
Central	-0.301***	-0.295***	-0.034	-0.308***	0.039	-0.293***	-0.140	0.027
	(0.088)	(0.090)	(0.320)	(0.089)	(0.092)	(0.092)	(0.319)	(0.092)
Coast	-0.031	0.061	-1.468***	-0.030	0.061	0.092	-1.354***	0.034

	(0.063)	(0.086)	(0.228)	(0.063)	(0.067)	(0.074)	(0.233)	(0.066)
Eastern	-0.478***	-0.301**	-2.822***	-0.439***	-0.283***	-0.237**	-2.382***	-0.326***
	(0.079)	(0.138)	(0.284)	(0.081)	(0.073)	(0.105)	(0.367)	(0.071)
Northeastern	-0.290	-0.208	-1.343	-0.202	-0.610	-0.173	-0.491	-0.597
	(0.363)	(0.375)	(1.317)	(0.368)	(0.404)	(0.381)	(1.385)	(0.404)
Nyanza	-0.540***	-0.520***	-0.272	-0.518***	-0.158*	-0.512***	-0.045	-0.142*
	(0.084)	(0.087)	(0.306)	(0.085)	(0.083)	(0.088)	(0.320)	(0.083)
Rift valley	-0.327***	-0.294***	-0.493**	-0.319***	-0.049	-0.282***	-0.442**	-0.049
	(0.059)	(0.064)	(0.214)	(0.059)	(0.063)	(0.063)	(0.217)	(0.062)
Western	-0.691***	-0.622***	-1.089***	-0.641***	-0.236***	-0.595***	-0.609**	-0.238***
	(0.069)	(0.082)	(0.248)	(0.073)	(0.069)	(0.077)	(0.310)	(0.069)
Lambda				-0.188**		-0.013	-1.556	
				(0.087)		(0.088)	(1.177)	
Constant	0.562***	0.553***	-0.107	1.208***	-4.310***	0.594*	6.089	-4.110***
	(0.149)	(0.153)	(0.543)	(0.334)	(0.162)	(0.331)	(4.350)	(0.160)
Observations	5,406	5,406	5,406	17,071	17,071	5,406	5,406	17,405
Censored				11665	11665			
R^2	0.420	0.391	0.282			0.368	0.296	
First stage F-Stats		53.33	.			24.44		
Shea R^2		0.00981	.			0.0266		
F	162.1	115.7	87.93			109.3	75.23	
Pseudo R^2								0.200
Wald chi^2				1947	1947			

Source: KIHBS (2005); Notes: Standard errors in parenthesis; *** p < 0.01, ** p < 0.05, * p < 0.1.; LnW: Log Hourly Wage; Eduyear: Year of Education: Individual factors include Age, Age squared, Marital status (1=Married); Post Primary_mom is a dummy variable (1=mother attained post-primary education); Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChild6-: Having children under 6 years old in households; HHAdult65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term.

Table 4-12 Return to Schooling with Mother's Education, Female Sample

Female(Age 30-40)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	IV		Heckman		Joint IV-Heckman		
VARIABLES	LnW	LnW	Eduyear	LnW	WageW	LnW	Eduyear	WageW
Year of Schooling	0.122***	0.220***		0.114***	0.038***	0.181***		
	(0.005)	(0.055)		(0.007)	(0.004)	(0.030)		
Married	0.132***	0.051	0.919***	0.198***	-0.212***	0.117*	0.451	-0.249***
	(0.040)	(0.062)	(0.135)	(0.057)	(0.029)	(0.060)	(0.449)	(0.029)
Age	0.084***	0.042	0.438***	0.049**	0.147***	0.040	0.765***	0.154***
	(0.011)	(0.026)	(0.035)	(0.024)	(0.007)	(0.026)	(0.275)	(0.006)
Age^2	-0.001***	-0.000	-0.007***	-0.000	-0.002***	-0.000	-0.011***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)
Urban	0.278***	0.089	1.911***	0.165**	0.494***	0.097	2.775***	0.560***
	(0.044)	(0.115)	(0.144)	(0.083)	(0.029)	(0.101)	(0.988)	(0.028)
Post-Primary_mom			2.425***				1.282	-0.504***
			(0.428)				(1.004)	(0.069)
LnHHExp					0.054***		0.308***	0.056***
					(0.012)		(0.109)	(0.012)
Headship					0.289***		0.261	0.232***
					(0.034)		(0.415)	(0.033)
HHChild6-					0.000		-0.492***	-0.024**
					(0.012)		(0.078)	(0.012)
HHAdult65+					-0.003		-0.212	-0.015
					(0.031)		(0.177)	(0.030)
Owned House					-0.072***		-0.252	-0.084***
					(0.025)		(0.190)	(0.025)
Embu	-0.623***	-0.765***	1.404**	-0.590***	-0.051	-0.700***	1.413**	0.029
	(0.185)	(0.210)	(0.620)	(0.187)	(0.105)	(0.193)	(0.615)	(0.103)
Kalenjin	-0.175*	-0.254**	0.840***	-0.136	-0.136**	-0.204**	0.712*	-0.128**
	(0.093)	(0.107)	(0.310)	(0.096)	(0.054)	(0.099)	(0.397)	(0.053)
Kamba	-0.256**	-0.357***	1.049***	-0.322***	0.365***	-0.365***	2.098**	0.483***
	(0.117)	(0.136)	(0.393)	(0.125)	(0.074)	(0.133)	(0.913)	(0.072)
Kikuyu	0.036	0.008	0.263	0.058	-0.072	0.026	0.258	-0.028
	(0.112)	(0.119)	(0.376)	(0.114)	(0.086)	(0.115)	(0.374)	(0.085)
Kisii	-0.091	-0.174	0.825	-0.032	-0.246**	-0.114	0.122	-0.224**
	(0.164)	(0.179)	(0.550)	(0.169)	(0.099)	(0.171)	(0.688)	(0.097)
Luhya	0.101	0.220	-1.137**	0.110	-0.044	0.180	-1.236**	-0.078
	(0.171)	(0.192)	(0.574)	(0.172)	(0.093)	(0.178)	(0.591)	(0.093)
Luo	0.051	0.159	-1.103***	-0.025	0.369***	0.078	-0.415	0.349***
	(0.118)	(0.138)	(0.395)	(0.128)	(0.079)	(0.131)	(0.715)	(0.077)
Maasai	0.659***	1.182***	-5.304***	0.588***	0.338***	0.957***	-4.708***	0.181**
	(0.144)	(0.330)	(0.473)	(0.151)	(0.085)	(0.214)	(0.557)	(0.083)
Meru	-0.528***	-0.660***	1.337***	-0.519***	0.013	-0.613***	1.475***	0.108
	(0.141)	(0.165)	(0.470)	(0.141)	(0.083)	(0.148)	(0.490)	(0.081)
Mijikenda	0.725***	1.028***	-3.087***	0.637***	0.457***	0.869***	-1.979**	0.410***
	(0.150)	(0.232)	(0.499)	(0.160)	(0.096)	(0.182)	(0.866)	(0.096)
Somali	0.183	0.122	0.752	0.247	-0.248	0.195	0.255	-0.406
	(0.607)	(0.637)	(2.032)	(0.611)	(0.409)	(0.619)	(2.147)	(0.397)
English	0.572***	0.375***	2.051***	0.521***	0.338***	0.414***	2.781***	0.418***
	(0.073)	(0.135)	(0.240)	(0.080)	(0.055)	(0.102)	(0.710)	(0.053)
Central	-0.247**	-0.209*	-0.299	-0.307**	0.301***	-0.255**	0.381	0.290***
	(0.119)	(0.126)	(0.398)	(0.126)	(0.096)	(0.126)	(0.623)	(0.095)
Coast	-0.109	0.130	-2.348***	-0.116	0.084	0.044	-2.094***	-0.035

	(0.093)	(0.166)	(0.310)	(0.094)	(0.069)	(0.119)	(0.317)	(0.067)
Eastern	-0.181	0.036	-2.140***	-0.154	-0.130*	-0.021	-2.491***	-0.268***
	(0.111)	(0.169)	(0.369)	(0.113)	(0.076)	(0.133)	(0.581)	(0.073)
Northeastern	0.423	1.044	-6.334***	0.507	-0.341	0.853	-7.143***	-0.425
	(0.616)	(0.734)	(2.059)	(0.621)	(0.411)	(0.654)	(2.187)	(0.399)
Nyanza	-0.682***	-0.628***	-0.471	-0.679***	0.006	-0.646***	-0.089	0.000
	(0.118)	(0.128)	(0.396)	(0.119)	(0.085)	(0.121)	(0.401)	(0.083)
Rift valley	-0.276***	-0.204**	-0.665**	-0.275***	0.008	-0.228***	-0.505*	-0.030
	(0.084)	(0.097)	(0.282)	(0.085)	(0.064)	(0.088)	(0.291)	(0.063)
Western	-0.805***	-0.709***	-0.950***	-0.743***	-0.206***	-0.711***	-0.877	-0.224***
	(0.100)	(0.118)	(0.336)	(0.108)	(0.071)	(0.112)	(0.534)	(0.071)
Lambda				-0.277		-0.145	2.780	
				(0.172)		(0.155)	(2.338)	
Constant	0.131	0.022	0.739	1.211*	-4.422***	0.601	-11.469	-4.118***
	(0.197)	(0.216)	(0.664)	(0.700)	(0.183)	(0.610)	(9.105)	(0.181)
Observations	3,146	3,146	3,146	17,798	17,798	3,146	3,146	18,158
Censored				14652	14652			
R^2	0.360	0.291	0.323			0.335	0.339	
First stage F-stats		0.0102				17.98		
Shea R^2						0.0335		
F	73.14	46.89	62.06			48.84	53.25	
Pseudo R^2								0.145
Wald chi^2		32.10		841.6	841.6			

Source: KIHBS (2005); Notes: Standard errors in parenthesis; *** p < 0.01, ** p < 0.05, * p < 0.1.; LnW: Log Hourly Wage; Eduyear: Year of Education (Dependent variable of the First Stage Estimation): Individual factors include Age, Age squared, Marital status (1=Married); FPE policy is a dummy variable (1=FPE treatment group); Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term.

4.2.2 Return to schooling with the 1st FPE policy dummy as instruments

This study also tests a different instrument, the first FPE policy implemented from 1974-79. As seen in the literature review section, policy related instruments is more relevant for identifying causal effect of own schooling on wage. The analytical sample is restricted to wage-earners aged 30-40 (born in 1965-75). This is to eliminate the influence comes from different birth cohorts to see difference of FPE treatment group and control group.

Again, this study starts to confirm average returns to an additional year of schooling for the overall sample of wage-workers. They are statistically significant for both sexes and across all means of estimation. OLS returns to schooling for both males (14.0%) and females (13.4%) are fair, compared to the global average (Table 4-13 and Table 4-14). IV estimates show that an additional year of schooling increases wage by 10.2% for males and 11.5% for females, reducing the OLS estimate by about 27% for males and 14% for females. Although they are not consistent with previous results for returns to schooling in the literature that typically find OLS results to be biased upwards with respect to those estimated by IV, the Cragg-Donald F-statistic (56.42 for males; and 34.49 for females) confirm the FPE policy instrument to be a fair instrument for years of schooling for both males and females overall.

Returns to schooling estimated by the Heckman two-step procedure show evidence of a statistically significant upward selectivity bias in the OLS returns to schooling. An additional year of schooling decreases wages by 5% for males and by 1.9% for females in the Heckman's model. Although the magnitude of the selectivity bias is comparatively small and they are statistically significant for both males and females. The selectivity term, Lambda is not statistically significant for both males and females. The statistically significance of selectivity term implies that the probability of working in wage sector is not random; rather other factors such as household

characteristics generates heterogeneous employability of wage workers. The negative sign of the Heckman's selectivity term implies that the employability of wage workers affects return to education downward. In this analysis, the selectivity term is usually not statistically significant. Considering the fact that a large proportion of workers are inactive due to unemployment, this result is puzzling. Further investigation is needed.

The IV and Heckman returns to schooling lower the OLS return to schooling for males and females. What if the instrument and Heckman's selectivity term are introduced simultaneously? Returns to education from the joint IV-Heckman procedure show 13.6% and 16.6% increase of wages for males and females, respectively. They are slightly higher for both males and females than those of the IV estimates. The selectivity term is statistically insignificant in the joint IV-Heckman estimate of returns to schooling for both males and females (it is statistically significant in a different model, see Appendix).

Table 4-13 Returns to Schooling with FPE policy instrument, Male Sample

Male(Age 30-40)	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	OLS	**IV**		**Heckman**		**Joint IV-Heckman**		
VARIABLES	LnW	LnW	Eduyear	LnW	WageW	LnW	Eduyear	WageW
Eduyear	0.140***	0.102***		0.133***	0.059***	0.136***		
	(0.006)	(0.037)		(0.009)	(0.006)	(0.032)		
Married	0.107*	0.150**	1.103***	0.091	0.065	0.083	0.789**	0.107
	(0.062)	(0.075)	(0.220)	(0.063)	(0.071)	(0.069)	(0.324)	(0.070)
Age	-0.057	-0.035	-2.714***	-0.083	0.27	-0.097	-2.746***	0.217
	(0.175)	(0.177)	(0.769)	(0.176)	(0.168)	(0.176)	(0.846)	(0.193)
Age2	0.001	0.001	0.037***	0.002	-0.004	0.002	0.037***	-0.003
	(0.003)	(0.003)	(0.011)	(0.003)	(0.002)	(0.003)	(0.012)	(0.003)
LnHHExp					0.101***		-0.135	0.110***
					(0.021)		(0.214)	(0.020)
Headship					0.297***		0.982	0.332***
					(0.071)		(0.705)	(0.070)
HHChildren6-					-0.094***		-0.252	-0.113***
					(0.022)		(0.226)	(0.021)
HHAdults65+					-0.146**		0.442	-0.129*
					(0.068)		(0.387)	(0.067)
Owned House					0.077*		-0.452**	0.057
					(0.046)		(0.202)	(0.045)
FPE policy			1.560***				1.469***	0.039
			(0.208)				-0.22	(0.054)
Central	-0.472***	-0.466***	0.223	-0.481***	0.095	-0.481***	0.139	0.078
	(0.142)	(0.142)	(0.511)	(0.142)	(0.179)	(0.141)	(0.527)	(0.174)
Coast	-0.08	-0.128	-1.248***	-0.077	0.046	-0.064	-1.153***	-0.053
	(0.105)	(0.115)	(0.375)	(0.105)	(0.126)	(0.110)	(0.381)	(0.122)
Eastern	-0.380**	-0.480***	-2.385***	-0.289*	-0.632***	-0.222	-1.706	-0.869***
	(0.152)	(0.180)	(0.546)	(0.170)	(0.146)	(0.180)	(1.703)	(0.137)
Northeastern	-0.162	-0.194	-0.567	-0.145	-0.002	-0.126	-0.386	-0.1
	(0.432)	(0.434)	(1.556)	(0.434)	(0.625)	(0.430)	(1.553)	(0.587)
Nyanza	-0.802***	-0.815***	-0.37	-0.763***	-0.387**	-0.751***	0.061	-0.354**
	(0.140)	(0.141)	(0.505)	(0.144)	(0.160)	(0.142)	(0.740)	(0.154)
Rift valley	-0.315***	-0.346***	-0.690**	-0.282***	-0.272**	-0.263***	-0.498	-0.320***
	(0.095)	(0.100)	(0.341)	(0.099)	(0.114)	(0.099)	(0.608)	(0.111)
Western	-0.751***	-0.802***	-1.308***	-0.676***	-0.487***	-0.642***	-0.886	-0.536***
	(0.115)	(0.126)	(0.415)	(0.131)	(0.129)	(0.131)	(1.031)	(0.126)
Embu	-0.413**	-0.362*	1.048	-0.434**	0.05	-0.466**	0.819	0.213
	(0.209)	(0.215)	(0.754)	(0.209)	(0.179)	(0.211)	(0.884)	(0.173)
Kalenjin	-0.323***	-0.345***	-0.592	-0.263**	-0.417***	-0.240**	-0.129	-0.433***
	(0.104)	(0.106)	(0.374)	(0.115)	(0.090)	(0.114)	(0.953)	(0.088)
Kamba	-0.103	-0.08	0.353	-0.174	0.540***	-0.223	0.031	0.697***
	(0.160)	(0.162)	(0.577)	(0.170)	(0.142)	(0.174)	(1.501)	(0.138)
Kikuyu	0.035	0.015	-0.564	0.081	-0.416***	0.096	-0.21	-0.402***
	(0.136)	(0.137)	(0.488)	(0.141)	(0.156)	(0.139)	(0.802)	(0.153)
Kisii	-0.141	-0.143	-0.004	-0.077	-0.461***	-0.055	0.196	-0.484***
	(0.191)	(0.192)	(0.689)	(0.198)	(0.174)	(0.198)	(1.206)	(0.170)
Luhya	-0.451**	-0.464**	-0.37	-0.453**	0.082	-0.450**	-0.246	0.055
	(0.191)	(0.192)	(0.687)	(0.190)	(0.166)	(0.190)	(0.694)	(0.165)
Luo	0.228	0.202	-0.633	0.204	0.338**	0.204	-0.809	0.272*
	(0.148)	(0.151)	(0.534)	(0.150)	(0.155)	(0.150)	(0.704)	(0.151)
Maasai	0.703***	0.488*	-5.331***	0.746***	-0.157	0.782***	-4.556***	-0.386***

	(0.194)	(0.285)	(0.689)	(0.197)	(0.156)	(0.249)	(1.057)	(0.148)
Meru	-0.445**	-0.414**	0.483	-0.437**	-0.181	-0.458**	0.523	-0.043
	(0.184)	(0.187)	(0.663)	(0.183)	(0.149)	(0.184)	(0.666)	(0.144)
Mijikenda	0.14	0.063	-1.806**	0.12	0.301	0.12	-1.544*	0.263
	(0.199)	(0.213)	(0.715)	(0.200)	(0.227)	(0.209)	(0.856)	(0.226)
Somali	0.496	0.372	-3.202**	0.553	-0.425	0.605	-2.474	-0.636
	(0.435)	(0.452)	(1.565)	(0.440)	(0.625)	(0.442)	(1.966)	(0.587)
English	0.779***	0.926***	3.795***	0.768***	0.234**	0.746***	3.494***	0.406***
	(0.094)	(0.170)	(0.326)	(0.094)	(0.110)	(0.144)	(0.706)	(0.103)
Lambda				-0.191		-0.252	-1.000	
				(0.159)		(0.163)	(3.075)	
Constant	2.708	2.71	57.606***	3.344	-5.977**	3.578	60.048***	-4.527
	(3.035)	(3.043)	(13.349)	(3.076)	(2.919)	(3.064)	(16.813)	(3.354)
Observations	1,801	1,801	1,801	3,620	3,620	1,801	1,801	3,695
Censored				1819	1819			
R^2	0.382	0.37	0.232			0.383	0.25	
First Stage F-stats		56.42	.			12.32	.	
Shea R^2		0.0308	.			0.0401	.	
F	47.71	27.19	23.4			27.74	20.35	
Wald Chi^2				551.8	551.8			
Pseudo R^2								0.0917

Source: KIHBS (2005); Notes: Standard errors in parenthesis; *** p < 0.01, ** p < 0.05, * p < 0.1.; LnW: Log Hourly Wage; Eduyear: Year of Education (Dependent variable of the First Stage Estimation): Individual factors include Age, Age squared, Marital status (1=Married); FPE policy is a dummy variable (1=FPE treatment group); Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term.

Table 4-14 Return to Schooling with FPE instruments, Female Sample

Female(Age 30-40)	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	OLS	**IV**		**Heckman**		**Joint IV-Heckman**		
VARIABLES	LnW	LnW	Eduyear	LnW	WageW	LnW	Eduyear	WageW
Eduyear	0.134***	0.115**		0.115***	0.087***	0.166**		
	(0.011)	(0.053)		(0.022)	(0.007)	(0.068)		
Married	0.228***	0.249**	1.036***	0.332**	-0.420***	0.218	3.466***	-0.364***
	(0.081)	(0.100)	(0.241)	(0.133)	(0.060)	(0.189)	(1.248)	(0.058)
Age	0.25	0.284	-2.436**	0.188	0.278	0.159	-1.528	-0.115
	(0.299)	(0.310)	(1.124)	(0.305)	(0.182)	(0.309)	(1.181)	(0.209)
Age^2	-0.003	-0.004	0.032**	-0.002	-0.004	-0.002	0.021	0.001
	(0.004)	(0.004)	(0.016)	(0.004)	(0.003)	(0.004)	(0.017)	(0.003)
LnHHExp					0.086***		-0.595	0.111***
					(0.024)		(0.384)	(0.023)
Headship					0.147**		-0.78	0.116**
					(0.060)		(0.477)	(0.058)
HHChildren6-					-0.056**		0.116	-0.090***
					(0.024)		(0.342)	(0.023)
HHAdults65+					-0.148**		0.933	-0.158**
					(0.066)		(0.632)	(0.064)
Owned House					-0.107**		0.759	-0.138***
					(0.049)		(0.518)	(0.047)
FPE policy			1.823***				-0.093	0.287***
			(0.294)				(1.024)	(0.058)
Central	-0.600**	-0.606***	-0.500	-0.643***	0.197	-0.600**	-1.469*	0.147
	(0.235)	(0.233)	(0.705)	(0.239)	(0.182)	(0.240)	(0.879)	(0.178)
Coast	-0.295	-0.334	-1.974***	-0.307*	0.124	-0.216	-1.294**	-0.103
	(0.180)	(0.208)	(0.537)	(0.180)	(0.133)	(0.205)	(0.615)	(0.127)
Eastern	-0.19	-0.208	-1.06	-0.146	-0.184	-0.125	2.185	-0.499***
	(0.226)	(0.229)	(0.677)	(0.229)	(0.150)	(0.242)	(1.778)	(0.139)
Northeastern					-0.48			-0.163
					(1.087)			(1.060)
Nyanza	-1.006***	-1.025***	-1.197	-0.956***	-0.175	-0.953***	0.274	-0.217
	(0.252)	(0.256)	(0.757)	(0.257)	(0.166)	(0.255)	(0.990)	(0.158)
Rift valley	-0.538***	-0.555***	-0.943**	-0.516***	-0.108	-0.498***	0.252	-0.193*
	(0.159)	(0.164)	(0.478)	(0.161)	(0.121)	(0.162)	(0.767)	(0.117)
Western	-0.971***	-0.990***	-1.123*	-0.888***	-0.254*	-0.906***	1.294	-0.312**
	(0.191)	(0.196)	(0.572)	(0.208)	(0.135)	(0.208)	(1.196)	(0.131)
Embu	-0.643*	-0.646*	0.078	-0.542	-0.355*	-0.618	1.345	-0.148
	(0.377)	(0.373)	(1.130)	(0.388)	(0.203)	(0.381)	(1.302)	(0.194)
Kalenjin	-0.360**	-0.357**	0.05	-0.267	-0.307***	-0.334	2.615**	-0.318***
	(0.183)	(0.181)	(0.549)	(0.204)	(0.103)	(0.219)	(1.315)	(0.099)
Kamba	-0.796***	-0.802***	-0.175	-0.852***	0.329**	-0.817***	-3.721*	0.550***
	(0.237)	(0.235)	(0.711)	(0.243)	(0.147)	(0.270)	(2.010)	(0.139)
Kikuyu	0.19	0.189	0.014	0.271	-0.328**	0.214	1.836	-0.283*
	(0.221)	(0.219)	(0.663)	(0.235)	(0.160)	(0.236)	(1.138)	(0.157)
Kisii	-0.256	-0.241	0.861	-0.169	-0.394**	-0.252	3.933**	-0.426**
	(0.360)	(0.359)	(1.080)	(0.369)	(0.199)	(0.391)	(1.965)	(0.191)
Luhya	-0.385	-0.431	-2.421**	-0.35	-0.177	-0.294	-0.554	-0.292
	(0.369)	(0.386)	(1.103)	(0.368)	(0.190)	(0.384)	(1.548)	(0.189)
Luo	0.097	0.069	-1.457*	-0.006	0.498***	0.119	-3.918**	0.410***
	(0.255)	(0.264)	(0.763)	(0.274)	(0.156)	(0.313)	(1.539)	(0.149)
Maasai	0.134	0.01	-5.575***	0.046	0.489***	0.354	-5.615***	0.097

	(0.282)	(0.441)	(0.836)	(0.295)	(0.168)	(0.486)	(0.897)	(0.159)
Meru	-0.977***	-1.009***	-1.279	-0.904***	-0.215	-0.908***	-0.748	-0.03
	(0.284)	(0.294)	(0.852)	(0.291)	(0.160)	(0.291)	(0.876)	(0.152)
Mijikenda	0.731**	0.631	-4.750***	0.664**	0.402**	0.899*	-5.473***	0.216
	(0.329)	(0.426)	(0.976)	(0.334)	(0.201)	(0.478)	(1.237)	(0.198)
Somali	0.486	0.374	-5.531***	0.577	0.2	0.745*	0.525	-0.64
	(0.356)	(0.468)	(1.052)	(0.365)	(1.089)	(0.428)	(3.154)	(1.059)
English	0.745***	0.800***	2.897***	0.696***	0.299***	0.622***	-0.04	0.469***
	(0.143)	(0.208)	(0.419)	(0.151)	(0.109)	(0.189)	(1.514)	(0.102)
Lambda				-0.299		-0.09	-9.111*	
				(0.302)		(0.353)	(4.794)	
Constant	-2.645	-3.019	53.377***	-1.109	-6.619**	-1.344	50.758***	1.022
	(5.173)	(5.223)	(19.474)	(5.380)	(3.157)	(5.443)	(19.359)	(3.643)
Observations	991	991	991	3,896	3,896	991	991	3,996
Censored				2905	2905			
R^2	0.333	0.331	0.283			0.327	0.301	
First Stage F-stats		38.46	.			4.072	.	
Shea R^2		0.0382	.			0.0248	.	
F	21.99	14.71	17.34			14.56	14.77	
Waldchi^2				290	290			
Pseudo R^2								0.101

Source: KIHBS (2005); Notes: Standard errors in parenthesis; *** p < 0.01, ** p < 0.05, * p < 0.1.; LnW: Log Hourly Wage; Eduyear: Year of Education (Dependent variable of the First Stage Estimation): Individual factors include Age, Age squared, Marital status (1=Married); FPE policy is a dummy variable (1=FPE treatment group); Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term.

5. DISCUSSION AND CONCLUSION

5.1 Discussion

5.1.1 Intergenerational Persistence in Kenya

This study investigates the changes of the intergenerational persistence in education, and the role of schooling in intergenerational persistence in Kenya. Using the three series of population and housing censuses, this study examines the intergenerational educational mobility for the three birth cohorts (1955-64, 1965-74, and 1975-84) in order to see the trend with a set of mobility indices and educational correlations between generations. As mentioned above, this study uses a sub-sample of individuals who live together with their parents (9-20% of total sample aged 25-34 in each birth cohort). Consequently, because of matching parent's information with household id and line number of household members within a household, those who do not co-reside with their parents either by choice or their parents are deceased are not investigated. Then, if the formation of household or choice to live together with their parents are not random, the findings of this study would suffer from sample selection bias (Kwenda et al., 2015).

In order to conduct robustness checks, Table 5-1 presents proportion of level of education by birth cohort for the sab-sample of individuals co-residing with parents and the sub-sample of individuals without co-residing parents. It is not true that one of the residential styles tends to have more education than the other. For example, while 10.47% of sons living without parents have Tertiary education and 8.92% of son co-residing with parent have Tertiary education in the latest cohort, the trend of daughters is opposite (8.54% of daughters living without parents have Tertiary education, but 10.5% of daughters co-residing with parents attain Tertiary education).

Interestingly, as far as this study examines the difference of educational attainment by co-habitation of their parents, there is not constant trend which is generated from co-residing lifestyle.

Following the steps conducted by Kwenda et al., (2015), this study estimates a probit model with the dependent variable (which is equal to one if an individual lives with at least one parents, 0 otherwise). The probit estimates indicate that individuals co-residing with parents are likely to be younger, single, unemployed and living in rural with higher level of education. This is consistent with the result of Kwenda et al. (2015). These differences are statistically different from zero, implying that sons and daughters co-residing with parents are to some extent different from individuals living without their parents. It is noted that the results of the intergenerational persistence in education in Kenya might be biased for excluding the individuals who do not live with parents; however, it is important to know the characteristics of the difference caused by extracting co-residing sub-samples and giving an attention to the biases would be helpful to interpret the findings of this study.

Table 5-1 Sons and Daughters Co-residing with at Least One Parent

Age 25-34	Born in 1955-64 (Census 1989)			Born in 1965-74 (Census 1999)			Born in 1975-84 (Census 2009)		
	Not co-residing with parents	Co-residing with parent	Total	Not co-residing with parents	Co-residing with parent	Total	Not co-residing with parents	Co-residing with parent	Total
Son									
No Education	33.63	38.06	34.46	31.11	38.15	32.37	32.86	43.28	34.95
Primary	24.36	22.18	23.95	16.24	15.64	16.14	23.60	19.2	22.71
Secondary	36.98	34.4	36.5	47.49	41.52	46.43	33.07	28.6	32.17
Tertiary	5.03	5.36	5.09	5.15	4.68	5.07	10.47	8.92	10.16
Total	100	100	100	100	100	100	100	100	100
N	54,348	12,429	66,777	79,782	17,290	97,072	216,385	54,356	270,741
	81.4%	18.6%		82.2%	17.8%		79.9%	20.1%	
Daughter									
No Education	58.54	47.74	57.55	45.29	41.79	44.94	40.06	40.38	40.1
Primary	17.99	19.82	18.15	16.65	16.05	16.59	24.05	19.87	23.58
Secondary	21.79	29.79	22.52	35.74	39.75	36.15	27.35	29.25	27.56
Tertiary	1.69	2.65	1.77	2.31	2.41	2.32	8.54	10.5	8.76
Total	100	100	100	100	100	100	100	100	100
N	64,068	6,412	70,480	92,300	10,434	102,734	257,313	32,954	290,267
	90.9%	9.1%		89.8%	10.2%		88.6%	11.4%	

Source: IPMUS-Kenya (1989, 1999, 2009)

Table 5-2 Probit Model Estimation for Individuals Co-residing with at Least One Parent

Age 25-34	**Born in 1955-64 (Census 1989)**	**Born in 1965-74 (Census 1999)**	**Born in 1975-84 (Census 2009)**
Variables	Co-residing with a parent	Co-residing with a parent	Co-residing with a parent
Child: Primary	0.013	0.007	0.002
	[0.002]***	[0.002]***	[0.001]*
Child: Secondary	0.023	0.023	0.022
	[0.002]***	[0.001]***	[0.001]***
Child: Tertiary	0.056	0.056	0.043
	[0.006]***	[0.005]***	[0.002]***
Female	-0.063	-0.054	-0.047
	[0.001]***	[0.001]***	[0.001]***
Employed	-0.017	-0.007	-0.014
	[0.002]***	[0.002]***	[0.001]***
Age	-0.003	0.045	0.008
	[0.005]	[0.004]***	[0.002]***
Age2	0.000	-0.001	0.000
	[0.000]	[0.000]***	[0.000]***
Number of siblings	-0.007	-0.001	-0.012
	[0.000]***	[0.000]**	[0.000]***
Firstborn	0.907	0.942	0.927
	[0.011]***	[0.002]***	[0.003]***
Married	-0.207	-0.208	-0.258
	[0.003]***	[0.002]***	[0.002]***
Married Polygamous	-0.056	-0.072	-0.065
	[0.001]***	[0.001]***	[0.000]***
Separated/Divorced/Widowed	-0.008	-0.010	-0.024
	[0.002]***	[0.002]***	[0.001]***
Family size	0.014	0.016	0.026
	[0.000]***	[0.000]***	[0.000]***
Extended family	0.069	0.052	0.050
	[0.002]***	[0.001]***	[0.001]***
Owned House	0.079	0.069	0.078
	[0.001]***	[0.001]***	[0.001]***
Access Sewage	0.001	-0.005	-0.009
	[0.003]	[0.002]	[0.001]***
Access Electricity	-0.008	-0.015	-0.023
	[0.003]**	[0.002]***	[0.001]***
Urban	-0.038	-0.033	-0.017
	[0.002]***	[0.001]***	[0.001]***
Central born	-0.036	-0.034	-0.035
	[0.003]***	[0.003]***	[0.001]***
Coast born	-0.040	-0.040	-0.046
	[0.002]***	[0.002]***	[0.001]***
Eastern born	-0.030	-0.035	-0.040
	[0.003]***	[0.002]***	[0.001]***
North Eastern born	-0.031	-0.037	-0.037
	[0.003]***	[0.002]***	[0.001]***
Nyanza born	-0.034	-0.044	-0.048
	[0.003]***	[0.002]***	[0.001]***
Rift Valley born	-0.040	-0.047	-0.047
	[0.003]***	[0.002]***	[0.001]***
Western born	-0.038	-0.044	-0.048
	[0.003]***	[0.002]***	[0.001]***
Foreign born	-0.043	-0.039	-0.045
	[0.001]***	[0.002]***	[0.001]***
Pseudo R^2	0.436	0.399	0.503
N	139491	199806	568260
Log Likelihood	-31209.741	-48380.743	-122308.404

* p<0.05, ** p<0.01, *** p<0.001

5.1.2 Rate of Return to Education in Kenya

In order to see the difference of the return to schooling by parental background, this study estimated return to education with Mother's education as an instrument. In addition, the 1st FPE policy implemented in 1974-79 is used for another instrument. Table 5-3 presents return to additional years of schooling by estimation method. Both instruments show different rate of return to schooling than corresponding OLS estimations. However one of the differences is that mother's education indicated higher return to schooling, but FPE policy instrument indicated lower return to schooling than the OLS estimation. The estimated return to an additional year of schooling for the FPE sub-sample was reduced in the IV models (from 14.0% to 10.2% for male and from 13.4% to 11.5% for female).

The lower return to education in the IV estimation for FPE sub-samples can be interpreted as Local Average Treatment Effect (LATE)(Montenegro & Patrinos, 2013). The interpretation is following: the fee abolition policy affects the decision of schooling of a subset of individuals, who would not continue education, otherwise (probably those who could not afford to pay; that is to say, poor children). The incrementally joined individuals (called the FPE treatment group) tend to have a lower return to education than the average individuals. A possible explanation of lower return to education of the FPE treatment group is that they might have less ability to learn than non-FPE groups. Except for the case that individuals who have genetically less ability are concentrated in the FPE treatment group, it is because the FPE treatment group (poor children) has lack of readiness of learning. As cultural capital theory explains, socio-economically disadvantaged families might have less learning culture at home or provide insufficient early childhood development. Furthermore, they would suffer from low quality of schooling in usual public school located in rural. It is like an implicitly-defined tracking system. Rich children can pass through a successful route promised by parents, while

poor children cannot.

Table 5-3 Return to Additional Years of Education by Estimation Method and Instrument Variable

Instrument Variable	Mother's Education		FPE Policy	
Methods	**Male**	**Female**	**Male**	**Female**
OLS	11.8%***	12.2%***	14.0%***	13.4%***
IV	17.9%***	22.0%***	10.2%***	11.5%***
Heckman	11.7%***	11.4%***	13.3%***	11.5%***
Joint IV-Heckman	20.0%***	18.1%***	13.6%***	16.6%***

Source: Created by Author

Note: The coefficients of educational variables are from the base line models from each method; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The patterns of the estimated returns to an additional year of schooling for the disaggregated subsamples of wage-workers by methodology vary from the hierarchy established by the returns estimated from the overall wage-working sample. Following results show the return to additional year of schooling by level of education sub-samples. It is noted that the discrete level of education is applied for only the sub-sample of the FPE policy for a preference of simplicity. Findings imply how much an additional year of schooling increases wage, compared to lower level of education. For example, reference of the primary level of education sub-sample is those who have no education. Similarly, reference of the secondary level of education is those who completed primary education, and that of the tertiary level of education is those who completed secondary education. By doing so, it is possible to estimate different return to an additional schooling in different level of education. Because the analytical sample is adults born in 1965-74, assuming that grade intake year of primary education in 1971-81, length of

schooling is assigned based on former education system (7 years for primary, 5 years for secondary, 3 years for tertiary)[10]. Table 2-1 shows the Mincerian coefficient to an additional year of primary, secondary and tertiary education (estimated on wage-workers who had completed up to the highest grade of given level of education) for both OLS and IV estimates. Generally, return to an additional year of schooling is quite low in each level of education. Return to an additional year of primary schooling is 0.8% for male, and it is not statistically significant for female. This is probably because the effect of averaged one year of schooling at a given level of education on one's wage. Returns to an additional year of secondary and tertiary education are 3.7% and 5.7% for secondary and tertiary education for males, respectively (OLS). Those of females are slightly higher, but still less than 10% for both secondary and tertiary education (4.8% for secondary and 7.0% for tertiary education).

These statistically insignificance might be due to averaging the return to education by level of education. For example, it is not always true that additional year of schooling at Tertiary education from the first year to second year is the same as the one extra year of schooling from the third year to the fourth. In order to apply instrumental variables, this study used the new approach introduced by Barouni & Broecke (2014). If a method which can deal with endogeneity bias for discrete level of education earning function, it would be a solution.

[10] This assumption might not be appropriate for some birth cohorts who graduated from secondary and tertiary education, because the length of schooling was changed due to educational reform in 1985. If current length of schooling is given, return to additional secondary schooling would be 0.046 for male, 0.061 for female, and that of tertiary would be 0.043 for male, and 0.053 for female (OLS).

Table 5-4 Return to Additional Years of Education by Level of Education Sub-Sample and Estimation Method (FPE instrument only)

Methods	Male			Female		
	Primary	*Secondary*	*Tertiary*	*Primary*	*Secondary*	*Tertiary*
OLS	0.8%***	3.7%***	5.7%***	-0.04%	4.8%***	7.0%***
IV	-0.7%	19.2%	10.3%	0.6%	-12.2%	73.6%
Heckman	0.6%**	3.2%***	5.6%***	-0.3%	4.3%***	6.8%***
Joint IV-Heckman	0.4%	7.1%**	3.0%	-0.6%	1.3%	5.4%

Source: Created by Author
Note: The coefficients of educational variables are from the base line models from each method; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The returns to an additional year of all level of schooling are not statistically significant for IV models. This is true for both males and females. Seemingly, the FPE policy is valid for primary education sub-sample, but not for secondary and tertiary education (exceptionally, it is statistically significant for tertiary educated males at the first stage, but not at the second stage). Unlike the findings of the continuous form of education estimates, what this implies is that there is little difference of wage between FPE treatment group and non-FPE group once level of education is accounted for. The statistically significance of FPE policy at primary education but dissipation of its significance at secondary and tertiary education show that the FPE policy is no longer valid for distinguishing educational attainment between FPE treatment and non-FPE treatment group.

In terms of Heckman's corrected return to schooling, an additional year of schooling is generally lower than those of OLS estimates but the selectivity terms are not statistically significant except for secondary-male sample. This means that the employability does not matter on determining individual's wage between primary education graduates and no educated wage workers. This is also true for tertiary education graduates and secondary education graduates. However, the employability

decreases 2.2% of an additional year of schooling from 18.3% to 16.1% for males and secondary education graduates. The coefficients of education are generally not statistically significant in the joint IV-Heckman estimations as well. An exceptional case is male graduates of secondary education. An additional year of secondary schooling increases 35.5% of wage, compared to that of primary school graduates. The Heckman's selectivity terms are also not statistically significant, implying that if both ability biases are accounted at the same time, the employability influence little on individual's wage.

Beyond the result that estimates of Mincerian returns to schooling in developing countries such as Kenya with clearly sectoral labor markets should be corrected for both endogeneity of education and sample selectivity, the updated returns to schooling have important implications for educational policy in Kenya and, more broadly speaking, the Sub-Saharan Africa context. The private return to an additional year of education for the overall sample, taking into account the endogeneity of schooling and sample selectivity, is 13.6% for males and 16.6% for females (FPE policy sub-samples), and 20.0% for males and 18.1% for females (Mother's education sub-samples) comfortably exceeding the regional mean coefficient on years of schooling reported by Psacharopoulos and Patrinos (2004) of 11.7%. This strongly suggests education overall remains a favorable sector for public and private investment in Kenya. Yet estimating the joint IV-Heckman-corrected wage equation on the subsamples of wage-workers disaggregated by their highest completed level of education reveals the returns to an additional year of each level of schooling to be statistically insignificant. Low returns to an additional year of each level of schooling even at the secondary and tertiary education level could lead to a rethinking of role of schooling.

5.2 Limitation of the Study

This study identifies the following limitations that readers should be aware of: (1) Restricted sample of child-parent pairs in the same household (co-habitation); (2) excluding non-biological children; and (3) using wage, not permanent income.

First, the restricted sample of the child-parent pairs living in the same household would cause a biased estimate due to a significant loss of observations as co-resident households are different from other households non-randomly(Azam & Bhatt, 2012). Surveys which ask question about parent's information separately could be useful for further research. In addition, using intergenerational income persistence is also needed for further studies, if possible. Second, this study cannot deal with non-biological children due to data constraints. It is known that there is relatively a small but significant minority of adoptees in Kenya. Probable stepfather and stepmother could be identified in the data, but it is not possible to find out when they are adopted. Comparing the biological children and adoptees enables us to control genetic traits transmitted from parents and provide some insight on the effect of unobservable family circumstances. If further research can analyze the difference of biological children and adoptees, taking African local contexts into account, it will advance our knowledge of the underlying mechanism of the intergenerational transmission of resources. Third, wage information used in the return to education analysis is not permanent income. This might cause biased estimates, because of lifecycle bias. However, this study tried to minimize the bias, focusing on adults around 30's to 40's. If more accurate income information is available, it will contribute to accumulating anecdotal evidence on intergenerational mobility.

5.3 Conclusion

This study investigates the changes of the intergenerational persistence in education, and the role of schooling in intergenerational upward mobility in Kenya. Using the three series of population and housing censuses, this study examines the intergenerational educational mobility for the three birth cohorts (1955-64, 1965-74, and 1975-84) in order to see the trend with a set of mobility indices and educational correlations between generations. The transition educational matrices reveal substantial intergenerational educational mobility between generations across time. Nevertheless, son's and daughter's educational attainment depends on both mother's and father's education to a large extent. While Kenya is a fairly mobile society, the findings show that origin effect become stronger during the three decades especially at the bottom level of education.

It is also noted that the intergenerational persistence in education varies among place of birth origin in Kenya. North Eastern province is the tightest intergenerational persistence with lower level of education. The findings of the intergenerational upward mobility analysis show that own schooling is positively associated with the probability of working in non-farm sector for both farmer's sons and daughters. While own education is generally an important predictor, parent's working in non-farm shows relatively strong and positive association with the child outcome for children of parents whose work in non-farm sector. These revealed results have implications for long-term assessment of human capital investment in Kenya. Seemingly, the longstanding policy objectives of the greater equality of educational opportunities as an indication of less intergenerational persistence in education have been accomplished at the beginning of the independence. However, it would appear that the intergenerational educational mobility has become weak in general but the intergenerational persistence has become tighter at the bottom level. Although the intergenerational persistence in education is still fair, compared to the global average, the alleviation of these inequalities at the

bottom level needs a more effective welfare system, because the remaining inequalities can be due to ethno-geographic factors in educational outcomes and other family background factors for inequality of opportunities. Broadly speaking, the assessment of social openness in Kenya shows that the chance to get ahead in terms of education seems to be a fair in the 1950s and the intergenerational mobility is gradually weakened due to the secular increase of parent's level of education.

Among potential channels which influence the intergenerational persistence in resources, this study focuses on the role of own schooling. If education has a power to break a cycle of poverty, it will enhance intergenerational upward mobility. Findings of the intergenerational upward mobility indicate that educational attainment at Tertiary level increases about 30% of the probability of child's working at non-farm sector for both farmer's sons and daughters. Whereas own schooling is generally statistically significant and positive, it is also worth noting that mother's working in non-farm (origin effect) is an important determinant child's working in non-farm sector. Mother's working in non-farm sector increases about 10% of the probability of child's working in non-farm sector. Interpretation of the findings should be cautious, because this study assessed the intergenerational persistence during the rapidly changed period (1955-84). Nevertheless, the results of the study are still informative on capturing inequality of opportunities in Kenya.

In order to investigate whether schooling functions as a driving force of intergenerational upward mobility, this study also uses a recent household survey and estimates an updated estimate for the private returns to an additional year of schooling on average and by level of education. Particular attention is paid for parental background (mother's education) and groups benefitted from FPE policy implemented in 1974-79. The difference of return to education by mother's education implies that there exists different pattern of parental investment in education for their children. In addition, if the FPE treatment group successfully improves their wage, it would imply

that education helps people succeed in their life. Then, Human capital theory would hold. In terms of political implication, reducing costs do not only improve access to basic education, but also contribute to upgrading their future well-being. Eventually, the finding is expected to reinforce validity of financial supports at the early stage of their education.

It is well known that return to education is suffered from not only the endogenous bias (ability bias), but also the sample selection bias. The simultaneously corrected return to schooling is expected to come close to *true* return to schooling. The joint IV-Heckman estimations show that return to an additional year of schooling is 13.6% for males, and 16.6% for females (the FPE sub-samples). If the OLS results can be seen as upper limit of return to schooling, and the IV results as lower limit of return to schooling, then, these results are convincing evidence. Then, the results of the joint IV-Heckman estimation can be close to true return to education.

This study also tests return to an additional year of schooling among level of education sub-samples. The OLS results showed that higher return to an additional year of secondary and tertiary schooling (3.7%, 5.7% for secondary-males, tertiary-males; and 4.8%, and 7.0% for secondary-female, and tertiary-females) than that of primary schooling (0.8% for male; and not statistically significant for female). This therefore suggests that the classical pattern of diminishing returns to schooling does not hold in Kenya and that a shift in educational policy and investment in Kenya is needed towards rethinking education system in terms of equality. The IV method and joint IV-Heckman estimations are generally not statistically significant. It implies that there is little difference of average additional year of schooling on wage between the FPE treatment group and non-FPE group if discrete level of education is accounted for. This is not surprising because the FPE treatment group seems to graduate from primary education only. Mean years of schooling of the FPE treatment group is 9.94 for males, and 9.50 for females, which is about 1-1.5 years more than non-FPE group. It is limited for

primary school leavers to acquire well-paid jobs(Bachmann, 1999). Poor but capable children who could continue further education and climb their career ladder successfully might increase their wage. However, this would be an exceptional case. In sum, even if the FPE treatment group has a higher return to an additional year of schooling on average, it is no longer valid within each level of education groups. In other word, schooling does not enhance intergenerational upward mobility sufficiently.

How can we ensure the socio-economically disadvantaged children more equal opportunities? Education is regarded as a "career ladder" to acquire better life (intergenerational upward mobility). However, seats of Tertiary education and positions in modern sectors are not enough for accommodating all the children in Kenya. Introduced modern education system after the independence of Kenya seemingly functioned opening more equal opportunities to get ahead, but a few decades later, the situation might change. In order to assess whether equal opportunities are ensured for all, this study examined how the social openness has changed over time during the 1950s-80s, and applied the private rate of return to education analysis, focusing on parental background and educational finance policy.

The first research question is: "how has the intergenerational persistence in education changed over time?" The degree of the intergenerational persistence in education is 0.3 on average. This is modest, compared to other countries. However, this study reveals that the intergenerational persistence becomes tight over time at the bottom level. Regarding the place of birth (a proxy of ethnicity), findings proves that north eastern province has the strongest persistence among them. Considering the fact that their level of both parent's and child's education are far behind than other provinces, low educational attainments of parents seem to be inherited to the next generation. In addition, this study examines the role of schooling on the intergenerational upward mobility. Introducing own schooling in the intergenerational mobility function, this study examines how much child's education associates with the probability of working

in non-farm sector for famer's sons and daughters. The findings indicate that "own schooling" is constantly an important but insufficient determinant on child's occupational attainment. Once they can attain Tertiary education, the probability of working in non-farm sector is likely to be high. However, parent's occupation also has relatively strong influence on the child's occupational outcome.

The second research question aims at investigating the difference of return to schooling by parental background and of those who benefited FPE policy and those who did not. The incrementally joined group who would be potential out-of-school children could earn more than the average; however, their return to education is not sufficient enough to elevate their socio-economic status. What these results imply is because of (1) less ability of learning in the incrementally joined group by FPE; and (2) discontinuity of schooling after primary education, hence getting less paid jobs. Further investigation is needed for the lower return to education for the FPE treatment group; however, unless continuous financial supports are provided until completion of higher education, children from poor families seem not to stand the same starting line as children from wealthier families.

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APPENDICES

Appendix A: Map of Kenya

Source: Elision Map., (2015)

Appendix B: Linkage between Income Mobility and Education Mobility Function

Following identification is based on (Hertz et al., 2008). Income mobility function (Solon, 1999) is defined as following equation:

$$y_1 = \alpha + \beta_y y_0 + \varepsilon \quad \text{(A1)}$$

Where, y_1 denotes children's log wage; y_0 denotes parent's log wage; β_y denotes Intergenerational Income elasticity (IGE); and ε denotes error term. Education mobility function can be identified through children's and parent's earning functions. Parent's earning function is defined as equation (2) and children's earning function is defined as equation (3).

$$y_0 = \alpha_0 + \rho_0 s_0 + \mu_0 \quad \text{(A2)}$$

$$y_1 = \alpha_1 + \rho_1 s_1 + \mu_1 \quad \text{(A3)}$$

Where, y_0 denotes parent's log wage; y_1 denotes children's log wage; ρ_0 denotes wage effect of parents on parent's wage; ρ_1 denotes wage effect of children on children's wage; μ_0, μ_1 denotes error term

Parent's education [s_0] and Parents wage [y_0] is added in Children's wage function (3).

$$y_1 = \alpha_1 + \rho_1 s_1 + \lambda s_0 + \delta y_0 + \mu_1 \quad \text{(A4)}$$

Where, λ denotes effect of parent's education on children's wage (intergenerational

effect of education); δ denotes effect of parent's wage on children's wage (intergenerational effect of wage). Equation [4] is intergenerational wage equation (or income mobility function). As an important assumption, there is the intergenerational transmission of ability. Error term of parent's wage equation [μ_0] and children's education is a covariance. It implies that the intergenerational transmission is done inherently and socially:

$$\phi = \frac{Cov(s_1,\mu_0)}{Var(\mu_0)} \quad \text{(A5)}$$

Where, Φ denotes intergenerational transmission of ability. Following equation indicates how the intergenerational income elasticity [β_y] and the intergenerational education effect [β_s].

$$\beta_y = \delta + \frac{(\rho_1\beta_s+\lambda)}{\rho_0}R^2 + \rho_1\phi(1-R^2) \quad \text{(A6)}$$

Where, R^2 denotes variance explained by parent's wage equation. The effect of the intergenerational education [β_s ,ϕ] is about 30% to explain the intergenerational income elasticity (Hert, 2005)

Appendix C: Identification of Two-Sample Two-Stage Least Squares (TSTSLS)

For the intergenerational mobility studies in developing countries, there is an issue: that is, income information of father-child pairs is rarely available. Previous studies such as Björklund & Jäntti, (1997), Núñez & Miranda, (2011), Piraino, (2015) use information from two separate samples: fist, Mincerian earning equation is estimated using an older sample of adults in order to get coefficients of some key determinants such as education, age, occupation and so on. After that, the estimated coefficients can be applied to predict the income of father's sample of sons who have the required information about their fathers. This technique is knows as two-sample instrumental variables estimation (TSIV) or two-sample two-stage least squares (TSTSLS). This study tried to use this methodology, but due to data constraint, it was not successful. Following specification explains the TSTSLS more formally:

$$Y_{it}^{f} = Y_{i}^{f} + \mu_{it}^{f} \tag{A7}$$

$$Y_{it}^{c} = Y_{i}^{c} + \mu_{it}^{c} \tag{A8}$$

Where μ_{it}^{f} and μ_{it}^{c} contain transitory fluctuations in the father and child's current income and measurement errors. Let Z_{t}^{f} denote a set of socio-demographic characteristics (like education, occupation, among others) of fathers from a sample of families $i \in$ I and assume that Y_{it}^{f} can be written as following:

$$Y_{it}^{f} = Z_{i}^{f}\gamma + v_{i}^{f} + \mu_{it}^{f} \tag{A9}$$

Where v_{i}^{f} is independent of Z_{t}^{f}. The dependent variable (Y_{it}^{f}) is not observed in sample I,

but if there exists a separate sample J from the same population, it can be used to provide an estimate of γ, called $\hat{\gamma}$, which can be derived from the estimation of equation (A10) using the sample of adult men J:

$$Y_{it} = Z_i\gamma + v_i + \mu_{it} \quad \text{(A10)}$$

with j ∈ J. An OLS estimation of the equation (A10) provides predictions of the father's earnings in sample I: $\hat{\gamma}_{it}{}^{f} = Z_i{}^{f}\hat{\gamma}$. The predicted income can be used to estimate the intergenerational income elasticity coefficient β_1 because the equations, A7, A8. A9 and A10 imply the following specification:

$$Y_{it}^{c} = \beta_0 + \beta_1(Z_i^{f}\hat{\gamma}) + \eta_{it} \quad \text{(A11)}$$

where $\eta_{it} = \varepsilon_i + \mu_{it}^{c} + \beta_1 v_i^{f} + \beta_1(Z_i^{f}(\gamma - \hat{\gamma}))$.

The estimates of β_1 are based on the estimation of the equations (A10) and (A11) on separate samples described in the following section. In particular, as a first stage estimation, this study estimates Mincerian earning equation (A10) that allows for different schooling returns by educational level:

$$Y_{js}^{f} = \gamma_0 + \gamma_1 S_{js} + \gamma_2 d_1(S_{js} - 8) + \gamma_3 d_2(S_{js} - 12) + \gamma_4 Exp_{js} + \gamma_5 Exp_{js}^2 + \varepsilon_{js} \quad \text{(A12)}$$

where S_{js} represents the years of schooling of fathers, Exp_{js} stands for father's potential working experience and ε_{js} is a random error term. Moreover, dummy variables for educational levels are defined as:

$$d_1 = \begin{cases} 1 \; if \; S > 8 \\ 0 \; otherwise \end{cases}$$

$$d_2 = \begin{cases} 1 \; if \; S > 12 \\ 0 \; otherwise \end{cases}$$

In the second stage, this study uses the estimated parameters in the equation (A12) and father's information reported by the sons to predict the father's income, as follows:

$$\hat{Y}_{is}^{f} = \hat{\gamma}_0 + \hat{\gamma_1} S_{is} + \hat{\gamma_2} d_1 (S_{js} - 8) + \hat{\gamma_3} d_2 (S_{js} - 12) + \hat{\gamma_4} Exp_{is} + \hat{\gamma_5} Exp_{is}^2 + \eta_{is} \quad \text{(A13)}$$

Hence, this study can obtain the intergenerational income elasticity β_1 from:

$$\hat{Y}_{it}^{c} = \beta_0 + \beta_1 \hat{Y}_{is}^{f} + \beta_2 age_{it} + \beta_3 age_{it}^2 + \eta_{it} \quad \text{(A14)}$$

where age_{it} stands for child's age and controls for life-cycle profiles in child's earnings. The TSTSLS specification described above is an innovative and useful approach for the intergenerational mobility in developing countries, but there exist some methodological problems. The first bias arises due to omitted variables. Given that the father's schooling and occupation, apart from being correlated with the father's earnings, are also positive predictors of the son's earnings in their own right side equation. Then, in the second stage, the intergenerational income elasticity would become upward biased because schooling and occupation of the fathers are used to predict the father's earnings but not included as independent variables at the upper stage(Núñez & Miranda, 2011; Solon, 2002). Another bias comes from the ages of sons. In particular, many studies have found that the estimated intergenerational earning elasticities increase substantially

as son's earnings are observed further on in their careers. Accordingly, studies that uses earnings data of sons in the early stages of their life-cycle tend to underestimated the intergenerational income elasticity. This arises if the measurement error in the son's early earnings is negatively correlated with the long-run income, as can be expected.

Appendix D: Kenya Population and Housing Census Characteristics

Table A 1 Kenya Population and Housing Census Detail Information

	1989	1999	2009
Title	1989 Population and Housing census	1999 Population and Housing census	2009 Kenya Population and Housing Census
Census agency	Central Bureau of Statistics Ministry of Finance and Planning	Central Bureau of Statistics Ministry of Finance and Planning	Kenya National Bureau of Statistics
Population universe	All persons present in Kenya on the reference date.	All persons present in Kenya on the reference date.	All persons who spent the Census Night in
De jure/ de facto	De facto	De facto	De facto
Enumeration unit	Household	Household	Households
Census day	25-Oct-89	25-Aug-99	August 24-25, 2009
Field work period	Unknown.	7 days after census day, to August 31	—
Enumeration forms	A long form was used to enumerate individuals in private households and in institutions such as schools, colleges, barracks, prisons, and hospitals. The long form includes both individual and housing characteristics. A greatly abbreviated form was used for persons in transit or who slept outdoors, in hotels or boarding houses.		
Type of field work	Direct enumeration	Direct enumeration	Direct enumeration
Respondent	Householder or responsible adult	Householder or responsible adult	Head of the household or responsible adult
Undercount	No official estimate	No official estimate	

Source: Minnesota Population Center (2014)

Table A 2 Microdata Sample Characteristics

	1989	1999	2009
Microdata source	Constructed by census agency. Microdata files dated October 31, 1995.	Constructed by census agency. Microdata files dated September 9, 2001.	Constructed by census agency.
Sample design	Systematic sample of every twentieth household.	Systematic sample of every twentieth household.	Systematic sample of every tenth household.
Sample universe	Microdata sample excludes vagrant population.	The current version of the microdata sample excludes travelers and vagrants.	The microdata sample includes conventional households, unconventional households (i.e. group quarters and those included in special populations), and households in refugee camps.
Sampling unit	Households	Households	Households
Sample fraction	5%	5%	10%
Sample size (person records)	1,074,098	1,407,547	3,841,935
Sample weights	Self-weighting. Expansion factor = 20.	Self-weighting. Expansion factor = 20.	

Source: Minnesota Population Center (2014)

Table A 3 Units Identified and Definition

	1989	1999	2009
Dwellings	No	No	No
Households	Yes	Yes	Yes
Persons	Yes	Yes	Yes
Special populations	Travelers, campers, lodgers (hotels)	Travelers, campers, lodgers (hotels). Note: These persons are not included in the current version of the microdata sample.	
Group quarters	Included in microdata without identification	Included in microdata without identification	
Smallest geography	District	District	District
Private household	A person or a group of persons who live together in the same dwelling unit or homestead and eat together. They may or may not be related by blood or marriage		
Group quarters	Group quarters consist of schools/colleges, barracks, prisons, hospitals and other institutions.		
Special populations	Persons who sleep outdoors and travelers in hotels, lodges, and boarding houses		
Dwelling/housing units	A homestead is a structurally separate and independent place of abode. A structure is a building that is used for dwelling purposes. In rural areas most of the structures will be found within a homestead and may contain one or more dwelling units. A dwelling unit is the abode occupied by the respondents and constitutes one or more households.		

Source: Minnesota Population Center (2014)

Appendix E: Definition of Variables Used in the Estimations

Table A 4 Definition of Variables Used for the Analyses

Variable	Type	Description
Year of Schooling	Continuous	Year of schooling attained. This is constructed based on "highest grade completed"
Mother's Education	Continuous	Year of schooling attained by Mother. This is constructed based on "highest grade completed"
Father's Education	Continuous	Year of schooling attained by Father. This is constructed based on "highest grade completed"
No. Siblings	Continuous	Number of siblings in household. This is constructed based on: (1) household, and individual identifier; and (2) relationship to household head
Family Size	Continuous	Number of family members in household
Polygamous Union	Dummy	1 if family unit is polygamous, 0 otherwise
Extended family	Dummy	1 if a family unit has others(including relatives and non-relatives) in the same household, 0 otherwise
Owned house	Dummy	1 if a household head owns their house. This is constructed based on ownership of dwelling unit (general version: ownrshp), 0 otherwise
Access Sewage	Dummy	1 if a household has access to sewage, 0 otherwise
Access Electricity	Dummy	1 if a household has access to electricity, 0 otherwise
Urban	Dummy	1 if a respondent lives in urban, 0 otherwise
Central_born	Dummy	1 if a respondent is born in Central, 0 otherwise
Coast_born	Dummy	1 if a respondent is born in Coast, 0 otherwise
Eastern_born	Dummy	1 if a respondent is born in Eastern, 0 otherwise
North Eastern_born	Dummy	1 if a respondent is born in North Eastern, 0 otherwise
Nyanza_born	Dummy	1 if a respondent is born in Nyanza, 0 otherwise
Rift valley_born	Dummy	1 if a respondent is born in Rift valley, 0 otherwise
Western_born	Dummy	1 if a respondent is born in Western, 0 otherwise
Completion of Primary	Dummy	1 if a respondent complete primary education, 0 otherwise
Head's age	Continuous	Household head's age
Head's age^2	Continuous	Square of household head's age
First born	Dummy	1 if a respondent is a first born child

Log hourly wage	Continuous	Log of hourly wage. Hourly wage is calculated based on total salary of main occupation, salary period for the reported salary, and hours worked last week.
Wage worker	Dummy	1 if a respondent is a wage worker, 0 otherwise
Married	Dummy	1 if a respondent is married, 0 otherwise
FPE policy	Dummy	1 if a respondent experienced 1st FPE policy implemented in 1974-79 at primary school, 0 otherwise
Ln HHE	Continuous	Log of household expenditure. This is constructed based on the total household expenditure
Headship	Dummy	1 if a respondent is a household head, 0 otherwise
HHChildren6-	Dummy	1 if a respondent lives in the household which has children under 6 years-old
HHAdults65+	Dummy	1 if a respondent lives in the household which has adults over 65 years-old
OwnedHouse	Dummy	1 if a respondent lives in the household whose head owns their house

Source: Created by Author

Appendix F: Proportion of Ethnic Group by Province

Table A 5 Language of Use in the Survey of KIHBS 2005-06 by Region

	Nairobi	Central	Coast	Eastern	North East	Nyanza	Rift Valley	Western	Total	N
Embu	0.0	0.0	1.2	96.7	0.0	0.6	1.3	0.2	100.0	598
Kalenjin	0.0	0.1	0.0	0.2	0.0	0.0	97.2	2.4	100.0	3,077
Kamba	0.5	0.4	0.0	98.9	0.0	0.0	0.1	0.0	100.0	3,159
Kikuyu	0.0	92.3	0.0	0.4	0.0	0.0	7.3	0.0	100.0	4,963
Kisii	0.0	0.9	0.0	0.3	0.0	98.8	0.0	0.0	100.0	1,448
Luhya	0.0	0.0	0.0	0.0	0.0	0.0	0.6	99.4	100.0	1,451
Luo	1.5	0.0	0.0	0.2	0.0	98.1	0.3	0.0	100.0	3,051
Massai	0.0	0.0	1.1	0.0	0.0	0.0	98.9	0.0	100.0	559
Meru	0.0	0.2	0.0	99.8	0.0	0.0	0.0	0.0	100.0	1,734
Mijikenda	0.0	0.4	99.6	0.0	0.0	0.0	0.0	0.0	100.0	621
Somali	2.5	0.0	0.1	0.0	97.5	0.0	0.0	0.0	100.0	911
Swahili	18.6	1.4	19.7	1.5	0.0	4.2	36.0	18.6	100.0	13,159
English	61.2	3.3	1.6	7.1	0.0	7.8	8.0	11.1	100.0	1,331
Unknown	0.0	0.0	31.9	64.7	0.0	0.0	0.0	3.4	100.0	302
Total	9.2	13.3	9.2	16.4	2.5	14.0	24.1	11.3	100.0	36,365

Source: KIHBS (2005)

Appendix G: Intergenerational Persistence in Education

Table A 6 Intergenerational Persistence in Education, Son' Sample

Son (Age 25-34)	**Census 1989 (Born in 1955-64)**				**Census 1999 (Born in 1965-74)**				**Census 2009 (Born in 1975-1984)**		
Variables	Son' Years of Schooling				Son's Years of Schooling				Son's Years of Schooling		
Mother's Education	0.222	0.222	0.2	0.188	0.184	0.187	0.168	0.152	0.243	0.23	0.203
	[0.027]***	[0.027]***	[0.027]***	[0.026]***	[0.016]***	[0.016]***	[0.016]***	[0.016]***	[0.008]***	[0.008]***	[0.008]***
Father's Education	0.374	0.365	0.348	0.296	0.327	0.326	0.314	0.266	0.381	0.357	0.335
	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.007]***	[0.007]***	[0.007]***
Age		0.281	0.239	0.24		0.981	0.934	0.983		-0.913	-0.944
		[0.461]	[0.460]	[0.443]		[0.361]**	[0.358]**	[0.347]**		[0.196]***	[0.193]***
Age^2		-0.006	-0.005	-0.006		-0.016	-0.015	-0.016		0.016	0.016
		[0.008]	[0.008]	[0.008]		[0.006]*	[0.006]*	[0.006]**		[0.003]***	[0.003]***
Number of siblings		0	0.033	0.036		-0.101	-0.212	-0.125		-0.267	-0.39
		[0.021]	[0.030]	[0.029]		[0.018]***	[0.028]***	[0.027]***		[0.010]***	[0.016]***
Firstborn		-0.673	-0.521	-0.462		-0.135	0.156	0.086		-0.352	0.035
		[0.260]**	[0.268]	[0.259]		[0.186]	[0.191]	[0.186]		[0.092]***	[0.094]
Married		0.066	-0.004	0.146		0.199	-0.045	0.071		0.001	-0.306
		[0.118]	[0.124]	[0.122]		[0.099]*	[0.103]	[0.103]		[0.058]	[0.060]***
Married Polygamous		-1.878	-1.868	-1.603		-0.84	-1.29	-1.3		-1.475	-1.744
		[0.471]***	[0.476]***	[0.462]***		[0.581]	[0.579]*	[0.563]*		[0.332]***	[0.328]***
Separated/Divorced/Widowed		-1.614	-1.611	-1.388		-1.07	-1.139	-1.052		-0.972	-1.051
		[0.348]***	[0.347]***	[0.335]***		[0.218]***	[0.217]***	[0.211]***		[0.124]***	[0.122]***
Family size			-0.017	0.028			0.129	0.118			0.157
			[0.021]	[0.021]			[0.021]***	[0.021]***			[0.013]***
Extended family			0.363	0.34			0.198	0.085			0.337
			[0.119]**	[0.115]**			[0.096]*	[0.093]			[0.055]***
Owned house			0.398	0.404			0.437	0.491			0.599
			[0.261]	[0.252]			[0.171]*	[0.166]**			[0.103]***
Access Sewage			0.921	0.873			0.236	0.523			0.098
			[0.365]*	[0.352]*			[0.230]	[0.225]*			[0.128]
Access Electricity			0.378	0.645			1.169	1.287			1.308
			[0.366]	[0.354]			[0.177]***	[0.173]***			[0.091]***
Urban			0.243	0.81			-0.003	0.115			0.49
			[0.244]	[0.237]***			[0.129]	[0.128]			[0.063]***
Place of Birth: Central				0.803				0.388			
				[0.181]***				[0.141]**			
Place of Birth: Coast				-2.036				-0.566			
				[0.205]***				[0.170]***			
Place of Birth: Eastern				0.498				0.386			
				[0.166]**				[0.140]**			
Place of Birth: North Eastern				-5.974				-4.679			
				[0.425]***				[0.250]***			
Place of Birth: Nyanza				0.578				0.611			
				[0.174]***				[0.151]***			
Place of Birth: Rift Valley				-0.129				-0.185			
				[0.187]				[0.143]			
Constant	6.391	3.427	3.531	3.235	6.242	-8.232	-8.524	-9.131	4.726	18.827	17.955
	[0.065]***	[6.575]	[6.563]	[6.322]	[0.059]***	[5.139]	[5.102]	[4.952]	[0.035]***	[2.806]***	[2.766]***
R^2	0.158	0.167	0.172	0.233	0.203	0.212	0.225	0.273	0.358	0.38	0.399
N	5735	5735	5735	5735	7959	7959	7959	7959	25603	25603	25603
F	536.376	127.23	79.001	82.594	1015.527	238.313	154.148	141.614	7136.256	1744.066	1130.817

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets; Polygamous union (Omitted)

Table A 7 Intergenerational Persistence in Education, Daughter's Sample

Daughter(Age 25-34)	**Census 1989 (Born in 1955-64)**				**Census 1999 (Born in 1965-74)**				**Census 2009 (Born in 1975-1984)**		
Variables	Daughter's Years of Schooling				Daughter' Years of Schooling				Daughter's Years of Schooling		
Mother's Education	0.296	0.275	0.255	0.247	0.225	0.213	0.194	0.178	0.282	0.256	0.223
	[0.037]***	[0.036]***	[0.037]***	[0.036]***	[0.019]***	[0.019]***	[0.020]***	[0.019]***	[0.010]***	[0.009]***	[0.010]***
Father's Education	0.424	0.381	0.371	0.333	0.289	0.279	0.27	0.236	0.362	0.333	0.313
	[0.027]***	[0.027]***	[0.027]***	[0.027]***	[0.017]***	[0.016]***	[0.017]***	[0.016]***	[0.009]***	[0.009]***	[0.009]***
Age		1.024	1.068	1.152		-0.625	-0.661	-0.571		-0.527	-0.547
		[0.654]	[0.654]	[0.638]		[0.448]	[0.447]	[0.436]		[0.245]*	[0.242]*
Age^2		-0.021	-0.022	-0.024		0.012	0.012	0.01		0.009	0.009
		[0.011]	[0.011]	[0.011]*		[0.008]	[0.008]	[0.008]		[0.004]*	[0.004]*
Number of siblings		0.031	0.034	0.038		-0.162	-0.199	-0.139		-0.347	-0.417
		[0.026]	[0.039]	[0.038]		[0.022]***	[0.032]***	[0.032]***		[0.012]***	[0.019]***
Firstborn		-0.462	-0.521	-0.49		-0.565	-0.342	-0.319		-0.582	-0.437
		[0.544]	[0.559]	[0.545]		[0.308]	[0.319]	[0.311]		[0.160]***	[0.164]**
Married		-1.611	-1.585	-1.178		-1.051	-1.079	-0.757		-0.756	-0.781
		[0.195]***	[0.196]***	[0.195]***		[0.140]***	[0.141]***	[0.141]***		[0.075]***	[0.075]***
Married Polygamous		-3.123	-3.13	-2.395		-2.993	-3.039	-2.551		-2.268	-2.291
		[0.357]***	[0.358]***	[0.361]***		[0.355]***	[0.354]***	[0.350]***		[0.253]***	[0.250]***
Separated/Divorced/Widowed		-1.84	-1.81	-1.544		-1.17	-1.199	-1.008		-1.123	-1.145
		[0.213]***	[0.214]***	[0.211]***		[0.145]***	[0.146]***	[0.144]***		[0.086]***	[0.086]***
Family size			0	0.023			0.056	0.06			0.1
			[0.029]	[0.029]			[0.025]*	[0.025]*			[0.015]***
Extended family			-0.057	-0.117			0.222	0.077			0.17
			[0.174]	[0.170]			[0.122]	[0.120]			[0.072]*
Owned house			0.506	0.505			0.496	0.508			0.52
			[0.351]	[0.343]			[0.202]*	[0.198]*			[0.117]***
Access Sewage			0.768	0.749			0.326	0.358			0.091
			[0.463]	[0.452]			[0.274]	[0.269]			[0.139]
Access Electricity			0.861	0.947			0.644	0.751			1.384
			[0.468]	[0.457]*			[0.205]**	[0.203]***			[0.102]***
Urban			-0.594	0.2			0.322	0.621			0.335
			[0.338]	[0.336]			[0.164]	[0.165]***			[0.078]***
Place of Birth: Central				1.368				0.195			
				[0.243]***				[0.170]			
Place of Birth: Coast				-1.56				-1.668			
				[0.289]***				[0.214]***			
Place of Birth: Eastern				0.841				0.301			
				[0.242]***				[0.177]			
Place of Birth: North Eastern				-4.147				-4.633			
				[0.702]***				[0.398]***			
Place of Birth: Nyanza				0.129				-0.177			
				[0.269]				[0.202]			
Place of Birth: Rift Valley				-0.123				-0.565			
				[0.255]				[0.175]**			
Constant	5.058	-6.035	-7.107	-8.851	5.797	15.187	14.809	13.874	4.725	14.139	13.366
	[0.096]***	[9.332]	[9.341]	[9.112]	[0.075]***	[6.383]*	[6.364]*	[6.212]*	[0.046]***	[3.507]***	[3.464]***
R^2	0.205	0.269	0.272	0.311	0.217	0.251	0.258	0.294	0.397	0.44	0.454
N	2922	2922	2922	2922	4704	4704	4704	4704	14968	14968	14968
F	376.28	119.079	72.39	62.193	652.104	174.697	108.48	92.861	4920.405	1303.924	828.253

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets; Polygamous union (Omitted)

Table A 8 Standardized Intergenerational Persistence in Education, Son's Sample

Son(Age 25-34)	**Census 1989 (Born in 1955-64)**				**Census 1999 (Born in 1965-74)**				**Census 2009 (Born in 1975-1984)**			
Variables	Son's Years of Schooling				Son's Years of Schooling				Son's Years of Schooling			
Mother's Education	0.112	0.112	0.101	0.096	0.153	0.155	0.14	0.126	0.234	0.221	0.195	0.181
	[0.014]***	[0.014]***	[0.014]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***
Father's Education	0.295	0.288	0.275	0.233	0.337	0.336	0.324	0.275	0.416	0.39	0.366	0.329
	[0.015]***	[0.015]***	[0.015]***	[0.015]***	[0.014]***	[0.014]***	[0.014]***	[0.014]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***
Age		0.063	0.053	0.054		0.24	0.229	0.241		-0.198	-0.205	-0.196
		[0.103]	[0.103]	[0.099]		[0.088]**	[0.088]**	[0.085]**		[0.043]***	[0.042]***	[0.041]***
Age^2		-0.001	-0.001	-0.001		-0.004	-0.004	-0.004		0.003	0.004	0.003
		[0.002]	[0.002]	[0.002]		[0.002]*	[0.002]*	[0.001]**		[0.001]***	[0.001]***	[0.001]***
Number of siblings		0	0.007	0.008		-0.025	-0.052	-0.031		-0.058	-0.085	-0.062
		[0.005]	[0.007]	[0.006]		[0.004]***	[0.007]***	[0.007]***		[0.002]***	[0.003]***	[0.004]***
Firstborn		-0.15	-0.116	-0.103		-0.033	0.038	0.021		-0.077	0.008	0.006
		[0.058]**	[0.060]	[0.058]		[0.046]	[0.047]	[0.046]		[0.020]***	[0.021]	[0.020]
Married		0.015	-0.001	0.033		0.049	-0.011	0.017		0	-0.067	-0.047
		[0.026]	[0.028]	[0.027]		[0.024]*	[0.025]	[0.025]		[0.013]	[0.013]***	[0.013]***
Married Polygamous		-0.418	-0.416	-0.357		-0.206	-0.316	-0.319		-0.321	-0.379	-0.351
		[0.105]***	[0.106]***	[0.103]***		[0.142]	[0.142]*	[0.138]*		[0.072]***	[0.071]***	[0.070]***
Separated/Divorced/Widowed		-0.36	-0.359	-0.309		-0.262	-0.279	-0.258		-0.211	-0.228	-0.221
		[0.077]***	[0.077]***	[0.075]***		[0.053]***	[0.053]***	[0.052]***		[0.027]***	[0.027]***	[0.026]***
Family size			-0.004	0.006			0.032	0.029			0.034	0.026
			[0.005]	[0.005]			[0.005]***	[0.005]***			[0.003]***	[0.003]***
Extended family			0.081	0.076			0.049	0.021			0.073	0.053
			[0.026]**	[0.026]**			[0.024]*	[0.023]			[0.012]***	[0.012]***
Owned house			0.089	0.09			0.107	0.12			0.13	0.143
			[0.058]	[0.056]			[0.042]*	[0.041]**			[0.022]***	[0.022]***
Access Sewage			0.205	0.195			0.058	0.128			0.021	0.028
			[0.081]*	[0.078]*			[0.056]	[0.055]*			[0.028]	[0.028]
Access Electricity			0.084	0.144			0.287	0.315			0.284	0.318
			[0.081]	[0.079]			[0.043]***	[0.042]***			[0.020]***	[0.020]***
Urban			0.054	0.18			-0.001	0.028			0.107	0.113
			[0.054]	[0.053]***			[0.032]	[0.031]			[0.014]***	[0.014]***
Place of Birth: Central				0.179				0.095				-0.018
				[0.040]***				[0.035]**				[0.019]
Place of Birth: Coast				-0.454				-0.139				-0.019
				[0.046]***				[0.042]***				[0.022]
Place of Birth: Eastern				0.111				0.095				-0.057
				[0.037]**				[0.034]**				[0.018]**
Place of Birth: North Eastern				-1.331				-1.146				-0.523
				[0.095]***				[0.061]***				[0.025]***
Place of Birth: Nyanza				0.129				0.15				0.17
				[0.039]***				[0.037]***				[0.020]***
Place of Birth: Rift Valley				-0.029				-0.045				-0.047
				[0.042]				[0.035]				[0.017]**
Constant	1.424	0.763	0.786	0.721	1.53	-2.017	-2.089	-2.238	1.027	4.093	3.904	3.847
	[0.015]***	[1.465]	[1.462]	[1.408]	[0.014]***	[1.259]	[1.250]	[1.213]	[0.008]***	[0.610]***	[0.601]***	[0.592]***
R^2	0.158	0.167	0.172	0.233	0.203	0.212	0.225	0.273	0.358	0.38	0.399	0.417
N	5735	5735	5735	5735	7959	7959	7959	7959	25603	25603	25603	25603
F	536.376	127.23	79.001	82.594	1015.527	238.313	154.148	141.614	7136.256	1744.066	1130.817	870.292

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Table A 9 Standardized Intergenerational Persistence in Education, Daughter‘s Sample

Daughter(Age 25-34)	**Census 1989 (Born in 1955-64)**				**Census 1999 (Born in 1965-74)**				**Census 2009 (Born in 1975-1984)**			
Variables	Daughter's Years of Schooling				Daughter's Years of Schooling				Daughter's Years of Schooling			
Mother's Education	0.271	0.246	0.215	0.2	0.187	0.177	0.161	0.148	0.15	0.139	0.129	0.125
	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.016]***	[0.016]***	[0.016]***	[0.016]***	[0.019]***	[0.018]***	[0.019]***	[0.018]***
Father's Education	0.396	0.364	0.341	0.31	0.298	0.288	0.278	0.244	0.335	0.3	0.293	0.263
	[0.010]***	[0.009]***	[0.009]***	[0.009]***	[0.017]***	[0.017]***	[0.017]***	[0.017]***	[0.022]***	[0.021]***	[0.021]***	[0.021]***
Age		-0.115	-0.119	-0.106		-0.153	-0.162	-0.14		0.228	0.238	0.257
		[0.053]*	[0.053]*	[0.052]*		[0.110]	[0.109]	[0.107]		[0.146]	[0.146]	[0.142]
Age^2		0.002	0.002	0.002		0.003	0.003	0.002		-0.005	-0.005	-0.005
		[0.001]*	[0.001]*	[0.001]		[0.002]	[0.002]	[0.002]		[0.003]	[0.003]	[0.002]*
Number of siblings		-0.075	-0.091	-0.067		-0.04	-0.049	-0.034		0.007	0.008	0.008
		[0.003]***	[0.004]***	[0.004]***		[0.005]***	[0.008]***	[0.008]***		[0.006]	[0.009]	[0.009]
Firstborn		-0.127	-0.095	-0.098		-0.138	-0.084	-0.078		-0.103	-0.116	-0.109
		[0.035]***	[0.036]**	[0.035]**		[0.075]	[0.078]	[0.076]		[0.121]	[0.124]	[0.121]
Married		-0.164	-0.17	-0.135		-0.258	-0.264	-0.185		-0.359	-0.353	-0.262
		[0.016]***	[0.016]***	[0.016]***		[0.034]***	[0.034]***	[0.034]***		[0.043]***	[0.044]***	[0.044]***
Married Polygamous		-0.493	-0.498	-0.475		-0.733	-0.745	-0.625		-0.696	-0.697	-0.533
		[0.055]***	[0.054]***	[0.054]***		[0.087]***	[0.087]***	[0.086]***		[0.080]***	[0.080]***	[0.081]***
Separated/Divorced/Widowed		-0.244	-0.249	-0.228		-0.287	-0.294	-0.247		-0.41	-0.403	-0.344
		[0.019]***	[0.019]***	[0.019]***		[0.036]***	[0.036]***	[0.035]***		[0.047]***	[0.048]***	[0.047]***
Family size			0.022	0.016			0.014	0.015			0	0.005
			[0.003]***	[0.003]***			[0.006]*	[0.006]*			[0.006]	[0.006]
Extended family			0.037	0.008			0.054	0.019			-0.013	-0.026
			[0.016]*	[0.015]			[0.030]	[0.029]			[0.039]	[0.038]
Owned house			0.113	0.126			0.122	0.125			0.113	0.112
			[0.026]***	[0.025]***			[0.050]*	[0.048]*			[0.078]	[0.076]
Access Sewage			0.02	0.044			0.08	0.088			0.171	0.167
			[0.030]	[0.030]			[0.067]	[0.066]			[0.103]	[0.101]
Access Electricity			0.301	0.315			0.158	0.184			0.192	0.211
			[0.022]***	[0.022]***			[0.050]**	[0.050]***			[0.104]	[0.102]*
Urban			0.073	0.085			0.079	0.152			-0.132	0.045
			[0.017]***	[0.017]***			[0.040]	[0.040]***			[0.075]	[0.075]
Place of Birth: Central				0.035				0.048				0.305
				[0.022]				[0.042]				[0.054]***
Place of Birth: Coast				-0.109				-0.409				-0.347
				[0.027]***				[0.052]***				[0.064]***
Place of Birth: Eastern				0.015				0.074				0.187
				[0.022]				[0.043]				[0.054]***
Place of Birth: North Eastern				-0.645				-1.135				-0.924
				[0.033]***				[0.097]***				[0.156]***
Place of Birth: Nyanza				0.09				-0.043				0.029
				[0.024]***				[0.049]				[0.060]
Place of Birth: Rift Valley				-0.055				-0.138				-0.027
				[0.021]**				[0.043]**				[0.057]
Constant	1.027	3.074	2.906	2.785	1.42	3.721	3.629	3.4	1.127	-1.344	-1.583	-1.972
	[0.010]***	[0.762]***	[0.753]***	[0.741]***	[0.018]***	[1.564]*	[1.559]*	[1.522]*	[0.021]***	[2.079]	[2.081]	[2.030]
R^2	0.397	0.44	0.454	0.472	0.217	0.251	0.258	0.294	0.205	0.269	0.272	0.311
N	14968	14968	14968	14968	4704	4704	4704	4704	2922	2922	2922	2922
F	4920.405	1303.924	828.253	636.569	652.104	174.697	108.48	92.861	376.28	119.079	72.39	62.193

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Table A 10 Intergenerational Persistence in Education by Place of Birth, Son's Sample

Son (Age 25-34)	[1] **Nairobi**	[2] **Central**	[3] **Coast**	[4] **Eastern**	[5] **North Eastern**	[6] **Nyanza**	[7] **Rift Valley**	[8] **Western**	[9] **Foreign-born**
Variables					**Son's Years of Schooling**				
Panel A: Census 1989(Born in 1955-64)									
Mother's Education	0.255	0.142	0.434	0.135		0.226	0.33	0.146	-0.362
	[0.090]**	[0.052]**	[0.111]***	[0.061]*		[0.066]***	[0.093]***	[0.060]*	[0.319]
Father's Education	0.228	0.211	0.377	0.244	0.59	0.229	0.386	0.355	0.283
	[0.093]*	[0.038]***	[0.069]***	[0.042]***	[0.661]	[0.041]***	[0.064]***	[0.047]***	[0.275]
Age	4.494	0.56	0.809	0.308	1.656	-1.138	0.474	0.669	-4.791
	[2.289]	[1.093]	[1.341]	[0.933]	[2.341]	[0.981]	[1.336]	[1.211]	[9.030]
Age^2	-0.077	-0.011	-0.017	-0.006	-0.029	0.02	-0.013	-0.013	0.083
	[0.040]	[0.019]	[0.023]	[0.016]	[0.041]	[0.017]	[0.023]	[0.021]	[0.158]
Number of siblings	0.312	-0.069	0.128	-0.006	0.061	0.11	-0.216	-0.082	0.377
	[0.178]	[0.085]	[0.072]	[0.063]	[0.174]	[0.064]	[0.104]*	[0.084]	[0.527]
Firstborn	-0.364	-0.78	-0.521	-0.993	-0.123	-0.29	0.331	-0.577	
	[1.171]	[0.538]	[0.864]	[0.551]	[2.440]	[0.559]	[0.713]	[0.929]	
Married	-0.389	0.348	0.185	0.263	-0.694	-0.289	-0.176	0.628	-0.591
	[0.617]	[0.396]	[0.352]	[0.252]	[0.623]	[0.249]	[0.407]	[0.317]*	[2.551]
Married Polygamous	0	2.777	-0.749	-0.482	0	-2.567	0	-1.403	-0.085
	[.]	[2.438]	[0.879]	[1.576]	[.]	[0.679]***	[.]	[1.608]	[4.166]
Separated/Divorced/Widowed	-5.526	-0.173	-0.948	-1.937	-0.849	-1.995	-0.749	-1.493	
	[2.934]	[0.941]	[1.044]	[0.676]**	[1.281]	[0.691]**	[1.033]	[0.892]	
Family size	0.013	0.055	-0.081	0.076	-0.04	0.005	0.319	0.209	-0.316
	[0.131]	[0.071]	[0.039]*	[0.047]	[0.154]	[0.047]	[0.089]***	[0.066]**	[0.453]
Extended family	0.182	-0.21	0.714	0.023	0.527	0.623	0.802	-0.462	0.069
	[0.657]	[0.275]	[0.365]	[0.234]	[0.689]	[0.276]*	[0.345]*	[0.337]	[1.838]
Owned house	0.429	0.841	0.949	-0.344	-4.495	-0.575	-0.148	1.008	0.817
	[0.758]	[0.577]	[0.660]	[0.702]	[1.706]*	[0.636]	[0.624]	[1.001]	[2.570]
Access Sewage	1.217	0.565	0.576	0.23		0.602	2.05	2.565	9.732
	[1.085]	[0.713]	[0.964]	[0.799]		[0.880]	[1.746]	[1.146]*	[3.992]*
Access Electricity	-0.107	1.005	1.484	0.683		-0.567	-1.925	-0.776	-2.979
	[1.012]	[0.561]	[0.929]	[1.146]		[1.018]	[1.551]	[1.397]	[4.426]
Urban	0.059	0.604	0.839	-0.199	2.662	0.094	1.622	-0.242	
	[0.725]	[0.665]	[0.577]	[0.659]	[0.964]**	[0.546]	[0.667]*	[0.990]	
Constant	-58.524	-0.081	-6.196	3.177	-18.645	23.13	0.5	-4.173	75.89
	[32.788]	[15.455]	[19.164]	[13.336]	[33.281]	[14.007]	[18.945]	[17.325]	[126.594]
R^2	0.468	0.136	0.284	0.084	0.225	0.131	0.224	0.198	0.638
N	120	902	627	1330	90	1044	821	774	27
F	6.602	9.279	16.156	8.085	2.056	10.322	16.635	12.449	2.056

Panel B: Census 1999 (Born in 1965-74)									
Mother's Education	0.11	0.098	0.183	0.117	-0.14	0.217	0.211	0.177	0.087
	[0.054]*	[0.030]***	[0.057]**	[0.039]**	[0.217]	[0.039]***	[0.043]***	[0.046]***	[0.100]
Father's Education	0.201	0.235	0.234	0.23	0.527	0.168	0.363	0.294	0.383
	[0.061]**	[0.026]***	[0.047]***	[0.031]***	[0.159]**	[0.032]***	[0.034]***	[0.039]***	[0.090]***
Age	3.609	1.266	1.186	0.573	0.361	1.351	0.704	0.3	-1.792
	[1.681]*	[0.696]	[1.110]	[0.792]	[2.286]	[0.906]	[0.918]	[1.072]	[2.412]
Age^2	-0.062	-0.021	-0.019	-0.009	-0.008	-0.022	-0.013	-0.005	0.035
	[0.029]*	[0.012]	[0.019]	[0.014]	[0.041]	[0.016]	[0.016]	[0.019]	[0.042]
Number of siblings	-0.065	-0.079	0.057	-0.139	-0.097	-0.142	-0.358	-0.164	0.066
	[0.154]	[0.078]	[0.059]	[0.067]*	[0.204]	[0.077]	[0.076]***	[0.085]	[0.195]
Firstborn	-0.16	0.574	1.254	-0.277	-2.164	-0.902	-0.94	-0.719	3.319
	[0.724]	[0.319]	[0.688]	[0.440]	[2.082]	[0.543]	[0.520]	[0.653]	[1.377]*
Married	0.449	0.084	0.326	0.273	-0.66	-0.008	-0.143	0.272	0.109
	[0.523]	[0.311]	[0.294]	[0.236]	[0.519]	[0.232]	[0.276]	[0.289]	[0.711]
Married Polygamous	0	3.238	-0.724	-2.077	-1.701	-2.029	6.643	-1.573	0
	[.]	[2.294]	[1.030]	[2.058]	[3.601]	[0.854]*	[3.864]	[1.717]	[.]
Separated/Divorced/Widowed	-1.551	-0.771	-1.125	-0.87	-2.234	-1.861	-0.939	-0.392	-0.364
	[1.277]	[0.480]	[0.711]	[0.429]*	[1.010]*	[0.562]***	[0.615]	[0.551]	[1.564]
Family size	-0.056	0.113	0.043	0.136	0.297	0.122	0.185	0.226	0.149
	[0.110]	[0.068]	[0.038]	[0.053]*	[0.191]	[0.067]	[0.063]**	[0.067]***	[0.159]
Extended family	0.093	-0.326	-0.488	-0.209	-0.044	-0.109	0.91	-0.132	0.358
	[0.403]	[0.210]	[0.309]	[0.215]	[0.515]	[0.268]	[0.236]***	[0.294]	[0.756]
Owned house	1.188	0.744	0.412	0.455	0.504	0.136	-0.143	0.909	1.855
	[0.409]**	[0.391]	[0.433]	[0.481]	[1.378]	[0.415]	[0.431]	[0.594]	[1.039]
Access Sewage	1.565	0.354	0.522	0.78	-1.964	-0.47	-0.375	0.977	1.796
	[0.599]**	[0.500]	[0.573]	[0.809]	[1.986]	[0.674]	[0.713]	[0.865]	[1.621]
Access Electricity	0.776	1.744	0.823	0.722	2.754	0.685	0.813	1.732	-0.019
	[0.615]	[0.268]***	[0.484]	[0.493]	[1.766]	[0.588]	[0.510]	[0.708]*	[1.546]
Urban	-1.032	-0.377	0.82	-0.059	3.415	-0.257	-0.284	-0.087	0.96
	[0.601]	[0.339]	[0.346]*	[0.276]	[0.797]***	[0.320]	[0.410]	[0.339]	[0.939]
Constant	-43.871	-13.094	-12.728	-2.924	-5.093	-13.573	-3.946	-0.126	24.734
	[24.046]	[9.961]	[15.907]	[11.293]	[31.825]	[12.899]	[13.025]	[15.302]	[34.258]
R^2	0.353	0.175	0.231	0.104	0.215	0.148	0.228	0.229	0.457
N	249	1545	764	1570	269	1081	1527	810	144
F	9.13	21.663	14.969	12.018	4.624	12.329	29.767	15.715	7.751
Panel C: Census 2009 (Born in 1975-84)									
Mother's Education	0.165	0.175	0.175	0.19	0.445	0.116	0.23	0.204	0.203
	[0.030]***	[0.016]***	[0.027]***	[0.017]***	[0.079]***	[0.019]***	[0.019]***	[0.023]***	[0.105]
Father's Education	0.244	0.211	0.246	0.258	0.332	0.239	0.401	0.27	0.386
	[0.031]***	[0.015]***	[0.022]***	[0.015]***	[0.065]***	[0.017]***	[0.016]***	[0.021]***	[0.087]***
Age	-0.091	-0.664	-1.753	-0.981	0.278	-0.677	-0.627	-0.396	-4.45

	[0.741]	[0.413]	[0.668]**	[0.403]*	[0.825]	[0.508]	[0.427]	[0.611]	[2.411]
Age²	0.002	0.011	0.032	0.018	-0.007	0.012	0.01	0.007	0.078
	[0.013]	[0.007]	[0.012]**	[0.007]*	[0.014]	[0.009]	[0.007]	[0.011]	[0.042]
Number of siblings	-0.271	-0.112	0.015	-0.303	-0.16	-0.081	-0.495	-0.173	0.374
	[0.095]**	[0.058]	[0.042]	[0.043]***	[0.080]*	[0.045]	[0.036]***	[0.051]***	[0.202]
Firstborn	0.409	0.048	0.101	0.074	-1.594	-0.3	0.335	-1.374	0.352
	[0.288]	[0.157]	[0.391]	[0.189]	[0.777]*	[0.287]	[0.246]	[0.413]***	[1.357]
Married	-0.104	0.294	-0.394	0.223	-0.506	0.033	-0.463	0.253	0.346
	[0.275]	[0.181]	[0.185]*	[0.140]	[0.211]*	[0.137]	[0.144]**	[0.181]	[0.718]
Married Polygamous	0.124	-2.915	-1.371	-2.453	-0.768	-0.59	-2.183	-0.186	
	[1.510]	[1.541]	[1.065]	[1.210]*	[0.810]	[0.810]	[0.565]***	[1.159]	
Separated/Divorced/Widowed	-0.256	-0.996	-0.788	-0.932	-0.454	-0.738	-0.928	-1.557	-1.988
	[0.606]	[0.250]***	[0.454]	[0.241]***	[0.506]	[0.368]*	[0.302]**	[0.304]***	[1.948]
Family size	0.203	0.04	-0.018	0.159	0.21	0.059	0.216	0.111	-0.283
	[0.074]**	[0.047]	[0.025]	[0.035]***	[0.070]**	[0.034]	[0.033]***	[0.041]**	[0.175]
Extended family	-0.126	0.008	0.199	-0.137	0.081	0.165	0.549	-0.23	2.558
	[0.219]	[0.138]	[0.191]	[0.123]	[0.224]	[0.148]	[0.117]***	[0.179]	[0.740]***
Owned house	0.49	0.594	0.401	0.328	0.708	-0.076	0.954	0.366	2.1
	[0.197]*	[0.261]*	[0.312]	[0.303]	[0.449]	[0.294]	[0.220]***	[0.352]	[0.893]*
Access Sewage	0.69	0.331	0.966	-0.288	-2.716	0.069	-0.443	1.207	-1.582
	[0.235]**	[0.270]	[0.332]**	[0.405]	[1.584]	[0.427]	[0.409]	[0.594]*	[1.551]
Access Electricity	1.558	1.473	1.316	1.783	4.916	1.088	1.157	1.562	4.457
	[0.308]***	[0.140]***	[0.296]***	[0.223]***	[0.605]***	[0.295]***	[0.233]***	[0.359]***	[2.098]*
Urban	0.151	0.262	0.474	0.08	3.252	0.211	0.5	-0.435	-0.468
	[0.362]	[0.134]	[0.216]*	[0.125]	[0.272]***	[0.151]	[0.150]***	[0.204]*	[1.485]
Constant	6.278	15.096	29.467	18.491	-2.13	16.439	13.312	10.677	65.353
	[10.652]	[5.924]*	[9.569]**	[5.800]**	[11.689]	[7.258]*	[6.088]*	[8.749]	[34.310]
R^2	0.407	0.275	0.322	0.279	0.231	0.208	0.411	0.292	0.442
N	856	3849	2019	4956	1928	3085	6294	2385	231
F	38.466	96.723	63.539	127.396	38.36	53.725	291.834	65.182	12.227

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Table A 11 Intergenerational Persistence in Education by Place of Birth, Daughter' Sample

Daughter (Age 25-34)	[1] **Nairobi**	[2] **Central**	[3] **Coast**	[4] **Eastern**	[5] **North Eastern**	[6] **Nyanza**	[7] **Rift Valley**	[8] **Western**	[9] **Foreign-born**
Variables					**Daughter's Years of Schooling**				
Panel A: Census 1989 (Born in 1955-64)									
Mother's Education	0.166	0.225	0.53	0.227		0.155	0.272	0.364	0.147
	[0.130]	[0.069]**	[0.127]***	[0.078]**		[0.091]	[0.134]*	[0.097]***	[.]
Father's Education	0.395	0.176	0.466	0.361	0.245	0.308	0.5	0.191	-0.072
	[0.111]***	[0.052]***	[0.088]***	[0.061]***	[0.177]	[0.065]***	[0.083]***	[0.074]*	[.]
Age	2.333	3.861	-1.393	-0.354	15.201	0.849	1.512	0.824	29.029
	[3.404]	[1.390]**	[1.855]	[1.407]	[7.075]*	[1.599]	[1.787]	[1.740]	[.]
Age^2	-0.043	-0.071	0.02	0.003	-0.275	-0.018	-0.03	-0.019	-0.566
	[0.059]	[0.024]**	[0.032]	[0.025]	[0.128]*	[0.028]	[0.031]	[0.030]	[.]
Number of siblings	-0.018	0.251	0.021	0.234	-0.074	0.056	-0.184	-0.224	1.495
	[0.352]	[0.091]**	[0.101]	[0.087]**	[0.379]	[0.118]	[0.100]	[0.099]*	[.]
Firstborn	-0.651	-0.976	0.135	-0.392		3.054	-0.332	-3.718	
	[2.118]	[1.081]	[1.667]	[1.106]		[1.427]*	[1.687]	[1.598]*	
Married	2.312	-0.245	-1.456	-1.424	-1.492	-1.45	-1.49	-0.795	0.828
	[1.417]	[0.472]	[0.551]**	[0.497]**	[0.952]	[0.466]**	[0.489]**	[0.506]	[.]
Married Polygamous	0	0	-3.592	-3.166	-0.942	-1.994	-2.658	-1.217	0
	[.]	[.]	[0.873]***	[1.312]*	[1.537]	[0.561]***	[1.225]*	[0.836]	[.]
Separated/Divorced/Widowed	-1.154	-0.943	-1.736	-1.835	0.207	-0.906	-1.974	-1.202	7.694
	[1.366]	[0.452]*	[0.594]**	[0.454]***	[1.985]	[0.566]	[0.587]***	[0.560]*	[.]
Family size	0.13	-0.099	-0.09	-0.083	0.095	0.086	0.183	0.225	0.434
	[0.322]	[0.073]	[0.061]	[0.066]	[0.376]	[0.085]	[0.077]*	[0.082]**	[.]
Extended family	-0.544	-0.496	-0.233	0.139	-0.926	0.447	0.183	-1.659	8.343
	[1.051]	[0.350]	[0.522]	[0.355]	[0.979]	[0.488]	[0.446]	[0.549]**	[.]
Owned house	-1.096	-0.22	1.679	-0.38		-0.553	0.905	2.536	-5.756
	[0.867]	[0.809]	[0.889]	[0.996]		[0.845]	[0.878]	[1.211]*	[.]
Access Sewage	-0.532	0.476	0.097	1.134		0.077	3.492	2.66	8.327
	[1.086]	[0.974]	[0.956]	[1.065]		[1.375]	[1.837]	[1.764]	[.]
Access Electricity	1.527	0.585	0.415	0.398		2.05	1.301	-0.805	
	[1.114]	[0.765]	[1.052]	[1.504]		[1.901]	[1.668]	[1.664]	
Urban	-0.042	-1.877	1.259	2.37	2.279	-0.394	-1.516	-0.513	-10.213
	[1.082]	[0.793]*	[0.785]	[1.053]*	[1.075]*	[0.905]	[1.022]	[1.296]	[.]
Constant	-25.098	-44.089	26.485	14.018	-207.969	-4.243	-15.665	-5.303	-369.658
	[48.750]	[19.734]*	[26.808]	[20.059]	[97.450]*	[22.843]	[25.457]	[24.948]	[.]
R^2	0.625	0.179	0.438	0.251	0.553	0.259	0.275	0.264	1
N	67	607	305	633	33	386	487	391	13
F	6.202	9.244	15.001	13.767	2.721	8.603	11.902	8.987	

Panel B: Census 1999 (Born in 1965-74)									
Mother's Education	0.186	0.187	0.215	0.146	1.914	0.163	0.173	0.164	0.318
	[0.104]	[0.034]***	[0.079]**	[0.049]**	[0.606]**	[0.055]**	[0.050]***	[0.052]**	[0.126]*
Father's Education	0.14	0.114	0.34	0.254	-0.293	0.185	0.341	0.245	0.311
	[0.094]	[0.029]***	[0.071]***	[0.039]***	[0.229]	[0.048]***	[0.039]***	[0.044]***	[0.120]*
Age	1.021	-1.539	-1.78	1.415	-5.87	-1.549	-0.308	0.013	-0.31
	[2.569]	[0.807]	[1.716]	[0.971]	[4.106]	[1.390]	[1.064]	[1.207]	[3.218]
Age^2	-0.017	0.028	0.03	-0.025	0.101	0.028	0.005	0	0.004
	[0.045]	[0.014]*	[0.030]	[0.017]	[0.073]	[0.024]	[0.019]	[0.021]	[0.056]
Number of siblings	-0.392	-0.02	0.008	-0.092	-0.106	0.038	-0.405	-0.024	-0.506
	[0.196]*	[0.073]	[0.094]	[0.082]	[0.360]	[0.108]	[0.078]***	[0.081]	[0.273]
Firstborn	-1.723	-0.36	0.209	0.497	-0.264	-1.106	-0.366	-0.899	0.78
	[1.049]	[0.543]	[1.127]	[0.733]	[4.327]	[0.964]	[0.921]	[0.998]	[1.833]
Married	-0.427	0.151	-0.905	-1.046	-0.014	-0.797	-1.198	-0.472	-2.698
	[0.939]	[0.317]	[0.486]	[0.383]**	[0.786]	[0.360]*	[0.317]***	[0.364]	[0.925]**
Married Polygamous	-9.217	-0.344	-2.543	-1.823	-1.431	-2.047	-4.909	-0.375	-0.913
	[3.344]**	[2.190]	[0.808]**	[1.064]	[1.865]	[0.700]**	[0.939]***	[0.879]	[2.361]
Separated/Divorced/Widowed	-0.74	-0.807	-1.394	-1.147	-0.51	-1.076	-0.549	-1.076	-2.355
	[1.213]	[0.275]**	[0.514]**	[0.311]***	[0.879]	[0.438]*	[0.387]	[0.373]**	[1.216]
Family size	0.15	0.001	-0.015	0.099	0.157	0.065	0.178	0.052	0.24
	[0.154]	[0.059]	[0.059]	[0.065]	[0.376]	[0.087]	[0.064]**	[0.054]	[0.200]
Extended family	-0.554	-0.373	-0.8	0.135	0.797	0.225	0.528	0.26	0.969
	[0.619]	[0.237]	[0.452]	[0.275]	[0.792]	[0.395]	[0.283]	[0.358]	[0.994]
Owned house	1.359	0.677	-0.367	-0.692	0.638	0.225	1.352	0.981	1.512
	[0.618]*	[0.436]	[0.588]	[0.535]	[2.973]	[0.576]	[0.509]**	[0.598]	[1.414]
Access Sewage	0.291	0.818	-0.795	-1.209	-2.546	0.306	0.842	1.741	4.327
	[0.788]	[0.513]	[0.800]	[0.900]	[6.593]	[0.927]	[0.857]	[1.019]	[1.810]*
Access Electricity	0.686	0.803	1.421	0.605	0.243	0.224	0.843	0.272	0.919
	[0.846]	[0.289]**	[0.659]*	[0.752]	[3.410]	[0.727]	[0.567]	[0.768]	[1.870]
Urban	0.774	0.447	0.771	1.082	1.865	0.138	0.793	-0.057	-2.971
	[1.043]	[0.380]	[0.521]	[0.385]**	[0.844]*	[0.451]	[0.493]	[0.393]	[1.160]*
Constant	-8.34	27.923	31.699	-12.652	83.811	27.329	8.381	4.593	9.445
	[36.988]	[11.535]*	[24.393]	[13.816]	[57.228]	[19.653]	[15.153]	[17.277]	[46.015]
R^2	0.284	0.158	0.37	0.169	0.357	0.174	0.271	0.218	0.63
N	158	1114	410	906	88	494	953	506	75
F	3.758	13.713	15.45	12.064	2.661	6.719	23.167	9.084	6.7
Panel C: Census 2009 (Born in 1975-84)									
Mother's Education	0.168	0.184	0.268	0.154	0.346	0.16	0.249	0.203	0.373
	[0.034]***	[0.019]***	[0.035]***	[0.023]***	[0.074]***	[0.026]***	[0.022]***	[0.027]***	[0.117]**
Father's Education	0.212	0.145	0.276	0.291	0.258	0.199	0.365	0.244	0.431
	[0.033]***	[0.018]***	[0.030]***	[0.020]***	[0.062]***	[0.023]***	[0.019]***	[0.025]***	[0.089]***
Age	0.435	-0.227	-0.755	-1.375	0.163	0.206	-0.54	-0.126	1.17

	[0.862]	[0.499]	[0.898]	[0.549]*	[1.134]	[0.689]	[0.514]	[0.710]	[3.415]
Age²	-0.007	0.003	0.014	0.024	-0.006	-0.004	0.008	0.002	-0.018
	[0.015]	[0.009]	[0.016]	[0.009]*	[0.020]	[0.012]	[0.009]	[0.012]	[0.059]
Number of siblings	-0.068	-0.05	-0.061	-0.328	-0.2	-0.201	-0.475	-0.129	0.206
	[0.101]	[0.056]	[0.061]	[0.050]***	[0.102]	[0.056]***	[0.037]***	[0.054]*	[0.333]
Firstborn	-0.014	-0.844	0.403	-1.148	-0.186	-1.286	-0.315	0.197	1.52
	[0.382]	[0.275]**	[0.692]	[0.389]**	[0.960]	[0.527]*	[0.442]	[0.632]	[1.334]
Married	0.54	-0.11	-0.714	-0.469	-0.22	-0.102	-0.993	-0.765	-2.736
	[0.339]	[0.180]	[0.267]**	[0.196]*	[0.282]	[0.197]	[0.155]***	[0.209]***	[1.041]*
Married Polygamous		0.039	-2.291	-1.411	-1.288	-1.902	-2.797	-1.298	-2.567
		[1.738]	[0.637]***	[1.184]	[0.758]	[0.515]***	[0.488]***	[0.627]*	[2.883]
Separated/Divorced/Widowed	-0.229	-0.912	-1.391	-0.831	-0.593	-0.59	-1.368	-1.11	-0.716
	[0.493]	[0.176]***	[0.300]***	[0.189]***	[0.346]	[0.252]*	[0.198]***	[0.234]***	[1.203]
Family size	0.007	-0.081	-0.045	0.04	0.167	0.092	0.167	0.061	-0.016
	[0.083]	[0.039]*	[0.041]	[0.039]	[0.096]	[0.044]*	[0.032]***	[0.040]	[0.272]
Extended family	-0.456	-0.405	-0.221	-0.452	-0.436	-0.372	0.854	-0.769	2.466
	[0.245]	[0.157]*	[0.278]	[0.170]**	[0.299]	[0.211]	[0.148]***	[0.229]***	[0.983]*
Owned house	0.713	0.794	0.519	0.815	-0.696	0.191	1.192	-0.505	-0.86
	[0.218]**	[0.263]**	[0.370]	[0.367]*	[0.669]	[0.342]	[0.267]***	[0.398]	[1.117]
Access Sewage	0.087	0.597	0.089	0.93	4.148	0.121	-0.493	-0.334	-0.871
	[0.263]	[0.275]*	[0.432]	[0.429]*	[1.374]**	[0.454]	[0.430]	[0.586]	[1.497]
Access Electricity	1.66	1.456	1.088	1.606	2.767	1.779	1.332	0.536	0.706
	[0.365]***	[0.160]***	[0.374]**	[0.273]***	[0.655]***	[0.339]***	[0.256]***	[0.411]	[2.031]
Urban	-0.049	0.224	0.499	-0.053	1.139	-0.098	0.449	0.599	0.788
	[0.428]	[0.154]	[0.280]	[0.174]	[0.346]**	[0.210]	[0.182]*	[0.234]*	[1.796]
Constant	0.835	11.066	15.686	25.745	1.961	4.489	12.106	9.086	-15.909
	[12.320]	[7.176]	[12.889]	[7.871]**	[16.040]	[9.817]	[7.355]	[10.179]	[48.447]
R^2	0.328	0.3	0.441	0.335	0.293	0.263	0.455	0.306	0.65
N	734	2590	1168	2544	833	1686	3766	1543	104
F	25.109	73.556	60.696	84.993	22.565	39.705	209.036	44.962	10.888

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Table A 12 Standardized Intergenerational Persistence in Education by Place of Birth, Son's Sample

Son (Age 25-34)					**Son's Years of Schooling**				
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Variables	**Nairobi**	**Central**	**Coast**	**Eastern**	**North Eastern**	**Nyanza**	**Rift Valley**	**Western**	**Foreign-born**
Panel A: Census 1989 (Born in 1955-64)									
Mother's Education	0.129	0.072	0.22	0.068		0.115	0.167	0.074	-0.183
	[0.046]**	[0.027]**	[0.056]***	[0.031]*		[0.034]***	[0.047]***	[0.030]*	[0.162]
Father's Education	0.18	0.167	0.297	0.193	0.465	0.181	0.305	0.28	0.223
	[0.073]*	[0.030]***	[0.054]***	[0.033]***	[0.522]	[0.033]***	[0.050]***	[0.037]***	[0.217]
Age	1.001	0.125	0.18	0.069	0.369	-0.253	0.106	0.149	-1.067
	[0.510]	[0.243]	[0.299]	[0.208]	[0.521]	[0.218]	[0.298]	[0.270]	[2.012]
Age^2	-0.017	-0.003	-0.004	-0.001	-0.006	0.005	-0.003	-0.003	0.018
	[0.009]	[0.004]	[0.005]	[0.004]	[0.009]	[0.004]	[0.005]	[0.005]	[0.035]
Number of siblings	0.069	-0.015	0.029	-0.001	0.014	0.024	-0.048	-0.018	0.084
	[0.040]	[0.019]	[0.016]	[0.014]	[0.039]	[0.014]	[0.023]*	[0.019]	[0.117]
Firstborn	-0.081	-0.174	-0.116	-0.221	-0.027	-0.065	0.074	-0.129	
	[0.261]	[0.120]	[0.192]	[0.123]	[0.543]	[0.124]	[0.159]	[0.207]	
Married	-0.087	0.078	0.041	0.059	-0.155	-0.064	-0.039	0.14	-0.132
	[0.138]	[0.088]	[0.078]	[0.056]	[0.139]	[0.055]	[0.091]	[0.071]*	[0.568]
Married Polygamous	0	0.619	-0.167	-0.107	0	-0.572	0	-0.313	-0.019
	[.]	[0.543]	[0.196]	[0.351]	[.]	[0.151]***	[.]	[0.358]	[0.928]
Separated/Divorced/Widowed	-1.231	-0.039	-0.211	-0.432	-0.189	-0.444	-0.167	-0.333	
	[0.654]	[0.210]	[0.233]	[0.151]**	[0.285]	[0.154]**	[0.230]	[0.199]	
Family size	0.003	0.012	-0.018	0.017	-0.009	0.001	0.071	0.047	-0.07
	[0.029]	[0.016]	[0.009]*	[0.010]	[0.034]	[0.010]	[0.020]***	[0.015]**	[0.101]
Extended family	0.041	-0.047	0.159	0.005	0.117	0.139	0.179	-0.103	0.015
	[0.146]	[0.061]	[0.081]	[0.052]	[0.154]	[0.061]*	[0.077]*	[0.075]	[0.409]
Owned house	0.096	0.187	0.211	-0.077	-1.001	-0.128	-0.033	0.224	0.182
	[0.169]	[0.129]	[0.147]	[0.156]	[0.380]*	[0.142]	[0.139]	[0.223]	[0.572]
Access Sewage	0.271	0.126	0.128	0.051		0.134	0.457	0.571	2.168
	[0.242]	[0.159]	[0.215]	[0.178]		[0.196]	[0.389]	[0.255]*	[0.889]*
Access Electricity	-0.024	0.224	0.331	0.152		-0.126	-0.429	-0.173	-0.664
	[0.225]	[0.125]	[0.207]	[0.255]		[0.227]	[0.346]	[0.311]	[0.986]
Urban	0.013	0.134	0.187	-0.044	0.593	0.021	0.361	-0.054	
	[0.162]	[0.148]	[0.129]	[0.147]	[0.215]**	[0.122]	[0.149]*	[0.221]	
Constant	-13.037	-0.018	-1.38	0.708	-4.153	5.152	0.111	-0.93	16.906
	[7.304]	[3.443]	[4.269]	[2.971]	[7.414]	[3.120]	[4.220]	[3.859]	[28.200]
R^2	0.468	0.136	0.284	0.084	0.225	0.131	0.224	0.198	0.638
N	120	902	627	1330	90	1044	821	774	27
F	6.602	9.279	16.156	8.085	2.056	10.322	16.635	12.449	2.056
Panel B: Census 1999 (Born in 1965-74)									
Mother's Education	0.091	0.082	0.152	0.098	-0.116	0.18	0.175	0.148	0.072
	[0.045]*	[0.025]***	[0.048]**	[0.032]**	[0.181]	[0.033]***	[0.035]***	[0.038]***	[0.083]

Father's Education	0.207	0.242	0.241	0.237	0.543	0.173	0.374	0.303	0.395
	[0.063]**	[0.027]***	[0.048]***	[0.032]***	[0.164]**	[0.033]***	[0.035]***	[0.041]***	[0.093]***
Age	0.884	0.31	0.291	0.14	0.088	0.331	0.172	0.073	-0.439
	[0.412]*	[0.171]	[0.272]	[0.194]	[0.560]	[0.222]	[0.225]	[0.263]	[0.591]
Age²	-0.015	-0.005	-0.005	-0.002	-0.002	-0.005	-0.003	-0.001	0.009
	[0.007]*	[0.003]	[0.005]	[0.003]	[0.010]	[0.004]	[0.004]	[0.005]	[0.010]
Number of siblings	-0.016	-0.019	0.014	-0.034	-0.024	-0.035	-0.088	-0.04	0.016
	[0.038]	[0.019]	[0.014]	[0.016]*	[0.050]	[0.019]	[0.019]***	[0.021]	[0.048]
Firstborn	-0.039	0.141	0.307	-0.068	-0.53	-0.221	-0.23	-0.176	0.813
	[0.178]	[0.078]	[0.168]	[0.108]	[0.510]	[0.133]	[0.127]	[0.160]	[0.337]*
Married	0.11	0.021	0.08	0.067	-0.162	-0.002	-0.035	0.067	0.027
	[0.128]	[0.076]	[0.072]	[0.058]	[0.127]	[0.057]	[0.068]	[0.071]	[0.174]
Married Polygamous	0	0.794	-0.177	-0.509	-0.417	-0.497	1.628	-0.385	0
	[.]	[0.562]	[0.252]	[0.504]	[0.882]	[0.209]*	[0.947]	[0.421]	[.]
Separated/Divorced/Widowed	-0.38	-0.189	-0.276	-0.213	-0.547	-0.456	-0.23	-0.096	-0.089
	[0.313]	[0.118]	[0.174]	[0.105]*	[0.247]*	[0.138]***	[0.151]	[0.135]	[0.383]
Family size	-0.014	0.028	0.011	0.033	0.073	0.03	0.045	0.055	0.036
	[0.027]	[0.017]	[0.009]	[0.013]*	[0.047]	[0.016]	[0.015]**	[0.016]***	[0.039]
Extended family	0.023	-0.08	-0.12	-0.051	-0.011	-0.027	0.223	-0.032	0.088
	[0.099]	[0.051]	[0.076]	[0.053]	[0.126]	[0.066]	[0.058]***	[0.072]	[0.185]
Owned house	0.291	0.182	0.101	0.112	0.124	0.033	-0.035	0.223	0.455
	[0.100]**	[0.096]	[0.106]	[0.118]	[0.338]	[0.102]	[0.106]	[0.146]	[0.255]
Access Sewage	0.384	0.087	0.128	0.191	-0.481	-0.115	-0.092	0.24	0.44
	[0.147]**	[0.123]	[0.140]	[0.198]	[0.487]	[0.165]	[0.175]	[0.212]	[0.397]
Access Electricity	0.19	0.427	0.202	0.177	0.675	0.168	0.199	0.424	-0.005
	[0.151]	[0.066]***	[0.119]	[0.121]	[0.433]	[0.144]	[0.125]	[0.174]*	[0.379]
Urban	-0.253	-0.092	0.201	-0.014	0.837	-0.063	-0.07	-0.021	0.235
	[0.147]	[0.083]	[0.085]*	[0.068]	[0.195]***	[0.078]	[0.100]	[0.083]	[0.230]
Constant	-10.75	-3.209	-3.119	-0.717	-1.248	-3.326	-0.967	-0.031	6.061
	[5.892]	[2.441]	[3.898]	[2.767]	[7.798]	[3.161]	[3.192]	[3.750]	[8.395]
R^2	0.353	0.175	0.231	0.104	0.215	0.148	0.228	0.229	0.457
N	249	1545	764	1570	269	1081	1527	810	144
F	9.13	21.663	14.969	12.018	4.624	12.329	29.767	15.715	7.751
Panel C: Census 2009 (Born in 1975-84)									
Mother's Education	0.159	0.169	0.169	0.183	0.429	0.112	0.222	0.196	0.196
	[0.029]***	[0.015]***	[0.026]***	[0.017]***	[0.076]***	[0.018]***	[0.018]***	[0.022]***	[0.102]
Father's Education	0.253	0.219	0.255	0.269	0.345	0.248	0.417	0.281	0.401
	[0.033]***	[0.016]***	[0.023]***	[0.016]***	[0.067]***	[0.018]***	[0.016]***	[0.021]***	[0.090]***
Age	-0.02	-0.146	-0.385	-0.215	0.061	-0.148	-0.138	-0.087	-0.976
	[0.163]	[0.091]	[0.147]**	[0.088]*	[0.181]	[0.111]	[0.094]	[0.134]	[0.529]
Age²	0	0.003	0.007	0.004	-0.002	0.003	0.002	0.002	0.017
	[0.003]	[0.002]	[0.003]**	[0.002]*	[0.003]	[0.002]	[0.002]	[0.002]	[0.009]
Number of siblings	-0.059	-0.024	0.003	-0.067	-0.035	-0.018	-0.109	-0.038	0.082
	[0.021]**	[0.013]	[0.009]	[0.010]***	[0.017]*	[0.010]	[0.008]***	[0.011]***	[0.044]

Firstborn	0.09	0.011	0.022	0.016	-0.35	-0.066	0.073	-0.301	0.077
	[0.063]	[0.034]	[0.086]	[0.042]	[0.170]*	[0.063]	[0.054]	[0.091]***	[0.298]
Married	-0.023	0.065	-0.086	0.049	-0.111	0.007	-0.102	0.056	0.076
	[0.060]	[0.040]	[0.041]*	[0.031]	[0.046]*	[0.030]	[0.032]**	[0.040]	[0.157]
Married Polygamous	0.027	-0.64	-0.301	-0.538	-0.168	-0.129	-0.479	-0.041	
	[0.331]	[0.338]	[0.234]	[0.265]*	[0.178]	[0.178]	[0.124]***	[0.254]	
Separated/Divorced/Widowed	-0.056	-0.218	-0.173	-0.205	-0.1	-0.162	-0.204	-0.342	-0.436
	[0.133]	[0.055]***	[0.100]	[0.053]***	[0.111]	[0.081]*	[0.066]**	[0.067]***	[0.427]
Family size	0.045	0.009	-0.004	0.035	0.046	0.013	0.047	0.024	-0.062
	[0.016]**	[0.010]	[0.005]	[0.008]***	[0.015]**	[0.008]	[0.007]***	[0.009]**	[0.038]
Extended family	-0.028	0.002	0.044	-0.03	0.018	0.036	0.121	-0.051	0.561
	[0.048]	[0.030]	[0.042]	[0.027]	[0.049]	[0.033]	[0.026]***	[0.039]	[0.162]***
Owned house	0.107	0.13	0.088	0.072	0.155	-0.017	0.209	0.08	0.461
	[0.043]*	[0.057]*	[0.068]	[0.066]	[0.098]	[0.065]	[0.048]***	[0.077]	[0.196]*
Access Sewage	0.151	0.073	0.212	-0.063	-0.596	0.015	-0.097	0.265	-0.347
	[0.052]**	[0.059]	[0.073]**	[0.089]	[0.348]	[0.094]	[0.090]	[0.130]*	[0.340]
Access Electricity	0.342	0.323	0.289	0.391	1.079	0.239	0.254	0.343	0.978
	[0.068]***	[0.031]***	[0.065]***	[0.049]***	[0.133]***	[0.065]***	[0.051]***	[0.079]***	[0.460]*
Urban	0.033	0.057	0.104	0.017	0.714	0.046	0.11	-0.095	-0.103
	[0.079]	[0.030]	[0.047]*	[0.027]	[0.060]***	[0.033]	[0.033]***	[0.045]*	[0.326]
Constant	0.837	2.736	5.94	3.57	-0.521	2.996	2.698	1.891	14.06
	[2.336]	[1.300]*	[2.100]**	[1.272]**	[2.567]	[1.593]	[1.336]*	[1.919]	[7.526]
R^2	0.407	0.275	0.322	0.279	0.231	0.208	0.411	0.292	0.442
N	856	3849	2019	4956	1928	3085	6294	2385	231
F	38.466	96.723	63.539	127.396	38.36	53.725	291.834	65.182	12.227

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Table A 13 Standardized Intergenerational Persistence in Education by Place of Birth, Daughter's Sample

Daughter (Age 25-34)					**Daughter's Years of Schooling**				
Variables	[1] **Nairobi**	[2] **Central**	[3] **Coast**	[4] **Eastern**	[5] **North Eastern**	[6] **Nyanza**	[7] **Rift Valley**	[8] **Western**	[9] **Foreign-born**
Panel A: Census 1989 (Born in 1955-64)									
Mother's Education	0.084	0.114	0.269	0.115	0.145	0.078	0.138	0.185	0.075
	[0.066]	[0.035]**	[0.064]***	[0.039]**	[0.105]	[0.046]	[0.068]*	[0.049]***	[.]
Father's Education	0.312	0.139	0.368	0.285		0.243	0.394	0.151	-0.057
	[0.088]***	[0.041]***	[0.070]***	[0.048]***		[0.052]***	[0.066]***	[0.059]*	[.]
Age	0.52	0.86	-0.31	-0.079	3.386	0.189	0.337	0.184	6.467
	[0.758]	[0.310]**	[0.413]	[0.313]	[1.576]*	[0.356]	[0.398]	[0.388]	[.]
Age^2	-0.01	-0.016	0.004	0.001	-0.061	-0.004	-0.007	-0.004	-0.126
	[0.013]	[0.005]**	[0.007]	[0.005]	[0.028]*	[0.006]	[0.007]	[0.007]	[.]
Number of siblings	-0.004	0.056	0.005	0.052	-0.016	0.012	-0.041	-0.05	0.333
	[0.078]	[0.020]**	[0.022]	[0.019]**	[0.084]	[0.026]	[0.022]	[0.022]*	[.]
Firstborn	-0.145	-0.217	0.03	-0.087		0.68	-0.074	-0.828	
	[0.472]	[0.241]	[0.371]	[0.246]		[0.318]*	[0.376]	[0.356]*	
Married	0.515	-0.055	-0.324	-0.317	-0.332	-0.323	-0.332	-0.177	0.184
	[0.316]	[0.105]	[0.123]**	[0.111]**	[0.212]	[0.104]**	[0.109]**	[0.113]	[.]
Married Polygamous	0	0	-0.8	-0.705	-0.21	-0.444	-0.592	-0.271	0
	[.]	[.]	[0.195]***	[0.292]*	[0.342]	[0.125]***	[0.273]*	[0.186]	[.]
Separated/Divorced/Widowed	-0.257	-0.21	-0.387	-0.409	0.046	-0.202	-0.44	-0.268	1.714
	[0.304]	[0.101]*	[0.132]**	[0.101]***	[0.442]	[0.126]	[0.131]***	[0.125]*	[.]
Family size	0.029	-0.022	-0.02	-0.018	0.021	0.019	0.041	0.05	0.097
	[0.072]	[0.016]	[0.014]	[0.015]	[0.084]	[0.019]	[0.017]*	[0.018]**	[.]
Extended family	-0.121	-0.11	-0.052	0.031	-0.206	0.1	0.041	-0.37	1.858
	[0.234]	[0.078]	[0.116]	[0.079]	[0.218]	[0.109]	[0.099]	[0.122]**	[.]
Owned house	-0.244	-0.049	0.374	-0.085		-0.123	0.202	0.565	-1.282
	[0.193]	[0.180]	[0.198]	[0.222]		[0.188]	[0.196]	[0.270]*	[.]
Access Sewage	-0.119	0.106	0.022	0.253		0.017	0.778	0.593	1.855
	[0.242]	[0.217]	[0.213]	[0.237]		[0.306]	[0.409]	[0.393]	[.]
Access Electricity	0.34	0.13	0.092	0.089		0.457	0.29	-0.179	
	[0.248]	[0.171]	[0.234]	[0.335]		[0.423]	[0.372]	[0.371]	
Urban	-0.009	-0.418	0.28	0.528	0.508	-0.088	-0.338	-0.114	-2.275
	[0.241]	[0.177]*	[0.175]	[0.235]*	[0.239]*	[0.202]	[0.228]	[0.289]	[.]
Constant	-5.591	-9.821	5.9	3.123	-46.328	-0.945	-3.49	-1.181	-82.346
	[10.860]	[4.396]*	[5.972]	[4.468]	[21.708]*	[5.088]	[5.671]	[5.558]	[.]
R^2	0.625	0.179	0.438	0.251	0.553	0.259	0.275	0.264	1
N	67	607	305	633	33	386	487	391	13
F	6.202	9.244	15.001	13.767	2.721	8.603	11.902	8.987	.
Panel A: Census 1999 (Born in 1965-74)									
Mother's Education	0.155	0.155	0.178	0.121	1.591	0.135	0.144	0.136	0.265
	[0.086]	[0.028]***	[0.065]**	[0.040]**	[0.504]**	[0.045]**	[0.042]***	[0.043]**	[0.105]*
Father's Education	0.144	0.118	0.351	0.262	-0.302	0.191	0.352	0.253	0.321
	[0.097]	[0.030]***	[0.073]***	[0.040]***	[0.237]	[0.050]***	[0.040]***	[0.046]***	[0.124]*

Age	0.25	-0.377	-0.436	0.347	-1.438	-0.38	-0.076	0.003	-0.076
	[0.630]	[0.198]	[0.420]	[0.238]	[1.006]	[0.341]	[0.261]	[0.296]	[0.789]
Age²	-0.004	0.007	0.007	-0.006	0.025	0.007	0.001	0	0.001
	[0.011]	[0.003]*	[0.007]	[0.004]	[0.018]	[0.006]	[0.005]	[0.005]	[0.014]
Number of siblings	-0.096	-0.005	0.002	-0.023	-0.026	0.009	-0.099	-0.006	-0.124
	[0.048]*	[0.018]	[0.023]	[0.020]	[0.088]	[0.027]	[0.019]***	[0.020]	[0.067]
Firstborn	-0.422	-0.088	0.051	0.122	-0.065	-0.271	-0.09	-0.22	0.191
	[0.257]	[0.133]	[0.276]	[0.180]	[1.060]	[0.236]	[0.226]	[0.244]	[0.449]
Married	-0.105	0.037	-0.222	-0.256	-0.003	-0.195	-0.294	-0.116	-0.661
	[0.230]	[0.078]	[0.119]	[0.094]**	[0.193]	[0.088]*	[0.078]***	[0.089]	[0.227]**
Married Polygamous	-2.258	-0.084	-0.623	-0.447	-0.351	-0.502	-1.203	-0.092	-0.224
	[0.819]**	[0.537]	[0.198]**	[0.261]	[0.457]	[0.171]**	[0.230]***	[0.215]	[0.579]
Separated/Divorced/Widowed	-0.181	-0.198	-0.342	-0.281	-0.125	-0.264	-0.135	-0.264	-0.577
	[0.297]	[0.067]**	[0.126]**	[0.076]***	[0.215]	[0.107]*	[0.095]	[0.092]**	[0.298]
Family size	0.037	0	-0.004	0.024	0.039	0.016	0.043	0.013	0.059
	[0.038]	[0.015]	[0.014]	[0.016]	[0.092]	[0.021]	[0.016]**	[0.013]	[0.049]
Extended family	-0.136	-0.091	-0.196	0.033	0.195	0.055	0.129	0.064	0.237
	[0.152]	[0.058]	[0.111]	[0.067]	[0.194]	[0.097]	[0.069]	[0.088]	[0.244]
Owned house	0.333	0.166	-0.09	-0.17	0.156	0.055	0.331	0.24	0.371
	[0.151]*	[0.107]	[0.144]	[0.131]	[0.729]	[0.141]	[0.125]**	[0.146]	[0.346]
Access Sewage	0.071	0.2	-0.195	-0.296	-0.624	0.075	0.206	0.427	1.06
	[0.193]	[0.126]	[0.196]	[0.221]	[1.616]	[0.227]	[0.210]	[0.250]	[0.444]*
Access Electricity	0.168	0.197	0.348	0.148	0.06	0.055	0.207	0.067	0.225
	[0.207]	[0.071]**	[0.161]*	[0.184]	[0.836]	[0.178]	[0.139]	[0.188]	[0.458]
Urban	0.19	0.11	0.189	0.265	0.457	0.034	0.194	-0.014	-0.728
	[0.255]	[0.093]	[0.128]	[0.094]**	[0.207]*	[0.110]	[0.121]	[0.096]	[0.284]*
Constant	-2.044	6.842	7.768	-3.1	20.537	6.697	2.054	1.125	2.314
	[9.064]	[2.826]*	[5.977]	[3.385]	[14.023]	[4.816]	[3.713]	[4.233]	[11.275]
R^2	0.284	0.158	0.37	0.169	0.357	0.174	0.271	0.218	0.63
N	158	1114	410	906	88	494	953	506	75
F	3.758	13.713	15.45	12.064	2.661	6.719	23.167	9.084	6.7
Panel C: Census 2009 (Born in 1975-84)									
Mother's Education	0.162	0.178	0.259	0.149	0.333	0.155	0.24	0.195	0.36
	[0.033]***	[0.018]***	[0.034]***	[0.022]***	[0.072]***	[0.025]***	[0.021]***	[0.026]***	[0.113]**
Father's Education	0.221	0.151	0.286	0.302	0.268	0.206	0.379	0.253	0.448
	[0.035]***	[0.019]***	[0.031]***	[0.021]***	[0.064]***	[0.024]***	[0.020]***	[0.026]***	[0.093]***
Age	0.095	-0.05	-0.166	-0.302	0.036	0.045	-0.118	-0.028	0.257
	[0.189]	[0.109]	[0.197]	[0.120]*	[0.249]	[0.151]	[0.113]	[0.156]	[0.749]
Age²	-0.002	0.001	0.003	0.005	-0.001	-0.001	0.002	0	-0.004
	[0.003]	[0.002]	[0.003]	[0.002]*	[0.004]	[0.003]	[0.002]	[0.003]	[0.013]
Number of siblings	-0.015	-0.011	-0.013	-0.072	-0.044	-0.044	-0.104	-0.028	0.045
	[0.022]	[0.012]	[0.013]	[0.011]***	[0.022]	[0.012]***	[0.008]***	[0.012]*	[0.073]
Firstborn	-0.003	-0.185	0.088	-0.252	-0.041	-0.282	-0.069	0.043	0.334
	[0.084]	[0.060]**	[0.152]	[0.085]**	[0.211]	[0.116]*	[0.097]	[0.139]	[0.293]
Married	0.118	-0.024	-0.157	-0.103	-0.048	-0.022	-0.218	-0.168	-0.6
	[0.074]	[0.039]	[0.059]**	[0.043]*	[0.062]	[0.043]	[0.034]***	[0.046]***	[0.228]*
Married Polygamous		0.009	-0.503	-0.31	-0.282	-0.417	-0.614	-0.285	-0.563

		[0.381]	[0.140]***	[0.260]	[0.166]	[0.113]***	[0.107]***	[0.138]*	[0.632]
Separated/Divorced/Widowed	-0.05	-0.2	-0.305	-0.182	-0.13	-0.129	-0.3	-0.244	-0.157
	[0.108]	[0.039]***	[0.066]***	[0.041]***	[0.076]	[0.055]*	[0.043]***	[0.051]***	[0.264]
Family size	0.002	-0.018	-0.01	0.009	0.037	0.02	0.037	0.013	-0.004
	[0.018]	[0.009]*	[0.009]	[0.009]	[0.021]	[0.010]*	[0.007]***	[0.009]	[0.060]
Extended family	-0.1	-0.089	-0.048	-0.099	-0.096	-0.082	0.187	-0.169	0.541
	[0.054]	[0.035]*	[0.061]	[0.037]**	[0.066]	[0.046]	[0.033]***	[0.050]***	[0.216]*
Owned house	0.156	0.174	0.114	0.179	-0.153	0.042	0.261	-0.111	-0.189
	[0.048]**	[0.058]**	[0.081]	[0.081]*	[0.147]	[0.075]	[0.059]***	[0.087]	[0.245]
Access Sewage	0.019	0.131	0.02	0.204	0.91	0.027	-0.108	-0.073	-0.191
	[0.058]	[0.060]*	[0.095]	[0.094]*	[0.302]**	[0.100]	[0.094]	[0.129]	[0.329]
Access Electricity	0.364	0.319	0.239	0.352	0.607	0.39	0.292	0.118	0.155
	[0.080]***	[0.035]***	[0.082]**	[0.060]***	[0.144]***	[0.074]***	[0.056]***	[0.090]	[0.446]
Urban	-0.011	0.049	0.109	-0.012	0.25	-0.022	0.099	0.132	0.173
	[0.094]	[0.034]	[0.061]	[0.038]	[0.076]**	[0.046]	[0.040]*	[0.051]*	[0.394]
Constant	-0.401	1.765	3.08	5.165	0.14	0.371	2.402	1.501	-3.487
	[2.701]	[1.574]	[2.830]	[1.727]**	[3.516]	[2.154]	[1.613]	[2.231]	[10.647]
R^2	0.328	0.3	0.441	0.335	0.293	0.263	0.455	0.306	0.65
N	734	2590	1168	2544	833	1686	3766	1543	104
F	25.109	73.556	60.696	84.993	22.565	39.705	209.036	44.962	10.888

Note: * p<0.05, ** p<0.01, *** p<0.001; Standard Error in square brackets

Appendix H: Intergenerational Mobility: Occupational Attainment

Table A 14 Marginal Effect of Own Schooling on Son's Working in Non-Farm

Age (25-34)		***Non-Farm Origin (Father work in Non-Farm)***					***Farm Origin (Father work in Farm)***				
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Variables	**Son's Work in Non-Farm**					**Son's Work in Non-Farm**				
Child: Primary Education	0.062	0.082	0.087	0.085	0.076	0.060	0.057	0.054	0.051	0.042
	[0.023]**	[0.024]***	[0.025]***	[0.025]***	[0.025]**	[0.007]***	[0.008]***	[0.008]***	[0.008]***	[0.007]***
Child: Secondary Education	-0.048	0.015	0.020	0.008	0.008	0.066	0.063	0.061	0.058	0.058
	[0.019]*	[0.021]	[0.022]	[0.022]	[0.023]	[0.006]***	[0.007]***	[0.007]***	[0.007]***	[0.007]***
Child: Tertiary Education	0.083	0.193	0.193	0.169	0.170	0.294	0.291	0.283	0.277	0.282
	[0.024]***	[0.028]***	[0.029]***	[0.030]***	[0.030]***	[0.013]***	[0.015]***	[0.015]***	[0.015]***	[0.015]***
Father: Primary Education		-0.016	0.008	0.003	-0.005		0.005	0.005	0.005	-0.003
		[0.026]	[0.027]	[0.027]	[0.027]		[0.007]	[0.007]	[0.007]	[0.007]
Father: Secondary Education		-0.077	-0.051	-0.061	-0.066		0.005	0.001	0.001	-0.002
		[0.021]***	[0.022]*	[0.022]**	[0.023]**		[0.006]	[0.006]	[0.006]	[0.006]
Father: Tertiary Education		-0.156	-0.113	-0.129	-0.131		-0.010	-0.012	-0.013	-0.014
		[0.026]***	[0.028]***	[0.028]***	[0.028]***		[0.010]	[0.010]	[0.010]	[0.010]
Mother: Primary Education		-0.023	-0.020	-0.018	-0.025		0.015	0.015	0.014	0.009
		[0.026]	[0.027]	[0.027]	[0.027]		[0.008]	[0.008]	[0.008]	[0.008]
Mother: Secondary Education		-0.050	-0.059	-0.070	-0.075		-0.001	-0.007	-0.008	-0.009
		[0.021]*	[0.022]**	[0.023]**	[0.023]**		[0.007]	[0.007]	[0.007]	[0.007]
Mother: Tertiary Education		0.006	-0.094	-0.115	-0.117		0.019	-0.012	-0.017	-0.015
		[0.035]	[0.034]**	[0.034]***	[0.034]***		[0.016]	[0.013]	[0.013]	[0.013]
Mother: Work in Non-farm			0.208	0.224	0.227			0.133	0.133	0.131
			[0.020]***	[0.021]***	[0.021]***			[0.019]***	[0.019]***	[0.019]***
Mother: Work in Farm			-0.083	-0.066	-0.059			0.003	0.004	0.005
			[0.019]***	[0.020]***	[0.020]**			[0.005]	[0.005]	[0.005]
Mother: Work in Other			0.022	0.028	0.038			0.090	0.089	0.093
			[0.083]	[0.083]	[0.083]			[0.051]	[0.051]	[0.051]
Age			0.111	0.108	0.118			0.034	0.034	0.034
			[0.071]	[0.071]	[0.071]			[0.018]	[0.018]	[0.018]
Age^2			-0.002	-0.002	-0.002			-0.001	-0.001	-0.001
			[0.001]	[0.001]	[0.001]			[0.000]	[0.000]	[0.000]
Number of siblings			-0.006	-0.002	0.001			-0.004	-0.005	-0.001
			[0.004]	[0.006]	[0.006]			[0.001]***	[0.002]***	[0.002]
Firstborn			0.093	0.092	0.090			0.012	0.018	0.013
			[0.029]**	[0.030]**	[0.030]**			[0.008]	[0.009]*	[0.009]
Married			0.096	0.095	0.109			0.020	0.016	0.025
			[0.020]***	[0.021]***	[0.021]***			[0.006]***	[0.006]**	[0.006]***
Married Polygamous			0.012	0.012	0.034			0.010	0.007	0.015
			[0.127]	[0.126]	[0.129]			[0.034]	[0.033]	[0.034]
Separated/Divorced/Widowed			-0.002	0.000	0.005			-0.009	-0.011	-0.007
			[0.048]	[0.048]	[0.048]			[0.011]	[0.011]	[0.011]

Family size				-0.002	-0.003				0.002	0.001
				[0.005]	[0.005]				[0.001]	[0.001]
Extended family				0.017	0.019				0.004	0.005
				[0.019]	[0.020]				[0.005]	[0.005]
Owned House				-0.007	-0.013				0.005	0.002
				[0.024]	[0.024]				[0.010]	[0.010]
Access Sewage				0.059	0.059				0.002	0.009
				[0.029]*	[0.030]				[0.013]	[0.013]
Access Electricity				0.016	0.000				0.000	-0.009
				[0.026]	[0.027]				[0.008]	[0.008]
Urban				0.029	0.029				0.020	0.021
				[0.020]	[0.021]				[0.007]**	[0.006]**
Central born					0.049					0.046
					[0.029]					[0.010]***
Coast born					0.021					0.059
					[0.031]					[0.013]***
Eastern born					-0.033					0.029
					[0.027]					[0.009]***
North Eastern born					-0.137					-0.052
					[0.048]**					[0.009]***
Nyanza born					-0.066					-0.011
					[0.029]*					[0.008]
RiftValley born					-0.009					0.010
					[0.026]					[0.008]
Pseudo R^2	0.008	0.018	0.074	0.077	0.081	0.051	0.052	0.062	0.063	0.071
N	4249	4249	4249	4249	4249	20685	20685	20685	20685	20685
Log Likelihood	-2854.957	-2825.524	-2666.139	-2657.294	-2645.334	-7107.414	-7103.253	-7030.427	-7021.219	-6957.625

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses:

Table A 15 Marginal Effect of Own Schooling on Daughter's Working in Non-Farm by Father's Level of Education

Daughter (Age 25-34)	**Non-Farm Origin (Father work in Non-Farm)**					**Farm Origin (Father work in Farm)**				
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Variables	**Daughter's Work in Non-Farm**					**Daughter's Work in Non-Farm**				
Child: Primary Education	-0.012	0.001	0.008	0.011	0.006	0.056	0.05	0.045	0.045	0.042
	[0.030]	[0.031]	[0.032]	[0.032]	[0.032]	[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.010]***
Child: Secondary Education	-0.001	0.038	0.052	0.048	0.044	0.125	0.113	0.104	0.1	0.099
	[0.024]	[0.027]	[0.029]	[0.029]	[0.029]	[0.009]***	[0.009]***	[0.009]***	[0.009]***	[0.009]***
Child: Tertiary Education	0.158	0.240	0.262	0.244	0.242	0.396	0.358	0.343	0.327	0.323
	[0.028]***	[0.036]***	[0.037]***	[0.039]***	[0.039]***	[0.018]***	[0.021]***	[0.021]***	[0.021]***	[0.021]***
Father: Primary Education		-0.028	0.003	0.005	0.000		0.015	0.014	0.013	0.01
		[0.032]	[0.034]	[0.034]	[0.034]		[0.009]	[0.009]	[0.009]	[0.009]
Father: Secondary Education		-0.050	-0.012	-0.015	-0.016		0.014	0.011	0.007	0.008
		[0.027]	[0.028]	[0.028]	[0.029]		[0.008]	[0.007]	[0.007]	[0.007]
Father: Tertiary Education		-0.107	-0.058	-0.065	-0.069		0.019	0.013	0.008	0.01
		[0.031]***	[0.034]	[0.034]	[0.034]*		[0.013]	[0.012]	[0.012]	[0.012]
Mother: Primary Education		0.028	0.010	0.013	0.009		0	0.006	0.004	0.001
		[0.033]	[0.033]	[0.034]	[0.034]		[0.009]	[0.009]	[0.009]	[0.009]
Mother: Secondary Education		-0.019	-0.038	-0.043	-0.043		0.012	0.013	0.006	0.005
		[0.026]	[0.027]	[0.027]	[0.027]		[0.008]	[0.009]	[0.008]	[0.008]
Mother: Tertiary Education		-0.010	-0.139	-0.153	-0.151		0.019	-0.002	-0.014	-0.014
		[0.038]	[0.034]***	[0.033]***	[0.034]***		[0.017]	[0.015]	[0.013]	[0.013]
Mother: Work in Non-farm			0.276	0.280	0.278			0.086	0.088	0.09
			[0.025]***	[0.026]***	[0.026]***			[0.020]***	[0.020]***	[0.020]***
Mother: Work in Farm			-0.068	-0.062	-0.064			-0.027	-0.023	-0.022
			[0.024]**	[0.025]*	[0.025]**			[0.007]***	[0.007]***	[0.007]**
Mother: Work in Other			-0.069	-0.070	-0.068			0.026	0.029	0.036
			[0.113]	[0.113]	[0.114]			[0.040]	[0.041]	[0.043]
Age			0.117	0.110	0.104			0.035	0.036	0.036
			[0.083]	[0.083]	[0.084]			[0.021]	[0.021]	[0.021]
Age^2			-0.002	-0.002	-0.002			-0.001	-0.001	-0.001
			[0.001]	[0.001]	[0.001]			[0.000]	[0.000]	[0.000]
Number of siblings			-0.007	-0.006	-0.005			-0.001	-0.001	-0.001
			[0.004]	[0.007]	[0.007]			[0.001]	[0.002]	[0.002]
Firstborn			0.124	0.110	0.115			0.027	0.022	0.021
			[0.049]*	[0.050]*	[0.051]*			[0.015]	[0.015]	[0.015]
Married			-0.024	-0.019	-0.017			-0.021	-0.019	-0.016
			[0.026]	[0.027]	[0.027]			[0.006]***	[0.006]**	[0.006]*
Married Polygamous			-0.026	-0.020	-0.024			-0.049	-0.048	-0.045
			[0.088]	[0.089]	[0.089]			[0.016]**	[0.016]**	[0.017]**
Separated/Divorced/Widowed			0.099	0.107	0.109			-0.013	-0.011	-0.01
			[0.034]**	[0.035]**	[0.035]**			[0.007]	[0.007]	[0.007]
Family size				-0.001	-0.001				0.001	0
				[0.005]	[0.006]				[0.001]	[0.001]
Extended family				-0.006	-0.006				-0.003	-0.003

				[0.023]	[0.023]				[0.006]	[0.006]
Owned House				0.044	0.039				-0.005	-0.006
				[0.026]	[0.027]				[0.011]	[0.011]
Access Sewage				0.090	0.091				0.011	0.017
				[0.033]**	[0.034]**				[0.013]	[0.014]
Access Electricity				-0.003	-0.013				0.017	0.009
				[0.029]	[0.030]				[0.009]	[0.009]
Urban				-0.004	0.004				0.016	0.018
				[0.025]	[0.026]				[0.008]*	[0.008]*
Central born					0.024					0.026
					[0.032]					[0.010]**
Coast born					-0.030					0.016
					[0.038]					[0.013]
Eastern born					-0.033					0.003
					[0.032]					[0.009]
North Eastern born					-0.076					-0.016
					[0.064]					[0.014]
Nyanza born					-0.029					-0.019
					[0.035]					[0.009]*
Rift Valley born					0.024					0.018
					[0.031]					[0.009]
Pseudo R^2	0.015	0.019	0.093	0.096	0.098	0.109	0.111	0.125	0.127	0.131
N	2670	2670	2670	2670	2670	11809	11809	11809	11809	11809
Log Likelihood	-1693.798	-1685.546	-1558.381	-1553.521	-1549.781	-3557.812	-3550.575	-3495.207	-3483.753	-3468.632

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses:

Appendix I: Return to Schooling with Mother's Education

Table A 16 Return to Education (OLS)

	Male(Age 15-65)				Female(Age 15-65)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW
Eduyear	0.122***	0.123***	0.120***	0.118***	0.119***	0.119***	0.121***	0.122***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Married	0.133***	0.165***	0.139***	0.160***	0.123***	0.176***	0.105**	0.132***
	(0.037)	(0.036)	(0.036)	(0.035)	(0.042)	(0.041)	(0.041)	(0.040)
Age	0.088***	0.077***	0.085***	0.081***	0.086***	0.079***	0.087***	0.084***
	(0.009)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)	(0.011)
Age^2	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.461***	0.332***	0.345***	0.292***	0.480***	0.314***	0.334***	0.278***
	(0.029)	(0.029)	(0.030)	(0.030)	(0.042)	(0.043)	(0.044)	(0.044)
Embu			-0.244***	-0.076			-0.505***	-0.623***
			(0.093)	(0.110)			(0.165)	(0.185)
Kalenjin			-0.234***	-0.196***			-0.188**	-0.175*
			(0.055)	(0.059)			(0.088)	(0.093)
Kamba			-0.107*	0.065			-0.137*	-0.256**
			(0.058)	(0.084)			(0.078)	(0.117)
Kikuyu			0.025	0.036			0.086	0.036
			(0.045)	(0.079)			(0.062)	(0.112)
Kisii			-0.403***	-0.153			-0.470***	-0.091
			(0.085)	(0.110)			(0.132)	(0.164)
Luhya			-0.721***	-0.345***			-0.388**	0.101
			(0.097)	(0.104)			(0.160)	(0.171)
Luo			-0.262***	-0.024			-0.319***	0.051
			(0.045)	(0.085)			(0.064)	(0.118)
Maasai			0.571***	0.576***			0.704***	0.659***
			(0.103)	(0.105)			(0.140)	(0.144)
Meru			-0.340***	-0.168*			-0.403***	-0.528***
			(0.069)	(0.092)			(0.111)	(0.141)
Mijikenda			0.490***	0.211*			0.928***	0.725***
			(0.106)	(0.110)			(0.143)	(0.150)
Somali			0.655***	0.648*			0.858***	0.183
			(0.098)	(0.361)			(0.188)	(0.607)
English			0.645***	0.662***			0.631***	0.572***
			(0.053)	(0.057)			(0.066)	(0.073)
Central		-0.451***		-0.301***		-0.470***		-0.247**
		(0.061)		(0.088)		(0.080)		(0.119)
Coast		-0.205***		-0.031		-0.294***		-0.109
		(0.061)		(0.063)		(0.085)		(0.093)
Eastern		-0.646***		-0.478***		-0.711***		-0.181
		(0.060)		(0.079)		(0.081)		(0.111)
North eastern		0.136		-0.290		0.273		0.423
		(0.108)		(0.363)		(0.201)		(0.616)
Nyanza		-0.744***		-0.540***		-0.927***		-0.682***
		(0.058)		(0.084)		(0.079)		(0.118)
Rift valley		-0.522***		-0.327***		-0.524***		-0.276***
		(0.056)		(0.059)		(0.077)		(0.084)
Western		-0.933***		-0.691***		-1.031***		-0.805***
		(0.065)		(0.069)		(0.094)		(0.100)
Constant	0.004	0.763***	0.157	0.562***	-0.237	0.496**	-0.217	0.131
	(0.145)	(0.151)	(0.141)	(0.149)	(0.190)	(0.197)	(0.186)	(0.197)
Observations	5,406	5,406	5,406	5,406	3,146	3,146	3,146	3,146
R-squared	0.350	0.393	0.401	0.420	0.277	0.328	0.341	0.360
F-test	582.3	290.6	212.3	162.1	240.8	127.2	95.08	73.14

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 17 Return to Education with Mother's Education as Instrument, Male Sample

	Male (Age 15-65)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.188***		0.189***		0.189***		0.179***	
	(0.033)		(0.035)		(0.038)		(0.039)	
Married	0.088**	0.785***	0.121***	0.759***	0.089*	0.813***	0.117***	0.780***
	(0.044)	(0.135)	(0.044)	(0.132)	(0.046)	(0.129)	(0.045)	(0.128)
Age	0.056***	0.489***	0.046**	0.482***	0.052***	0.476***	0.053***	0.462***
	(0.018)	(0.031)	(0.019)	(0.030)	(0.020)	(0.030)	(0.019)	(0.029)
Age^2	-0.000	-0.007***	-0.000	-0.007***	-0.000	-0.007***	-0.000	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.305***	2.325***	0.188**	2.148***	0.203**	2.029***	0.177**	1.891***
	(0.083)	(0.100)	(0.081)	(0.104)	(0.083)	(0.104)	(0.079)	(0.106)
Embu					-0.277***	0.486	-0.219	2.313***
					(0.098)	(0.338)	(0.144)	(0.399)
Kalenjin					-0.273***	0.549***	-0.204***	0.117
					(0.061)	(0.200)	(0.061)	(0.214)
Kamba					-0.092	-0.239	-0.036	1.610***
					(0.060)	(0.209)	(0.107)	(0.305)
Kikuyu					-0.053	1.096***	0.017	0.260
					(0.063)	(0.162)	(0.082)	(0.288)
Kisii					-0.481***	1.096***	-0.184	0.472
					(0.097)	(0.307)	(0.114)	(0.400)
Luhya					-0.710***	-0.335	-0.342***	-0.201
					(0.100)	(0.350)	(0.107)	(0.379)
Luo					-0.315***	0.744***	-0.030	0.089
					(0.055)	(0.164)	(0.087)	(0.308)
Maasai					0.827***	-3.711***	0.829***	-4.174***
					(0.176)	(0.370)	(0.192)	(0.376)
Meru					-0.309***	-0.472*	-0.257**	1.385***
					(0.073)	(0.248)	(0.109)	(0.332)
Mijikenda					0.633***	-2.051***	0.306**	-1.536***
					(0.134)	(0.381)	(0.127)	(0.397)
Somali					0.872***	-3.123***	0.815**	-2.696**
					(0.156)	(0.351)	(0.384)	(1.309)
English					0.433***	2.976***	0.483***	2.846***
					(0.129)	(0.188)	(0.127)	(0.202)
Central			-0.411***	-0.536**			-0.295***	-0.034
			(0.066)	(0.225)			(0.090)	(0.320)
Coast			-0.030	-2.544***			0.061	-1.468***
			(0.110)	(0.219)			(0.086)	(0.228)
Eastern			-0.497***	-2.151***			-0.301**	-2.822***
			(0.099)	(0.217)			(0.138)	(0.284)
North Eastern			0.468**	-4.867***			-0.208	-1.343
			(0.205)	(0.391)			(0.375)	(1.317)
Nyanza			-0.687***	-0.791***			-0.520***	-0.272
			(0.067)	(0.212)			(0.087)	(0.306)
Rift valley			-0.416***	-1.496***			-0.294***	-0.493**
			(0.079)	(0.204)			(0.064)	(0.214)
Western			-0.811***	-1.795***			-0.622***	-1.089***
			(0.092)	(0.238)			(0.082)	(0.248)
Post-Primary mom		3.414***		3.159***		2.887***		2.790***
		(0.404)		(0.393)		(0.386)		(0.382)
Constant	0.087	-1.514***	0.727***	0.206	0.236	-1.357***	0.553***	-0.107
	(0.155)	(0.530)	(0.156)	(0.555)	(0.152)	(0.512)	(0.153)	(0.543)
Observations	5,406	5,406	5,406	5,406	5,406	5,406	5,406	5,406
R-squared	0.311	0.182	0.356	0.231	0.363	0.263	0.391	0.282
First stage F-stats	71.27	.	64.55	.	55.83	.	53.33	.
Shear2	0.0130	.	0.0118	.	0.0103	.	0.00981	.
F	351.6	240.9	189.5	135.1	144.5	113.0	115.7	87.93

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 18 Return to Education with Mother's Education as Instrument, Female Sample

	Female(Age 15-65)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.197***		0.203***		0.212***		0.220***	
	(0.051)		(0.056)		(0.052)		(0.055)	
Married	0.077	0.700***	0.121**	0.751***	0.029	0.930***	0.051	0.919***
	(0.053)	(0.145)	(0.056)	(0.140)	(0.060)	(0.137)	(0.062)	(0.135)
Age	0.049*	0.477***	0.040	0.474***	0.048*	0.438***	0.042	0.438***
	(0.026)	(0.038)	(0.029)	(0.037)	(0.025)	(0.036)	(0.026)	(0.035)
Age^2	-0.000	-0.007***	-0.000	-0.007***	-0.000	-0.007***	-0.000	-0.007***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.284**	2.500***	0.112	2.390***	0.156	1.938***	0.089	1.911***
	(0.134)	(0.138)	(0.142)	(0.142)	(0.110)	(0.143)	(0.115)	(0.144)
Embu					-0.545***	0.410	-0.765***	1.404**
					(0.174)	(0.553)	(0.210)	(0.620)
Kalenjin					-0.304***	1.306***	-0.254**	0.840***
					(0.112)	(0.292)	(0.107)	(0.310)
Kamba					-0.141*	0.072	-0.357***	1.049***
					(0.082)	(0.263)	(0.136)	(0.393)
Kikuyu					-0.013	1.086***	0.008	0.263
					(0.085)	(0.206)	(0.119)	(0.376)
Kisii					-0.609***	1.503***	-0.174	0.825
					(0.158)	(0.441)	(0.179)	(0.550)
Luhya					-0.300*	-0.919*	0.220	-1.137**
					(0.174)	(0.535)	(0.192)	(0.574)
Luo					-0.281***	-0.413*	0.159	-1.103***
					(0.070)	(0.214)	(0.138)	(0.395)
Maasai					1.146***	-4.806***	1.182***	-5.304***
					(0.289)	(0.462)	(0.330)	(0.473)
Meru					-0.435***	0.351	-0.660***	1.337***
					(0.117)	(0.371)	(0.165)	(0.470)
Mijikenda					1.321***	-4.275***	1.028***	-3.087***
					(0.267)	(0.471)	(0.232)	(0.499)
Somali					1.235***	-4.054***	0.122	0.752
					(0.289)	(0.625)	(0.637)	(2.032)
English					0.386**	2.690***	0.375***	2.051***
					(0.154)	(0.217)	(0.135)	(0.240)
Central			-0.404***	-0.726***			-0.209*	-0.299
			(0.094)	(0.275)			(0.126)	(0.398)
Coast			0.031	-3.776***			0.130	-2.348***
			(0.234)	(0.285)			(0.166)	(0.310)
Eastern			-0.546***	-1.897***			0.036	-2.140***
			(0.138)	(0.274)			(0.169)	(0.369)
North Eastern			0.832*	-6.530***			1.044	-6.334***
			(0.428)	(0.678)			(0.734)	(2.059)
Nyanza			-0.775***	-1.750***			-0.628***	-0.471
			(0.131)	(0.270)			(0.128)	(0.396)
Rift valley			-0.378***	-1.675***			-0.204**	-0.665**
			(0.126)	(0.261)			(0.097)	(0.282)
Western			-0.884***	-1.706***			-0.709***	-0.950***
			(0.138)	(0.320)			(0.118)	(0.336)
Post-Primary mom		2.765***		2.405***		2.608***		2.425***
		(0.465)		(0.447)		(0.433)		(0.428)
Constant	-0.188	-0.947	0.397*	0.828	-0.210	-0.410	0.022	0.739
	(0.199)	(0.655)	(0.215)	(0.675)	(0.194)	(0.626)	(0.216)	(0.664)
Observations	3,146	3,146	3,146	3,146	3,146	3,146	3,146	3,146
R-squared	0.225	0.192	0.271	0.257	0.278	0.303	0.291	0.323
First stage F-stats	35.40	.	28.95	.	36.31	.	32.10	.
Shear2	0.0111	.	0.00916	.	0.0115	.	0.0102	.
F	127.6	149.2	78.33	90.33	59.97	79.95	46.89	62.06

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 19 Return to Education, Sample Selection Correction, Male Sample

	Male (15-65)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.119***	0.014***	0.122***	0.008***	0.117***	0.007**	0.117***	0.006*
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Married	0.111***	0.043	0.155***	0.047	0.105***	0.041	0.135***	0.039
	(0.038)	(0.039)	(0.038)	(0.039)	(0.038)	(0.039)	(0.037)	(0.039)
Age	0.065***	0.154***	0.068***	0.156***	0.050***	0.159***	0.058***	0.158***
	(0.014)	(0.006)	(0.014)	(0.006)	(0.014)	(0.006)	(0.014)	(0.006)
Age^2	-0.001***	-0.002***	-0.001***	-0.002***	-0.000**	-0.002***	-0.000***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.385***	0.497***	0.301***	0.511***	0.226***	0.535***	0.216***	0.520***
	(0.045)	(0.025)	(0.047)	(0.026)	(0.047)	(0.027)	(0.046)	(0.027)
Central			-0.451***	-0.020			-0.308***	0.039
			(0.061)	(0.062)			(0.089)	(0.092)
Coast			-0.205***	0.043			-0.030	0.061
			(0.061)	(0.062)			(0.063)	(0.067)
Eastern			-0.637***	-0.131**			-0.439***	-0.283***
			(0.060)	(0.060)			(0.081)	(0.073)
Northeastern			0.180	-0.711***			-0.202	-0.610
			(0.119)	(0.085)			(0.368)	(0.404)
Nyanza			-0.743***	-0.001			-0.518***	-0.158*
			(0.058)	(0.059)			(0.085)	(0.083)
Rift valley			-0.514***	-0.161***			-0.319***	-0.049
			(0.057)	(0.057)			(0.059)	(0.063)
Western			-0.912***	-0.292***			-0.641***	-0.236***
			(0.070)	(0.063)			(0.073)	(0.069)
LnHHExp		0.102***		0.083***		0.092***		0.081***
		(0.010)		(0.010)		(0.010)		(0.011)
Headship		0.443***		0.456***		0.467***		0.484***
		(0.038)		(0.038)		(0.039)		(0.039)
HHChildren6-		-0.044***		-0.039***		-0.043***		-0.043***
		(0.011)		(0.011)		(0.011)		(0.011)
HHAdults65+		0.053*		0.067**		0.059**		0.065**
		(0.028)		(0.028)		(0.029)		(0.029)
Owned House		-0.002		-0.001		-0.024		-0.011
		(0.022)		(0.023)		(0.023)		(0.023)
Lambda	-0.189**		-0.078		-0.281***		-0.188**	
	(0.086)		(0.090)		(0.085)		(0.087)	
Embu					-0.250***	0.070	-0.101	0.258***
					(0.094)	(0.074)	(0.111)	(0.088)
Kalenjin					-0.203***	-0.123***	-0.168***	-0.153***
					(0.057)	(0.042)	(0.060)	(0.046)
Kamba					-0.133**	0.201***	0.027	0.390***
					(0.059)	(0.048)	(0.086)	(0.069)
Kikuyu					0.004	0.108***	0.043	-0.004
					(0.046)	(0.039)	(0.080)	(0.078)
Kisii					-0.350***	-0.257***	-0.123	-0.185**
					(0.087)	(0.065)	(0.111)	(0.092)
Luhya					-0.689***	-0.092	-0.355***	0.053
					(0.098)	(0.072)	(0.105)	(0.079)
Luo					-0.319***	0.342***	-0.068	0.415***
					(0.049)	(0.040)	(0.088)	(0.076)
Maasai					0.567***	0.060	0.583***	0.018
					(0.104)	(0.078)	(0.105)	(0.081)
Meru					-0.326***	-0.045	-0.181**	0.147**
					(0.069)	(0.053)	(0.092)	(0.072)
Mijikenda					0.413***	0.442***	0.176	0.288***
					(0.109)	(0.093)	(0.111)	(0.098)
Somali					0.784***	-0.560***	0.664*	-0.049
					(0.105)	(0.068)	(0.363)	(0.403)
English					0.636***	0.133***	0.654***	0.183***
					(0.054)	(0.050)	(0.057)	(0.056)
Constant	0.673**	-4.566***	1.029***	-4.255***	1.157***	-4.522***	1.208***	-4.310***
	(0.337)	(0.139)	(0.342)	(0.159)	(0.334)	(0.141)	(0.334)	(0.162)
Observations	17,116	17,116	17,116	17,116	17,071	17,071	17,071	17,071
Censored	11710	11710	11710	11710	11665	11665	11665	11665
Waldchi2	1121	1121	1623	1623	1802	1802	1947	1947

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses

Table A 20 Return to Education, Sample Selection Correction, Female Sample

	Female (Age 15-65)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.112***	0.044***	0.114***	0.036***	0.109***	0.038***	0.114***	0.038***
	(0.008)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.004)
Married	0.173***	-0.203***	0.214***	-0.198***	0.202***	-0.218***	0.198***	-0.212***
	(0.056)	(0.029)	(0.057)	(0.029)	(0.058)	(0.029)	(0.057)	(0.029)
Age	0.060***	0.140***	0.059**	0.143***	0.037	0.147***	0.049**	0.147***
	(0.023)	(0.006)	(0.024)	(0.006)	(0.024)	(0.006)	(0.024)	(0.007)
Age^2	-0.000*	-0.002***	-0.000	-0.002***	-0.000	-0.002***	-0.000	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.396***	0.465***	0.246***	0.493***	0.166**	0.504***	0.165**	0.494***
	(0.077)	(0.026)	(0.082)	(0.028)	(0.084)	(0.029)	(0.083)	(0.029)
Central			-0.482***	0.094			-0.307**	0.301***
			(0.082)	(0.060)			(0.126)	(0.096)
Coast			-0.291***	-0.000			-0.116	0.084
			(0.086)	(0.062)			(0.094)	(0.069)
Eastern			-0.695***	-0.130**			-0.154	-0.130*
			(0.082)	(0.059)			(0.113)	(0.076)
Northeastern			0.376*	-0.756***			0.507	-0.341
			(0.228)	(0.104)			(0.621)	(0.411)
Nyanza			-0.936***	0.046			-0.679***	0.006
			(0.080)	(0.058)			(0.119)	(0.085)
Riftvalley			-0.506***	-0.159***			-0.275***	0.008
			(0.079)	(0.057)			(0.085)	(0.064)
Western			-0.977***	-0.373***			-0.743***	-0.206***
			(0.109)	(0.064)			(0.108)	(0.071)
LnHHExp		0.078***		0.055***		0.063***		0.054***
		(0.012)		(0.012)		(0.012)		(0.012)
Headship		0.285***		0.302***		0.279***		0.289***
		(0.033)		(0.033)		(0.034)		(0.034)
HHChildren6-		-0.001		0.005		-0.001		0.000
		(0.011)		(0.012)		(0.012)		(0.012)
HHAdults65+		-0.007		0.008		-0.006		-0.003
		(0.030)		(0.030)		(0.031)		(0.031)
Owned House		-0.059**		-0.060**		-0.082***		-0.072***
		(0.024)		(0.025)		(0.025)		(0.025)
Lambda	-0.214		-0.166		-0.402**		-0.277	
	(0.161)		(0.171)		(0.169)		(0.172)	
Embu					-0.435***	-0.153*	-0.590***	-0.051
					(0.169)	(0.091)	(0.187)	(0.105)
Kalenjin					-0.140	-0.112**	-0.136	-0.136**
					(0.090)	(0.049)	(0.096)	(0.054)
Kamba					-0.212**	0.268***	-0.322***	0.365***
					(0.086)	(0.050)	(0.125)	(0.074)
Kikuyu					0.022	0.230***	0.058	-0.072
					(0.068)	(0.041)	(0.114)	(0.086)
Kisii					-0.397***	-0.213***	-0.032	-0.246**
					(0.136)	(0.074)	(0.169)	(0.099)
Luhya					-0.302*	-0.218***	0.110	-0.044
					(0.165)	(0.085)	(0.172)	(0.093)
Luo					-0.442***	0.401***	-0.025	0.369***
					(0.083)	(0.041)	(0.128)	(0.079)
Maasai					0.581***	0.376***	0.588***	0.338***
					(0.151)	(0.081)	(0.151)	(0.085)
Meru					-0.368***	-0.090	-0.519***	0.013
					(0.113)	(0.062)	(0.141)	(0.083)
Mijikenda					0.771***	0.575***	0.637***	0.457***
					(0.159)	(0.090)	(0.160)	(0.096)
Somali					1.052***	-0.554***	0.247	-0.248
					(0.205)	(0.091)	(0.611)	(0.409)
English					0.550***	0.333***	0.521***	0.338***
					(0.076)	(0.049)	(0.080)	(0.055)
Constant	0.592	-4.544***	1.124*	-4.213***	1.370**	-4.535***	1.211*	-4.422***
	(0.652)	(0.157)	(0.678)	(0.178)	(0.694)	(0.161)	(0.700)	(0.183)
Observations	17,844	17,844	17,844	17,844	17,798	17,798	17,798	17,798
Censored	14698	14698	14698	14698	14652	14652	14652	14652
Waldchi2	404.5	404.5	731.9	731.9	742.5	742.5	841.6	841.6

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses

Table A 21 Probit Estimation for Generating Inverse Mill's Ratio (Mother's Education)

	Male (Age 15-65)				Female (Age 15-65)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW
Married	0.038	0.041	0.036	0.032	-0.246***	-0.239***	-0.254***	-0.249***
	(0.038)	(0.038)	(0.039)	(0.039)	(0.028)	(0.029)	(0.029)	(0.029)
Age	0.154***	0.153***	0.156***	0.155***	0.152***	0.151***	0.155***	0.154***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Age ^{2}	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Urban	0.534***	0.538***	0.561***	0.542***	0.537***	0.558***	0.575***	0.560***
	(0.024)	(0.025)	(0.026)	(0.026)	(0.025)	(0.027)	(0.027)	(0.028)
LnHHExp	0.105***	0.083***	0.092***	0.080***	0.089***	0.056***	0.066***	0.056***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)	(0.012)	(0.012)
Headship	0.386***	0.394***	0.406***	0.423***	0.214***	0.241***	0.220***	0.232***
	(0.038)	(0.038)	(0.039)	(0.039)	(0.032)	(0.033)	(0.033)	(0.033)
HHChildren6-	-0.052***	-0.042***	-0.046***	-0.045***	-0.034***	-0.020*	-0.026**	-0.024**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)
HHAdults65+	0.029	0.046	0.036	0.043	-0.032	-0.007	-0.023	-0.015
	(0.028)	(0.028)	(0.028)	(0.028)	(0.030)	(0.030)	(0.030)	(0.030)
Owned house	-0.005	-0.003	-0.030	-0.016	-0.060**	-0.065***	-0.092***	-0.084***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)	(0.025)
Post Primary mom	-0.690***	-0.728***	-0.742***	-0.752***	-0.436***	-0.485***	-0.503***	-0.504***
	(0.061)	(0.061)	(0.062)	(0.062)	(0.068)	(0.068)	(0.069)	(0.069)
Central		-0.024		0.027		0.094		0.290***
		(0.062)		(0.092)		(0.059)		(0.095)
Coast		-0.014		0.034		-0.153**		-0.035
		(0.061)		(0.066)		(0.060)		(0.067)
Eastern		-0.171***		-0.326***		-0.214***		-0.268***
		(0.059)		(0.071)		(0.058)		(0.073)
Northeastern		-0.820***		-0.597		-1.014***		-0.425
		(0.082)		(0.404)		(0.099)		(0.399)
Nyanza		-0.019		-0.142*		0.007		0.000
		(0.059)		(0.083)		(0.057)		(0.083)
Riftvalley		-0.196***		-0.049		-0.233***		-0.030
		(0.057)		(0.062)		(0.055)		(0.063)
Western		-0.316***		-0.238***		-0.423***		-0.224***
		(0.063)		(0.069)		(0.063)		(0.071)
Embu			0.064	0.283***			-0.152*	0.029
			(0.074)	(0.087)			(0.090)	(0.103)
Kalenjin			-0.123***	-0.165***			-0.083*	-0.128**
			(0.041)	(0.046)			(0.048)	(0.053)
Kamba			0.210***	0.431***			0.309***	0.483***
			(0.048)	(0.068)			(0.050)	(0.072)
Kikuyu			0.147***	0.037			0.317***	-0.028
			(0.039)	(0.078)			(0.040)	(0.085)
Kisii			-0.233***	-0.187**			-0.141*	-0.224**
			(0.065)	(0.091)			(0.072)	(0.097)
Luhya			-0.054	0.081			-0.213**	-0.078
			(0.071)	(0.079)			(0.085)	(0.093)
Luo			0.357***	0.404***			0.432***	0.349***
			(0.040)	(0.076)			(0.041)	(0.077)
Maasai			0.033	-0.017			0.240***	0.181**
			(0.075)	(0.078)			(0.079)	(0.083)
Meru			-0.034	0.190***			-0.076	0.108
			(0.053)	(0.071)			(0.062)	(0.081)
Mijikenda			0.444***	0.307***			0.469***	0.410***
			(0.092)	(0.097)			(0.090)	(0.096)
Somali			-0.627***	-0.135			-0.736***	-0.406
			(0.066)	(0.403)			(0.087)	(0.397)
English			0.214***	0.270***			0.424***	0.418***
			(0.049)	(0.055)			(0.047)	(0.053)
Constant	-4.400***	-4.030***	-4.334***	-4.110***	-4.388***	-3.904***	-4.312***	-4.118***
	(0.137)	(0.157)	(0.140)	(0.160)	(0.155)	(0.177)	(0.159)	(0.181)
Observations	17,455	17,455	17,405	17,405	18,214	18,214	18,158	18,158
Pseudo R^2	0.181	0.191	0.197	0.200	0.116	0.132	0.142	0.145

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses

Table A 22 Return to Education with Joint IV-Heckman Estimations (Mother's Education), Male Sample

	Male (Age 15-65)							
	(1)	(2	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.184***		0.193***		0.207***		0.200***	
	(0.020)		(0.022)		(0.023)		(0.024)	
Married	0.086**	0.634***	0.124***	0.527***	0.067	0.555***	0.101**	0.490***
	(0.040)	(0.157)	(0.040)	(0.153)	(0.041)	(0.148)	(0.040)	(0.146)
Age	0.053***	0.460***	0.050***	0.315**	0.035**	0.319**	0.042***	0.251*
	(0.015)	(0.166)	(0.016)	(0.148)	(0.015)	(0.137)	(0.015)	(0.131)
Age2	-0.000*	-0.007***	-0.000	-0.005**	-0.000	-0.005***	-0.000	-0.004**
	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)	(0.002)
Urban	0.297***	1.966***	0.201***	1.419***	0.135**	1.322***	0.131**	1.062**
	(0.057)	(0.528)	(0.061)	(0.479)	(0.058)	(0.452)	(0.058)	(0.423)
Central			-0.409***	-0.608***			-0.293***	-0.140
			(0.064)	(0.226)			(0.092)	(0.319)
Coast			-0.022	-2.443***			0.092	-1.354***
			(0.084)	(0.221)			(0.074)	(0.233)
Eastern			-0.495***	-1.977***			-0.237**	-2.382***
			(0.077)	(0.255)			(0.105)	(0.367)
North eastern			0.455***	-3.850***			-0.173	-0.491
			(0.156)	(0.826)			(0.381)	(1.385)
Nyanza			-0.685***	-0.758***			-0.512***	-0.045
			(0.062)	(0.216)			(0.088)	(0.320)
Riftvalley			-0.417***	-1.375***			-0.282***	-0.442**
			(0.066)	(0.249)			(0.063)	(0.217)
Western			-0.819***	-1.425***			-0.595***	-0.609**
			(0.079)	(0.355)			(0.077)	(0.310)
LnHHExp		0.070		-0.088		0.014		-0.049
		(0.110)		(0.082)		(0.081)		(0.072)
Headship		1.082**		0.715*		0.704*		0.572
		(0.432)		(0.396)		(0.372)		(0.369)
HHChildren6-		-0.411***		-0.316***		-0.239***		-0.209***
		(0.073)		(0.063)		(0.062)		(0.060)
HHAdults65+		-0.257*		-0.171		-0.286**		-0.207
		(0.151)		(0.150)		(0.145)		(0.145)
Owned house		-0.259**		-0.191*		-0.289***		-0.248**
		(0.101)		(0.100)		(0.099)		(0.098)
Post Primary mom		3.783***		4.204***		3.872***		4.061***
		(0.876)		(0.827)		(0.778)		(0.756)
Lambda	-0.040	0.155	0.049	-1.189	-0.069	-1.018	-0.013	-1.556
	(0.086)	(1.503)	(0.089)	(1.345)	(0.088)	(1.227)	(0.088)	(1.177)
Embu					-0.287***	0.459	-0.270**	2.018***
					(0.098)	(0.337)	(0.126)	(0.447)
Kalenjin					-0.275***	0.673***	-0.205***	0.395
					(0.061)	(0.231)	(0.063)	(0.258)
Kamba					-0.094	-0.216	-0.074	1.291***
					(0.062)	(0.262)	(0.096)	(0.443)
Kikuyu					-0.080	0.954***	0.011	0.334
					(0.053)	(0.197)	(0.083)	(0.288)
Kisii					-0.489***	1.255***	-0.192*	0.670
					(0.095)	(0.360)	(0.117)	(0.425)
Luhya					-0.698***	-0.086	-0.341***	-0.246
					(0.102)	(0.352)	(0.109)	(0.381)
Luo					-0.343***	0.561*	-0.035	-0.271
					(0.052)	(0.321)	(0.091)	(0.429)
Maasai					0.896***	-3.501***	0.917***	-3.844***
					(0.137)	(0.368)	(0.146)	(0.375)
Meru					-0.298***	-0.430*	-0.288***	1.188***
					(0.072)	(0.251)	(0.101)	(0.355)
Mijikenda					0.652***	-2.163***	0.336***	-1.754***
					(0.126)	(0.520)	(0.123)	(0.463)
Somali					0.965***	-2.313***	0.874**	-2.353*
					(0.124)	(0.639)	(0.381)	(1.302)
English					0.371***	2.896***	0.420***	2.683***
					(0.088)	(0.235)	(0.090)	(0.266)
Constant	0.218	-1.524	0.564*	5.660	0.495	2.810	0.594*	6.089
	(0.323)	(5.822)	(0.332)	(4.918)	(0.329)	(4.679)	(0.331)	(4.350)
Observations	5,406	5,406	5,406	5,406	5,406	5,406	5,406	5,406
R-squared	0.316	0.206	0.352	0.247	0.341	0.280	0.368	0.296
First stage F-stats	34.32	.	28.63	.	26.81	.	24.44	.
Shea R2	0.0368	.	0.0309	.	0.0290	.	0.0266	.
F	306.4	127.0	177.7	98.16	135.9	90.85	109.3	75.23

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses

Table A 23 Return to Education with Joint IV-Heckman Estimation (Mother's Education), Female Sample

	Female (Age 15-65)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.180***		0.153***		0.211***		0.181***	
	(0.023)		(0.027)		(0.028)		(0.030)	
Married	0.138**	0.815	0.182***	1.097**	0.093	0.033	0.117*	0.451
	(0.059)	(0.628)	(0.057)	(0.518)	(0.062)	(0.480)	(0.060)	(0.449)
Age	0.030	0.409	0.048*	0.252	0.014	1.041***	0.040	0.765***
	(0.023)	(0.394)	(0.026)	(0.328)	(0.025)	(0.292)	(0.026)	(0.275)
Age2	-0.000	-0.006	-0.000	-0.004	0.000	-0.015***	-0.000	-0.011***
	(0.000)	(0.005)	(0.000)	(0.004)	(0.000)	(0.004)	(0.000)	(0.004)
Urban	0.226**	1.730	0.173	1.197	0.030	3.794***	0.097	2.775***
	(0.091)	(1.366)	(0.108)	(1.196)	(0.100)	(1.066)	(0.101)	(0.988)
Central			-0.452***	-0.792**			-0.255**	0.381
			(0.084)	(0.357)			(0.126)	(0.623)
Coast			-0.144	-3.183***			0.044	-2.094***
			(0.135)	(0.415)			(0.119)	(0.317)
Eastern			-0.624***	-1.416***			-0.021	-2.491***
			(0.100)	(0.511)			(0.133)	(0.581)
North eastern			0.604**	-4.388*			0.853	-7.143***
			(0.301)	(2.336)			(0.654)	(2.187)
Nyanza			-0.866***	-1.453***			-0.646***	-0.089
			(0.093)	(0.283)			(0.121)	(0.401)
Riftvalley			-0.443***	-1.060**			-0.228***	-0.505*
			(0.094)	(0.536)			(0.088)	(0.291)
Western			-0.925***	-0.536			-0.711***	-0.877
			(0.121)	(0.950)			(0.112)	(0.534)
LnHHExp		0.200		0.064		0.466***		0.308***
		(0.230)		(0.130)		(0.131)		(0.109)
Headship		-0.610		-0.722		0.612		0.261
		(0.535)		(0.512)		(0.412)		(0.415)
HHChildren6-		-0.623***		-0.534***		-0.551***		-0.492***
		(0.112)		(0.080)		(0.082)		(0.078)
HHAdults65+		-0.355*		-0.203		-0.340*		-0.212
		(0.209)		(0.183)		(0.183)		(0.177)
Owned house		0.017		0.101		-0.423**		-0.252
		(0.201)		(0.190)		(0.207)		(0.190)
Post Primary mom		2.754**		2.934**		0.558		1.282
		(1.223)		(1.144)		(1.048)		(1.004)
Lambda	-0.214	-0.671	-0.123	-2.002	-0.264*	5.143**	-0.145	2.780
	(0.147)	(3.358)	(0.158)	(2.830)	(0.154)	(2.464)	(0.155)	(2.338)
Embu					-0.499***	-0.338	-0.700***	1.413**
					(0.175)	(0.638)	(0.193)	(0.615)
Kalenjin					-0.278***	1.079***	-0.204**	0.712*
					(0.099)	(0.341)	(0.099)	(0.397)
Kamba					-0.199**	1.219**	-0.365***	2.098**
					(0.089)	(0.616)	(0.133)	(0.913)
Kikuyu					-0.073	2.154***	0.026	0.258
					(0.078)	(0.610)	(0.115)	(0.374)
Kisii					-0.574***	0.787	-0.114	0.122
					(0.146)	(0.524)	(0.171)	(0.688)
Luhya					-0.244	-1.456**	0.180	-1.236**
					(0.172)	(0.688)	(0.178)	(0.591)
Luo					-0.367***	1.289	0.078	-0.415
					(0.085)	(0.812)	(0.131)	(0.715)
Maasai					1.090***	-3.751***	0.957***	-4.708***
					(0.203)	(0.624)	(0.214)	(0.557)
Meru					-0.416***	-0.135	-0.613***	1.475***
					(0.117)	(0.404)	(0.148)	(0.490)
Mijikenda					1.237***	-2.171**	0.869***	-1.979**
					(0.199)	(0.974)	(0.182)	(0.866)
Somali					1.395***	-6.821***	0.195	0.255
					(0.243)	(1.591)	(0.619)	(2.147)
English					0.313***	4.026***	0.414***	2.781***
					(0.109)	(0.759)	(0.102)	(0.710)
Constant	0.596	0.409	0.895	7.476	0.793	-22.380**	0.601	-11.469
	(0.580)	(13.861)	(0.600)	(10.645)	(0.616)	(9.938)	(0.610)	(9.105)
Observations	3,146	3,146	3,146	3,146	3,146	3,146	3,146	3,146
R-squared	0.246	0.226	0.318	0.278	0.281	0.322	0.335	0.339
First stage F-stats	27.73	.	20.40	.	20.59	.	17.98	.
Shea R2	0.0504	.	0.0377	.	0.0381	.	0.0335	.
F	118.2	83.16	78.70	67.05	59.20	64.40	48.84	53.25

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses

Appendix J: Return to Schooling with FPE Policy Instrument

Table A 24: OLS Estimates of Return to Schooling

	Male(Age30-40)				Female(Age30-40)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW
Eduyear	0.156***	0.151***	0.142***	0.140***	0.156***	0.145***	0.136***	0.134***
	(0.006)	(0.006)	(0.007)	(0.006)	(0.010)	(0.010)	(0.011)	(0.011)
Married	0.068	0.100	0.069	0.107*	0.076	0.230***	0.158*	0.228***
	(0.066)	(0.063)	(0.063)	(0.062)	(0.084)	(0.082)	(0.081)	(0.081)
Age	-0.099	-0.097	-0.049	-0.057	0.005	0.207	0.175	0.250
	(0.189)	(0.181)	(0.178)	(0.175)	(0.320)	(0.305)	(0.303)	(0.299)
Age^2	0.002	0.002	0.001	0.001	0.001	-0.002	-0.002	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)
Embu			-0.492***	-0.413**			-0.365	-0.643*
			(0.168)	(0.209)			(0.334)	(0.377)
Kalenjin			-0.355***	-0.323***			-0.444***	-0.360**
			(0.097)	(0.104)			(0.169)	(0.183)
Kamba			-0.181*	-0.103			-0.516***	-0.796***
			(0.097)	(0.160)			(0.152)	(0.237)
Kikuyu			-0.129*	0.035			0.057	0.190
			(0.077)	(0.136)			(0.123)	(0.221)
Kisii			-0.643***	-0.141			-0.803***	-0.256
			(0.149)	(0.191)			(0.286)	(0.360)
Luhya			-0.887***	-0.451**			-0.870**	-0.385
			(0.178)	(0.191)			(0.349)	(0.369)
Luo			-0.267***	0.228			-0.436***	0.097
			(0.085)	(0.148)			(0.124)	(0.255)
Maasai			0.705***	0.703***			0.078	0.134
			(0.193)	(0.194)			(0.274)	(0.282)
Meru			-0.527***	-0.445**			-0.699***	-0.977***
			(0.133)	(0.184)			(0.219)	(0.284)
Mijikenda			0.364*	0.140			0.921***	0.731**
			(0.194)	(0.199)			(0.319)	(0.329)
Somali			0.650***	0.496			0.963***	0.486
			(0.144)	(0.435)			(0.338)	(0.356)
English			0.757***	0.779***			0.866***	0.745***
			(0.088)	(0.094)			(0.132)	(0.143)
Central		-0.686***		-0.472***		-0.764***		-0.600**
		(0.098)		(0.142)		(0.155)		(0.235)
Coast		-0.333***		-0.080		-0.538***		-0.295
		(0.100)		(0.105)		(0.167)		(0.180)
Eastern		-0.826***		-0.380**		-1.146***		-0.190
		(0.098)		(0.152)		(0.153)		(0.226)
North Eastern		0.043		-0.162		0.164		
		(0.160)		(0.432)		(0.359)		
Nyanza		-0.900***		-0.802***		-1.272***		-1.006***
		(0.096)		(0.140)		(0.152)		(0.252)
Rift valley		-0.606***		-0.315***		-0.929***		-0.538***
		(0.089)		(0.095)		(0.143)		(0.159)
Western		-1.073***		-0.751***		-1.306***		-0.971***
		(0.110)		(0.115)		(0.181)		(0.191)
Constant	2.915	3.537	2.314	2.708	0.905	-1.703	-1.755	-2.645
	(3.270)	(3.132)	(3.087)	(3.035)	(5.531)	(5.277)	(5.244)	(5.173)
Observations	1,801	1,801	1,801	1,801	991	991	991	991
R-squared	0.269	0.336	0.356	0.382	0.207	0.288	0.307	0.333
F-test	165.5	82.19	61.54	47.71	64.47	36.00	26.96	21.99

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 25 IV Estimates of Return to Schooling, Male Sample

	Male (Age 30-40)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.095***		0.099***		0.106***		0.102***	
	(0.032)		(0.034)		(0.037)		(0.037)	
Married	0.139*	1.114***	0.160**	1.114***	0.110	1.095***	0.150**	1.103***
	(0.077)	(0.241)	(0.075)	(0.234)	(0.075)	(0.221)	(0.075)	(0.220)
Age	-0.050	-3.362***	-0.071	-3.283***	-0.024	-2.682***	-0.035	-2.714***
	(0.195)	(0.845)	(0.184)	(0.817)	(0.181)	(0.773)	(0.177)	(0.769)
Age^2	0.001	0.046***	0.002	0.045***	0.001	0.036***	0.001	0.037***
	(0.003)	(0.012)	(0.003)	(0.012)	(0.003)	(0.011)	(0.003)	(0.011)
Embu					-0.504***	-0.476	-0.362*	1.048
					(0.169)	(0.597)	(0.215)	(0.754)
Kalenjin					-0.372***	-0.438	-0.345***	-0.592
					(0.099)	(0.347)	(0.106)	(0.374)
Kamba					-0.220**	-1.170***	-0.080	0.353
					(0.105)	(0.343)	(0.162)	(0.577)
Kikuyu					-0.111	0.463*	0.015	-0.564
					(0.079)	(0.273)	(0.137)	(0.488)
Kisii					-0.624***	0.485	-0.143	-0.004
					(0.150)	(0.529)	(0.192)	(0.689)
Luhya					-0.913***	-0.795	-0.464**	-0.370
					(0.180)	(0.633)	(0.192)	(0.687)
Luo					-0.270***	-0.143	0.202	-0.633
					(0.085)	(0.301)	(0.151)	(0.534)
Maasai					0.505*	-5.173***	0.488*	-5.331***
					(0.280)	(0.678)	(0.285)	(0.689)
Meru					-0.559***	-1.047**	-0.414**	0.483
					(0.138)	(0.474)	(0.187)	(0.663)
Mijikenda					0.279	-2.188***	0.063	-1.806**
					(0.213)	(0.688)	(0.213)	(0.715)
Somali					0.538***	-2.869***	0.372	-3.202**
					(0.183)	(0.507)	(0.452)	(1.565)
English					0.913***	4.249***	0.926***	3.795***
					(0.181)	(0.298)	(0.170)	(0.326)
Central			-0.764***	-1.402***			-0.466***	0.223
			(0.111)	(0.361)			(0.142)	(0.511)
Coast			-0.488***	-2.886***			-0.128	-1.248***
			(0.142)	(0.366)			(0.115)	(0.375)
Eastern			-1.001***	-3.289***			-0.480***	-2.385***
			(0.149)	(0.355)			(0.180)	(0.546)
Northeastern			-0.241	-5.031***			-0.194	-0.567
			(0.243)	(0.583)			(0.434)	(1.556)
Nyanza			-0.995***	-1.791***			-0.815***	-0.370
			(0.115)	(0.354)			(0.141)	(0.505)
Rift valley			-0.744***	-2.450***			-0.346***	-0.690**
			(0.126)	(0.325)			(0.100)	(0.341)
Western			-1.208***	-2.544***			-0.802***	-1.308***
			(0.141)	(0.404)			(0.126)	(0.415)
FPE policy		1.956***		1.785***		1.600***		1.560***
		(0.226)		(0.220)		(0.208)		(0.208)
Constant	2.642	68.072***	3.675	68.591***	2.204	56.288***	2.710	57.606***
	(3.354)	(14.667)	(3.183)	(14.180)	(3.100)	(13.430)	(3.043)	(13.349)
Observations	1,801	1,801	1,801	1,801	1,801	1,801	1,801	1,801
R-squared	0.231	0.054	0.310	0.124	0.345	0.219	0.370	0.232
First stage								
F-stat	74.72	.	65.99	.	58.99	.	56.42	.
Shear2	0.0399	.	0.0356	.	0.0320	.	0.0308	.
F	12.53	25.52	28.68	23.06	32.17	31.29	27.19	23.40

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 26 IV Estimates of Return to Schooling, Female Sample

	Female (Age 30-40)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.096**		0.121***		0.099*		0.115**	
	(0.040)		(0.040)		(0.054)		(0.053)	
Married	0.125	0.638**	0.255***	0.921***	0.199**	0.978***	0.249**	1.036***
	(0.091)	(0.260)	(0.091)	(0.254)	(0.099)	(0.238)	(0.100)	(0.241)
Age	0.100	-4.322***	0.245	-3.944***	0.237	-2.610**	0.284	-2.436**
	(0.331)	(1.232)	(0.311)	(1.182)	(0.315)	(1.127)	(0.310)	(1.124)
Age^2	-0.001	0.059***	-0.003	0.053***	-0.003	0.035**	-0.004	0.032**
	(0.005)	(0.018)	(0.004)	(0.017)	(0.005)	(0.016)	(0.004)	(0.016)
Embu					-0.366	0.129	-0.646*	0.078
					(0.333)	(0.990)	(0.373)	(1.130)
Kalenjin					-0.432**	0.209	-0.357**	0.050
					(0.170)	(0.501)	(0.181)	(0.549)
Kamba					-0.521***	-0.125	-0.802***	-0.175
					(0.151)	(0.449)	(0.235)	(0.711)
Kikuyu					0.081	0.581	0.189	0.014
					(0.127)	(0.365)	(0.219)	(0.663)
Kisii					-0.772***	0.764	-0.241	0.861
					(0.289)	(0.848)	(0.359)	(1.080)
Luhya					-0.957***	-2.420**	-0.431	-2.421**
					(0.369)	(1.033)	(0.386)	(1.103)
Luo					-0.489***	-1.545***	0.069	-1.457*
					(0.145)	(0.365)	(0.264)	(0.763)
Maasai					-0.158	-5.392***	0.010	-5.575***
					(0.431)	(0.803)	(0.441)	(0.836)
Meru					-0.758***	-1.227*	-1.009***	-1.279
					(0.234)	(0.650)	(0.294)	(0.852)
Mijikenda					0.688	-5.604***	0.631	-4.750***
					(0.457)	(0.931)	(0.426)	(0.976)
Somali					0.782*	-4.419***	0.374	-5.531***
					(0.423)	(0.993)	(0.468)	(1.052)
English					0.999***	3.512***	0.800***	2.897***
					(0.229)	(0.375)	(0.208)	(0.419)
Central			-0.803***	-1.787***			-0.606***	-0.500
			(0.167)	(0.482)			(0.233)	(0.705)
Coast			-0.641***	-4.057***			-0.334	-1.974***
			(0.237)	(0.506)			(0.208)	(0.537)
Eastern			-1.212***	-2.713***			-0.208	-1.060
			(0.187)	(0.470)			(0.229)	(0.677)
Northeastern			-0.015	-6.902***				
			(0.462)	(1.100)				
Nyanza			-1.353***	-3.520***			-1.025***	-1.197
			(0.200)	(0.463)			(0.256)	(0.757)
Rift valley			-0.997***	-2.800***			-0.555***	-0.943**
			(0.180)	(0.438)			(0.164)	(0.478)
Western			-1.365***	-2.603***			-0.990***	-1.123*
			(0.205)	(0.562)			(0.196)	(0.572)
FPE policy		2.570***		2.415***		1.849***		1.823***
		(0.318)		(0.306)		(0.294)		(0.294)
Constant	-0.101	85.764***	-2.046	81.630***	-2.464	55.347***	-3.019	53.377***
	(5.658)	(21.355)	(5.290)	(20.477)	(5.326)	(19.528)	(5.223)	(19.474)
Observations	991	991	991	991	991	991	991	991
R-squared	0.177	0.082	0.284	0.170	0.298	0.272	0.331	0.283
First stage F-stat	65.49	.	62.16	.	39.47	.	38.46	.
Shear2	0.0623	.	0.0597	.	0.0389	.	0.0382	.
F	3.538	21.98	17.36	18.18	16.63	22.76	14.71	17.34

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 27 Heckman's Estimates of Return to Schooling, Male Sample

	Male (Age 30- 40)							
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.150***	0.068***	0.154***	0.063***	0.128***	0.064***	0.133***	0.059***
	(0.010)	(0.005)	(0.009)	(0.006)	(0.009)	(0.006)	(0.009)	(0.006)
Married	0.060	0.067	0.104	0.067	0.048	0.060	0.091	0.065
	(0.066)	(0.070)	(0.064)	(0.071)	(0.064)	(0.071)	(0.063)	(0.071)
Age	-0.120	0.266	-0.089	0.264	-0.099	0.296*	-0.083	0.270
	(0.190)	(0.165)	(0.182)	(0.166)	(0.181)	(0.167)	(0.176)	(0.168)
Age^2	0.002	-0.004	0.002	-0.004	0.002	-0.004*	0.002	-0.004
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Central			-0.695***	-0.321***			-0.481***	0.095
			(0.101)	(0.114)			(0.142)	(0.179)
Coast			-0.333***	0.027			-0.077	0.046
			(0.100)	(0.119)			(0.105)	(0.126)
Eastern			-0.845***	-0.536***			-0.289*	-0.632***
			(0.113)	(0.111)			(0.170)	(0.146)
Northeastern			0.023	-0.459***			-0.145	-0.002
			(0.171)	(0.150)			(0.434)	(0.625)
Nyanza			-0.912***	-0.378***			-0.763***	-0.387**
			(0.103)	(0.111)			(0.144)	(0.160)
Rift valley			-0.622***	-0.486***			-0.282***	-0.272**
			(0.101)	(0.105)			(0.099)	(0.114)
Western			-1.095***	-0.546***			-0.676***	-0.487***
			(0.129)	(0.119)			(0.131)	(0.129)
LnHHExp		0.133***		0.101***		0.128***		0.101***
		(0.019)		(0.020)		(0.020)		(0.021)
Headship		0.241***		0.267***		0.279***		0.297***
		(0.070)		(0.070)		(0.070)		(0.071)
HHChildren6-		-0.094***		-0.093***		-0.096***		-0.094***
		(0.021)		(0.021)		(0.022)		(0.022)
HHAdults65+		-0.125*		-0.133**		-0.149**		-0.146**
		(0.066)		(0.067)		(0.067)		(0.068)
Owned house		0.036		0.078*		0.051		0.077*
		(0.044)		(0.045)		(0.045)		(0.046)
Lambda	-0.137		0.054		-0.306**		-0.191	
	(0.149)		(0.165)		(0.145)		(0.159)	
Embu					-0.432**	-0.328**	-0.434**	0.050
					(0.171)	(0.145)	(0.209)	(0.179)
Kalenjin					-0.255**	-0.446***	-0.263**	-0.417***
					(0.109)	(0.080)	(0.115)	(0.090)
Kamba					-0.203**	0.171*	-0.174	0.540***
					(0.098)	(0.097)	(0.170)	(0.142)
Kikuyu					-0.115	-0.116	0.081	-0.416***
					(0.078)	(0.075)	(0.141)	(0.156)
Kisii					-0.531***	-0.605***	-0.077	-0.461***
					(0.158)	(0.120)	(0.198)	(0.174)
Luhya					-0.824***	-0.144	-0.453**	0.082
					(0.181)	(0.152)	(0.190)	(0.166)
Luo					-0.293***	0.196**	0.204	0.338**
					(0.086)	(0.088)	(0.150)	(0.155)
Maasai					0.767***	-0.153	0.746***	-0.157
					(0.196)	(0.150)	(0.197)	(0.156)
Meru					-0.422***	-0.560***	-0.437**	-0.181
					(0.143)	(0.106)	(0.183)	(0.149)
Mijikenda					0.282	0.613***	0.120	0.301
					(0.200)	(0.218)	(0.200)	(0.227)
Somali					0.710***	-0.144	0.553	-0.425
					(0.147)	(0.117)	(0.440)	(0.625)
English					0.738***	0.198**	0.768***	0.234**
					(0.090)	(0.100)	(0.094)	(0.110)
Constant	3.449	-6.623**	3.354	-5.861**	3.525	-6.981**	3.344	-5.977**
	(3.325)	(2.854)	(3.173)	(2.880)	(3.164)	(2.901)	(3.076)	(2.919)
Observations	3,629	3,629	3,629	3,629	3,620	3,620	3,620	3,620
Censored	1828	1828	1828	1828	1819	1819	1819	1819
Waldchi2	276.2	276.2	398.4	398.4	484.9	484.9	551.8	551.8

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 28 Heckman's Estimates of Return to Schooling, Female Sample

	Female (Age 30-40)							
	(5)		(6)		(7)		(8)	
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.123***	0.084***	0.128***	0.082***	0.107***	0.087***	0.115***	0.087***
	(0.022)	(0.006)	(0.021)	(0.006)	(0.022)	(0.007)	(0.022)	(0.007)
Married	0.260*	-0.412***	0.325**	-0.393***	0.315**	-0.429***	0.332**	-0.420***
	(0.136)	(0.058)	(0.133)	(0.059)	(0.132)	(0.059)	(0.133)	(0.060)
Age	-0.088	0.261	0.149	0.283	0.085	0.278	0.188	0.278
	(0.329)	(0.177)	(0.312)	(0.179)	(0.311)	(0.181)	(0.305)	(0.182)
Age^2	0.002	-0.004	-0.002	-0.004	-0.001	-0.004	-0.002	-0.004
	(0.005)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Central			-0.719***	-0.228**			-0.643***	0.197
			(0.163)	(0.113)			(0.239)	(0.182)
Coast			-0.531***	0.013			-0.307*	0.124
			(0.168)	(0.121)			(0.180)	(0.133)
Eastern			-1.077***	-0.308***			-0.146	-0.184
			(0.171)	(0.111)			(0.229)	(0.150)
Northeastern			0.275	-0.476***				-0.480
			(0.378)	(0.184)				(1.087)
Nyanza			-1.251***	-0.080			-0.956***	-0.175
			(0.154)	(0.112)			(0.257)	(0.166)
Rift valley			-0.865***	-0.334***			-0.516***	-0.108
			(0.160)	(0.106)			(0.161)	(0.121)
Western			-1.199***	-0.446***			-0.888***	-0.254*
			(0.216)	(0.122)			(0.208)	(0.135)
LnHHExp		0.114***		0.093***		0.098***		0.086***
		(0.023)		(0.024)		(0.024)		(0.024)
Headship		0.162***		0.185***		0.131**		0.147**
		(0.058)		(0.059)		(0.059)		(0.060)
HHChildren6-		-0.045**		-0.044*		-0.059**		-0.056**
		(0.023)		(0.023)		(0.024)		(0.024)
HHAdults65+		-0.144**		-0.129**		-0.150**		-0.148**
		(0.065)		(0.066)		(0.066)		(0.066)
Owned house		-0.112**		-0.100**		-0.120**		-0.107**
		(0.047)		(0.048)		(0.048)		(0.049)
Lambda	-0.495*		-0.270		-0.438		-0.299	
	(0.285)		(0.297)		(0.289)		(0.302)	
Embu					-0.189	-0.460***	-0.542	-0.355*
					(0.353)	(0.172)	(0.388)	(0.203)
Kalenjin					-0.308	-0.342***	-0.267	-0.307***
					(0.192)	(0.091)	(0.204)	(0.103)
Kamba					-0.571***	0.232**	-0.852***	0.329**
					(0.157)	(0.098)	(0.243)	(0.147)
Kikuyu					0.086	-0.082	0.271	-0.328**
					(0.126)	(0.077)	(0.235)	(0.160)
Kisii					-0.636**	-0.488***	-0.169	-0.394**
					(0.307)	(0.149)	(0.369)	(0.199)
Luhya					-0.733**	-0.348**	-0.350	-0.177
					(0.360)	(0.175)	(0.368)	(0.190)
Luo					-0.548***	0.404***	-0.006	0.498***
					(0.146)	(0.082)	(0.274)	(0.156)
Maasai					-0.056	0.462***	0.046	0.489***
					(0.290)	(0.160)	(0.295)	(0.168)
Meru					-0.564**	-0.321***	-0.904***	-0.215
					(0.236)	(0.116)	(0.291)	(0.160)
Mijikenda					0.766**	0.610***	0.664**	0.402**
					(0.337)	(0.191)	(0.334)	(0.201)
Somali					1.059***	-0.197	0.577	0.200
					(0.343)	(0.158)	(0.365)	(1.089)
English					0.785***	0.298***	0.696***	0.299***
					(0.144)	(0.099)	(0.151)	(0.109)
Constant	3.320	-6.696**	-0.330	-6.625**	0.485	-6.789**	-1.109	-6.619**
	(5.781)	(3.077)	(5.487)	(3.105)	(5.483)	(3.150)	(5.380)	(3.157)
Observations	3,903	3,903	3,903	3,903	3,896	3,896	3,896	3,896
Censored	2912	2912	2912	2912	2905	2905	2905	2905
Waldchi2	111.1	111.1	220.4	220.4	248.6	248.6	290.0	290.0

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: LnW: Log Hourly Wage; WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Eduyear: Year of schooling; Provincial dummies are current place of residence.

Table A 29 Probit Estimates for Generating Inverse Mill's Ratio (FPE Policy)

	Male(Age 30-40)				Female(Age 30-40)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW
Married	0.114*	0.107	0.106	0.107	-0.376***	-0.348***	-0.376***	-0.364***
	(0.069)	(0.070)	(0.070)	(0.070)	(0.056)	(0.057)	(0.057)	(0.058)
Age	0.187	0.189	0.227	0.217	-0.112	-0.082	-0.126	-0.115
	(0.188)	(0.190)	(0.192)	(0.193)	(0.202)	(0.205)	(0.208)	(0.209)
Age^2	-0.003	-0.003	-0.003	-0.003	0.001	0.001	0.002	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
LnHHExp	0.152***	0.109***	0.144***	0.110***	0.155***	0.116***	0.129***	0.111***
	(0.019)	(0.020)	(0.019)	(0.020)	(0.022)	(0.023)	(0.022)	(0.023)
Headship	0.284***	0.307***	0.316***	0.332***	0.100*	0.143**	0.095*	0.116**
	(0.068)	(0.069)	(0.069)	(0.070)	(0.056)	(0.057)	(0.057)	(0.058)
HHChildren6-	-0.132***	-0.121***	-0.118***	-0.113***	-0.096***	-0.086***	-0.094***	-0.090***
	(0.020)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)	(0.023)	(0.023)
HHAdults65+	-0.113*	-0.120*	-0.142**	-0.129*	-0.162**	-0.139**	-0.164**	-0.158**
	(0.065)	(0.065)	(0.066)	(0.067)	(0.063)	(0.063)	(0.064)	(0.064)
Owned House	0.016	0.066	0.032	0.057	-0.138***	-0.124***	-0.152***	-0.138***
	(0.043)	(0.044)	(0.044)	(0.045)	(0.045)	(0.046)	(0.046)	(0.047)
FPE policy	0.086*	0.060	0.060	0.039	0.313***	0.273***	0.295***	0.287***
	(0.052)	(0.053)	(0.053)	(0.054)	(0.055)	(0.056)	(0.057)	(0.058)
Embu			-0.341**	0.213			-0.440***	-0.148
			(0.142)	(0.173)			(0.167)	(0.194)
Kalenjin			-0.440***	-0.433***			-0.313***	-0.318***
			(0.079)	(0.088)			(0.088)	(0.099)
Kamba			0.158	0.697***			0.264***	0.550***
			(0.096)	(0.138)			(0.096)	(0.139)
Kikuyu			-0.055	-0.402***			0.029	-0.283*
			(0.074)	(0.153)			(0.074)	(0.157)
Kisii			-0.527***	-0.484***			-0.442***	-0.426**
			(0.119)	(0.170)			(0.145)	(0.191)
Luhya			-0.154	0.055			-0.397**	-0.292
			(0.151)	(0.165)			(0.175)	(0.189)
Luo			0.232***	0.272*			0.399***	0.410***
			(0.087)	(0.151)			(0.080)	(0.149)
Maasai			-0.378***	-0.386***			0.119	0.097
			(0.142)	(0.148)			(0.151)	(0.159)
Meru			-0.598***	-0.043			-0.329***	-0.030
			(0.104)	(0.144)			(0.113)	(0.152)
Mijikenda			0.538**	0.263			0.333*	0.216
			(0.216)	(0.226)			(0.189)	(0.198)
Somali			-0.399***	-0.636			-0.592***	-0.640
			(0.111)	(0.587)			(0.145)	(1.059)
English			0.395***	0.406***			0.505***	0.469***
			(0.092)	(0.103)			(0.089)	(0.102)
Central		-0.395***		0.078		-0.304***		0.147
		(0.110)		(0.174)		(0.108)		(0.178)
Coast		-0.157		-0.053		-0.296***		-0.103
		(0.114)		(0.122)		(0.112)		(0.127)
Eastern		-0.740***		-0.869***		-0.522***		-0.499***
		(0.105)		(0.137)		(0.104)		(0.139)
North Eastern		-0.851***		-0.100		-1.023***		-0.163
		(0.141)		(0.587)		(0.167)		(1.060)
Nyanza		-0.449***		-0.354**		-0.241**		-0.217
		(0.108)		(0.154)		(0.106)		(0.158)
Rift valley		-0.632***		-0.320***		-0.509***		-0.193*
		(0.100)		(0.111)		(0.100)		(0.117)
Western		-0.671***		-0.536***		-0.578***		-0.312**
		(0.116)		(0.126)		(0.117)		(0.131)
Constant	-4.746	-3.895	-5.308	-4.527	0.361	0.578	0.855	1.022
	(3.273)	(3.304)	(3.334)	(3.354)	(3.505)	(3.568)	(3.626)	(3.643)
Observations	3,704	3,704	3,695	3,695	4,006	4,006	3,996	3,996
Pseudo R^2	0.0468	0.0670	0.0778	0.0917	0.0623	0.0778	0.0964	0.101

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses: WageW: Wage worker; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 30 Joint IV-Heckman Estimates of Return to Schooling, Male Sample

	Male(Age 30-40)							
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.142***		0.146***		0.132***		0.136***	
	(0.027)		(0.027)		(0.033)		(0.032)	
Married	0.060	1.796***	0.093	0.963***	0.044	0.909***	0.083	0.789**
	(0.070)	(0.449)	(0.068)	(0.366)	(0.069)	(0.350)	(0.069)	(0.324)
Age	-0.153	-1.813*	-0.116	-2.911***	-0.117	-2.512***	-0.097	-2.746***
	(0.191)	(0.994)	(0.182)	(0.907)	(0.179)	(0.894)	(0.176)	(0.846)
Age^2	0.003	0.023	0.002	0.040***	0.002	0.034***	0.002	0.037***
	(0.003)	(0.014)	(0.003)	(0.013)	(0.003)	(0.013)	(0.003)	(0.012)
Central			-0.667***	-1.646**			-0.481***	0.139
			(0.104)	(0.822)			(0.141)	(0.527)
Coast			-0.330***	-2.827***			-0.064	-1.153***
			(0.122)	(0.439)			(0.110)	(0.381)
Eastern			-0.782***	-3.689**			-0.222	-1.706
			(0.128)	(1.601)			(0.180)	(1.703)
Northeastern			0.099	-5.191***			-0.126	-0.386
			(0.205)	(1.988)			(0.430)	(1.553)
Nyanza			-0.873***	-1.901**			-0.751***	0.061
			(0.107)	(0.930)			(0.142)	(0.740)
Rift valley			-0.568***	-2.836**			-0.263***	-0.498
			(0.112)	(1.333)			(0.099)	(0.608)
Western			-1.022***	-3.004**			-0.642***	-0.886
			(0.134)	(1.477)			(0.131)	(1.031)
LnHHExp		1.048**		-0.072		0.048		-0.135
		(0.470)		(0.265)		(0.318)		(0.214)
Headship		3.488***		1.777**		1.255		0.982
		(0.923)		(0.797)		(0.770)		(0.705)
HHChildren6-		-1.470***		-0.613**		-0.357		-0.252
		(0.397)		(0.294)		(0.268)		(0.226)
HHAdults65+		-0.393		0.293		0.231		0.442
		(0.474)		(0.422)		(0.435)		(0.387)
Owned House		-0.452**		-0.339		-0.451**		-0.452**
		(0.190)		(0.238)		(0.183)		(0.202)
FPE policy		2.360***		1.729***		1.538***		1.469***
		(0.331)		(0.256)		(0.245)		(0.220)
Embu					-0.422**	-0.540	-0.466**	0.819
					(0.169)	(0.951)	(0.211)	(0.884)
Kalenjin					-0.239**	-0.405	-0.240**	-0.129
					(0.106)	(1.077)	(0.114)	(0.953)
Kamba					-0.208**	-0.871*	-0.223	0.031
					(0.104)	(0.484)	(0.174)	(1.501)
Kikuyu					-0.122	0.495*	0.096	-0.210
					(0.078)	(0.290)	(0.139)	(0.802)
Kisii					-0.527***	0.378	-0.055	0.196
					(0.159)	(1.300)	(0.198)	(1.206)
Luhya					-0.811***	-0.576	-0.450**	-0.246
					(0.179)	(0.730)	(0.190)	(0.694)
Luo					-0.301***	0.113	0.204	-0.809
					(0.086)	(0.568)	(0.150)	(0.704)
Maasai					0.789***	-4.800***	0.782***	-4.556***
					(0.248)	(1.119)	(0.249)	(1.057)
Meru					-0.406***	-1.131	-0.458**	0.523
					(0.140)	(1.453)	(0.184)	(0.666)
Mijikenda					0.278	-1.551	0.120	-1.544*
					(0.215)	(1.301)	(0.209)	(0.856)
Somali					0.762***	-2.580**	0.605	-2.474
					(0.165)	(1.092)	(0.442)	(1.966)
English					0.719***	4.260***	0.746***	3.494***
					(0.153)	(0.792)	(0.144)	(0.706)
Lambda	-0.278*	10.958**	-0.121	1.418	-0.349**	0.497	-0.252	-1.000
	(0.149)	(4.756)	(0.165)	(3.770)	(0.148)	(3.544)	(0.163)	(3.075)
Constant	4.186	21.927	3.987	62.048***	3.826	52.424***	3.578	60.048***
	(3.329)	(23.132)	(3.187)	(18.407)	(3.125)	(19.227)	(3.064)	(16.813)
Observations	1,801	1,801	1,801	1,801	1,801	1,801	1,801	1,801
R-squared	0.270	0.102	0.336	0.156	0.358	0.239	0.383	0.250
First stage F-stat	18.25	.	16.47	.	12.00	.	12.32	.
Shea R^2	0.0577	.	0.0525	.	0.0389	.	0.0401	.
F	22.75	20.26	30.30	19.39	33.14	25.37	27.74	20.35

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 31 Joint IV-Heckman Estimates of Return to Schooling, Female Sample

	Female(Age 30-40)							
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.118***		0.135***		0.133*		0.166**	
	(0.046)		(0.045)		(0.069)		(0.068)	
Married	0.297*	1.606	0.329**	4.714***	0.267	3.456**	0.218	3.466***
	(0.157)	(2.091)	(0.159)	(1.667)	(0.188)	(1.375)	(0.189)	(1.248)
Age	-0.179	-3.440**	0.106	-2.516**	0.046	-1.629	0.159	-1.528
	(0.331)	(1.351)	(0.316)	(1.233)	(0.310)	(1.210)	(0.309)	(1.181)
Age^2	0.003	0.046**	-0.001	0.035**	-0.000	0.022	-0.002	0.021
	(0.005)	(0.019)	(0.005)	(0.017)	(0.004)	(0.017)	(0.004)	(0.017)
Central			-0.707***	1.341			-0.600**	-1.469*
			(0.163)	(1.380)			(0.240)	(0.879)
Coast			-0.486**	-0.776			-0.216	-1.294**
			(0.211)	(1.356)			(0.205)	(0.615)
Eastern			-1.036***	2.949			-0.125	2.185
			(0.180)	(2.417)			(0.242)	(1.778)
Northeastern			0.371	5.285				
			(0.419)	(5.214)				
Nyanza			-1.232***	-0.660			-0.953***	0.274
			(0.182)	(1.104)			(0.255)	(0.990)
Rift valley			-0.833***	2.805			-0.498***	0.252
			(0.168)	(2.335)			(0.162)	(0.767)
Western			-1.167***	4.154			-0.906***	1.294
			(0.216)	(2.747)			(0.208)	(1.196)
LnHHExp		-0.055		-1.107*		-0.654		-0.595
		(0.884)		(0.565)		(0.476)		(0.384)
Headship		-0.917		-1.819**		-0.662		-0.780
		(0.611)		(0.735)		(0.432)		(0.477)
HHChildren6-		-0.607		0.209		0.140		0.116
		(0.561)		(0.445)		(0.375)		(0.342)
HHAdults65+		0.230		1.357*		0.959		0.933
		(0.984)		(0.761)		(0.687)		(0.632)
Owned House		0.040		1.212*		0.777		0.759
		(0.796)		(0.639)		(0.589)		(0.518)
FPE policy		1.642		-0.724		-0.083		-0.093
		(1.785)		(1.359)		(1.124)		(1.024)
Embu					-0.221	3.207	-0.618	1.345
					(0.358)	(2.027)	(0.381)	(1.302)
Kalenjin					-0.341*	2.631*	-0.334	2.615**
					(0.205)	(1.345)	(0.219)	(1.315)
Kamba					-0.565***	-1.780*	-0.817***	-3.721*
					(0.160)	(1.064)	(0.270)	(2.010)
Kikuyu					0.050	0.346	0.214	1.836
					(0.128)	(0.378)	(0.236)	(1.138)
Kisii					-0.678**	3.921**	-0.252	3.933**
					(0.329)	(1.955)	(0.391)	(1.965)
Luhya					-0.756**	0.462	-0.294	-0.554
					(0.358)	(1.890)	(0.384)	(1.548)
Luo					-0.522**	-3.822**	0.119	-3.918**
					(0.209)	(1.488)	(0.313)	(1.539)
Maasai					0.097	-5.649***	0.354	-5.615***
					(0.486)	(0.912)	(0.486)	(0.897)
Meru					-0.577**	1.188	-0.908***	-0.748
					(0.229)	(1.477)	(0.291)	(0.876)
Mijikenda					0.890*	-7.079***	0.899*	-5.473***
					(0.539)	(1.552)	(0.478)	(1.237)
Somali					1.158***	0.151	0.745*	0.525
					(0.392)	(2.652)	(0.428)	(3.154)
English					0.738***	0.300	0.622***	-0.040
					(0.203)	(1.742)	(0.189)	(1.514)
Lambda	-0.571*	-3.325	-0.292	-14.993**	-0.344	-8.924*	-0.090	-9.111*
	(0.305)	(7.720)	(0.321)	(6.675)	(0.335)	(5.125)	(0.353)	(4.794)
Constant	5.025	75.269***	0.344	77.692***	0.828	52.992***	-1.344	50.758***
	(5.877)	(21.189)	(5.596)	(20.262)	(5.462)	(19.407)	(5.443)	(19.359)
Observations	991	991	991	991	991	991	991	991
R-squared	0.203	0.145	0.289	0.210	0.309	0.291	0.327	0.301
Fstat_iv	8.800	.	8.569	.	3.995	.	4.072	.
Shear2	0.0511	.	0.0502	.	0.0242	.	0.0248	.
F	11.37	16.65	17.80	15.22	16.96	18.08	14.56	14.77

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Appendix K: Return to Schooling with FPE Policy Instrument, Level of Education Sub-Sample

Table A 32 OLS Estimates of Return to Schooling, Level of Education Sub-Sample (Male)

Male (Age30-40)	Primary				Secondary				Tertiary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW
Eduyear	0.028*	0.040***	0.064***	0.057***	0.206***	0.200***	0.181***	0.183***	0.237***	0.206***	0.171***	0.170***
	(0.015)	(0.015)	(0.017)	(0.016)	(0.014)	(0.014)	(0.014)	(0.014)	(0.025)	(0.023)	(0.025)	(0.023)
Married	0.128	0.159*	0.086	0.127	0.149*	0.193**	0.158**	0.204***	0.020	0.066	0.049	0.072
	(0.094)	(0.091)	(0.092)	(0.091)	(0.078)	(0.076)	(0.076)	(0.076)	(0.134)	(0.121)	(0.127)	(0.120)
Age	-0.580*	-0.680**	-0.572*	-0.631**	-0.124	-0.164	-0.097	-0.118	-0.334	-0.492	-0.328	-0.453
	(0.302)	(0.289)	(0.292)	(0.287)	(0.208)	(0.202)	(0.201)	(0.198)	(0.401)	(0.363)	(0.378)	(0.360)
Age^2	0.009**	0.010**	0.009**	0.009**	0.002	0.003	0.002	0.002	0.006	0.008	0.005	0.007
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)	(0.005)	(0.005)
Embu			-0.577**	-0.307			-0.450**	-0.494**			-0.525	-0.255
			(0.263)	(0.338)			(0.187)	(0.246)			(0.484)	(0.503)
Kalenjin			-0.350**	-0.304*			-0.351***	-0.331***			0.069	0.078
			(0.149)	(0.161)			(0.106)	(0.113)			(0.248)	(0.249)
Kamba			-0.164	0.094			-0.174	-0.218			-0.416	-0.099
			(0.139)	(0.256)			(0.112)	(0.197)			(0.272)	(0.339)
Kikuyu			0.037	0.086			-0.173**	-0.063			-0.094	0.025
			(0.129)	(0.265)			(0.081)	(0.150)			(0.148)	(0.208)
Kisii			-0.651**	-0.546			-0.681***	-0.078			-0.755***	-0.351
			(0.281)	(0.421)			(0.157)	(0.208)			(0.272)	(0.302)
Luhya			-0.811***	-0.227			-0.823***	-0.403*			-0.633	-0.258
			(0.271)	(0.290)			(0.191)	(0.213)			(0.555)	(0.539)
Luo			-0.277**	-0.173			-0.291***	0.304*			-0.353**	0.020
			(0.131)	(0.343)			(0.094)	(0.166)			(0.168)	(0.222)
Maasai			0.491**	0.468*			-0.212	-0.252			0.398	0.418
			(0.235)	(0.243)			(0.376)	(0.372)			(0.481)	(0.457)
Meru			-0.878***	-0.612**			-0.349**	-0.393*			-0.031	0.277
			(0.188)	(0.283)			(0.166)	(0.231)			(0.272)	(0.338)
Mijikenda			0.631**	0.228			0.268	0.072			-0.453	-0.422
			(0.247)	(0.257)			(0.226)	(0.231)			(0.677)	(0.647)
Somali			0.711***	-0.071			0.488***	0.537			0.062	0.176
			(0.215)	(0.994)			(0.187)	(0.462)			(0.324)	(0.559)
English			0.292	0.370			0.554***	0.653***			0.789***	0.581***
			(0.338)	(0.350)			(0.113)	(0.119)			(0.116)	(0.124)
Central		0.034		-0.039		-0.466***		-0.276*		-1.042***		-0.828***
		(0.213)		(0.313)		(0.106)		(0.160)		(0.144)		(0.193)
Coast		0.413**		0.398*		-0.118		0.035		-1.038***		-0.716***
		(0.206)		(0.208)		(0.109)		(0.114)		(0.162)		(0.175)
Eastern		-0.411**		-0.259		-0.527***		-0.117		-1.248***		-1.007***
		(0.202)		(0.286)		(0.109)		(0.187)		(0.167)		(0.248)
Northeastern		0.573**		0.741		0.087		-0.234		-1.130***		-0.928*
		(0.272)		(0.986)		(0.201)		(0.462)		(0.306)		(0.536)
Nyanza		-0.322		-0.100		-0.709***		-0.766***		-1.345***		-1.100***
		(0.208)		(0.371)		(0.105)		(0.158)		(0.140)		(0.179)
Rift valley		-0.062		-0.008		-0.396***		-0.160		-0.943***		-0.705***
		(0.197)		(0.203)		(0.098)		(0.104)		(0.135)		(0.149)
Western		-0.712***		-0.618***		-0.832***		-0.578***		-1.307***		-1.093***
		(0.221)		(0.229)		(0.124)		(0.135)		(0.170)		(0.176)
Constant	12.169**	13.925***	12.012**	12.992***	2.708	3.846	2.617	3.083	5.823	9.732	6.632	9.301
	(5.235)	(4.998)	(5.062)	(4.978)	(3.625)	(3.513)	(3.506)	(3.455)	(6.823)	(6.169)	(6.429)	(6.115)
Observations	707	707	707	707	1,255	1,255	1,255	1,255	493	493	493	493
R-squared	0.019	0.126	0.112	0.157	0.158	0.217	0.224	0.252	0.260	0.412	0.371	0.450
F-test	3.456	9.102	5.451	5.549	58.76	31.28	22.38	18.07	42.97	30.61	17.53	16.65

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence.

Table A 33 OLS Estimates of Return to Schooling, Level of Education Sub-Sample (Female)

Female (Age30-40)	Primary				Secondary				Tertiary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW	LnW
Eduyear	-0.028	-0.012	-0.008	-0.003	0.276***	0.263***	0.240***	0.242***	0.332***	0.247***	0.251***	0.209***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.025)	(0.024)	(0.025)	(0.025)	(0.034)	(0.034)	(0.037)	(0.036)
Married	-0.207*	-0.060	-0.140	-0.078	0.139	0.243**	0.221**	0.281***	0.023	0.131	0.054	0.120
	(0.117)	(0.116)	(0.118)	(0.117)	(0.094)	(0.095)	(0.094)	(0.095)	(0.130)	(0.121)	(0.125)	(0.122)
Age	-0.714	-0.263	-0.688	-0.450	0.290	0.337	0.391	0.417	0.057	0.319	0.237	0.374
	(0.449)	(0.435)	(0.435)	(0.430)	(0.364)	(0.356)	(0.358)	(0.355)	(0.541)	(0.502)	(0.521)	(0.497)
Age^2	0.010	0.004	0.010	0.007	-0.003	-0.004	-0.005	-0.005	0.000	-0.003	-0.002	-0.004
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)	(0.007)	(0.008)	(0.007)
Embu			-0.926*	-0.921			-0.078	-0.479			-0.487	-0.569
			(0.502)	(0.596)			(0.412)	(0.451)			(0.516)	(0.553)
Kalenjin			-0.686***	-0.565**			-0.184	-0.159			-0.067	-0.015
			(0.261)	(0.280)			(0.190)	(0.207)			(0.281)	(0.283)
Kamba			-0.145	-0.167			-0.434***	-0.814***			-0.471*	-0.514
			(0.213)	(0.397)			(0.167)	(0.257)			(0.270)	(0.366)
Kikuyu			0.341*	0.461			0.086	0.108			0.207	0.265
			(0.188)	(0.342)			(0.133)	(0.256)			(0.189)	(0.298)
Kisii			-1.470***	-1.114*			-0.521	-0.069			-0.477	0.108
			(0.458)	(0.649)			(0.326)	(0.407)			(0.323)	(0.414)
Luhya			-0.209	0.754*			-0.769	-0.384			-1.876**	-1.563*
			(0.404)	(0.441)			(0.519)	(0.535)			(0.890)	(0.864)
Luo			-0.269*	0.061			-0.295*	0.156			-0.164	0.420
			(0.157)	(0.498)			(0.154)	(0.291)			(0.262)	(0.375)
Maasai			0.232	0.282			-1.165**	-1.153**				
			(0.279)	(0.299)			(0.518)	(0.520)				
Meru			-1.034***	-1.042**			-0.541*	-0.916***			0.233	0.237
			(0.277)	(0.432)			(0.278)	(0.338)			(0.517)	(0.558)
Mijikenda			0.599*	0.202			0.378	0.409				
			(0.345)	(0.355)			(0.575)	(0.582)				
Somali			0.543	0.133			0.667	0.258			0.817	0.093
			(0.390)	(0.436)			(0.576)	(0.587)			(0.514)	(0.512)
English			0.760**	0.691**			0.566***	0.466***			0.653***	0.458***
			(0.298)	(0.310)			(0.155)	(0.171)			(0.161)	(0.173)
Central		-0.334		-0.554		-0.497***		-0.430		-0.746***		-0.753***
		(0.270)		(0.409)		(0.175)		(0.272)		(0.194)		(0.272)
Coast		-0.184		-0.015		-0.603***		-0.429**		-1.034***		-0.791***
		(0.260)		(0.271)		(0.196)		(0.211)		(0.239)		(0.253)
Eastern		-1.011***		-0.411		-0.797***		-0.029		-1.128***		-0.682**
		(0.253)		(0.396)		(0.175)		(0.252)		(0.216)		(0.298)
Northeastern		-0.108				0.029				-0.162		
		(0.438)				(0.588)				(0.512)		
Nyanza		-0.965***		-0.758		-0.913***		-0.863***		-1.288***		-1.304***
		(0.244)		(0.521)		(0.178)		(0.283)		(0.211)		(0.308)
Rift valley		-0.696***		-0.482*		-0.687***		-0.426**		-0.967***		-0.770***
		(0.240)		(0.259)		(0.165)		(0.185)		(0.186)		(0.203)
Western		-1.429***		-1.417***		-0.981***		-0.813***		-1.108***		-0.900***
		(0.294)		(0.312)		(0.210)		(0.219)		(0.225)		(0.230)
Constant	14.977*	7.578	14.580*	10.666	-5.477	-5.597	-6.813	-6.948	-2.621	-5.230	-4.852	-6.032
	(7.804)	(7.528)	(7.558)	(7.449)	(6.297)	(6.166)	(6.200)	(6.153)	(9.210)	(8.535)	(8.872)	(8.462)
Observations	424	424	424	424	673	673	673	673	238	238	238	238
R-squared	0.017	0.130	0.140	0.202	0.167	0.211	0.219	0.244	0.431	0.539	0.515	0.574
F-test	1.788	5.578	4.158	4.617	33.43	16.10	11.51	9.531	44.05	24.05	16.94	14.62

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 34 IV Estimates of Return to Schooling (Primary-Male Sub Sample)

Male(30-40)					**IV-Primary**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	-0.090		-0.053		-0.056		-0.050	
	(0.056)		(0.062)		(0.077)		(0.074)	
Married	0.216**	0.792***	0.235**	0.836***	0.182	0.827***	0.211*	0.808***
	(0.106)	(0.223)	(0.105)	(0.216)	(0.112)	(0.205)	(0.108)	(0.204)
Age	-0.736**	-3.915***	-0.818***	-3.691***	-0.758**	-3.364***	-0.813**	-3.535***
	(0.322)	(0.791)	(0.307)	(0.764)	(0.321)	(0.721)	(0.316)	(0.716)
Age^2	0.011**	0.051***	0.012***	0.049***	0.011**	0.044***	0.012***	0.047***
	(0.005)	(0.011)	(0.004)	(0.011)	(0.005)	(0.010)	(0.004)	(0.010)
Embu					-0.491*	0.494	-0.016	2.415***
					(0.275)	(0.591)	(0.395)	(0.761)
Kalenjin					-0.281*	0.535	-0.261	0.289
					(0.159)	(0.335)	(0.166)	(0.365)
Kamba					-0.139	0.066	0.327	1.958***
					(0.143)	(0.313)	(0.304)	(0.575)
Kikuyu					0.172	1.061***	0.111	0.224
					(0.156)	(0.286)	(0.268)	(0.599)
Kisii					-0.585**	0.446	-0.513	0.051
					(0.290)	(0.630)	(0.427)	(0.954)
Luhya					-0.678**	0.994	-0.067	1.467**
					(0.290)	(0.608)	(0.314)	(0.655)
Luo					-0.185	0.671**	-0.116	0.283
					(0.146)	(0.294)	(0.349)	(0.777)
Maasai					-0.033	-4.111***	-0.021	-4.410***
					(0.405)	(0.504)	(0.413)	(0.524)
Meru					-0.899***	-0.214	-0.419	1.690***
					(0.193)	(0.421)	(0.316)	(0.639)
Mijikenda					0.583**	-0.290	0.182	-0.291
					(0.255)	(0.555)	(0.262)	(0.583)
Somali					0.241	-3.539***	-0.694	-5.802***
					(0.366)	(0.464)	(1.092)	(2.240)
English					0.004	-2.072***	0.209	-1.214
					(0.390)	(0.756)	(0.371)	(0.792)
Central			0.087	0.625			-0.006	0.378
			(0.219)	(0.510)			(0.317)	(0.708)
Coast			0.356*	-0.479			0.336	-0.488
			(0.213)	(0.494)			(0.215)	(0.471)
Eastern			-0.487**	-0.760			-0.537	-2.393***
			(0.211)	(0.483)			(0.346)	(0.641)
Northeastern			0.175	-3.661***			0.878	1.749
			(0.377)	(0.640)			(1.003)	(2.235)
Nyanza			-0.311	0.178			-0.140	-0.093
			(0.212)	(0.500)			(0.376)	(0.841)
Rift valley			-0.134	-0.542			-0.051	-0.190
			(0.206)	(0.472)			(0.208)	(0.461)
Western			-0.774***	-0.646			-0.731***	-1.026**
			(0.229)	(0.530)			(0.244)	(0.516)
FPE policy		1.798***		1.526***		1.272***		1.276***
		(0.230)		(0.224)		(0.214)		(0.212)
Constant	15.945***	77.548***	17.151***	73.483***	16.237***	67.209***	17.089***	70.504***
	(5.700)	(13.723)	(5.495)	(13.231)	(5.816)	(12.513)	(5.758)	(12.396)
Observations	707	707	707	707	707	707	707	707
R-squared	-0.064	0.169	0.079	0.251	0.044	0.333	0.106	0.356
First stage F-stat	60.91	.	46.38	.	35.45	.	36.09	.
Shea R^2	0.0798	.	0.0626	.	0.0489	.	0.0502	.
F	3.041	35.78	8.103	21.17	4.214	21.51	4.753	16.42

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 35 IV Estimates of Return to Schooling (Secondary-Male Sub-Sample)

Male (Age 30-40)					**IV-Secondary**			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.632		0.687		0.807		0.962	
	(1.622)		(1.814)		(2.058)		(2.842)	
Married	0.037	0.260*	0.059	0.273*	-0.015	0.275*	-0.002	0.263*
	(0.436)	(0.154)	(0.509)	(0.155)	(0.580)	(0.151)	(0.763)	(0.152)
Age	0.454	-1.487***	0.475	-1.436***	0.646	-1.309**	0.796	-1.275**
	(2.215)	(0.520)	(2.399)	(0.519)	(2.463)	(0.508)	(3.353)	(0.509)
Age^2	-0.006	0.021***	-0.006	0.020***	-0.008	0.018**	-0.010	0.017**
	(0.031)	(0.007)	(0.033)	(0.007)	(0.034)	(0.007)	(0.046)	(0.007)
Embu					-0.394	-0.090	-0.136	-0.465
					(0.349)	(0.372)	(1.384)	(0.497)
Kalenjin					-0.268	-0.132	-0.307	-0.032
					(0.320)	(0.210)	(0.227)	(0.228)
Kamba					0.066	-0.385*	0.369	-0.759*
					(0.808)	(0.222)	(2.173)	(0.398)
Kikuyu					-0.189	0.026	0.066	-0.165
					(0.140)	(0.162)	(0.545)	(0.302)
Kisii					-0.677***	-0.007	0.181	-0.329
					(0.250)	(0.312)	(1.020)	(0.420)
Luhya					-0.322	-0.800**	0.216	-0.794*
					(1.674)	(0.379)	(2.289)	(0.429)
Luo					-0.171	-0.192	0.705	-0.511
					(0.419)	(0.186)	(1.493)	(0.335)
Maasai					-0.403	0.317	-0.574	0.421
					(0.866)	(0.747)	(1.358)	(0.751)
Meru					-0.188	-0.261	0.096	-0.635
					(0.590)	(0.330)	(1.834)	(0.467)
Mijikenda					1.015	-1.187***	0.935	-1.101**
					(2.481)	(0.447)	(3.176)	(0.466)
Somali					0.261	0.363	-0.110	0.818
					(0.803)	(0.371)	(2.508)	(0.933)
English					-0.470	1.634***	-0.500	1.480***
					(3.368)	(0.219)	(4.211)	(0.236)
Central			-0.285	-0.370*			-0.333	0.073
			(0.689)	(0.215)			(0.360)	(0.322)
Coast			0.229	-0.714***			0.210	-0.226
			(1.303)	(0.221)			(0.673)	(0.230)
Eastern			-0.196	-0.680***			-0.297	0.236
			(1.243)	(0.221)			(0.742)	(0.377)
Northeastern			0.226	-0.283			0.279	-0.644
			(0.592)	(0.408)			(2.056)	(0.933)
Nyanza			-0.500	-0.428**			-0.911	0.183
			(0.789)	(0.213)			(0.604)	(0.320)
Rift valley			-0.110	-0.585***			0.036	-0.248
			(1.076)	(0.197)			(0.737)	(0.209)
Western			-0.505	-0.669***			-0.464	-0.145
			(1.229)	(0.251)			(0.486)	(0.272)
FPE policy		0.057		0.053		0.053		0.044
		(0.140)		(0.140)		(0.137)		(0.138)
Constant	-11.846	36.405***	-12.625	35.966***	-16.939	33.353***	-21.190	32.916***
	(55.520)	(9.025)	(61.559)	(9.014)	(64.495)	(8.823)	(88.724)	(8.847)
Observations	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255
R-squared	-0.435	0.017	-0.546	0.029	-0.975	0.079	-1.597	0.082
First stage F-stat	0.167	.	0.145	.	0.150	.	0.104	.
Shea R^2	0.000133	.	0.000116	.	0.000122	.	8.42e-05	.
F	4.470	5.452	6.407	3.426	4.874	6.595	3.109	4.797

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 36 IV Estimates of Return to Schooling (Tertiary-Male Sub-Sample)

Male (Age 30-40)					**IV-Tertiary**			
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.380**		0.348**		0.317		0.309	
	(0.186)		(0.174)		(0.218)		(0.212)	
Married	0.137	-0.826***	0.179	-0.804***	0.150	-0.697***	0.164	-0.671***
	(0.205)	(0.238)	(0.186)	(0.239)	(0.197)	(0.231)	(0.185)	(0.232)
Age	-0.875	2.185**	-1.004	2.081**	-0.830	2.166**	-0.930	2.223***
	(0.808)	(0.870)	(0.725)	(0.871)	(0.837)	(0.843)	(0.811)	(0.848)
Age^2	0.013	-0.027**	0.015	-0.026**	0.012	-0.027**	0.014	-0.028**
	(0.011)	(0.013)	(0.010)	(0.013)	(0.011)	(0.012)	(0.011)	(0.012)
Embu					-0.400	-0.902	-0.178	-0.682
					(0.526)	(0.889)	(0.522)	(0.985)
Kalenjin					0.162	-0.578	0.214	-0.918*
					(0.288)	(0.456)	(0.326)	(0.486)
Kamba					-0.380	-0.220	-0.108	0.002
					(0.282)	(0.501)	(0.342)	(0.662)
Kikuyu					-0.079	-0.096	0.070	-0.305
					(0.152)	(0.272)	(0.221)	(0.406)
Kisii					-0.799***	0.263	-0.425	0.507
					(0.285)	(0.501)	(0.326)	(0.590)
Luhya					-0.478	-1.092	-0.141	-0.877
					(0.609)	(1.019)	(0.573)	(1.053)
Luo					-0.343**	-0.081	-0.002	0.159
					(0.172)	(0.309)	(0.227)	(0.434)
Maasai					0.311	0.689	0.366	0.478
					(0.506)	(0.885)	(0.469)	(0.894)
Meru					-0.030	-0.128	0.235	0.095
					(0.277)	(0.503)	(0.347)	(0.665)
Mijikenda					-0.294	-0.927	-0.297	-0.742
					(0.729)	(1.246)	(0.681)	(1.267)
Somali					0.087	-0.167	0.250	-0.476
					(0.332)	(0.597)	(0.576)	(1.092)
English					0.595*	1.286***	0.389	1.349***
					(0.310)	(0.204)	(0.318)	(0.235)
Central			-0.974***	-0.454			-0.872***	0.311
			(0.170)	(0.287)			(0.207)	(0.378)
Coast			-0.908***	-0.879***			-0.706***	-0.069
			(0.229)	(0.319)			(0.178)	(0.343)
Eastern			-1.128***	-0.825**			-0.980***	-0.109
			(0.225)	(0.331)			(0.254)	(0.486)
Northeastern			-1.020***	-0.760			-1.002*	0.471
			(0.342)	(0.609)			(0.554)	(1.048)
Nyanza			-1.278***	-0.472*			-1.083***	-0.132
			(0.165)	(0.277)			(0.183)	(0.351)
Rift valley			-0.891***	-0.337			-0.768***	0.446
			(0.152)	(0.267)			(0.179)	(0.291)
Western			-1.209***	-0.659*			-1.078***	-0.101
			(0.211)	(0.337)			(0.179)	(0.343)
FPE policy		0.678***		0.652***		0.543**		0.524**
		(0.220)		(0.220)		(0.214)		(0.215)
Constant	13.844	-28.476*	17.210	-26.243*	13.909	-27.805*	16.242	-28.973**
	(12.475)	(14.964)	(11.070)	(14.975)	(12.607)	(14.484)	(12.229)	(14.581)
Observations	493	493	493	493	493	493	493	493
R-squared	0.211	0.272	0.364	0.289	0.325	0.350	0.409	0.358
First stage F-stat	9.468	.	8.798	.	6.468	.	5.949	.
Shea R^2	0.0190	.	0.0180	.	0.0134	.	0.0125	.
F	20.14	45.53	21.71	17.76	13.68	16.05	13.46	11.36

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 37 IV Estimates of Return to Schooling (Primary-Female Sample)

Female (Age 30-40)					**IV-Primary**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	-0.017		0.027		0.010		0.039	
	(0.048)		(0.053)		(0.062)		(0.061)	
Married	-0.206*	-0.234	-0.053	-0.196	-0.139	-0.127	-0.080	-0.023
	(0.116)	(0.260)	(0.115)	(0.257)	(0.115)	(0.256)	(0.114)	(0.259)
Age	-0.707	-5.279***	-0.235	-4.747***	-0.683	-3.961***	-0.447	-3.636***
	(0.447)	(1.120)	(0.432)	(1.082)	(0.427)	(1.074)	(0.421)	(1.079)
Age^2	0.010	0.071***	0.004	0.063***	0.010	0.052***	0.007	0.048***
	(0.006)	(0.016)	(0.006)	(0.015)	(0.006)	(0.015)	(0.006)	(0.015)
Embu					-0.931*	0.720	-0.952	0.960
					(0.493)	(1.093)	(0.584)	(1.323)
Kalenjin					-0.697***	0.624	-0.580**	0.319
					(0.259)	(0.566)	(0.274)	(0.621)
Kamba					-0.165	1.140**	-0.232	1.334
					(0.220)	(0.461)	(0.398)	(0.880)
Kikuyu					0.316	1.221***	0.442	0.370
					(0.203)	(0.404)	(0.335)	(0.759)
Kisii					-1.480***	0.514	-1.132*	0.621
					(0.450)	(0.996)	(0.635)	(1.442)
Luhya					-0.206	-0.430	0.770*	-0.410
					(0.397)	(0.880)	(0.432)	(0.980)
Luo					-0.281*	0.365	0.040	0.448
					(0.159)	(0.343)	(0.487)	(1.106)
Maasai					0.282	-2.026***	0.418	-2.398***
					(0.320)	(0.603)	(0.347)	(0.657)
Meru					-1.022***	-0.468	-1.028**	-0.276
					(0.274)	(0.602)	(0.423)	(0.960)
Mijikenda					0.671	-3.416***	0.338	-2.627***
					(0.415)	(0.731)	(0.393)	(0.778)
Somali					0.616	-3.752***	0.360	-4.890***
					(0.456)	(0.829)	(0.528)	(0.937)
English					0.773***	-0.732	0.744**	-1.231*
					(0.296)	(0.648)	(0.311)	(0.686)
Central			-0.369	0.526			-0.555	-0.178
			(0.271)	(0.600)			(0.400)	(0.910)
Coast			-0.094	-2.045***			0.073	-1.940***
			(0.281)	(0.569)			(0.291)	(0.595)
Eastern			-0.997***	-0.272			-0.348	-1.322
			(0.251)	(0.563)			(0.396)	(0.877)
Northeastern			0.082	-4.373***				
			(0.496)	(0.950)				
Nyanza			-0.964***	-0.408			-0.718	-1.204
			(0.242)	(0.546)			(0.512)	(1.157)
Rift valley			-0.659***	-0.803			-0.449*	-0.786
			(0.242)	(0.533)			(0.257)	(0.575)
Western			-1.406***	-0.910			-1.377***	-1.175*
			(0.293)	(0.655)			(0.310)	(0.692)
FPE policy		2.807***		2.444***		2.140***		2.090***
		(0.299)		(0.294)		(0.293)		(0.292)
Constant	14.765*	101.251***	6.721	92.463***	14.355*	77.818***	10.213	73.185***
	(7.803)	(19.464)	(7.532)	(18.740)	(7.449)	(18.675)	(7.306)	(18.705)
Observations	424	424	424	424	424	424	424	424
R-squared	0.016	0.236	0.122	0.324	0.139	0.362	0.194	0.382
First stage F-stat	87.94	.	69.21	.	53.24	.	51.16	.
Shea R^2	0.173	.	0.144	.	0.116	.	0.113	.
F	1.318	32.27	5.522	17.94	4.145	14.41	4.588	11.26

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 38 IV Estimates of Return to Schooling (Secondary-Female Sub-Sample)

Female (Age 30-40)				**IV-Secondary**				
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	-1.280		-1.909		-0.559		-0.612	
	(3.025)		(4.557)		(1.183)		(1.090)	
Married	0.663	0.341**	1.123	0.408***	0.570	0.443***	0.621	0.403***
	(1.048)	(0.148)	(1.878)	(0.151)	(0.537)	(0.144)	(0.460)	(0.147)
Age	-0.827	-0.444	-1.141	-0.436	-0.059	-0.152	-0.108	-0.151
	(2.371)	(0.754)	(3.351)	(0.754)	(0.870)	(0.730)	(0.887)	(0.734)
Age^2	0.010	0.005	0.014	0.005	0.001	0.001	0.001	0.001
	(0.030)	(0.011)	(0.043)	(0.011)	(0.011)	(0.010)	(0.012)	(0.010)
Embu					0.491	0.705	-0.056	0.481
					(1.060)	(0.633)	(0.914)	(0.703)
Kalenjin					-0.001	0.238	0.019	0.211
					(0.403)	(0.292)	(0.408)	(0.323)
Kamba					-0.867	-0.551**	-1.474	-0.788**
					(0.693)	(0.257)	(0.941)	(0.399)
Kikuyu					-0.214	-0.376*	-0.661	-0.903**
					(0.489)	(0.204)	(1.067)	(0.398)
Kisii					0.186	0.886*	0.563	0.732
					(1.165)	(0.501)	(1.045)	(0.633)
Luhya					-2.069	-1.603**	-1.799	-1.629*
					(2.089)	(0.797)	(2.006)	(0.832)
Luo					-1.095	-0.999***	-0.822	-1.151**
					(1.209)	(0.234)	(1.336)	(0.451)
Maasai					-2.924	-2.234***	-3.048	-2.263***
					(2.727)	(0.794)	(2.564)	(0.808)
Meru					-0.995	-0.607	-1.600	-0.852
					(0.800)	(0.430)	(1.033)	(0.528)
Mijikenda					-0.067	-0.576	0.110	-0.364
					(1.115)	(0.885)	(1.027)	(0.907)
Somali					1.710	1.289	1.468	1.411
					(1.789)	(0.886)	(1.819)	(0.913)
English					1.276	0.891***	1.169	0.831***
					(1.079)	(0.237)	(0.941)	(0.266)
Central			-1.360	-0.393			0.146	0.689
			(1.916)	(0.279)			(0.859)	(0.424)
Coast			-1.685	-0.497			-0.515	-0.096
			(2.375)	(0.313)			(0.363)	(0.329)
Eastern			-1.853	-0.486*			0.264	0.363
			(2.303)	(0.278)			(0.557)	(0.393)
Northeastern			2.245	1.015				
			(5.103)	(0.939)				
Nyanza			-2.515	-0.730**			-0.642	0.280
			(3.421)	(0.284)			(0.542)	(0.441)
Rift valley			-1.271	-0.260			-0.311	0.156
			(1.360)	(0.264)			(0.337)	(0.290)
Western			-1.506	-0.234			-0.678*	0.173
			(1.334)	(0.336)			(0.397)	(0.341)
FPE policy		-0.108		-0.096		-0.163		-0.183
		(0.195)		(0.196)		(0.189)		(0.190)
Constant	31.717	19.146	45.572	19.325	10.033	13.948	11.759	13.838
	(74.143)	(13.037)	(109.583)	(13.054)	(26.760)	(12.629)	(25.908)	(12.707)
Observations	673	673	673	673	673	673	673	673
R-squared	-4.795	0.035	-9.293	0.051	-0.962	0.128	-1.098	0.134
First stage F-stat	0.307	.	0.242	.	0.739	.	0.927	.
Shea R^2	0.000459	.	0.000366	.	0.00112	.	0.00142	.
F	0.348	6.126	0.433	3.219	2.359	6.024	1.934	4.564

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 39 IV Estimates of Return to Schooling (Tertiary-Female Sample)

Female (Age 30-40)	IV-Tertiary							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	-0.343		1.841		-0.572		2.207	
	(4.286)		(5.109)		(3.749)		(6.356)	
Married	0.269	0.365	-0.693	0.515**	0.390	0.411*	-0.984	0.551**
	(1.571)	(0.251)	(2.669)	(0.238)	(1.548)	(0.227)	(3.540)	(0.227)
Age	-0.133	-0.093	0.073	-0.138	-0.049	-0.125	0.760	-0.462
	(1.494)	(1.419)	(1.801)	(1.351)	(1.592)	(1.292)	(2.217)	(1.275)
Age^2	0.007	0.007	-0.007	0.006	0.005	0.006	-0.018	0.011
	(0.042)	(0.020)	(0.026)	(0.019)	(0.037)	(0.019)	(0.051)	(0.018)
Embu					-0.864	-0.450	-0.843	0.128
					(1.938)	(0.942)	(2.232)	(1.040)
Kalenjin					0.036	0.129	0.101	-0.063
					(0.680)	(0.514)	(1.113)	(0.532)
Kamba					-0.377	0.117	-2.008	0.745
					(0.637)	(0.494)	(4.939)	(0.686)
Kikuyu					0.468	0.322	-1.952	1.114**
					(1.237)	(0.344)	(7.134)	(0.554)
Kisii					-0.659	-0.223	-0.744	0.447
					(1.004)	(0.591)	(3.113)	(0.780)
Luhya					-0.034	2.247	-6.776	2.604
					(8.538)	(1.620)	(16.884)	(1.614)
Luo					0.028	0.237	-1.259	0.854
					(0.989)	(0.479)	(5.519)	(0.704)
Maasai								
Meru					1.203	1.150	-3.406	1.859*
					(4.513)	(0.949)	(11.767)	(1.048)
Mijikenda								
Somali					0.810	-0.024	1.506	-0.695
					(0.899)	(0.941)	(4.879)	(0.961)
English					2.294	1.997***	-3.263	1.860***
					(7.487)	(0.262)	(11.850)	(0.300)
Central			1.945	-1.700***			2.261	-1.524***
			(8.641)	(0.369)			(9.638)	(0.503)
Coast			2.218	-2.041***			0.698	-0.749
			(10.445)	(0.454)			(4.828)	(0.472)
Eastern			1.854	-1.874***			2.008	-1.353**
			(9.575)	(0.410)			(8.622)	(0.552)
Northeastern			3.053	-2.001**				
			(10.429)	(1.006)				
Nyanza			1.744	-1.915***			1.350	-1.353**
			(9.735)	(0.400)			(8.515)	(0.578)
Rift valley			1.482	-1.542***			0.226	-0.504
			(7.868)	(0.355)			(3.254)	(0.380)
Western			1.546	-1.675***			1.022	-0.972**
			(8.531)	(0.433)			(6.171)	(0.429)
FPE policy		-0.068		0.105		-0.080		0.096
		(0.346)		(0.328)		(0.313)		(0.310)
Constant	5.499	8.769	-15.974	11.788	6.422	9.853	-29.610	16.457
	(53.668)	(24.312)	(44.082)	(23.150)	(53.667)	(22.135)	(81.290)	(21.842)
Observations	238	238	238	238	238	238	238	238
R-squared	-0.541	0.226	-4.057	0.343	-0.580	0.411	-5.440	0.452
First stage F-stat	0.0386	.	0.102	.	0.0651	.	0.0966	.
Shea R^2	0.000166	.	0.000451	.	0.000292	.	0.000445	.
F	7.395	16.98	1.755	10.72	4.171	11.14	0.862	8.966

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 40 Heckman's Estimates of Return to Schooling (Primary-Male Sub-Sample)

Male (Age 30-40)			**Heckman-Primary**					
	(1)		(2)		(3)		(4)	
VARIABLES	**LnW**	**WageW**	**LnW**	**WageW**	**LnW**	**WageW**	**LnW**	**WageW**
Eduyear	0.012	0.061***	0.031*	0.050***	0.048**	0.048***	0.045**	0.040***
	(0.019)	(0.011)	(0.018)	(0.012)	(0.019)	(0.013)	(0.019)	(0.013)
Married	0.149	-0.015	0.170*	-0.027	0.108	-0.029	0.142	-0.038
	(0.096)	(0.100)	(0.092)	(0.101)	(0.094)	(0.101)	(0.092)	(0.102)
Age	-0.692**	0.543**	-0.759**	0.527**	-0.710**	0.525**	-0.750**	0.499**
	(0.316)	(0.235)	(0.302)	(0.238)	(0.305)	(0.240)	(0.300)	(0.242)
Age^2	0.010**	-0.008**	0.011***	-0.008**	0.011**	-0.008**	0.011***	-0.007**
	(0.005)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Central			0.102	-0.413*			-0.019	-0.126
			(0.227)	(0.241)			(0.317)	(0.347)
Coast			0.459**	-0.168			0.491**	-0.272
			(0.213)	(0.238)			(0.221)	(0.245)
Eastern			-0.289	-0.716***			0.064	-1.002***
			(0.246)	(0.231)			(0.368)	(0.274)
Northeastern			0.712**	-0.720***			0.609	5.603
			(0.315)	(0.263)			(1.016)	(0.000)
Nyanza			-0.251	-0.390			0.139	-0.889***
			(0.225)	(0.237)			(0.408)	(0.330)
Rift valley			0.046	-0.635***			0.148	-0.573**
			(0.233)	(0.227)			(0.235)	(0.238)
Western			-0.587**	-0.650***			-0.414	-0.679***
			(0.264)	(0.242)			(0.273)	(0.253)
LnHHExp		0.198***		0.161***		0.199***		0.160***
		(0.033)		(0.034)		(0.033)		(0.034)
Headship		-0.015		0.011		0.028		0.057
		(0.098)		(0.099)		(0.099)		(0.100)
HHChildren6-		-0.061**		-0.060**		-0.053*		-0.055*
		(0.029)		(0.030)		(0.030)		(0.030)
HHAdults65+		-0.187**		-0.202**		-0.179*		-0.181*
		(0.092)		(0.093)		(0.094)		(0.094)
Owned House		0.089		0.123*		0.104		0.123*
		(0.064)		(0.066)		(0.067)		(0.068)
Embu					-0.475*	-0.302	-0.387	0.158
					(0.270)	(0.205)	(0.341)	(0.253)
Kalenjin					-0.251	-0.367***	-0.218	-0.327**
					(0.161)	(0.114)	(0.172)	(0.128)
Kamba					-0.219	0.232*	-0.132	0.690***
					(0.144)	(0.130)	(0.302)	(0.197)
Kikuyu					0.035	-0.018	0.196	-0.370
					(0.130)	(0.115)	(0.278)	(0.268)
Kisii					-0.550*	-0.522**	-0.532	-0.164
					(0.287)	(0.209)	(0.419)	(0.310)
Luhya					-0.713**	-0.212	-0.187	-0.076
					(0.278)	(0.210)	(0.291)	(0.230)
Luo					-0.361**	0.403***	-0.350	0.770***
					(0.143)	(0.132)	(0.365)	(0.270)
Maasai					0.519**	-0.128	0.505**	-0.116
					(0.236)	(0.173)	(0.244)	(0.185)
Meru					-0.765***	-0.494***	-0.676**	-0.033
					(0.199)	(0.139)	(0.285)	(0.202)
Mijikenda					0.538**	0.497**	0.194	0.228
					(0.257)	(0.251)	(0.261)	(0.266)
Somali					0.806***	-0.265*	0.322	-6.455***
					(0.221)	(0.149)	(1.057)	(0.269)
English					0.415	-0.506**	0.404	-0.202
					(0.345)	(0.227)	(0.349)	(0.254)
Lambda	-0.297		-0.220		-0.376*		-0.364	
	(0.226)		(0.253)		(0.223)		(0.262)	
Constant	14.454***	-11.801***	15.427***	-10.579**	14.778***	-11.350***	15.259***	-9.942**
	(5.549)	(4.067)	(5.279)	(4.119)	(5.348)	(4.156)	(5.240)	(4.190)
Observations	1,768	1,768	1,768	1,768	1,763	1,763	1,763	1,763
Censored	1061	1061	1061	1061	1056	1056	1056	1056
Wald chi2	13.70	13.70	88.40	88.40	81.45	81.45	112.5	112.5

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi".

Table A 41 Heckman's Estimates of Return to Schooling (Secondary-Male Sub-Sample)

Male (Age 30-40)	Heckman-Secondary							
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.176***	0.089***	0.179***	0.088***	0.158***	0.085***	0.161***	0.086***
	(0.017)	(0.014)	(0.017)	(0.015)	(0.017)	(0.015)	(0.017)	(0.015)
Married	0.088	0.138	0.135*	0.153*	0.098	0.143	0.140*	0.163*
	(0.083)	(0.089)	(0.082)	(0.090)	(0.081)	(0.090)	(0.081)	(0.091)
Age	-0.121	-0.035	-0.154	-0.043	-0.102	0.007	-0.117	-0.012
	(0.215)	(0.207)	(0.206)	(0.209)	(0.206)	(0.211)	(0.202)	(0.212)
Age^2	0.002	0.001	0.003	0.001	0.002	-0.000	0.002	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Central			-0.386***	-0.363***			-0.284*	0.036
			(0.114)	(0.134)			(0.164)	(0.210)
Coast			-0.124	0.130			0.023	0.147
			(0.113)	(0.145)			(0.117)	(0.152)
Eastern			-0.381***	-0.567***			0.037	-0.548***
			(0.128)	(0.133)			(0.199)	(0.196)
Northeastern			0.175	-0.249			-0.208	-0.011
			(0.209)	(0.227)			(0.481)	(0.720)
Nyanza			-0.588***	-0.460***			-0.677***	-0.414**
			(0.119)	(0.132)			(0.166)	(0.191)
Rift valley			-0.280**	-0.483***			-0.095	-0.260*
			(0.111)	(0.124)			(0.109)	(0.135)
Western			-0.638***	-0.656***			-0.380**	-0.673***
			(0.150)	(0.144)			(0.158)	(0.156)
LnHHExp		0.144***		0.103***		0.132***		0.097***
		(0.025)		(0.026)		(0.026)		(0.027)
Headship		0.467***		0.498***		0.501***		0.519***
		(0.089)		(0.090)		(0.091)		(0.092)
HHChildren6-		-0.099***		-0.103***		-0.107***		-0.107***
		(0.026)		(0.027)		(0.027)		(0.028)
HHAdults65+		-0.084		-0.085		-0.114		-0.120
		(0.088)		(0.088)		(0.089)		(0.090)
Owned House		0.023		0.090		0.039		0.092
		(0.055)		(0.057)		(0.056)		(0.058)
Lambda	-0.494***		-0.388**		-0.431***		-0.403**	
	(0.148)		(0.162)		(0.147)		(0.160)	
Embu					-0.359*	-0.355**	-0.499**	-0.060
					(0.193)	(0.177)	(0.249)	(0.237)
Kalenjin					-0.212*	-0.440***	-0.209*	-0.414***
					(0.117)	(0.098)	(0.124)	(0.109)
Kamba					-0.170	0.114	-0.303	0.391**
					(0.115)	(0.122)	(0.202)	(0.198)
Kikuyu					-0.138	-0.144*	0.035	-0.401**
					(0.084)	(0.086)	(0.158)	(0.183)
Kisii					-0.487***	-0.655***	0.080	-0.501**
					(0.172)	(0.135)	(0.219)	(0.202)
Luhya					-0.745***	-0.028	-0.465**	0.388*
					(0.197)	(0.186)	(0.217)	(0.205)
Luo					-0.283***	0.088	0.284*	0.248
					(0.096)	(0.102)	(0.169)	(0.183)
Maasai					0.045	-0.527*	-0.013	-0.545*
					(0.387)	(0.297)	(0.384)	(0.304)
Meru					-0.158	-0.714***	-0.302	-0.416**
					(0.180)	(0.140)	(0.236)	(0.211)
Mijikenda					0.159	0.740**	0.043	0.333
					(0.236)	(0.294)	(0.238)	(0.307)
Somali					0.510***	0.057	0.596	-0.194
					(0.192)	(0.202)	(0.482)	(0.720)
English					0.492***	0.299**	0.606***	0.306*
					(0.118)	(0.147)	(0.123)	(0.157)
Constant	3.361	-2.033	4.128	-1.106	3.273	-2.505	3.530	-1.624
	(3.751)	(3.602)	(3.581)	(3.634)	(3.590)	(3.667)	(3.516)	(3.694)
Observations	2,323	2,323	2,323	2,323	2,319	2,319	2,319	2,319
Censored	1068	1068	1068	1068	1064	1064	1064	1064
Wald chi2	121.5	121.5	159.1	159.1	183.2	183.2	208.1	208.1

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 42 Heckman's Estimates of Return to Schooling (Tertiary-Male Sub-Sample)

Male (Age 30-40)			**Heckman-Tertiary**					
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.225***	0.080***	0.194***	0.068**	0.171***	0.041	0.167***	0.034
	(0.028)	(0.029)	(0.025)	(0.030)	(0.025)	(0.031)	(0.023)	(0.032)
Married	-0.078	0.294*	-0.042	0.295*	0.035	0.359**	-0.007	0.377**
	(0.161)	(0.150)	(0.146)	(0.153)	(0.155)	(0.156)	(0.147)	(0.157)
Age	-0.372	0.165	-0.529	0.165	-0.335	0.306	-0.485	0.262
	(0.406)	(0.413)	(0.366)	(0.418)	(0.375)	(0.427)	(0.355)	(0.430)
Age^2	0.006	-0.002	0.009	-0.002	0.006	-0.005	0.008	-0.004
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
Central			-1.015***	-0.243			-0.858***	0.196
			(0.147)	(0.192)			(0.194)	(0.308)
Coast			-1.070***	0.134			-0.755***	0.298
			(0.165)	(0.228)			(0.178)	(0.246)
Eastern			-1.177***	-0.451**			-0.958***	-0.463
			(0.177)	(0.204)			(0.250)	(0.290)
Northeastern			-1.103***	-0.103			-0.965*	0.300
			(0.310)	(0.388)			(0.533)	(0.942)
Nyanza			-1.298***	-0.286			-1.098***	-0.099
			(0.145)	(0.184)			(0.177)	(0.257)
Rift valley			-0.871***	-0.497***			-0.697***	-0.162
			(0.146)	(0.173)			(0.147)	(0.200)
Western			-1.253***	-0.458**			-1.088***	-0.200
			(0.176)	(0.223)			(0.173)	(0.248)
LnHHExp		0.001		-0.031		-0.012		-0.028
		(0.036)		(0.039)		(0.039)		(0.042)
Headship		0.785***		0.834***		0.779***		0.808***
		(0.153)		(0.156)		(0.158)		(0.160)
HHChildren6-		-0.112**		-0.113**		-0.103*		-0.108**
		(0.051)		(0.052)		(0.054)		(0.054)
HHAdults65+		-0.113		-0.101		-0.163		-0.141
		(0.142)		(0.146)		(0.148)		(0.151)
Owned House		-0.050		-0.019		-0.033		-0.036
		(0.098)		(0.102)		(0.102)		(0.105)
Lambda	-0.323		-0.350		-0.042		-0.236	
	(0.286)		(0.259)		(0.279)		(0.262)	
Embu					-0.525	0.065	-0.306	0.471
					(0.475)	(0.517)	(0.498)	(0.573)
Kalenjin					0.087	-0.732***	0.167	-0.637***
					(0.271)	(0.221)	(0.264)	(0.242)
Kamba					-0.410	-0.192	-0.114	0.209
					(0.271)	(0.278)	(0.333)	(0.369)
Kikuyu					-0.091	-0.116	0.069	-0.349
					(0.147)	(0.163)	(0.211)	(0.299)
Kisii					-0.735**	-0.805***	-0.244	-0.769**
					(0.298)	(0.238)	(0.319)	(0.325)
Luhya					-0.609	-0.588	-0.130	-0.460
					(0.568)	(0.447)	(0.545)	(0.475)
Luo					-0.357**	0.382*	-0.010	0.421
					(0.168)	(0.214)	(0.221)	(0.307)
Maasai					0.399	0.203	0.424	0.241
					(0.473)	(0.571)	(0.450)	(0.585)
Meru					-0.027	-0.199	0.246	0.201
					(0.268)	(0.292)	(0.333)	(0.380)
Mijikenda					-0.480	5.662	-0.534	5.314
					(0.689)	(0.000)	(0.654)	(0.000)
Somali					0.062	0.147	0.211	-0.205
					(0.319)	(0.378)	(0.554)	(0.950)
English					0.781***	0.410***	0.533***	0.421**
					(0.125)	(0.155)	(0.133)	(0.174)
Constant	6.876	-4.107	10.744*	-3.355	6.789	-5.799	10.063*	-4.785
	(6.937)	(7.066)	(6.248)	(7.144)	(6.407)	(7.289)	(6.073)	(7.349)
Observations	758	758	758	758	756	756	756	756
Censored	265	265	265	265	263	263	263	263
Wald chi2	134.8	134.8	270.3	270.3	229.1	229.1	327.3	327.3

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 43 Heckman's Estimates of Return to Schooling (Primary-Female Sub-Sample)

Female (30-40)			**Heckman-Primary**					
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	-0.066**	0.056***	-0.034	0.042***	-0.037	0.047***	-0.022	0.042***
	(0.028)	(0.011)	(0.026)	(0.012)	(0.027)	(0.012)	(0.026)	(0.013)
Married	0.177	-0.527***	0.214	-0.501***	0.185	-0.552***	0.147	-0.510***
	(0.224)	(0.079)	(0.234)	(0.080)	(0.214)	(0.080)	(0.220)	(0.081)
Age	-0.743	0.118	-0.321	0.141	-0.653	0.012	-0.442	0.017
	(0.467)	(0.238)	(0.444)	(0.242)	(0.444)	(0.246)	(0.429)	(0.248)
Age^2	0.011	-0.002	0.005	-0.002	0.009	-0.000	0.006	-0.000
	(0.007)	(0.003)	(0.006)	(0.003)	(0.006)	(0.004)	(0.006)	(0.004)
Central			-0.117	-0.437**			-0.390	-0.447
			(0.323)	(0.204)			(0.437)	(0.311)
Coast			0.028	-0.418**			0.162	-0.413*
			(0.313)	(0.199)			(0.312)	(0.212)
Eastern			-0.632*	-0.724***			0.064	-1.103***
			(0.384)	(0.193)			(0.556)	(0.245)
Northeastern			0.441	-1.079***				4.635
			(0.599)	(0.249)				(0.000)
Nyanza			-0.793***	-0.347*			-0.403	-0.815***
			(0.285)	(0.193)			(0.594)	(0.289)
Rift valley			-0.346	-0.744***			-0.241	-0.637***
			(0.361)	(0.189)			(0.331)	(0.206)
Western			-1.002**	-0.812***			-1.070**	-0.743***
			(0.437)	(0.207)			(0.425)	(0.223)
LnHHExp		0.150***		0.116***		0.143***		0.115***
		(0.033)		(0.034)		(0.033)		(0.034)
Headship		0.116		0.130		0.055		0.095
		(0.079)		(0.081)		(0.082)		(0.083)
HHChildren6-		-0.008		-0.007		-0.016		-0.016
		(0.028)		(0.029)		(0.030)		(0.030)
HHAdults65+		-0.148*		-0.123		-0.167*		-0.150*
		(0.088)		(0.089)		(0.089)		(0.089)
Owned House		-0.056		-0.052		-0.087		-0.069
		(0.064)		(0.066)		(0.067)		(0.068)
Lambda	-0.788**		-0.615		-0.697*		-0.523	
	(0.388)		(0.454)		(0.381)		(0.433)	
Embu					-0.618	-0.443*	-0.925	0.057
					(0.531)	(0.250)	(0.587)	(0.299)
Kalenjin					-0.441	-0.384***	-0.387	-0.333**
					(0.293)	(0.129)	(0.313)	(0.147)
Kamba					-0.275	0.338**	-0.497	0.833***
					(0.231)	(0.134)	(0.479)	(0.217)
Kikuyu					0.262	0.182	0.461	0.070
					(0.198)	(0.117)	(0.346)	(0.249)
Kisii					-1.221**	-0.438*	-1.046	-0.220
					(0.479)	(0.229)	(0.642)	(0.317)
Luhya					-0.159	-0.088	0.691	0.057
					(0.409)	(0.214)	(0.440)	(0.239)
Luo					-0.546**	0.561***	-0.262	0.778***
					(0.223)	(0.104)	(0.559)	(0.244)
Maasai					0.033	0.380**	0.148	0.392**
					(0.305)	(0.167)	(0.319)	(0.183)
Meru					-0.935***	-0.115	-1.201***	0.395*
					(0.285)	(0.149)	(0.447)	(0.227)
Mijikenda					0.323	0.543***	0.080	0.337
					(0.384)	(0.207)	(0.369)	(0.220)
Somali					0.792*	-0.393**	0.576	-5.648***
					(0.410)	(0.177)	(0.567)	(0.258)
English					0.601*	0.227	0.549	0.394*
					(0.320)	(0.193)	(0.336)	(0.230)
Constant	16.608**	-4.401	9.149	-3.824	14.961*	-2.414	11.030	-1.657
	(8.145)	(4.139)	(7.741)	(4.226)	(7.703)	(4.277)	(7.428)	(4.320)
Observations	2,418	2,418	2,418	2,418	2,415	2,415	2,415	2,415
Censored	1994	1994	1994	1994	1991	1991	1991	1991
Wald chi2	8.889	8.889	52.65	52.65	60.50	60.50	87.34	87.34

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 44 Heckman's Estimates of Return to Schooling (Secondary-Female Sub-Sample)

Female (Age 30-40)				**Heckman-Secondary**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.217***	0.128***	0.225***	0.126***	0.204***	0.130***	0.215***	0.128***
	(0.042)	(0.016)	(0.042)	(0.016)	(0.044)	(0.017)	(0.045)	(0.017)
Married	0.344**	-0.407***	0.371**	-0.379***	0.341**	-0.402***	0.367**	-0.391***
	(0.151)	(0.074)	(0.149)	(0.075)	(0.152)	(0.076)	(0.153)	(0.076)
Age	0.166	0.206	0.253	0.208	0.286	0.308	0.342	0.295
	(0.380)	(0.232)	(0.366)	(0.233)	(0.373)	(0.237)	(0.367)	(0.238)
Age^2	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004
	(0.005)	(0.003)	(0.005)	(0.003)	(0.005)	(0.003)	(0.005)	(0.003)
Central			-0.412**	-0.277**			-0.454*	0.154
			(0.192)	(0.135)			(0.273)	(0.215)
Coast			-0.590***	0.017			-0.442**	0.115
			(0.199)	(0.155)			(0.211)	(0.166)
Eastern			-0.709***	-0.270**			-0.055	0.167
			(0.193)	(0.137)			(0.253)	(0.201)
Northeastern			0.037	0.118				-5.857
			(0.596)	(0.466)				(0.000)
Nyanza			-0.846***	-0.174			-0.808***	-0.208
			(0.190)	(0.140)			(0.290)	(0.198)
Rift valley			-0.586***	-0.346***			-0.402**	-0.141
			(0.189)	(0.130)			(0.187)	(0.144)
Western			-0.821***	-0.478***			-0.742***	-0.292*
			(0.255)	(0.153)			(0.239)	(0.164)
LnHHExp		0.112***		0.087***		0.083***		0.067**
		(0.031)		(0.032)		(0.032)		(0.033)
Headship		0.173**		0.214***		0.146*		0.167**
		(0.073)		(0.074)		(0.075)		(0.076)
HHChildren6-		-0.056*		-0.053		-0.073**		-0.070**
		(0.032)		(0.032)		(0.033)		(0.034)
HHAdults65+		-0.160*		-0.141		-0.147*		-0.149*
		(0.086)		(0.087)		(0.088)		(0.088)
Owned House		-0.138**		-0.119*		-0.136**		-0.118*
		(0.060)		(0.062)		(0.062)		(0.064)
Lambda	-0.587*		-0.392		-0.369		-0.275	
	(0.330)		(0.348)		(0.367)		(0.386)	
Embu					0.108	-0.622***	-0.296	-0.866***
					(0.449)	(0.221)	(0.514)	(0.269)
Kalenjin					-0.066	-0.363***	-0.078	-0.302**
					(0.223)	(0.115)	(0.235)	(0.129)
Kamba					-0.478***	0.207*	-0.801***	-0.053
					(0.173)	(0.120)	(0.255)	(0.197)
Kikuyu					0.132	-0.167*	0.182	-0.379**
					(0.141)	(0.088)	(0.275)	(0.187)
Kisii					-0.356	-0.565***	0.020	-0.451*
					(0.364)	(0.184)	(0.421)	(0.241)
Luhya					-0.527	-0.682***	-0.258	-0.486*
					(0.567)	(0.248)	(0.556)	(0.263)
Luo					-0.344**	0.248**	0.085	0.362*
					(0.162)	(0.109)	(0.305)	(0.191)
Maasai					-1.387**	1.074**	-1.320**	1.114**

					(0.568)	(0.459)	(0.569)	(0.463)
Meru					-0.369	-0.548***	-0.743*	-0.801***
					(0.325)	(0.156)	(0.413)	(0.221)
Mijikenda					0.314	0.324	0.395	0.120
					(0.580)	(0.426)	(0.578)	(0.436)
Somali					0.583	0.478	0.212	6.250***
					(0.587)	(0.488)	(0.587)	(0.502)
English					0.485***	0.294**	0.411**	0.284**
					(0.176)	(0.130)	(0.187)	(0.140)
Constant	-2.144	-6.151	-3.450	-5.721	-4.262	-7.593*	-5.126	-7.117*
	(6.730)	(4.040)	(6.487)	(4.064)	(6.699)	(4.126)	(6.609)	(4.144)
Observations	2,083	2,083	2,083	2,083	2,079	2,079	2,079	2,079
Censored	1410	1410	1410	1410	1406	1406	1406	1406
Wald chi2	81.70	81.70	117.2	117.2	139.5	139.5	160.1	160.1

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 45 Heckman's Estimates of Return to Schooling (Tertiary-Female Sub-Sample)

Female (Age 30-40)				**Heckman-Tertiary**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	WageW	LnW	WageW	LnW	WageW	LnW	WageW
Eduyear	0.326***	0.145***	0.246***	0.177***	0.265***	0.126***	0.205***	0.163***
	(0.057)	(0.039)	(0.057)	(0.043)	(0.051)	(0.044)	(0.054)	(0.047)
Married	0.035	-0.109	0.133	-0.145	0.020	-0.153	0.130	-0.241
	(0.155)	(0.145)	(0.143)	(0.148)	(0.149)	(0.149)	(0.150)	(0.152)
Age	0.022	0.683	0.314	0.647	0.345	0.859*	0.354	0.730
	(0.589)	(0.491)	(0.525)	(0.501)	(0.576)	(0.503)	(0.516)	(0.509)
Age^2	0.001	-0.010	-0.003	-0.009	-0.004	-0.013*	-0.004	-0.011
	(0.009)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
Central			-0.748***	0.347			-0.779**	0.985***
			(0.208)	(0.216)			(0.362)	(0.323)
Coast			-1.037***	0.559**			-0.810***	0.718**
			(0.268)	(0.268)			(0.301)	(0.291)
Eastern			-1.129***	0.247			-0.707*	0.958**
			(0.219)	(0.234)			(0.375)	(0.405)
Northeastern			-0.174	6.688				
			(0.702)	(0.000)				
Nyanza			-1.290***	0.341			-1.307***	0.169
			(0.216)	(0.239)			(0.295)	(0.324)
Rift valley			-0.968***	0.193			-0.783***	0.484**
			(0.185)	(0.210)			(0.229)	(0.238)
Western			-1.110***	0.318			-0.912***	0.486*
			(0.228)	(0.258)			(0.249)	(0.277)
LnHHExp		0.013		0.033		-0.010		0.010
		(0.048)		(0.052)		(0.051)		(0.055)
Headship		0.203		0.182		0.181		0.135
		(0.153)		(0.158)		(0.159)		(0.162)
HHChildren6-		-0.113*		-0.127*		-0.127*		-0.132*
		(0.068)		(0.069)		(0.071)		(0.072)
HHAdults65+		-0.269		-0.273		-0.309*		-0.304
		(0.180)		(0.180)		(0.185)		(0.186)
Owned House		-0.082		-0.138		-0.101		-0.148
		(0.113)		(0.120)		(0.117)		(0.124)
Lambda	-0.079		-0.012		0.204		-0.050	
	(0.556)		(0.465)		(0.518)		(0.481)	
Embu					-0.577	-0.555	-0.533	-1.035*
					(0.551)	(0.411)	(0.631)	(0.543)
Kalenjin					-0.127	-0.346	-0.000	-0.325
					(0.313)	(0.241)	(0.304)	(0.264)
Kamba					-0.424	0.360	-0.514	-0.097
					(0.290)	(0.306)	(0.350)	(0.473)
Kikuyu					0.183	-0.188	0.283	-0.646**
					(0.194)	(0.178)	(0.334)	(0.307)
Kisii					-0.476	-0.002	0.098	0.323
					(0.315)	(0.311)	(0.408)	(0.415)
Luhya					-1.959**	-0.850	-1.542*	-0.901
					(0.891)	(0.734)	(0.850)	(0.760)
Luo					-0.157	0.132	0.409	0.478
					(0.256)	(0.266)	(0.373)	(0.381)

Maasai								
Meru					0.106	-0.959**	0.279	-1.442***
					(0.596)	(0.383)	(0.674)	(0.526)
Mijikenda								
Somali					0.999	6.515	0.036	7.005
					(0.685)	(0.000)	(0.735)	(0.000)
English					0.674***	0.160	0.449**	0.319
					(0.166)	(0.177)	(0.188)	(0.200)
Constant	-1.883	-13.483	-5.123	-13.670	-7.008	-15.915*	-5.579	-14.679*
	(10.503)	(8.393)	(9.340)	(8.550)	(10.239)	(8.596)	(9.201)	(8.698)
Observations	517	517	517	517	515	515	515	515
Censored	279	279	279	279	277	277	277	277
Wald chi2	76.23	76.23	198.7	198.7	164.7	164.7	258.0	258.0

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 46 Probit Estimates for Generating Inverse Mill's Ratio, Level of Education Sub-Sample (Male)

Male (Age 30-40)	Primary				Secondary				Tertiary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW
Married	-0.002	-0.017	-0.016	-0.033	0.157*	0.172*	0.163*	0.181**	0.281*	0.282*	0.373**	0.386**
	(0.099)	(0.101)	(0.101)	(0.102)	(0.089)	(0.090)	(0.090)	(0.091)	(0.145)	(0.148)	(0.151)	(0.152)
Age	0.463*	0.478*	0.507**	0.510*	0.272	0.254	0.289	0.292	-0.043	-0.083	0.019	-0.022
	(0.253)	(0.257)	(0.259)	(0.261)	(0.259)	(0.261)	(0.263)	(0.266)	(0.451)	(0.455)	(0.466)	(0.469)
Age^2	-0.007*	-0.007*	-0.007**	-0.007**	-0.004	-0.004	-0.004	-0.004	0.001	0.001	-0.001	-0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.006)	(0.007)	(0.007)	(0.007)
Embu			-0.232	0.309			-0.376**	-0.060			-0.265	0.041
			(0.205)	(0.250)			(0.176)	(0.235)			(0.420)	(0.478)
Kalenjin			-0.341***	-0.313**			-0.444***	-0.418***			-0.739***	-0.704***
			(0.114)	(0.127)			(0.098)	(0.109)			(0.210)	(0.231)
Kamba			0.284**	0.826***			0.099	0.396**			-0.262	0.043
			(0.131)	(0.194)			(0.122)	(0.196)			(0.266)	(0.352)
Kikuyu			0.050	-0.330			-0.138	-0.415**			-0.089	-0.291
			(0.113)	(0.267)			(0.086)	(0.182)			(0.158)	(0.286)
Kisii			-0.466**	-0.146			-0.636***	-0.528***			-0.776***	-0.738**
			(0.209)	(0.311)			(0.135)	(0.200)			(0.229)	(0.306)
Luhya			-0.180	-0.075			-0.049	0.368*			-0.580	-0.414
			(0.208)	(0.230)			(0.187)	(0.205)			(0.444)	(0.470)
Luo			0.461***	0.789***			0.078	0.192			0.330	0.365
			(0.131)	(0.271)			(0.102)	(0.181)			(0.204)	(0.288)
Maasai			-0.278	-0.251			-0.536*	-0.556*			-0.169	-0.161
			(0.170)	(0.181)			(0.296)	(0.303)			(0.369)	(0.382)
Meru			-0.492***	0.058			-0.723***	-0.403*			-0.200	0.107
			(0.139)	(0.199)			(0.140)	(0.209)			(0.274)	(0.358)
Mijikenda			0.526**	0.258			0.623**	0.225				
			(0.252)	(0.266)			(0.292)	(0.305)				
Somali			-0.459***	-5.252			0.081	-0.070			0.044	-0.320
			(0.141)	(146.725)			(0.200)	(0.714)			(0.349)	(0.911)
English			-0.611***	-0.226			0.425***	0.425***			0.489***	0.498***
			(0.225)	(0.254)			(0.143)	(0.154)			(0.141)	(0.160)
LnHHExp	0.220***	0.175***	0.217***	0.172***	0.154***	0.110***	0.140***	0.105***	0.011	-0.024	-0.003	-0.016

	(0.032)	(0.033)	(0.033)	(0.034)	(0.025)	(0.026)	(0.025)	(0.027)	(0.033)	(0.036)	(0.036)	(0.039)
Headship	0.016	0.037	0.051	0.082	0.462***	0.491***	0.497***	0.513***	0.791***	0.830***	0.769***	0.779***
	(0.097)	(0.098)	(0.099)	(0.100)	(0.089)	(0.090)	(0.090)	(0.091)	(0.147)	(0.150)	(0.152)	(0.154)
HHChildren6-	-0.073**	-0.064**	-0.054*	-0.057*	-0.112***	-0.116***	-0.118***	-0.117***	-0.148***	-0.139***	-0.114**	-0.113**
	(0.029)	(0.030)	(0.030)	(0.030)	(0.026)	(0.027)	(0.027)	(0.027)	(0.048)	(0.049)	(0.051)	(0.051)
HHAdults65+	-0.188**	-0.203**	-0.175*	-0.174*	-0.075	-0.077	-0.106	-0.113	-0.074	-0.067	-0.115	-0.103
	(0.092)	(0.092)	(0.093)	(0.094)	(0.088)	(0.088)	(0.089)	(0.090)	(0.133)	(0.137)	(0.139)	(0.141)
Owned House	0.100	0.126*	0.105	0.119*	0.010	0.079	0.028	0.080	-0.053	-0.015	-0.028	-0.029
	(0.064)	(0.065)	(0.066)	(0.068)	(0.054)	(0.056)	(0.056)	(0.058)	(0.093)	(0.097)	(0.097)	(0.100)
FPE policy	0.043	-0.001	-0.030	-0.050	-0.170**	-0.163**	-0.151**	-0.162**	0.120	0.127	0.106	0.107
	(0.077)	(0.078)	(0.080)	(0.081)	(0.071)	(0.072)	(0.072)	(0.073)	(0.120)	(0.121)	(0.125)	(0.126)
Central		-0.391		-0.141		-0.394***		0.043		-0.258		0.195
		(0.242)		(0.347)		(0.133)		(0.210)		(0.182)		(0.292)
Coast		-0.215		-0.314		0.064		0.121		0.012		0.242
		(0.238)		(0.245)		(0.143)		(0.151)		(0.210)		(0.228)
Eastern		-0.772***		-1.127***		-0.621***		-0.583***		-0.512***		-0.334
		(0.231)		(0.272)		(0.133)		(0.194)		(0.188)		(0.274)
Northeastern		-0.956***		4.194		-0.278		-0.132		-0.211		0.346
		(0.257)		(146.725)		(0.226)		(0.714)		(0.359)		(0.904)
Nyanza		-0.380		-0.893***		-0.485***		-0.381**		-0.309*		-0.062
		(0.238)		(0.330)		(0.131)		(0.189)		(0.173)		(0.239)
Rift valley		-0.687***		-0.605**		-0.526***		-0.275**		-0.494***		-0.065
		(0.227)		(0.238)		(0.124)		(0.135)		(0.163)		(0.192)
Western		-0.667***		-0.689***		-0.700***		-0.689***		-0.504**		-0.201
		(0.243)		(0.253)		(0.143)		(0.155)		(0.211)		(0.237)
Constant	-10.106**	-9.424**	-10.852**	-9.917**	-6.488	-5.328	-6.548	-6.028	0.313	1.713	-0.323	0.509
	(4.395)	(4.453)	(4.499)	(4.534)	(4.507)	(4.551)	(4.590)	(4.628)	(7.771)	(7.838)	(8.024)	(8.078)
Observations	1,770	1,770	1,765	1,765	2,329	2,329	2,325	2,325	829	829	825	825
Pseudo R^2	0.0439	0.0647	0.0773	0.0923	0.0513	0.0716	0.0816	0.0966	0.0841	0.0994	0.131	0.137

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 47 Probit Estimates of Return to Schooling, Level of Education Sub-Sample (Female)

Female (Age 30-40)	**Primary**				**Secondary**				**Tertiary**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW	WageW
Married	-0.510***	-0.487***	-0.537***	-0.494***	-0.402***	-0.370***	-0.384***	-0.375***	-0.068	-0.082	-0.102	-0.167
	(0.078)	(0.080)	(0.080)	(0.081)	(0.073)	(0.074)	(0.075)	(0.076)	(0.133)	(0.135)	(0.136)	(0.139)
Age	-0.159	-0.077	-0.234	-0.215	-0.086	-0.102	0.004	-0.002	-0.285	-0.195	-0.038	-0.099
	(0.258)	(0.265)	(0.271)	(0.273)	(0.302)	(0.304)	(0.309)	(0.311)	(0.553)	(0.564)	(0.575)	(0.582)
Age^2	0.002	0.001	0.003	0.003	0.001	0.001	-0.000	-0.000	0.004	0.003	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)	(0.008)	(0.008)
Embu			-0.390	0.139			-0.620***	-0.857***			-0.826**	-0.997**
			(0.249)	(0.296)			(0.214)	(0.262)			(0.382)	(0.478)
Kalenjin			-0.338***	-0.309**			-0.381***	-0.321**			-0.371	-0.413*
			(0.127)	(0.145)			(0.113)	(0.127)			(0.228)	(0.249)
Kamba			0.390***	0.915***			0.123	-0.130			0.307	0.155
			(0.133)	(0.213)			(0.118)	(0.194)			(0.281)	(0.404)
Kikuyu			0.244**	0.110			-0.188**	-0.471**			-0.157	-0.570*
			(0.114)	(0.246)			(0.087)	(0.187)			(0.169)	(0.295)
Kisii			-0.414*	-0.194			-0.505***	-0.433*			-0.117	0.112
			(0.228)	(0.317)			(0.180)	(0.237)			(0.299)	(0.388)
Luhya			-0.069	0.050			-0.775***	-0.571**			-0.906	-0.933
			(0.215)	(0.240)			(0.247)	(0.262)			(0.672)	(0.691)
Luo			0.624***	0.842***			0.168	0.243			0.068	0.308
			(0.102)	(0.245)			(0.107)	(0.187)			(0.248)	(0.348)
Maasai			0.314*	0.317*			0.905**	0.944**			-0.651	-0.670
			(0.164)	(0.180)			(0.459)	(0.462)			(0.677)	(0.690)
Meru			-0.098	0.447**			-0.589***	-0.834***			-0.819**	-0.987**
			(0.149)	(0.225)			(0.154)	(0.218)			(0.335)	(0.444)
Mijikenda			0.487**	0.317			0.239	0.050				
			(0.207)	(0.220)			(0.419)	(0.429)				
Somali			-0.527***	-4.494			0.615	4.787			0.402	0.773
			(0.171)	(133.841)			(0.477)	(150.587)			(0.464)	(0.496)
English			0.165	0.343			0.455***	0.428***			0.265*	0.427**
			(0.190)	(0.229)			(0.128)	(0.138)			(0.148)	(0.176)
LnHHExp	0.165***	0.125***	0.155***	0.124***	0.142***	0.112***	0.105***	0.088***	-0.009	-0.006	-0.045	-0.027
	(0.032)	(0.033)	(0.033)	(0.034)	(0.030)	(0.031)	(0.031)	(0.032)	(0.045)	(0.048)	(0.049)	(0.051)
Headship	0.105	0.123	0.051	0.093	0.150**	0.198***	0.139*	0.159**	0.132	0.125	0.123	0.068
	(0.078)	(0.080)	(0.081)	(0.082)	(0.072)	(0.074)	(0.074)	(0.076)	(0.141)	(0.145)	(0.146)	(0.149)
HHChildren6-	-0.019	-0.014	-0.021	-0.021	-0.083***	-0.080**	-0.097***	-0.094***	-0.163***	-0.170***	-0.157**	-0.161***
	(0.028)	(0.029)	(0.029)	(0.030)	(0.031)	(0.032)	(0.033)	(0.033)	(0.059)	(0.060)	(0.061)	(0.062)
HHAdults65+	-0.138	-0.106	-0.150*	-0.130	-0.163*	-0.139	-0.144	-0.145	-0.283*	-0.285*	-0.334*	-0.346**
	(0.086)	(0.087)	(0.087)	(0.088)	(0.085)	(0.086)	(0.087)	(0.088)	(0.169)	(0.169)	(0.174)	(0.174)

Owned House	-0.053	-0.058	-0.096	-0.078	-0.167***	-0.141**	-0.156**	-0.139**	-0.156	-0.175	-0.174	-0.213*
	(0.063)	(0.066)	(0.066)	(0.067)	(0.059)	(0.061)	(0.061)	(0.063)	(0.104)	(0.109)	(0.108)	(0.112)
FPE policy	0.266***	0.194**	0.215***	0.199**	0.080	0.088	0.084	0.082	0.452***	0.454***	0.410***	0.410***
	(0.075)	(0.078)	(0.080)	(0.081)	(0.080)	(0.081)	(0.082)	(0.083)	(0.143)	(0.145)	(0.148)	(0.149)
Central		-0.413**		-0.476		-0.328**		0.223		0.116		0.798***
		(0.203)		(0.308)		(0.134)		(0.214)		(0.188)		(0.302)
Coast		-0.481**		-0.486**		-0.050		0.091		0.139		0.420
		(0.197)		(0.209)		(0.154)		(0.165)		(0.227)		(0.260)
Eastern		-0.744***		-1.182***		-0.363***		0.152		-0.096		0.520
		(0.192)		(0.241)		(0.135)		(0.199)		(0.200)		(0.341)
Northeastern		-1.223***		3.319		0.207		-4.268		0.498		0.135
		(0.242)		(133.841)		(0.458)		(150.586)		(0.478)		(0.287)
Nyanza		-0.331*		-0.864***		-0.236*		-0.175		0.086		0.414*
		(0.191)		(0.289)		(0.139)		(0.195)		(0.208)		(0.216)
Rift valley		-0.757***		-0.664***		-0.405***		-0.148		0.001		0.369
		(0.187)		(0.204)		(0.129)		(0.144)		(0.178)		(0.258)
Western		-0.817***		-0.763***		-0.533***		-0.306*		0.096		
		(0.206)		(0.222)		(0.151)		(0.162)		(0.233)		
Constant	0.780	0.278	2.161	2.692	0.181	0.998	-0.977	-0.612	4.942	3.343	1.192	1.766
	(4.506)	(4.624)	(4.721)	(4.764)	(5.241)	(5.289)	(5.367)	(5.402)	(9.495)	(9.702)	(9.880)	(10.006)
Observations	2,421	2,421	2,418	2,418	2,087	2,087	2,083	2,083	614	614	609	609
Pseudo R^2	0.0628	0.0894	0.106	0.120	0.0491	0.0583	0.0832	0.0888	0.0413	0.0446	0.0759	0.0868

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 48 Joint IV-Heckman Estimates of Return to Schooling (Primary-Male Sample)

Male (Age 30-40)			**Joint IV-Heckman Primary**					
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	-0.047		0.012		0.017		0.026	
	(0.053)		(0.055)		(0.068)		(0.062)	
Married	0.206*	0.591**	0.191*	0.531**	0.140	0.633***	0.162	0.496**
	(0.106)	(0.264)	(0.102)	(0.257)	(0.108)	(0.242)	(0.102)	(0.248)
Age	-0.826**	-3.338*	-0.801**	-2.283	-0.782**	-3.485**	-0.795**	-1.757
	(0.333)	(1.721)	(0.316)	(1.435)	(0.328)	(1.376)	(0.317)	(1.315)
Age^2	0.012**	0.043*	0.012***	0.028	0.012**	0.046**	0.012***	0.021
	(0.005)	(0.025)	(0.004)	(0.021)	(0.005)	(0.020)	(0.004)	(0.019)
Central			0.124	0.032			-0.007	0.122
			(0.230)	(0.899)			(0.309)	(0.716)
Coast			0.459**	-0.580			0.494**	-1.059
			(0.213)	(0.596)			(0.217)	(0.681)
Eastern			-0.280	-2.165			0.052	-5.836**
			(0.245)	(1.806)			(0.377)	(2.546)
Northeastern			0.663*	-5.523**			0.624	4.928
			(0.359)	(2.404)			(0.976)	(3.033)
Nyanza			-0.236	-0.305			0.150	-2.495
			(0.224)	(0.870)			(0.400)	(1.967)
Rift valley			0.052	-1.832			0.158	-1.731
			(0.232)	(1.575)			(0.228)	(1.201)
Western			-0.581**	-1.795			-0.421	-2.720*
			(0.260)	(1.574)			(0.266)	(1.428)
LnHHExp		0.244		0.530		0.091		0.708*
		(0.728)		(0.454)		(0.514)		(0.385)
Headship		0.956***		0.941***		0.637**		0.955***
		(0.284)		(0.285)		(0.282)		(0.311)
HHChildren6-		-0.271		-0.274		-0.011		-0.213
		(0.253)		(0.186)		(0.147)		(0.149)
HHAdults65+		-0.025		-0.478		0.161		-0.397
		(0.721)		(0.633)		(0.518)		(0.500)
Owned House		-0.106		0.133		-0.258		0.211
		(0.386)		(0.368)		(0.304)		(0.316)
FPE policy		1.650***		1.415***		1.202***		1.032***
		(0.264)		(0.225)		(0.228)		(0.243)
Embu					-0.442	0.840	-0.353	3.767***
					(0.275)	(0.804)	(0.368)	(1.145)
Kalenjin					-0.216	0.781	-0.201	-0.750
					(0.170)	(0.888)	(0.173)	(0.817)
Kamba					-0.230	0.085	-0.122	5.042**
					(0.142)	(0.723)	(0.314)	(2.095)
Kikuyu					0.064	1.073***	0.207	-0.547
					(0.144)	(0.316)	(0.272)	(0.902)
Kisii					-0.526*	0.690	-0.527	-0.525
					(0.289)	(1.269)	(0.415)	(1.005)
Luhya					-0.654**	1.231	-0.140	1.120
					(0.292)	(0.756)	(0.303)	(0.681)
Luo					-0.357**	0.519	-0.351	2.819
					(0.141)	(1.054)	(0.358)	(1.879)
Maasai					0.383	-3.816***	0.411	-5.144***

					(0.352)	(0.835)	(0.355)	(0.791)
Meru					-0.753***	0.179	-0.654**	2.108***
					(0.197)	(1.262)	(0.298)	(0.700)
Mijikenda					0.504**	-0.281	0.176	0.756
					(0.256)	(1.285)	(0.256)	(0.787)
Somali					0.717**	-3.050**	0.252	-12.036**
					(0.307)	(1.280)	(1.054)	(4.860)
English					0.361	-1.719	0.364	-2.127**
					(0.361)	(1.743)	(0.355)	(0.986)
Lambda	-0.416*	0.848	-0.250	3.861	-0.437*	-0.764	-0.392	5.195
	(0.231)	(4.919)	(0.250)	(3.913)	(0.234)	(3.568)	(0.254)	(3.411)
Constant	17.395***	64.351	16.348***	41.683	16.332***	68.784**	16.211***	29.897
	(5.994)	(39.740)	(5.678)	(30.371)	(6.004)	(30.673)	(5.746)	(27.393)
Observations	707	707	707	707	707	707	707	707
R-squared	-0.008	0.205	0.123	0.273	0.108	0.354	0.156	0.373
First stage F-stats	11.15	.	9.567	.	7.180	.	8.231	.
Shea R^2	0.0877	.	0.0769	.	0.0592	.	0.0680	.
F	2.667	17.89	7.846	15.21	4.524	17.03	4.934	13.88

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 49 Joint IV-Heckman Estimates of Return to Schooling (Secondary-Male Sub-Sample)

Male (Age 30-40)			**Joint IV-Heckman Secondary**					
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.465***		0.326**		0.427***		0.355**	
	(0.146)		(0.136)		(0.164)		(0.153)	
Married	0.047	0.750**	0.118	0.510*	0.051	0.527**	0.115	0.385
	(0.093)	(0.318)	(0.085)	(0.270)	(0.093)	(0.266)	(0.088)	(0.254)
Age	0.247	-0.724	0.023	-1.122*	0.205	-0.941	0.099	-1.126*
	(0.300)	(0.694)	(0.268)	(0.598)	(0.293)	(0.613)	(0.271)	(0.585)
Age^2	-0.003	0.010	0.000	0.015*	-0.002	0.013	-0.001	0.015*
	(0.004)	(0.010)	(0.004)	(0.009)	(0.004)	(0.009)	(0.004)	(0.008)
Central			-0.358***	-0.718			-0.294*	0.144
			(0.118)	(0.456)			(0.168)	(0.327)
Coast			-0.020	-0.537**			0.072	-0.089
			(0.146)	(0.242)			(0.124)	(0.265)
Eastern			-0.329**	-1.298*			-0.049	-0.038
			(0.141)	(0.729)			(0.216)	(0.693)
Northeastern			0.190	-0.375			-0.091	-0.618
			(0.211)	(0.490)			(0.493)	(0.938)
Nyanza			-0.564***	-0.813			-0.739***	0.157
			(0.123)	(0.560)			(0.175)	(0.465)
Rift valley			-0.233*	-1.095*			-0.070	-0.329
			(0.123)	(0.602)			(0.115)	(0.327)
Western			-0.603***	-1.382			-0.413**	-0.417
			(0.158)	(0.860)			(0.164)	(0.782)
LnHHExp		0.451*		0.127		0.201		0.066
		(0.266)		(0.142)		(0.178)		(0.119)
Headship		1.663*		0.993		1.036		0.622
		(0.858)		(0.673)		(0.694)		(0.613)
HHChildren6-		-0.468**		-0.310**		-0.288*		-0.200
		(0.195)		(0.151)		(0.154)		(0.133)
HHAdults65+		0.032		0.171		0.154		0.243
		(0.250)		(0.232)		(0.249)		(0.242)
Owned House		-0.189*		-0.104		-0.153		-0.163
		(0.110)		(0.145)		(0.112)		(0.136)
FPE policy		-0.408		-0.147		-0.145		-0.045
		(0.315)		(0.240)		(0.225)		(0.212)
Embu					-0.367*	-0.637	-0.416	-0.518
					(0.209)	(0.599)	(0.267)	(0.501)
Kalenjin					-0.228*	-0.731	-0.242*	-0.245
					(0.127)	(0.621)	(0.130)	(0.532)
Kamba					-0.073	-0.171	-0.141	-0.433
					(0.138)	(0.258)	(0.246)	(0.584)
Kikuyu					-0.159*	-0.138	0.033	-0.357
					(0.091)	(0.226)	(0.162)	(0.492)
Kisii					-0.559***	-0.931	0.086	-0.772
					(0.189)	(0.902)	(0.228)	(0.774)
Luhya					-0.572**	-0.859**	-0.306	-0.617
					(0.242)	(0.390)	(0.260)	(0.601)
Luo					-0.235**	0.009	0.387**	-0.415
					(0.107)	(0.211)	(0.191)	(0.377)

Maasai					-0.126	-0.346	-0.166	0.237
					(0.436)	(1.065)	(0.415)	(1.009)
Meru					-0.161	-1.348	-0.222	-0.909
					(0.196)	(1.024)	(0.257)	(0.681)
Mijikenda					0.511	-0.214	0.260	-0.785
					(0.327)	(0.837)	(0.296)	(0.521)
Somali					0.411*	0.587	0.423	0.880
					(0.216)	(0.385)	(0.503)	(0.932)
English					0.090	2.097***	0.346	1.664***
					(0.280)	(0.488)	(0.246)	(0.433)
Lambda	-0.266	4.616	-0.267	2.153	-0.273	2.408	-0.269	1.072
	(0.184)	(2.807)	(0.178)	(2.074)	(0.172)	(2.119)	(0.176)	(1.829)
Constant	-6.266	14.224	-0.661	27.579**	-5.045	22.750*	-2.392	28.772**
	(6.359)	(16.112)	(5.758)	(12.135)	(6.405)	(13.053)	(5.933)	(11.653)
Observations	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255
R-squared	-0.058	0.035	0.168	0.044	0.042	0.089	0.164	0.093
First stage F-stats	2.566	.	2.337	.	1.926	.	1.942	.
Shea R^2	0.0122	.	0.0112	.	0.00929	.	0.00942	.
F	10.13	4.533	12.15	3.323	10.43	5.504	9.783	4.326

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 50 Joint IV-Heckman Estimates of Return to Schooling (Tertiary-Male Sub-Sample)

Male (Age 30-40)	Joint IV-Heckman Tertiary							
	(1)		(2)		(3)		(4)	
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.243		0.224*		-0.106		0.090	
	(0.157)		(0.129)		(0.196)		(0.159)	
Married	-0.100	-0.963	-0.035	-0.714	-0.174	-0.417	-0.067	-0.731
	(0.208)	(0.999)	(0.184)	(0.640)	(0.219)	(0.640)	(0.183)	(0.600)
Age	-0.423	2.219**	-0.606	2.072**	0.618	2.201**	-0.208	2.238***
	(0.704)	(0.884)	(0.574)	(0.890)	(0.797)	(0.857)	(0.653)	(0.862)
Age^2	0.007	-0.028**	0.010	-0.026**	-0.007	-0.028**	0.004	-0.028**
	(0.010)	(0.013)	(0.008)	(0.013)	(0.011)	(0.012)	(0.009)	(0.012)
Central			-0.997***	-0.620			-0.835***	0.226
			(0.154)	(0.551)			(0.200)	(0.432)
Coast			-1.033***	-0.984***			-0.758***	-0.184
			(0.198)	(0.325)			(0.178)	(0.464)
Eastern			-1.135***	-1.086			-0.980***	-0.238
			(0.199)	(1.034)			(0.251)	(0.682)
Northeastern			-1.055***	-0.962			-0.931*	0.356
			(0.317)	(0.714)			(0.539)	(1.131)
Nyanza			-1.276***	-0.667			-1.110***	-0.226
			(0.151)	(0.635)			(0.178)	(0.380)
Rift valley			-0.851***	-0.612			-0.670***	0.346
			(0.147)	(0.980)			(0.164)	(0.320)
Western			-1.215***	-1.216			-1.091***	-0.431
			(0.190)	(1.028)			(0.175)	(0.477)
LnHHExp		-0.091		-0.149**		-0.069		-0.095
		(0.062)		(0.072)		(0.049)		(0.058)
Headship		-0.479		0.425		0.681		-0.031
		(3.033)		(1.889)		(1.355)		(1.257)
HHChildren6-		0.008		-0.114		-0.047		0.059
		(0.500)		(0.298)		(0.190)		(0.178)
HHAdults65+		0.064		-0.140		-0.251		-0.193
		(0.396)		(0.332)		(0.343)		(0.332)
Owned House		-0.010		0.065		-0.004		0.036
		(0.233)		(0.172)		(0.165)		(0.172)
FPE policy		0.604		0.674**		0.610**		0.502*
		(0.431)		(0.325)		(0.263)		(0.260)
Embu					-0.743	-1.178	-0.299	-0.717
					(0.564)	(1.000)	(0.505)	(0.990)
Kalenjin					-0.062	-1.287	0.108	-0.969
					(0.334)	(1.338)	(0.313)	(1.201)
Kamba					-0.464	-0.471	-0.091	-0.000
					(0.312)	(0.671)	(0.335)	(0.665)
Kikuyu					-0.116	-0.166	0.040	-0.333
					(0.166)	(0.306)	(0.216)	(0.527)
Kisii					-0.623*	-0.386	-0.199	0.581
					(0.337)	(1.405)	(0.331)	(1.304)
Luhya					-0.867	-1.795	-0.197	-0.728
					(0.673)	(1.591)	(0.564)	(1.392)
Luo					-0.381**	0.114	0.006	0.055
					(0.188)	(0.558)	(0.222)	(0.640)

Maasai					0.587	0.502	0.509	0.413
					(0.549)	(0.933)	(0.460)	(0.933)
Meru					-0.024	-0.256	0.273	0.143
					(0.302)	(0.579)	(0.338)	(0.690)
Somali					0.022	-0.203	0.191	-0.589
					(0.362)	(0.607)	(0.562)	(1.165)
English					1.132***	1.629**	0.629**	1.286**
					(0.299)	(0.677)	(0.259)	(0.649)
Lambda	-0.424	-1.137	-0.383	0.545	-0.103	1.510	-0.252	-0.103
	(0.263)	(6.130)	(0.249)	(3.706)	(0.311)	(2.901)	(0.265)	(2.663)
Constant	7.661	-26.865*	11.789	-24.883*	-6.990	-28.980*	5.987	-28.093*
	(10.932)	(15.910)	(8.916)	(15.066)	(12.185)	(15.039)	(10.041)	(14.853)
Observations	493	493	493	493	491	491	491	491
R-squared	0.264	0.277	0.414	0.299	0.203	0.354	0.436	0.363
First stage F-stats	2.048	.	2.480	.	1.555	.	1.673	.
Shea R^2	0.0249	.	0.0304	.	0.0195	.	0.0213	.
F	17.55	18.43	21.79	11.93	11.40	12.21	13.95	9.386

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 51 Joint IV-Heckman Estimates of Return to Schooling (Primary-Female Sub-Sample)

Female (Age 30-40)	**Joint IV-Heckman Primary**							
	(1)		(2)		(3)		(4)	
VARIABLES	**LnW**	**Eduyear**	**LnW**	**Eduyear**	**LnW**	**Eduyear**	**LnW**	**Eduyear**
Eduyear	-0.057		0.005		-0.055		-0.018	
	(0.058)		(0.062)		(0.075)		(0.073)	
Married	0.149	0.626	0.182	1.951	0.205	-0.861	0.162	-0.631
	(0.212)	(3.968)	(0.228)	(2.528)	(0.216)	(2.467)	(0.223)	(1.907)
Age	-0.849*	-4.734***	-0.344	-4.173***	-0.728*	-4.133***	-0.488	-3.818***
	(0.452)	(1.661)	(0.442)	(1.188)	(0.427)	(1.541)	(0.419)	(1.374)
Age^2	0.012*	0.063***	0.005	0.056***	0.010*	0.055**	0.007	0.050***
	(0.006)	(0.023)	(0.006)	(0.017)	(0.006)	(0.021)	(0.006)	(0.019)
Central			-0.174	2.174			-0.367	-0.449
			(0.324)	(1.825)			(0.424)	(1.781)
Coast			0.091	-0.025			0.195	-2.166
			(0.300)	(2.144)			(0.303)	(1.683)
Eastern			-0.649*	3.003			0.142	-2.232
			(0.383)	(3.511)			(0.554)	(4.474)
Northeastern			0.560	1.178				
			(0.581)	(6.277)				
Nyanza			-0.822***	1.007			-0.368	-1.701
			(0.269)	(1.429)			(0.580)	(3.257)
Rift valley			-0.349	2.402			-0.210	-1.239
			(0.345)	(3.549)			(0.318)	(2.322)
Western			-1.037**	2.788			-1.038**	-1.514
			(0.420)	(3.927)			(0.409)	(2.802)
LnHHExp		-0.072		-0.425		0.422		0.298
		(1.286)		(0.645)		(0.720)		(0.485)
Headship		-0.344		-0.692		-0.171		-0.128
		(0.865)		(0.683)		(0.365)		(0.451)
HHChildren6-		-0.206		-0.126		-0.087		-0.080
		(0.185)		(0.129)		(0.149)		(0.139)
HHAdults65+		-0.005		0.211		-0.502		-0.402
		(1.146)		(0.651)		(0.760)		(0.617)
OwnedHouse		0.063		0.002		-0.370		-0.348
		(0.494)		(0.393)		(0.498)		(0.375)
FPE policy		2.359		1.555		2.433**		2.312***
		(2.098)		(1.051)		(1.028)		(0.818)
Embu					-0.586	0.359	-0.949	1.154
					(0.527)	(2.190)	(0.579)	(1.444)
Kalenjin					-0.416	0.179	-0.376	-0.014
					(0.303)	(1.795)	(0.316)	(1.501)
Kamba					-0.268	1.798	-0.556	2.387
					(0.222)	(1.862)	(0.472)	(3.754)
Kikuyu					0.267	1.568	0.449	0.558
					(0.200)	(1.198)	(0.333)	(0.867)
Kisii					-1.182**	0.073	-1.029	0.371
					(0.479)	(2.262)	(0.636)	(1.702)
Luhya					-0.188	-0.525	0.676	-0.533
					(0.396)	(0.951)	(0.435)	(1.007)
Luo					-0.596***	1.233	-0.312	1.277
					(0.224)	(2.823)	(0.559)	(3.384)

Maasai					-0.018	-1.477	0.162	-1.892
					(0.371)	(1.570)	(0.393)	(1.379)
Meru					-0.948***	-0.537	-1.242***	0.181
					(0.275)	(0.792)	(0.452)	(2.022)
Mijikenda					0.198	-2.705	0.062	-2.232
					(0.508)	(2.386)	(0.441)	(1.463)
Somali					0.745*	-4.440	0.649	-5.890
					(0.445)	(2.831)	(0.566)	(4.601)
English					0.578*	-0.772	0.534	-1.060
					(0.316)	(0.973)	(0.350)	(1.325)
Lambda	-0.760**	-2.013	-0.548	-5.825	-0.765*	1.738	-0.575	1.451
	(0.385)	(10.196)	(0.466)	(6.807)	(0.408)	(6.088)	(0.457)	(5.130)
Constant	18.353**	94.917***	9.131	90.963***	16.500**	75.005***	11.831	72.478***
	(8.040)	(19.646)	(7.868)	(18.982)	(7.546)	(19.579)	(7.361)	(19.887)
Observations	424	424	424	424	424	424	424	424
R-squared	0.027	0.252	0.132	0.336	0.142	0.374	0.206	0.390
First stage F-stats	9.842	.	8.455	.	6.084	.	6.007	.
Shea R^2	0.125	.	0.111	.	0.0834	.	0.0836	.
F	1.827	13.93	5.274	12.10	4.122	10.89	4.506	9.027

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 52 Joint IV-Heckman Estimates of Return to Schooling (Secondary-Female Sub-Sample)

Female (Age 30-40)					**Joint IV-Heckman Secondary**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.345		0.098		0.203		0.063	
	(0.239)		(0.217)		(0.256)		(0.275)	
Married	0.260	1.346	0.507**	0.633	0.356	2.104**	0.500*	1.387*
	(0.258)	(1.468)	(0.247)	(1.126)	(0.267)	(0.881)	(0.280)	(0.794)
Age	0.284	-0.331	0.137	-0.415	0.289	-0.259	0.207	-0.217
	(0.429)	(0.804)	(0.417)	(0.799)	(0.425)	(0.729)	(0.450)	(0.734)
Age^2	-0.003	0.004	-0.001	0.005	-0.004	0.003	-0.003	0.002
	(0.006)	(0.011)	(0.006)	(0.011)	(0.006)	(0.010)	(0.006)	(0.010)
Central			-0.395**	-0.062			-0.376	0.189
			(0.197)	(0.969)			(0.307)	(0.652)
Coast			-0.619***	-0.252			-0.457**	-0.265
			(0.214)	(0.330)			(0.219)	(0.397)
Eastern			-0.684***	-0.115			-0.013	0.045
			(0.201)	(1.082)			(0.264)	(0.507)
Northeastern			0.195	1.409				
			(0.640)	(1.190)				
Nyanza			-0.881***	-0.262			-0.727**	0.831
			(0.208)	(0.714)			(0.331)	(0.548)
Rift valley			-0.531***	0.191			-0.355*	0.550
			(0.204)	(1.200)			(0.207)	(0.409)
Western			-0.721**	0.416			-0.641**	1.147
			(0.289)	(1.658)			(0.299)	(0.728)
LnHHExp		-0.166		0.109		-0.345		-0.123
		(0.527)		(0.351)		(0.247)		(0.197)
Headship		-0.407		-0.171		-0.485		-0.371
		(0.559)		(0.626)		(0.352)		(0.367)
HHChildren6-		-0.068		-0.235		0.196		0.013
		(0.321)		(0.266)		(0.244)		(0.220)
HHAdults65+		0.292		-0.015		0.540		0.307
		(0.644)		(0.477)		(0.386)		(0.363)
Owned House		0.225		-0.060		0.580		0.236
		(0.630)		(0.458)		(0.383)		(0.329)
FPE policy		-0.282		-0.144		-0.527*		-0.397
		(0.358)		(0.333)		(0.279)		(0.265)
Embu					0.144	3.634**	-0.053	2.828
					(0.578)	(1.750)	(0.676)	(2.091)
Kalenjin					-0.044	2.076**	0.038	1.248
					(0.289)	(1.004)	(0.311)	(0.824)
Kamba					-0.476**	-1.065***	-0.895***	-0.468
					(0.232)	(0.381)	(0.309)	(0.469)
Kikuyu					0.125	0.416	0.114	0.272
					(0.144)	(0.495)	(0.301)	(1.078)
Kisii					-0.334	3.238**	0.217	1.927
					(0.515)	(1.390)	(0.547)	(1.246)
Luhya					-0.552	2.328	-0.427	0.159
					(0.576)	(2.264)	(0.615)	(1.707)
Luo					-0.354	-1.580***	-0.125	-1.678**
					(0.317)	(0.455)	(0.486)	(0.662)

Maasai					-1.405	-5.398**	-1.758*	-4.043*
					(0.894)	(2.144)	(0.966)	(2.076)
Meru					-0.368	2.098	-0.724*	1.385
					(0.321)	(1.566)	(0.423)	(1.945)
Mijikenda					0.321	-1.439	0.350	-0.375
					(0.596)	(1.038)	(0.600)	(0.910)
Somali					0.598	-1.052	0.398	0.399
					(0.616)	(1.664)	(0.667)	(1.446)
English					0.468**	-0.897	0.462**	-0.222
					(0.209)	(0.964)	(0.222)	(0.837)
Lambda	-0.413	-3.296	-0.612	-0.642	-0.376	-6.067*	-0.485	-3.646
	(0.482)	(5.315)	(0.472)	(4.446)	(0.487)	(3.389)	(0.550)	(3.113)
Constant	-5.828	21.749	0.157	18.485	-4.310	23.897*	-0.932	18.964
	(9.418)	(13.489)	(8.883)	(12.984)	(9.497)	(13.551)	(10.172)	(13.201)
Observations	673	673	673	673	673	673	673	673
R-squared	0.160	0.070	0.162	0.082	0.218	0.148	0.187	0.153
First stage F-stats	1.224	.	1.484	.	1.058	.	0.955	.
Shea R^2	0.0110	.	0.0134	.	0.00967	.	0.00882	.
F	4.942	4.954	5.265	3.430	5.849	5.139	4.865	4.144

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.

Table A 53 Joint IV-Heckman Estimates of Return to Schooling (Tertiary-Female Sub-Sample)

Female(Age 30-40)	**Joint IV-Heckman Tertiary**							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear	LnW	Eduyear
Eduyear	0.390**		0.109		0.053		0.163	
	(0.167)		(0.177)		(0.209)		(0.164)	
Married	0.018	0.612	0.220	0.570	0.134	0.605	0.162	0.603
	(0.152)	(0.595)	(0.159)	(0.587)	(0.161)	(0.472)	(0.156)	(0.498)
Age	-0.013	1.935	0.243	0.233	0.169	0.263	0.293	-0.357
	(0.595)	(2.816)	(0.561)	(1.941)	(0.608)	(1.323)	(0.525)	(1.341)
Age^2	0.001	-0.023	-0.002	0.001	-0.000	0.000	-0.003	0.009
	(0.009)	(0.041)	(0.008)	(0.028)	(0.009)	(0.019)	(0.008)	(0.019)
Central			-0.990***	-1.921**			-0.876**	-2.116
			(0.355)	(0.832)			(0.393)	(1.922)
Coast			-1.322***	-2.397**			-0.853***	-1.270
			(0.430)	(0.977)			(0.283)	(1.148)
Eastern			-1.375***	-1.804**			-0.780**	-1.689
			(0.391)	(0.785)			(0.375)	(1.371)
Northeastern			-0.460	-2.551				
			(0.628)	(3.546)				
Nyanza			-1.552***	-2.112***			-1.377***	-1.582**
			(0.393)	(0.702)			(0.366)	(0.699)
Rift valley			-1.175***	-1.586***			-0.822***	-0.896
			(0.326)	(0.392)			(0.228)	(1.114)
Western			-1.344***	-2.052***			-0.971***	-1.601
			(0.369)	(0.746)			(0.281)	(1.023)
LnHHExp		0.022		-0.148		-0.009		-0.164
		(0.114)		(0.100)		(0.173)		(0.105)
Headship		-1.227		-0.413		-0.664		-0.283
		(1.109)		(0.893)		(0.548)		(0.342)
HHChildren6-		0.544		-0.011		0.242		-0.005
		(1.379)		(1.172)		(0.631)		(0.460)
HHAdults65+		1.848		0.397		1.128		0.239
		(2.377)		(1.970)		(1.330)		(0.988)
Owned House		0.737		0.501		0.596		0.494
		(1.286)		(1.183)		(0.691)		(0.598)
FPE policy		-2.485		-0.387		-1.202		-0.132
		(3.672)		(3.028)		(1.604)		(1.129)
Embu					-0.577	1.979	-0.478	0.573
					(0.592)	(3.711)	(0.589)	(3.100)
Kalenjin					-0.043	1.287	0.023	0.192
					(0.316)	(1.647)	(0.297)	(1.324)
Kamba					-0.448	-0.618	-0.493	0.506
					(0.291)	(1.237)	(0.372)	(0.821)
Kikuyu					0.270	0.781	0.355	1.399
					(0.209)	(0.724)	(0.357)	(1.443)
Kisii					-0.521	0.114	0.124	0.385
					(0.337)	(0.762)	(0.402)	(0.807)
Luhya					-1.434	4.647	-1.382	3.275
					(1.043)	(3.896)	(0.947)	(2.982)
Luo					-0.118	0.092	0.451	0.459
					(0.274)	(0.574)	(0.384)	(1.035)

Meru					0.466	3.695	0.409	2.596
					(0.644)	(3.660)	(0.667)	(3.025)
Somali					0.816	-0.982	0.022	-1.382
					(0.531)	(1.868)	(0.516)	(2.265)
English					1.047**	1.350	0.512	1.600
					(0.447)	(0.992)	(0.352)	(1.083)
Lambda	-0.138	-7.906	-0.143	-1.660	-0.000	-4.145	-0.118	-1.031
	(0.389)	(12.549)	(0.354)	(10.306)	(0.405)	(6.052)	(0.355)	(4.246)
Constant	-1.703	-18.847	-2.488	8.841	-2.146	6.801	-4.110	17.808
	(10.549)	(40.279)	(9.822)	(28.102)	(10.849)	(22.351)	(9.317)	(22.332)
Observations	238	238	238	238	238	238	238	238
R-squared	0.424	0.258	0.505	0.367	0.452	0.431	0.571	0.477
First stage F-stats	1.603	.	1.398	.	1.222	.	1.643	.
Shea R^2	0.0406	.	0.0367	.	0.0327	.	0.0446	.
F	16.90	7.877	16.32	7.498	11.18	8.203	12.23	7.393

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors in parentheses; LnW: Log Hourly Wage; WageW: Wage worker; Eduyear: Year of Schooling; Provincial dummies are current place of residence. Ethnicity dummies (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, Somali, English) are constructed based on "language of use" in the survey. Reference is "Swahili". Regional dummies (Central, Coast, Eastern, Northeastern, Nyanza, Rift valley, Western) of reference is "Nairobi"; LnHHExp: Log Household Expenditure; Headship: Household head; HHChildren6-: Having children under 6 years old in households; HHAdults65+: Having adults over 65 years old in household; Owned House: Ownership of household; Lambda: Selectivity term; Provincial dummies are current place of residence.