Informal User Fees and School Choice under Free Primary Education Policy in Rural Uganda

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Informal User Fees and School Choice under Free Primary Education Policy in Rural Uganda

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ABSTRACT

The international community has made significant efforts to ensure universal primary education (UPE) since the World Conference on Education for All (EFA) was held in Jomtien, Thailand, in 1990. Under the encouragement of the EFA movement, a school fee abolition policy was introduced as a crucial step to achieve UPE in many developing countries. In sub-Saharan Africa (SSA), Uganda became one of the pioneers in introducing a school fee abolition policy. Since the UPE policy started in 1997, the government commitment to the education sector has dramatically increased, and a greater explicit priority has been given to primary education sub-sector development. Consequently, Uganda has made notable achievements in expanding access to primary education. However, UPE has not been achieved due to several economic and non-economic factors, and there has been no progress in reducing the proportion of out-of-school children in recent years. Furthermore, due to insufficient public financing, the role of private financing in the provision of primary education has been increasing in an informal way, particularly in rural areas.

Although abolishing fees in public schools is central to the aims of UPE policy (aiming at the removal of the financial hurdle in accessing education for the poor), some public schools have charged various fees from parents/guardians, even at the initial stage of UPE policy implementation. In addition, charging fees from households has recently become increasingly common, even in rural public schools, although it is strictly prohibited by law. Moreover, the failures of public providers under UPE policy have triggered the mushrooming of private schools in Uganda. This has been observed in many developing countries, particularly South Asia and SSA. In addition to the expensive private schools for elites in urban areas, there has been an increasing role played by private schools in rural area, which may cater for the needs of children from poor households.

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In the situation where the replacement of abolished fees from public financing is not sufficient, there may be a growing need for the government to undertake appropriate measures for making use of the increasing role of private financing, especially from households, in order to make educational financing sustainable. However, little is known about how the recently increasing role of private financing affect access for primary schooling in rural areas, although this might provide critical evidence required to adjust current UPE policy to fit this new situation. Regarding the debate on the role of fee charges in public primary schools, some empirical evidence shows that there is a strong willingness to pay for educational improvement even in poor households in developing countries. On the other hand, there are also studies that find that schooling cost still remains an obstacle for primary school attendance. Concerning the issue of emerging private primary education, some studies highlight how increasing the share private sector provision contributes to reducing the number of out-of-school children. However, there are also many studies that find that only wealthier households are able to make a school choice. The issues here must be resolved by examining empirical evidence.

Against this background, this study aims to explore the following two major research questions: (1) What is the difference in the effects of demand and supply factors that determine primary school attendance and choice between children from poor and non-poor households in rural Uganda? (2) What is the difference in the effect of high informal user fee charges in public schools on primary school attendance and choice between children from poor and non-poor households in rural Uganda? This study aims to investigate the determinants of primary school attendance and choice in rural Uganda with special focus on assessing the effect of high informal user fee charges in public schools, shedding light on the difference in effects between children from poor and non-poor households.

This study is significant because it makes an academic contribution in the following respects. First, the study explicitly assesses the effect of informal fee collection in public primary schools under the fee abolition policy. There are several studies that identify the

existence of this type of non-negligible payment in Uganda and other developing countries where a free primary education policy has been implemented. However, few studies have empirically examined its determinants and effects on access to primary education. Second, the study sheds light on the school choice between public schools and private schools. A growing number of studies have accounted for the emergence of private school choice at primary education level in developing counties. However, with a few exceptions, few studies have been conducted to analyze the case in the rural area of SSA. Updating a series of Ugandan empirical studies about the determinants of access to primary education using a fresh large scale household survey dataset and using a panel dataset in assessing the effect of fees on access to basic education in SSA are the other significant contributions of this study.

The analytical framework of this study is set by borrowing the key components of the economic model, which has been widely used to specify households' behavior on their children's schooling and school choice, taking into account school quality and school cost. It is regarded that households are rational in making decisions about whether they send their children to schools and, if they do, to what type of school they send their children, comparing the cost and the future return from the investment for schooling. Under this framework, if human capital formulated through education is a normal good, households are more likely to choose the alternative with high price and high quality as income rises.

The study bases its analysis related to the first research question on the following hypotheses: (1-1) the probability of attending private school increases among children from non-poor households; (1-2) the positive effect of household wealth on the probability of attending private school instead of attending public school increases among children from non-poor households; (1-3) the low quality of public school in the community has a positive effect on the probability of attending private school instead of attending public school among children from non-poor households; (1-4) the presence of community contributions for public schooling has a positive effect on the probability of attending public school among children from poor households. The other hypotheses related to the second research question are as

follows: (2-1) public schools in the community with high average wealth and no community contribution are more likely to charge informal user fees and charge higher informal user fees; (2-2) children from poor households are more likely to be out of school if a public school in their community charges high informal fees; (2-3) the probability of attending public schools by children from non-poor households is not affected by the presence of high informal fees charged in a public school in their community.

This study applies a linear probability model (LPM) and a logit model to analyze the determinants of primary school attendance. Furthermore, determinants of primary school choice between public and private schools are investigated by applying a multinomial logit (MNL) model. To examine the impact of high informal user fee charges in rural public schools, a double-difference (DD) method is utilized, combining the propensity score matching (PSM) technique. The study relies on the nationally representative panel household survey data, collected through the Uganda National Household Survey (UNHS) in 2005/2006 and the third wave of the Uganda National Panel Survey (UNPS) in 2011/2012. The sub-sample of primary school age children in rural area is used for the analyses. The study treats the dataset as a pooled cross section with a panel feature at the community level.

The estimation results about the determinants of school attendance and school choice basically show that the recent emergence of private education in rural Uganda mainly affects decision making made by non-poor households. While the effects of wealth on school attendance have been diminished, wealth has become the predictor of school choice between public and private schools, even in rural areas. However, the study unveils the fact that this shift in the trend of wealth's effects took place only among children from non-poor households. Probably due to the remaining schooling cost, wealth remains one of the predictors of school attendance among children from poor households. In addition, this study finds that there was no significant increase in the likelihood of attending private school among poor children. The estimation results also reveal that low quality of education in a

public school seems to be one of the important factors increasing private school attendance, particularly among children from non-poor households.

The estimation results on the determinants of high informal fee charges in public schools show that high fees are more likely to be charged in the community with relatively rich households, on average. In addition, the study finds that a high informal fee charge is more likely to take place in the community when there is little voluntary contribution on public schooling by residents. The estimation results on the impact of high informal fee charges in public schools on school attendance and school choice show that there is a strong negative impact of high informal fee charges on public school attendance among children from poor households in rural Uganda. Furthermore, the analysis reveals that there is a limited role played by private schools in absorbing children from poor households who left school due to the high fee charges in public schools. On the other hand, the study reveals that the presence of high informal fee charges in public school does not affect public school attendance, as well as overall school attendance, among children from non-poor households in rural Uganda. Moreover, the study reveals that the high informal fee charge may have little effect on school choice of children from non-poor households.

Due to the UPE policy that prohibits the collection of user fees among rural public schools, the necessary voluntary contribution from the community, found to have a positive effect on primary school attendance among children from poor households, is lacking in some rural public schools. High informal fee charges in public schools might expand among this type of community, with no voluntary contribution from households, consisting of relatively rich households, on average. Under the situation, wherein the role of private schools in increasing access to primary education among the poor is limited, children from poor households in such a community might find attending both public and private schools in rural Uganda unviable financially. On the other hand, children from non-poor households utilize their expanding option of attending private schools, and their school attendance may not be affected even by the high informal fee charges in public schools.

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LIST OF ACRONYMS AND ABBREVIATIONS

ABEK	Alternative Basic Education for Karamoja
ADB	Asian Development Bank
AME	average marginal effect
ASER	Annual Status of Education Report
BEUPA	Basic Education for Urban Poverty Areas
BOD	Board of Director
BRMS	Basic Requirements and Minimum Standards
BTVET	Business, Technical, Vocational Education and Training
CAO	Chief Administrative Officer
CC	Coordinating Center
CCT	Coordinating Center Tutor
CHANCE	Child-Centred Alternative, Non-Formal Community-Based Education
COPE	Complementary Opportunities for Primary Education
COU	Church of Uganda
CPI	consumer price index
DD	double-difference
DEO	District Education Officer
DES	Directorate of Education Standards
DFID	Department for International Development
DHI	District Health Inspector
DHS	Demographic and Health Survey
DIS	District Inspector of Schools
EA	enumeration area
EFA	Education for All
EFAG	Education Funding Agencies Group
EFMP	Economic and Financial Management Project
ELSE	Empowering Lifelong Skills Education
EMIS	Education Management Information System
EMO	educational management organization
ESIP	Education Sector Investment Plan
ESSP	Education Sector Strategic Plan
FTI	Fast Track Initiative
FY	fiscal year
GDP	gross domestic product
GPE	Global Partnership for Education
GWPE	Government White Paper on Education
HIPC	Highly Indebted Poor Countries
HIV/AIDS	human immunodeficiency virus infection and acquired immune deficiency syndrome
IBE	International Bureau of Education
IDB	Inter-American Development Bank
IDP	Internally Displaced People
IIA	independence of irrelevant alternatives
IIEP	International Institute for Educational Planning

IMF	International Monetary Fund
ISCED	International Standard Classification of Education
ITT	intention-to-treat
IV	instrumental variable
LC	Local Council
LPM	linear probability model
LRA	Lord's Resistance Army
LSDV	least squares dummy variable
LSMS-ISA	Living Standard Measurement Study - Integrated Survey on Agriculture
MEO	Municipal Education Officer
MGLSD	Ministry of Gender, Labour and Social Development
MNL	multinomial logit
MNFE	Mubende Non-Formal Education
MoES	Ministry of Education and Sports
MoESTS	Ministry of Education, Science, Technology and Sports
MoFPED	Ministry of Finance, Planning and Economic Development
MPCE	monthly per capita expenditure
MTEF	Medium Term Expenditure Framework
NAPE	National Assessment of Progress in Education
NCDC	National Curriculum Development Centre
NDP	National Development Plan
NER	net enrollment ratio
NFTP	Non-Formal Training Programme
NGO	non-governmental organization
NPM	New Public Management
NRM	National Resistance Movement
NTC	National Teachers College
OLS	ordinary least squares
PAF	Poverty Action Fund
PEAP	Poverty Eradication Action Plan
PETS	public expenditure tracking survey
PLE	Primary Leaving Examination
PPP	public-private partnership
PS	Permanent Secretary
PSM	propensity score matching
PSU	primary sampling unit
PTA	Parents and Teachers Association
PTC	primary teachers' college
RCT	randomized control trial
RC	Residence Council
RD	regression discontinuity
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SDA	Seventh-Day Adventist
SDC	Skills Development Centres
SDG	Sustainable Development Goal
SDI	Service Delivery Indicators
SES	socioeconomic status
SFC	school finance committee

SFG	school facilitation grant
SMC	School Management Committee
SSA	sub-Sahara Africa
SWAP	sector-wide approach
UACE	Uganda Advanced Certificate of Education
UBOS	Uganda Bureau of Statistics
UCE	Uganda Certificate of Education
UIHS	Uganda Integrated Household Survey
UK	United Kingdom
UIS	United Nations Educational, Scientific and Cultural Organization, Institute for Statistics
UN	United Nations
UNEB	Uganda National Examinations Board
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	International Centre for Technical and Vocational Education and Training
UNHS	Uganda National Household Survey
UNICEF	United Nations Children's Fund
UPE	Universal Primary Education
UPOLET	Universal Post "O" Level Education and Training
UPPET	Universal Post Primary Education and Training
USA	United States of America
USD	United States dollar
USE	Universal Secondary Education
USh	Uganda Shilling
UVQF	Uganda Vocational Qualifications Framework
WEF	World Education Forum
WTP	willingness to pay

CHAPTER 1 :

INTRODUCTION

1.1   Background

A view of education as an essential part of human capital investment is by now widely recognized among both researchers and practitioners in the field of international development. Many empirical studies have shown that there is a high return on early investment for basic cognitive and non-cognitive skill formation in children (Heckman 2000; Psacharopoulos and Patrinos 2004; Heckman and Masterov 2007). Moreover, education for early-age children is an important investment not only for economic development, namely generating a highly productive labor force, but also for a wide range of human and social developments.

Partly inspired by the work which has shown higher rates of return on education in the primary education sub-sector in low-income countries, the international community has been making considerable efforts to ensure Universal Primary Education (UPE) since the World Conference on Education for All (EFA) was held in Jomtien, Thailand, in 1990. Their commitment to UPE by 2015 was reaffirmed at the World Education Forum (WEF) in Dakar, Senegal, in 2000, and achieving UPE is one of the six goals in the Dakar Framework for Action.[1] Achieving UPE is also incorporated in one of the Millennium Development Goals (MDGs).[2]

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[1] Specifically, the second goal in the Dakar Framework for Action related to UPE is "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" (UNESCO 2000, 8).

[2] Taking a step further than the UPE related goal in Dakar Framework for Action, Target 2.A under Goal 2 in MDGs is set to "ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling" (UN 2015, 24).

Currently, international efforts for education sector development are guided by the Education 2030 Framework for Action, which was adopted in November 2015 to succeed the Dakar Framework for Action as an agreed position on the global education agenda incorporated in the 2030 Agenda for Sustainable Development.[3] In the new so-called Sustainable Development Goals (SDGs), an education SDG and its targets have become much more holistic, and more outcome-oriented, as well as putting more focus on higher levels of education (UNESCO 2015a).[4] Achieving UPE has become just a part of one of the ten targets under the education SDG.[5]

While the new framework for action toward 2030 set ambitious and challenging goal and targets, we have to acknowledge the fact that the most important EFA target, namely UPE, is still far from being reached (UNESCO 2015a; Yoshida 2015). It is true that, under the encouragement of the EFA movement, most of the low-income countries have been substantially increasing government commitments to education sector development by allocating more public resources. As a result, the number of out-of-school children who are at primary school age has been dramatically reduced from 107 million to 58 million between 1999 and 2012 (UNESCO 2014; UNESCO 2015a). However, the progress toward UPE has stalled in recent years, and sub-Sahara Africa (SSA) is the region which has lagged behind the most in achieving UPE (see Figure 1-1). As shown in Figure 1-2, over half of out-of-school children in the world dwell in SSA.

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[3] The new framework is based on the Incheon Declaration which was issued at the WEF in Incheon, South Korea, in May 2015 (UNESCO 2015b).

[4] SDGs themselves are much more comprehensive than MDGs with 169 targets under 17 goals (UN General Assembly 2015). Education related SDG, namely Goal 4, is aiming to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN General Assembly 2015, 14). Although there was a gap between the goals in the Dakar Framework for Action and education-related MDGs, Education 2030 Framework for Action was simply developed to propose more specific ways and strategies in achieving SDG 4 and its targets.

[5] This UPE-related target under education SDG is namely Target 4.1, which was set to, "by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes" (UN General Assembly 2015, 17).

Figure 1-1: Trends of Adjusted Net Enrollment Rate in Primary Education by Regions, 1999-2013
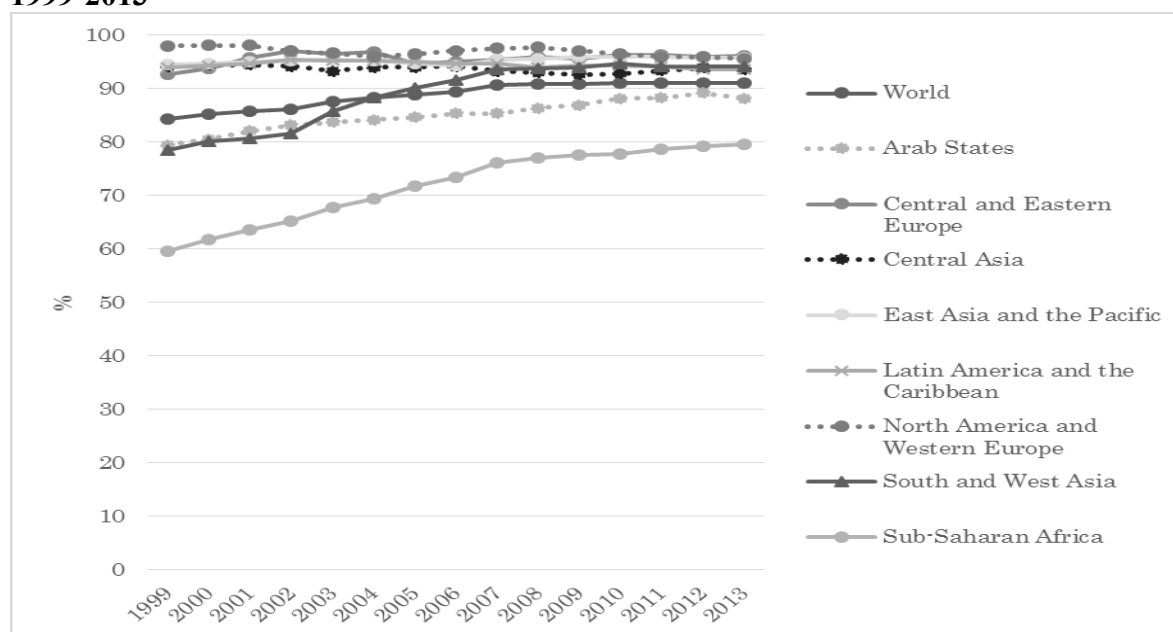
Source: Created by the author based on UIS (2015).
Note: Adjusted net enrollment rate is an "enrolment of the official age group for a given level of education either at that level or the levels above, expressed as a percentage of the population in that age group" (UNESCO 2015a, 408).

Figure 1-2: Trends of Number of Out-of-School Children in Primary Education by Regions, 1999-2013
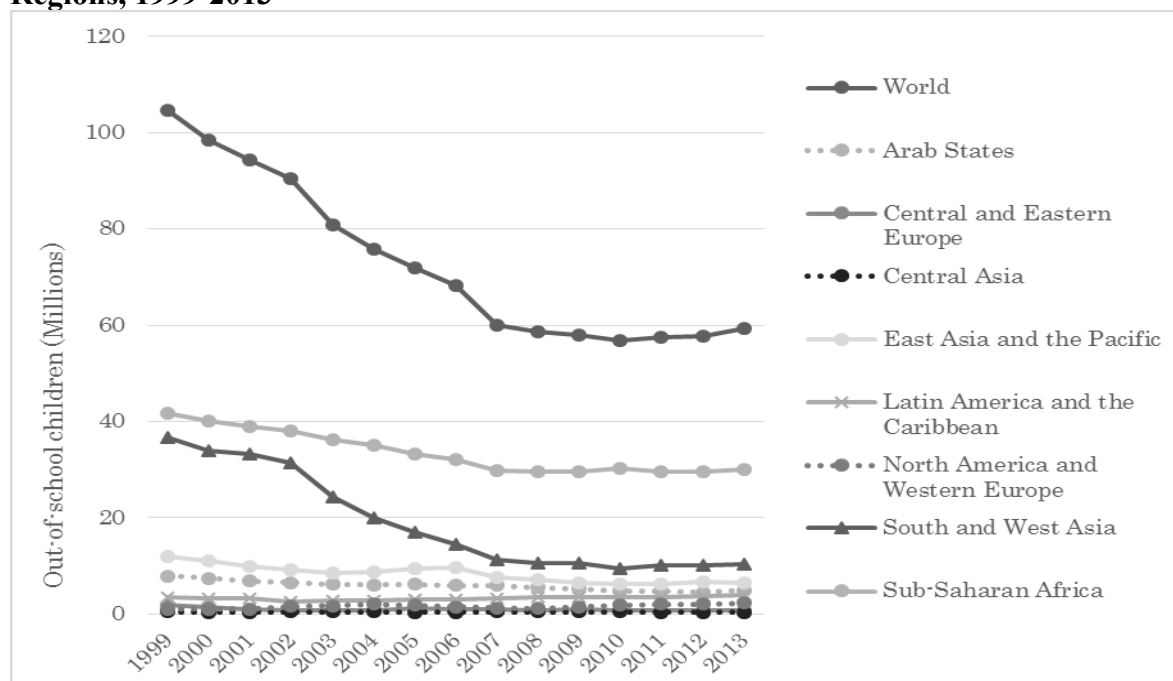
Source: Created by the author based on UIS (2015).
Note: Out-of-school children are "children in the official primary school age range who are not enrolled in either primary or secondary school" (UNESCO 2015a, 409).

School fee abolition policy has been introduced as a crucial step to achieve UPE in many countries around the world. In SSA, many countries introduced fee abolition policy soon after their independence in the 1960s. [6] However, in most of the countries, implementation of the policies was hindered mainly because of their supply-driven approach, weak structure, and quality degradation, as well as serious economic and political crises (Nishimura et al. 2009). Bray (1986) pointed out that the concept of UPE itself, which is not necessarily achieved through fee abolition policies, had a very weak rationale at that time.

In the 1980s, many developing countries charged user fees in providing social services under the structural adjustment policies in place at the time; these were fueled by some empirical studies such as Thobani (1984). A landmark UNICEF study by Cornia, Jolly, and Stewart (1987), which played a significant role in reviewing the structural adjustment policies as a whole, clearly stated that collecting user fees had negative impacts on school participation. The view that user fees work as the most evident barriers for the poorest and the most vulnerable children to access education became dominant by the late 1980s (Fredriksen 2009).

Fee abolition became prominent again in SSA after the Jomtien Conference in 1990. In the mid-1990s, Malawi and Uganda became pioneers in introducing school fees abolition policy under the framework of the EFA movement in SSA. Since then, almost all the SSA countries have introduced or, in most cases, reintroduced a school fee abolition policy. In Uganda, the introduction of UPE policy was pledged in 1996, and its implementation began in 1997. The government commitment to the education sector has dramatically increased and it has been giving more explicit priority to primary education development. Consequently, Uganda has made notable achievements in expanding access to primary education. It is worth noting that the country succeeded in bringing significant

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[6] For instance, Ghana abolished school fee in 1961, and Kenya and Tanzania introduced fee abolition policy in 1974.

benefits to girls from poor households in the rural areas by removing the barriers to their enrollment (Nishimura, Yamano, and Sasaoka 2008).

However, a great many studies also find that there are numerous challenges under UPE. In addition to the seriously low completion rate, the quality of education in public schools was seriously undermined after the introduction of UPE policy (Byamugisha and Ogawa 2010; Byamugisha 2010; Deininger 2003; Nannyonjo 2007; Zuze and Leibbrandt 2011; Nishimura, Yamano, and Sasaoka 2007; Tamusuza 2011). As commonly happened in many cases, the government could not supply sufficient resources to respond to the expansion in quantity because of budget constraints. Typically, a shortage of teachers brought about an extremely high pupil-teacher ratio (PTR), which lowered the pupils' learning achievements.

Despite significant government efforts for over nearly two decades, the quality of primary education in Uganda remains seriously low, especially in rural public schools (Sakaue 2014; Najjumba and Marshall 2013; Byamugisha 2012). In addition to the lack of resources, recent studies highlight the issue of weak accountability in primary education service delivery as a key bottleneck in the implementation of UPE policy (Sasaoka and Nishimura 2010; Wane and Martin 2013; Bruns, Filmer, and Patrinos 2011). Besides, there has been no progress in reducing the proportion of out-of-school children over recent years, and the issue of notably low completion is becoming prominent, especially in rural area (Tamusuza 2011).

Moreover, the role of private financing in the provision of primary education is becoming more and more considerable even under the free primary education policy operating in Uganda. Because of the insufficient public financing of learning activities, there has been a non-negligible private household contribution to public schools under UPE policy even at the early stage of its implementation (Deininger 2003; Nishimura, Yamano, and Sasaoka 2008; Byamugisha and Nishimura 2008). Although the heart of UPE policy is to abolish tuition fees and Parent and Teacher Associations' (PTA) charges aim at removing

the impediments to poor households accessing education, in reality, some public schools charge various fees from households owing to the frequently delayed and inadequate amounts of grants.

This phenomenon, namely, the return to a reliance on post abolition fees, is also found in many developing countries where a fee abolition policy is implemented, and is sometimes called "fee creep" (Nordstrum 2012a; World Bank 2009). This has commonly taken place in urban public schools, and has been identified as one of the factors which creates a large urban-rural gap in pupils' learning achievements (Sakaue 2014). However, charging parents fees has recently become more and more common even in rural public schools although it is strictly prohibited by law (Kayabwe and Nbacwa 2014).

Furthermore, the failures of public providers under UPE policy have triggered the mushrooming of private schools in Uganda, as is observed in many developing countries especially in South Asia and SSA (Kisira 2008; Tooley and Dixon 2005a; Heyneman and Stern 2013; Ashley et al. 2014; Lewin 2007). In addition to expensive private schools for elites in urban areas, there is a growing awareness of the role of private schools, which may cater for children from poor households, in rural areas (Kisira 2008).

It is worth noting that dealing with the issues of the primary education sub-sector is also crucial in promoting high, sustainable, and inclusive growth in Uganda. Although the country has experienced high economic growth and significant poverty reduction over the past two decades, the transformation of its economy from a low to a high productivity area is one of the top priorities for graduating into a middle income country; this is highlighted in the National Development Plan for 2010/2011–2014/2015 (Republic of Uganda 2010).[7,8]

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[7] The annual average growth during the 2000s marked 7.0% (World Bank 2012a). This high pace of growth has been slowed down, and the annual growth was 3.4% between 2011 and 2012 (World Bank 2014a).

[8] According to the ambitious projection in the Uganda Vision 2040, which is the most overarching national development plan in Uganda, "Uganda will graduate into a lower middle income country by 2017, progressing to an upper middle income category by 2032" (Republic of Uganda 2013, 13-14). As one of the newest petro-states in SSA, whether the country can realize this long-term vision highly depends on how they manage the oil revenues (Olanya 2015).

The high proportion of new labor market entrants without primary education completion is regarded as a main bottleneck, impeding the achievement of its national development goals (World Bank 2012a). Hence, in Uganda, an interest in how to reduce the number of out-of-school children, which has remained unchanged for many years, remains and continues to grow.

More than 15 years have passed since the introduction of current UPE policy in Uganda. The same president promised the launch of Universal Secondary Education (USE) policy during his national presidential election campaign in 2006, and Uganda became the first SSA country to implement USE policy in 2007. However, while the interest of the government and donors is more or less shifting to development of the post-primary education sub-sector, it is essential to deal with the substantial shortcomings of the ongoing UPE policy.

1.2   Problem Statement

Beyond its dominant role in paying tax, the role of the private sector in achieving UPE is receiving unprecedented attention in many developing countries all over the world (Peano 2011; Patrinos, Barrera-Osorio, and Guaqueta 2009). At the same time, the role of the state as a duty bearer in ensuring access to good quality basic education for all is explicitly re-emphasized in the Education 2030 Framework for Action (UNESCO 2015b). There is a growing importance for the government not only to undertake appropriate measures to make use of private financing but also to regulate private sector involvement to avoid the issue of inequities in access.

As mentioned in the prior section, it is important to recall that, historically, fee abolition policies became prevalent again because cost-sharing had served as a significant barrier for children from poor households to attend schools under the structural adjustment policies. We should avoid a scenario in which a re-emphasis on user fees exacerbates the

situation. Although it might be essential for the government to make use of private financing, especially from households, to overcome the current sluggish situation in achieving UPE, it is also worth noting that there is considerable scope for improvement on the supply-side of the primary education system, including enhancing the overall efficiency and effectiveness of the limited public resources, and raising more aid from donors.

Nevertheless, in Uganda, in a situation where the replacement of abolished fees is insufficient, the role of private financing in the provision of primary education is increasing in an informal way even in rural areas, as it is in many developing countries. Besides, little is known about how this increasing de facto role of private financing affects access for primary schooling in rural areas, although this can be crucial evidence that shows the necessity to adjust the UPE policy to fit the new situation. In fact, there is a debate in terms of the effect of two types of private financing that this study tackles: (1) fee charges in public schools, and (2) the development of private schools.

With regard to the debate on the effect of fee charges in public schools, some studies find that the financial contribution from the households are playing a key role in ensuring the quality of primary education in rural Uganda (Najjumba et al. 2013). In fact, collecting user fees for primary education is common in many countries all over the world; some empirical evidence shows that there is a strong willingness to pay for educational improvement even in poor households in developing countries (Kattan and Burnett 2004; Gertler and Glewwe 1990).

Traditionally, Ugandan communities, like so many SSA countries, had a strong willingness to take responsibility for the education of their children (Hanson 2010). However, even though the policy states the necessity of the parents' contribution, including financial contributions in areas such as school feeding, overemphasis on the free nature of the UPE policies by some politicians has generally spoiled the attitudes of parents, especially in rural areas, toward making the necessary financial contributions for primary schooling (Byamugisha and Nishimura 2008; MoES 2008a; Najjumba et al. 2013). The

urban-rural difference in the level of household contributions in public schools may be widening the gap in the educational outcomes of these schools (Sakaue 2014). On the other hand, there are also studies which find that schooling costs still remain an obstacle to primary school attendance (Garde 2014; Lincove 2012).

With regard to the effect of the increasing role of private primary schools in developing countries, many recent empirical studies have focused on the so-called low-fee private school which may cater to children from poor households. As found in Kisira (2008), the emergence of private education has spread to rural areas in Uganda, and there are many private schools which are informal (not registered). As previous studies show, these non-government schools may be affordable to the poor, and contribute to reducing the number of out-of-school children (Tooley and Dixon 2005a; Tooley and Longfield 2013).

However, a rigorous review undertaken by Ashley et al. (2014) states that the overall strength of evidence on the affordability of low-fee private schools for the poor is weak. In fact, there are many case studies from various developing countries which provide counter evidence to the findings from Tooley and Dixon (2005a). These studies generally find that only wealthier households are able to make a choice to send their children to private primary schools, so the gap is widening (Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006; Nishimura and Yamano 2013; Akaguri 2014; Bold et al. 2011).

The issues here must be resolved by examining empirical evidence. There is a lack of knowledge on the effects of increasing roles of private financing under UPE policy on ensuring equitable access to primary education, as well as on the role of private schools in absorbing children who are not satisfied with fee charges in public schools.

1.3   Research Questions

Against this background, this study intends to answer the following main research questions: (1) What is the difference in the effects of the demand and supply factors that

determine primary school attendance and choice between the children from poor and non-poor households in rural Uganda; and (2) what is the difference in the effects of high informal user fee charges in public schools on primary school attendance and choice, between the children from poor and non-poor households in rural Uganda. Seven sub-research questions were identified as follows.

Research Question 1: What is the difference in the effects of demand and supply factors that determine primary school attendance and choice between the children from poor and non-poor households in rural Uganda?

 1-1: What is the difference in the increase of private school attendance probability between the poor and the non-poor?

 1-2: What is the difference in the change in the effect of wealth on school attendance and choice between the poor and the non-poor?

 1-3: What is the difference in the effect of the quality of education in the public schools on school attendance and choice between the poor and the non-poor?

 1-4: What is the difference in the effect of voluntary contributions on school attendance and choice between the poor and the non-poor?

Research Question 2: What is the difference in the effect of high informal user fee charges in public schools on primary school attendance and choice between the children from poor and non-poor households in rural Uganda?

 2-1: What are the determinants of informal fee charges in public schools?

 2-2: To what extent does a high informal fee charge in a public school have effects on school attendance and choice by the poor households?

 2-3: To what extent does a high informal fee charge in a public school have effects on school attendance and choice by the non-poor households?

1.4   Objectives of the Study

In answering the above research questions, this study investigates the determinants of primary school attendance and choice in rural Uganda with special focus on assessing the effects of high informal user fee charges in public school, and sheds light on the differences in their effects between the children from poor and non-poor households.

1.5   Significance of the Study

This study is significant because it makes an academic contribution in the following respects. First, this study explicitly assesses the effect of informal fees in public primary schools under the fee abolition policy. There are many studies which identify the existence of this type of non-negligible fee in Uganda and other developing countries where free primary education policy is implemented (Byamugisha and Nishimura 2008; Foko, Tiyab, and Husson 2012; Garde 2014; Kattan and Burnett 2004; Lincove 2012; Nordstrum 2012a; Oumer 2009; Byamugisha and Nishimura 2015; Lincove 2009; Nordstrum 2012b). However, only a very few studies have empirically examined its determinants and effects on access to primary education using a large-scale dataset.

There is especially a lack of research which uses supply-side information to capture the presence of fee charges. There is a group of related studies which analyze the effect of schooling cost or price on access to primary education mainly by relying on information about household educational expenditures (Lincove 2009; Lincove 2012; Glewwe and Patrinos 1999; Gertler and Glewwe 1990; Grenzke 2007; Glick and Sahn 2006; Alderman, Orazem, and Paterno 2001). The information on how much households spend for their child's attendance in public schools can be a good proxy for measuring how much public schools charge fees per child. Besides, as most of the household surveys also collect information on this breakdown, some studies can analyze a particular effect of the

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expenditure spent on school. However, there still remains a limitation in distinguishing the amount which is spent in a compulsory manner and that which is spent voluntarily.

Second, the study sheds light on the school choice between public school and private school in rural Uganda. A growing number of studies have accounted for the emergence of private school at primary education level in developing counties to analyze the determinants of access to primary education (Heyneman and Stern 2013; Ashley et al. 2014). Some of them are based on quantitative analyses using large-scale datasets, and include analyses of rural contexts (Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006; Nishimura and Yamano 2013; Akaguri 2014; Bold et al. 2011). However, few studies have been conducted that analyze the Ugandan situation.

Kisira (2008), who conducts an empirical case study of Uganda on this topic mainly by relying on qualitative data analysis, is one of the exceptions. Building on the findings from his informative research on the emergence of private education in rural Uganda, this study explores whether the trend found in his micro-level study can be generalized at the national level. Moreover, this study can make a notable contribution to the existing literature because there are a relatively small number of previous quantitative studies in rural areas of SSA countries except for the case study in rural Kenya by Nishimura and Yamano (2013). In contrast to Nishimura and Yamano (2013), who investigate how school choice is affected by the introduction of free primary education policy, this study investigates how school choice is affected by the return to a reliance on post abolition fees.

Third, the originality of this study also lies in updating a series of empirical studies, which use large-scale data, to explore the determinants of access to primary schools in Uganda. These previous studies typically utilized the nationally representative household survey data, and most of the early studies focus on assessing the effect of UPE policy on several access indicators. As the heart of UPE policy is to remove cost barriers for the children to enroll in schools, some of these studies examine the extent to which UPE policy reduced household education expenditure, as well as the determinants of these expenditures

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(Deininger 2003; Nishimura, Yamano, and Sasaoka 2008; Appleton 2001a). There are also studies using relatively fresh datasets which include analyses of whether schooling cost still remains an obstacle for school attendance under free primary education policy in Uganda (Lincove 2012; Tamusuza 2011).

Specifically, this study uses the nationally representative panel household survey data collected in 2005/2006 and 2011/2012 primarily to investigate the effect of expanding new phenomena under UPE policy. To the best of our knowledge, there are few studies which use large-scale data collected after 2011. The above-cited study by Tamusuza (2011) uses data collected in 2009/2010, and updates previous findings on the determinants of primary school attendance and dropout. The other recent panel data collected in 2005 and 2009 is used to assess the impact of the USE policy introduced in 2007 (Asankha and Yamano 2011).

Fourth, the utilization of panel data in examining the effect of school fees on access to basic education in SSA is another notably original contribution of this study. Panel data have been widely used in empirical studies in various fields including education, because they have the potential to remove several types of bias which cannot be removed in cross-sectional studies (Angrist and Pischke 2009; Murnane and Willett 2011; Deaton 1997; Gertler et al. 2011; Khandker, Koolwal, and Samad 2010). Although infrequent, some studies have examined the effect of school fees on access to basic education in developing countries using panel data (Chyi and Zhou 2014).

However, few studies are conducted in the context of SSA partly because of the scarcity of panel data collected in the region in general. For instance, one of the Ugandan case studies by Deininger (2003) only uses two cross-sectional datasets collected in different time periods to assess the effects of fee abolition on school attendance. In contrast, this study utilizes the latest and the first rigorous panel household survey data in Uganda. It is worth noting that most of the published works using this panel data have not yet covered

issues in the education sector (Ssewanyana and Kasirye 2012; Campenhout, Pauw, and Minot 2013; Okoboi, Kuteesa, and Barungi 2013).

Perhaps one of the closest prior studies to this study is Lincove (2012) which empirically analyzes the effect of price on schooling under the free primary education policy in Uganda using the cross-sectional household survey data collected in 2001. This study basically attempts to update her findings by using much fresher panel data and applying the different methodologies used in recent studies, such as Chyi and Zhou (2014) and Nishimura and Yamano (2013). While Lincove (2012) uses the amount of household educational expenditure paid to schools as a proxy for the school fee, this study uses school-level information to create a variable related to the fee charge. Moreover, while Lincove (2012) only applies a simple school attendance model in her analysis, this study applies a school-choice model to account for the recent increase in the participation of the private sector in the provision of primary education in developing countries.

CHAPTER 2 :

DEVELOPMENT OF PRIMARY EDUCATION SUB-SECTOR IN UGANDA

2.1 Primary Education Sub-Sector in the National Education System

The Government White Paper on Education (GWPE) of 1992 is the foundation of Uganda's current education policy framework, which is composed of education policies, including those on cross-cutting issues as well as international commitments on education.[9] These policies are implemented by several strategic plans centering on the Education Sector Strategic Plan (ESSP) as well as flagship programs which include UPE and USE.[10] The previous ESSP covered the fiscal years (FYs) 2007/2008 to 2014/2015, which was aligned with the National Development Plan (NDP) for the fiscal years up to 2014/2015.[11, 12] The original ten-year ESSP formulated in 2004 had been revised in 2007 so as to add new items to education policy agenda (MoES 2008).

Figure 2-1 shows the basic structure of formal education system in Uganda. The current structure of Uganda's formal education system has been essentially unchanged from the one which was set up by the Castle Education Commission in 1963 soon after gaining

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[9] The education system in Uganda has been developed within the scope of British Government White Paper on Education in Tropical Africa of 1923. Partly as a result of this white paper, the Protectorate Government set up a Department of Education and started playing an active role in controlling education system in 1925 (Ssekamwa and Lugumba 2001; Tuck 2004).

[10] Although it is commonly referred to as USE policy, the program is formally called the Universal Post Primary Education and Training (UPPET) because it convers Business, Technical, Vocational Education and Training (BTVET) at the lower-secondary level. In 2011, the government launched a new program, called Universal Post "O" Level Education and Training (UPOLET), to expand UPPET to the upper-secondary level (MoES 2013).

[11] Uganda's FY starts on July 1 and ends on June 30.

[12] There is the most overarching national development plan, called Vision 2040, which is being operated by NDP. According to MoFPED (2013), in Vision 2040, Uganda's government has partly identified a set of operational strategies and measures which will guide them during the post 2015 era. The current ESSP, which should be aligned with the current NDP for the FYs 2015/2016 to 2019/2020, has not been published (Republic of Uganda 2015).

independence (Ssekamwa 1997). Pre-primary education is still optional in Uganda (Ejuu 2012). It is usually provided for children from age three or so, and is mainly provided by the private sector in urban areas. Most Ugandan children start with seven years of primary education for 6-12 year-olds, which is compulsory and free in principle; this leads to the Primary Leaving Examination (PLE).[13] Primary, secondary, and Business, Technical, Vocational Education and Training (BTVET) schools at the secondary level share the same school calendar, which consists of three terms: February–April, May–August and September–December. The PLE is usually conducted at the beginning of November every year.

Figure 2-1: Structure of Formal Education System in Uganda
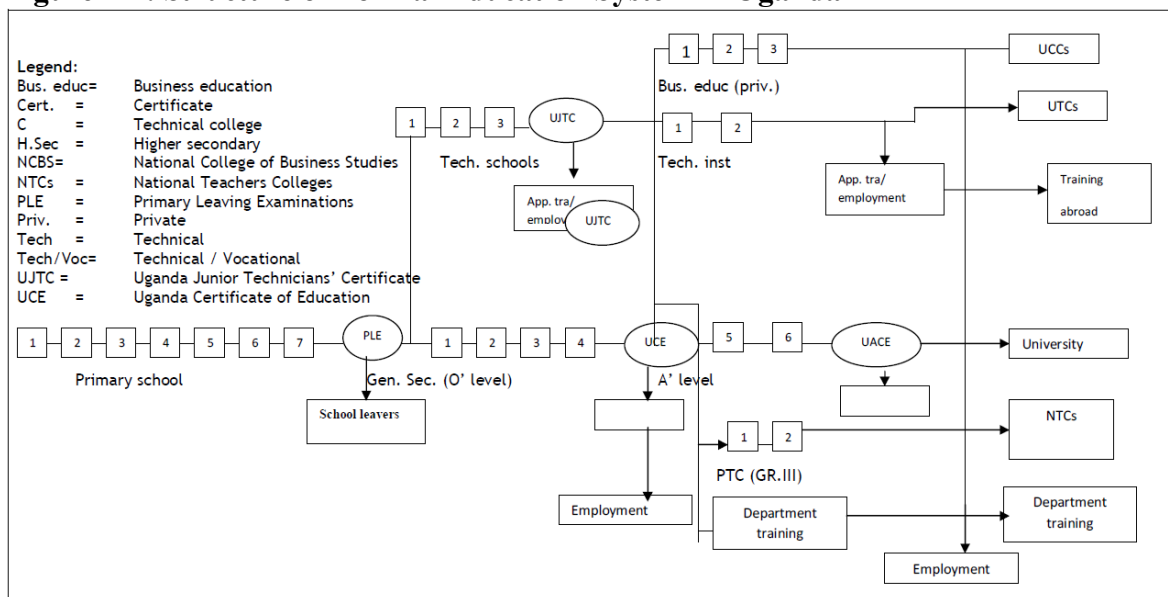
Source: Adopted from TISSA (2013, 31).

As is the case with the other end-of-course exams, Uganda National Examinations Board (UNEB) is in charge of implementing the PLE. The examination subjects are English, mathematics, science and social studies. The highest PLE score for each subject is

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[13] Education (Pre-primary, Primary and Post-primary) Act of 2008, which provides a legal framework for these sub-sectors, clearly articulates that "primary education shall be universal and compulsory for pupils aged 6 (six) years and above which shall last seven years" (Republic of Uganda 2008, 16). Right to education for all the citizens are guaranteed in the Constitution of 1995 (UNESCO IBE 2010).

1, and the lowest is 9.[14] Because of this, the best and the worst aggregate PLE score become 4 and 36, respectively. Based on the standardized grading system, UNEB grades the top performers who meets a certain standard as Division 1.[15] Second, third and fourth closest to the top are graded as Division 2, Division 3 and Division 4, respectively. Failures in PLE are those who are not in any of the four divisions (Division U) and those who are absent (Division X).

In 2014, 88.2% of pupils who sat PLE successfully passed the exam. Out of those who sat the exam, only 10.4% were qualified for Division 1 (UNEB 2015). Although all the children who passed PLE are qualified to join any post-primary institutions, the aggregated PLE score determines which lower-secondary schools children are able to enroll in through the national selection process. In reality, pupils need to be qualified at least as Division 1 if they want to attend well performing schools (Wood 2008).[16]

Primary education is divided into three cycles: lower primary (from primary one [P1] to primary three [P3]), transition year (primary four [P4]) and upper primary (from primary five [P5] to primary seven [P7]) (NCDC 2008). At the primary level, an automatic promotion policy was introduced in 2005 which aimed at improving the low completion rate.[17] Under this policy, public schools are supposed to promote pupils from one grade to the next regardless of their performance. In addition, the National Curriculum Development Centre (NCDC) replaced the subject curriculum at the lower primary level with a thematically-oriented curriculum in 2006/2007. One of the most notable changes was made

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[14] The PLE score for each subject is classified into four standards: (a) distinction (1-2), (b) credit (3-6), (c) pass (7-8), and (d) fail (9).

[15] According to the standard grading system used in 2012 PLE, one in Division 1 passed all the four examination subjects with credits or above, and aggregated PLE score ranged from 4 to 12 (Kaheru 2013).

[16] If their aggregated PLE score is below the admission cut-off point of their first choice school, they have to give up enrolling in that school. Pupils can apply to three schools. If they fail to be selected even by their third choice, they might remain unselected or have a chance to enroll in BTVET schools (Ninsiima 2013).

[17] Recent study by Okurut (2015) even reveals the impact of automatic promotion policy on pupils' learning achievement.

in the language policy. Under this new curriculum, mother tongue is used as the medium of instruction at the lower primary level (Ssentanda 2014).

Secondary education in Uganda consists of two cycles: the first four years of lower-secondary education, which leads to the award of the Uganda Certificate of Education (UCE) or "O" level, and the second two years of upper-secondary education, which leads to the award of the Uganda Advanced Certificate of Education (UACE) or "A" level. As an alternative to these academic/general education options, those who complete seven years of primary education have some additional options. For instance, there is a three-year craftsman training in vocational training centers as well as farm and technical schools. Four-year training is provided in community polytechnics at a lower-secondary level (UNESCO UNEVOC 2014; UNESCO IBE 2010).

Alternative options are also provided at an upper-secondary level. In addition to various types of BTVET courses, a two-year teacher training program in Primary Teachers' College (PTC) is provided for UCE holders. This program leads to the award of the Grade III Teacher Certificate, which is a minimum requirement to teach as a qualified teacher in primary schools. At a tertiary level, there are institutions and universities which provide two to five years of education. In general, tertiary level institutions are regulated by National Council for Higher Education.[18] Among the several types of tertiary institutions, National Teachers College (NTC) provides a two-year teacher training program. The graduates from NTC obtain Grade V Diploma, which qualifies them to teach both in primary and secondary schools as well as in PTCs.

Besides the formal education system depicted in Figure 2-1, the GWPE 1992 clearly specifies the objectives and strategies of non-formal education (Jamal 2010). Although the government initially planned to address the needs of disadvantaged children

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[18] National Council for Higher Education is established under the Universities and Other Tertiary Institutions Act of 2001.

by expanding the formal education system, the emphasis was placed on the provision of adult education and skill development opportunities through non-formal settings (Hoppers 2008). In practice, the Ministry of Gender, Labour and Social Development (MGLSD) is in charge of implementing adult education programs, and coordinates with various types of actors in this field as a lead agency (UNESCO IBE 2010). In terms of skill development, community polytechnics at the lower-secondary level, described above, are designed to widely absorb non-selected primary leavers in non-formal education (Hoppers 2008). Although there is potential for this type of non-formal BTVET, community polytechnics are functioning in a very limited way (Hoppers 2008; Blaak, Openjuru, and Zeelen 2013).[19]

On the other hand, non-formal education is playing an essential role in the provision of primary education to disadvantaged children, including the pastoralist communities of the Karamoja region, and the children in a post-conflict area, namely, the Northern region. The Ministry of Education and Sports (MoES) launched many of these types of non-formal education programs initiated by an international non-governmental organization (NGO) as well as an international aid agency, and they are financially supported by a bi-lateral donor agency in many cases. Although it is out of the scope of this work to give detailed information about each program, they include: Complementary Opportunities for Primary Education (COPE), Alternative Basic Education for Karamoja (ABEK), Basic Education for Urban Poverty Areas (BEUPA), Mubende Non-Formal Education (MNFE), Empowering Lifelong Skills Education (ELSE) and Child-Centred Alternative, Non-Formal Community-Based Education (CHANCE) (Hoppers 2008).[20]

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[19] MoES has been making lots of efforts on strengthening non-formal BTVET including the launch of Non-Formal Training Programme (NFTP) in 2010. Moreover, as a lead agency, MoES is now carrying out a bold BTVET reform under the BTVET strategic plan 2011-2020, titled Skilling Uganda. Following the adoption of BTVET Act in 2008 and the development of Uganda Vocational Qualifications Framework (UVQF), this strategy was formulated by the MoES with the supports from the World Bank and the Government of Belgium. Under this reform, existing community polytechnics and technical schools might be converted into the Skills Development Centres (SDCs) (MoES 2011b).

[20] The first three programs started before the introduction of UPE policy (Hoppers 2008).

2.2   Overview of Universal Primary Education Policy

Uganda became independent on October 9, 1962. The country experienced two decades of violent political and military turmoil, after the Buganda monarchy was abolished in an unconstitutional manner in the late 1960s (Nave 2010). Under the rule of Idi Amin from 1971 to 1979 and the succeeding regime of Milton Obote from 1980 to 1985, public financing for primary schools almost disappeared, and private financing from households was the most important source of income for running schools (Tuck 2004; Reinikka and Svensson 2004). The recovery of all sectors, including education, in Uganda started after the incumbent president, Yoweri Museveni, seized power in 1986.

Uganda became one of the first countries which eliminated user fees in primary education in the 1990s partly influenced by the EFA movement launched at the Jomtien Conference in 1990.[21] The introduction of UPE policy was pledged by Museveni during a presidential election in 1996, and its implementation started from the first school term in January 1997, soon after he was re-elected as president.

In 1997, the government waived primary school fees for four school-age children per family. If families had both sons and daughters, they were required to select at least two girls to be eligible to receive benefits from UPE policy. Moreover, if there were children with disabilities in a family, they were supposed to receive the highest priority in the selection process (CARD 1998).[22] In 2002, the government removed this criteria for selection, so that UPE policy was expanded to cover all school-age children (MoES 2004).

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[21] The idea of UPE policy had been proposed in Uganda before the Jomtien Conference in 1990. The post-conflict National Resistance Movement (NRM) government appointed several commissions. One of them for education sector was called Education Policy Review Commissions and was lead by Professor W. Setenza Kajubi. The universalization of primary education was one of the key recommendations made by this committee in 1989, and its major recommendations were incorporated in the Government White Paper on Education of 1992. Gradual approach to UPE was recommended at this point.

[22] All the children who have lost both parents were eligible to receive benefits from UPE policy (CARD 1998).

UPE policy was initially implemented under the Education Sector Investment Plan (ESIP) 1998–2003, within the framework of the Poverty Eradication Action Plan (PEAP), the national policy framework for fighting poverty at that time. In addition to the increase in public financing, Uganda's government used the Poverty Action Fund (PAF), which had been supported by debt relief granted under the Highly Indebted Poor Countries (HIPC) initiative, to meet the required spending (Saito 2003; Bategeka and Okurut 2006).

In Uganda's context, several budgetary reforms were undertaken around the time when the government started implementing PEAP and receiving PAF. In 1997, the full implementation of the Medium Term Expenditure Framework (MTEF) was started (World Bank 2013a).[23] A sector-wide approach (SWAP) was also introduced through the launch of ESIP (Eilor 2004).[24] In addition, the funding modality was shifted from a project-based approach to a budget support approach.[25] Thanks to the high reputation of their education sector plan, Uganda succeeded in attracting considerable donor support, and was selected as one of the eligible countries for the EFA Fast Track Initiative (FTI) in 2004 (Nishimura and Byamugisha 2007).

Since the inception of UPE policy in 1997, the government has been in charge of paying tuition fees for all the children enrolled in government-aided primary schools by

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[23] Multiyear budget planning to address the shortcomings of annual budgeting is the defining characteristics of MTEF (World Bank 2013a). Strictly speaking, MTEF was introduced in 1992, initially putting emphasis on achieving macroeconomic stability under a severe budget constrain. Since 1997, emphasis has been shifted to realize transparent sector allocations aligned with national development plans. Institutional capacity to implement MTEF was strengthened by merging the finance and planning ministries to establish the Ministry of Finance, Planning and Economic Development (MoFPED).

[24] Under SWAP, in general, the activities of the government, Education Funding Agencies Group (EFAG) and the other stakeholders are brought together into a single strategy to reduce donor fragmentation. Eilor (2004) summarizes the characteristics of Uganda's SWAP as follows: "(a) new partnerships; (b) well defined sectoral and sub-sectoral strategies incorporating macro and sector-specific institutional and financial management policies and structures; (c) a forward-looking work programme for medium- to long-term sector strategy formulation, expenditure framework preparation as well as common government/EFAG management arrangements and capacity-building programmes; and (d) in-built mechanisms for strategic negotiations and sector performance reviews jointly agreed by all stakeholders" (Eilor 2004, 78).

[25] In general, under the budget support approach, financial support from the donor is directly provided to a recipient country's budget without earmarking (Koeberle and Stavreski 2006).

distributing the UPE capitation grant.[26] The amount of grant received by each school is calculated according to the number of pupils in each school as the name of the grant implies. According to Byamugisha and Nishimura (2008), from 1997 to 2002, schools received Uganda Shilling (USh) 5,000 per pupil per year for those in P1-P3, and USh 8,100 for those in grades 4–7. However, since FY2003/2004, the government has been using the new allocation formula to calculate the amount as follows:

$$\begin{aligned} &\text{Total annual allocation of UPE capitation grant for a respective local government} \\ =& \left(\text{Annual threshold grant per school} \times \text{Number of schools in a respective local government}\right) + \\ & \left(\text{Annual variable grant per pupil} \times \frac{\text{Total enrollment in a respective local government}}{\text{Total enrollment in Uganda}}\right). \end{aligned}$$

"Threshold grant" is a grant which is provided to every government-aided school regardless of its enrollment. On the other hand, "variable grant" can be varied depending on the enrollment in each government-aided school. "Annual variable grant per pupil" in the above formula can be obtained by the following formula:

$$\begin{aligned} &\text{Annual variable grant per pupil} \\ =& \frac{\text{Total annual budget for UPE capitation grant - Total annual threshhold grant}}{\text{Total enrollment in Uganda}}. \end{aligned}$$

In principle, the MoES advises the MoFPED to release the calculated amount to each local government twice per quarter. Local governments are then responsible for transferring an appropriate amount of grant to each school's UPE bank account on a quarterly basis. It is worth noting that the enrollment figures in these formulas are computed by applying a given annual growth rate to the latest annual school census data

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[26] PLE fees for all the pupils in government-aided schools are also covered by the government (Byamugisha and Nishimura 2015).

available at the time of making the budget (MoES 2008a).[27] Although "annual threshold grant per school" used to be USh 900,000, it has been increased to USh 1,350,000 so as to take inflation into consideration (MoES 2014a).[28]

Another important activity by the government under UPE policy is to develop the primary school infrastructure by providing the school facilitation grant (SFG). SFG was created in 1998 to support the communities most in need by constructing new school facilities as well as new schools. Local governments are responsible for the allocation of the grant which is transferred from the central government. Moreover, the government has been allocating a budget for the provision of instructional materials in government-aided schools since the launching of the UPE policy (Byamugisha and Nishimura 2015; MoES 2014b).

The UPE policy is currently being implemented under Act 13, called the Education (Pre-Primary, Primary and Post-Primary) Act, 2008 (hereafter referred to as the Education Act of 2008). The MoES published a handbook, entitled "Guidelines on: Policy, Planning, Roles and Responsibilities of Stakeholders in the Implementation of UPE for District and Urban Councils," (hereafter referred to as the UPE Guidelines of 2008) to provide key stakeholders with a basic guideline to implement UPE policy in line with Education Act of 2008.

2.3   Financing Primary Education Sub-Sector

2.3.1 Public Financing

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[27] For instance, to calculate the amount of UPE capitation grant for FY2013/2014, annual school census data in 2012 is used.

[28] Currently, a threshold grant per month per school is USh 150,000. Since schools officially open for nine months in Uganda, annual threshold grant per school becomes USh 1,350,000 (MoES 2014a).

Before looking at the strength of Ugandan government's commitment to the primary education sub-sector, it is necessary to review the level of its overall commitment to the sector's development. Figure 2-2 shows the trends in the most common indicators on this topic. In general, available data shows that there has been a decreasing trend at least since 2005. Although public expenditure on education as a percentage of gross domestic product (GDP) was approximately 5% in 2005, it has been reduced to less than 3%. Figure 2-2 also shows that there has been a significant reduction in the proportion of education expenditure in total public expenditure from 21.9% in 2005 to 12.9% in 2013.

Figure 2-2: Trends in the Public Expenditure on Education in Uganda, 2005 and 2009-2013
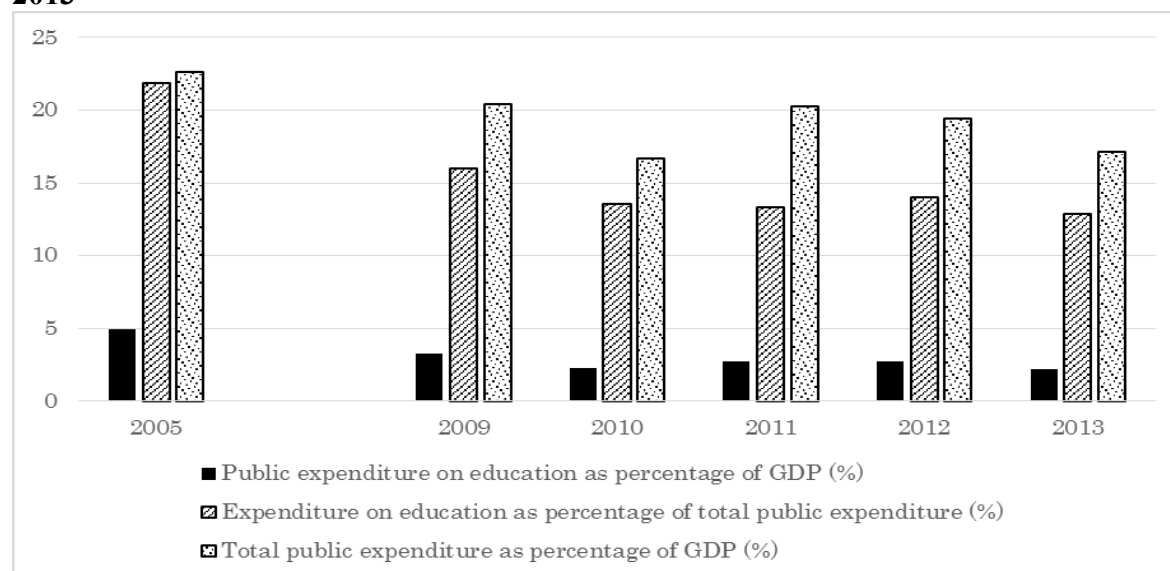
Source: Created by the author based on UIS (2015).
Note: Total public expenditure as percentage of GDP is calculated by the author by applying the following formula: Total public expenditure as percentage of GDP=Public expenditure on education as percentage of GDP/Expenditure on education as percentage of total public expenditure.

According to Byamugisha and Nishimura (2008), the share of public education expenditure on GDP increased from 1.6% to 3.8% after the introduction of UPE policy. Although the strength of the government's commitment to education sector development is still above the pre-UPE level, it is currently returning to that level. It is also important to note that Uganda has fallen well below the desirable levels set by the international community. The Incheon Declaration explicitly set benchmarks of "efficiently allocating at

least 4–6% of Gross Domestic Product and/or at least 15–20% of total public expenditure to education" (UNESCO 2015b, 9).

The Ugandan government's relatively weak commitment is revealed even in comparison with other developing countries in SSA. Figure 2-3 clearly shows that Uganda is one of the countries in the group at the bottom-left corner with the lowest education expenditure as a percentage of GDP. Figure 2-3 also suggests that this result might be partly attributed to the relatively small size of its public sector (17.1% of GDP in 2013).[29]

Figure 2-3: Public Education Expenditure as a Percentage of Total Public Expenditure in Relation to Total Public Expenditure as a Percentage of Gross Domestic Product among Developing Countries in SSA, the Most Recent Year Available
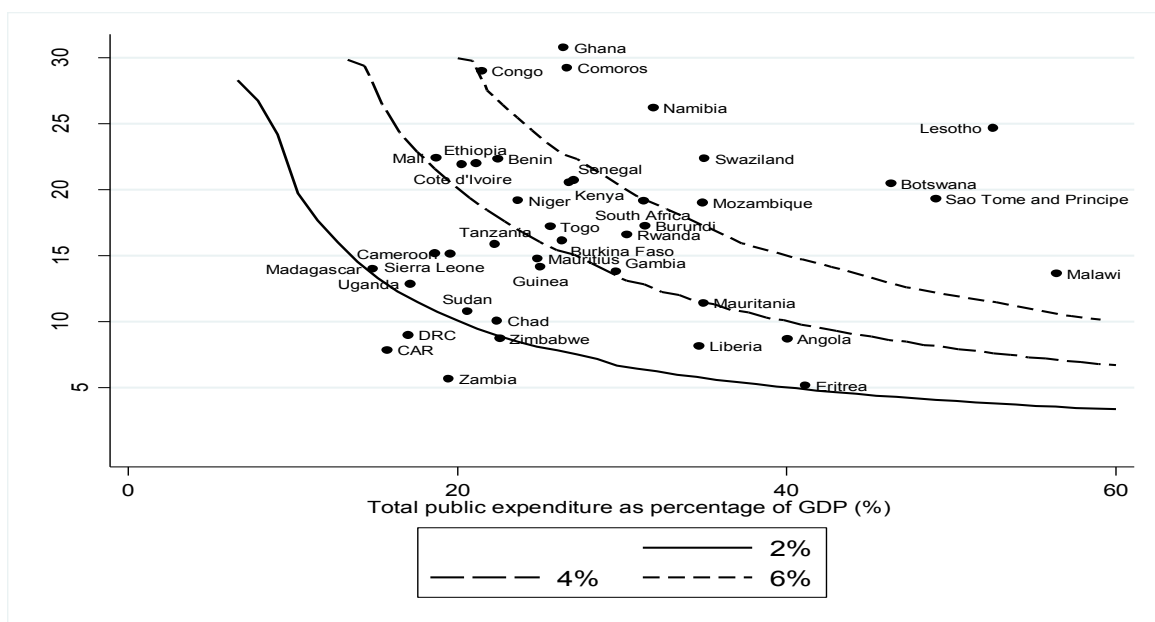
Source: Created by the author based on UIS (2015)
Note: CAR=Central African Republic. DRC=Democratic Republic of the Congo. Coverage includes only developing countries in SSA. The three curved lines show the data points that are consistent with the public expenditure on education corresponding to 2%, 4%, and 6% of GDP, respectively. Due to lack of data, the figure does not include Gabon, Guinea- Bissau, Nigeria, Somalia, and South Sudan. Data in the most recent year available are used: 2014 for Tanzania; 2013 for Benin, Burkina Faso, Burundi, Guinea, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Rwanda, Sierra Leone, South Africa Togo, and Uganda; 2012 for Cameroon, Gambia, Liberia, Mali, and Niger; 2011 for CAR, Chad, Ghana, and Swaziland; 2010 for Angola, Congo, DRC, Ethiopia, Kenya, Namibia, Sao Tome and Principe, Senegal, and Zimbabwe; 2009 for Botswana, and Sudan; 2008 for Comoros, Côte d'Ivoire, Lesotho, and Zambia; 2006 for Eritrea.

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[29] The World Bank's recent public expenditure review says that the recent reduction in the total public expenditure as a share of GDP might be attributed to the decline in the contribution of donor funding (World Bank 2013b).

Table 2-1 shows the recent trend on the allocation of public education expenditure by sub-sector in Uganda.[30] It reveals that primary education occupies the largest share in general, which is 53.7% in 2012. The introduction of UPE policy increased this share from 40% to 65–70% (Byamugisha and Nishimura 2008). Since then, Uganda has been maintaining the primary education sub-sector as its highest priority.

However, Table 2-1 also shows that there was a significant change between 2004 and 2009. The primary education sub-sector witnessed a notable drop in its share of public expenditure from 61.2% in 2004 to 55.4% in 2009. At the same time, the secondary education sub-sector witnessed a strong increase in its share from 17.3% to 23.5%. This shift is clearly attributable to the introduction of USE policy in 2007. In general, the new pattern in resource allocation by sub-sector has been continuing up to today.

Table 2-1: Trends on Expenditure by Level of Education as Percentage of Total Public Expenditure on Education in Uganda, 2004 and 2009-2012

	2004	2009	2010	2011	2012
Primary education	61.2%	55.4%	57.7%	59.6%	53.7%
Secondary education	17.3%	23.5%	24.2%	24.6%	25.5%
Higher education	11.9%	11.3%	11.3%	9.7%	11.5%
Post-secondary non-higher education	6.9%	5.7%	4.2%	4.1%	5.8%
Not allocated by level	2.7%	4.1%	2.7%	2.0%	3.6%

Source: Created by the author based on UIS (2015).
Note: In the mappings for Uganda based on ISCED 1997, secondary education sub-sector includes all types of BTVET institutions at either lower-secondary or upper-secondary level (UIS 2014a).

Given the fact that Uganda has weakened its overall commitment on education sector development as well as lowered the priority it places on the primary education sub-sector, it is important to carefully review the extent to which these policy shifts at the macro-level have made a difference at the individual level. Figure 2-4 captures the recent trends on the unit cost at primary level as a percentage of GDP per capita. It shows that

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[30] UIS (2015) uses International Standard Classification of Education (ISCED) 1997 to define each sub-sector so as to make the data internationally comparable.

public education expenditure per pupil significantly reduced from 10.7% in 2004 to 7.2% in 2009. TISSA (2013) states that Uganda invests in its primary school pupils at a level lower by 30% than the average level found in low-income countries.

It is worth noting that public expenditure per student at secondary schools also significantly reduced from 32.1% to 21.4% between 2004 and 2009 despite the fact that the government placed more priority on the secondary education sub-sector between these years. This might mean that the effect of increasing the allocation for the sub-sector was surpassed by the effects of an overall decrease in available resources in the education sector as well as by the increase in secondary school enrollments.

Figure 2-4: Trends on Public Expenditure per Pupil/Student as a Percentage of Gross Domestic Product per Capita by Level of Education in Uganda, 2004 and 2009-2012
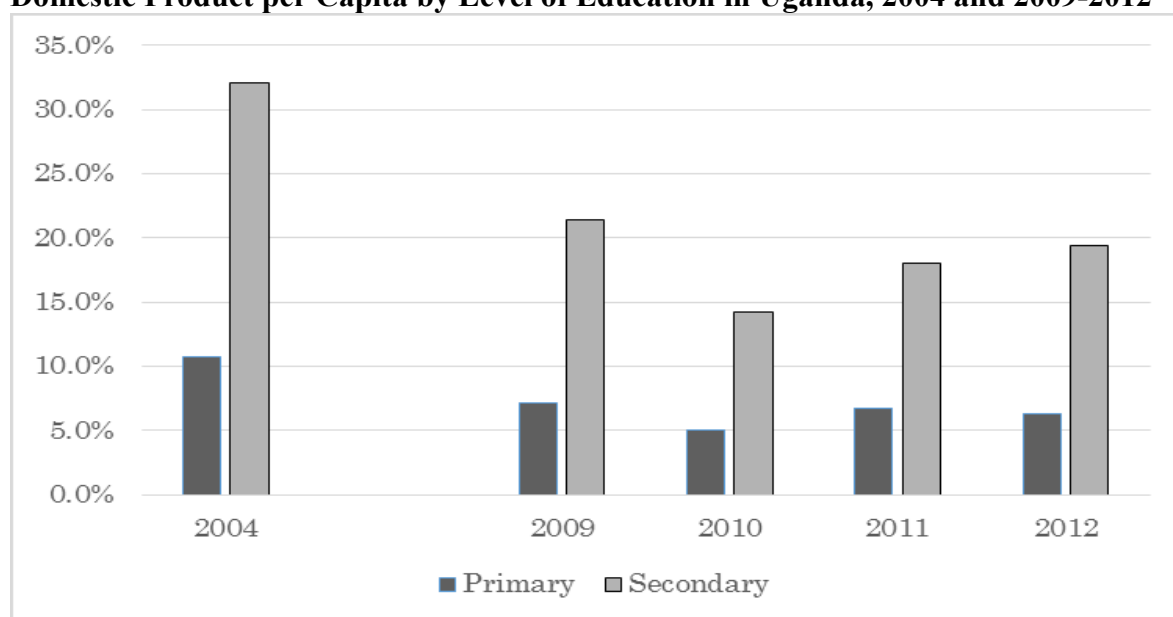
Source: Created by the author based on UIS (2015).
Note: In the mappings for Uganda based on ISCED 1997, secondary education sub-sector includes all types of BTVET institutions at either lower-secondary or upper-secondary level (UIS 2014a).

The next concern is how the available resources for the primary education sub-sector are spent. There are two large categories in public education expenditure: current and capital expenditure. The former is used in the current year and can be divided into salary and non-salary expenditure. The latter is used to consume items which can be used over a

long period of time (UIS 2014). Table 2-2 shows that the share of capital expenditure within total expenditure dramatically decreased from 25.8% in 2004 to 6.5% in 2009, and has hovered around 10% in recent years.

It is also worth noting that the share of salary expenditure as a percentage of total current expenditure in Uganda is considerably higher than in other countries in SSA. According to TISSA (2013), countries in SSA spent 69% of their current expenditure on average on paying salaries in 2010/2011. In contrast to this, Table 2-2 shows that Uganda constantly spends more than 80% of its current spending on salary payments. Although non-salary expenditure in current expenditure enjoyed a significant increase between 2004 and 2009, it has shrunk to a level which is even lower than in 2004. The share of salary expenditure in current spending has almost reached 90%.

Table 2-2: Trends on Primary Education Expenditure in Public Institutions by Nature in Uganda, 2004 and 2009-2013

	2004	2009	2010	2011	2012	2013
Salary current expenditure as percentage of total expenditure	64.8%	77.6%	76.2%	76.4%	76.4%	81.2%
Non-salary current expenditure as percentage of total expenditure	9.4%	16.0%	16.3%	12.6%	14.1%	9.1%
Capital expenditure as percentage of total expenditure	25.8%	6.5%	7.5%	11.0%	9.5%	9.7%
Salary expenditure as percentage of current expenditure	87.3%	83.0%	82.4%	85.8%	84.4%	89.9%
Non-salary expenditure as percentage of current expenditure	9.4%	16.0%	16.3%	12.6%	14.1%	9.1%

Source: Created by the author based on UIS (2015).
Note: Expenditure in public institutions (instructional and non-instructional) does not include financial aid to pupils and other transfers (UIS 2014b).

Figure 2-5 shows the recent trends in the most typical current and capital spending in the form of providing grants, namely, UPE capitation grants and SFG, respectively. In terms of the UPE capitation grant, the amount has been gradually decreasing, while the enrollment in government-aided schools has been constantly increasing. In FY2011/2012, the amount of actual spending on UPE capitation grants per pupil has dropped to USh 3,435 at the FY2005/2006 price level, which is equivalent to United States dollar (USD)

1.88.[31] Regarding SFG, there has, overall, been a decreasing trend as well, which is consistent with findings about the trends on total capital expenditure based on UIS (2015).

Figure 2-5: Trends on Actual Expenditure for the Grants per Year and Enrollment in Government-Aided Primary Schools in Uganda, 2004/2005-2011/2012
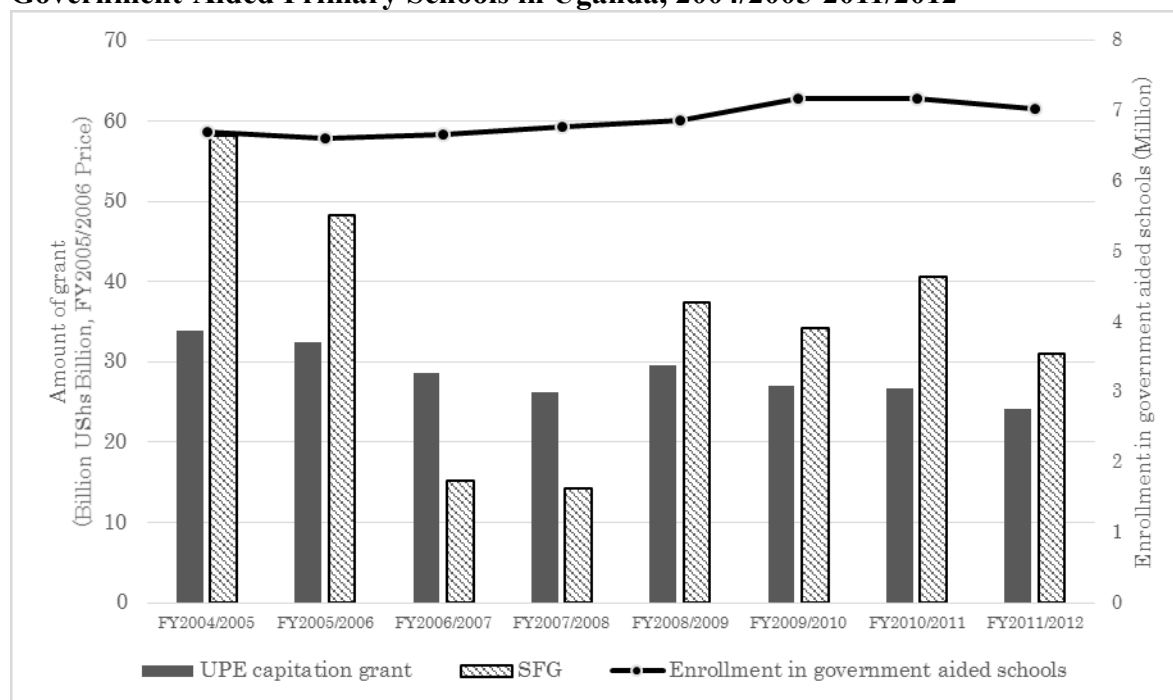
Source: Created by the author based on MoES (2014a) and MoES (2014b).
Note: Amounts of grant is adjusted to the price level in FY2005/2006 using Consumer Parity Index provided in UBOS (2013b), UBOS (2007) and UBOS (2008a). Enrollment statistics in a first year of the FY is used to create the figure.

All the figures related to public expenditure used so far in this subsection include expenditure funded by transfers from international sources by definition. As stated in the previous subsection, Uganda used external funding including PAF when it launched UPE policy in 1997. Byamugisha and Nishimura (2015) note that, thanks to the mainstreaming of general budget support under PEAP, between 54% and 61% of the recurrent costs of primary education were funded by external support at the initial stage of UPE policy implementation.

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[31] The amount is converted to USD using the official mid-rate foreign exchange rates for FY2005/2006 in Bank of Uganda (2015).

However, it is clear that there has been substantial shifts in donor funding to Uganda's education sector, which might explain most of the major shifts in its overall public education financing mentioned so far in this subsection. First, aid to the education sector has been constantly decreasing after peaking in FY2001/2002. Second, after the introduction of USE policy in 2007, the share for primary education sub-sector dramatically decreased. Third, along with this change in intra-sectoral aid distribution, the project-based approach has become dominant again while the budget support approach has lost most of its share.

According to Hedger et al. (2010), the primary education sub-sector occupied 37% of total on-budget aid in FY2005/2006. However, it had reduced to 8% in FY2007/2008, and the share for secondary education and BTVET dominated by project aid had expanded from 8% in FY2005/2006 to 53% in FY2007/2008. It is also worth noting that this situation might have been changed by the launch of a large-scale aid project for the primary education sub-sector, entitled "Uganda Teacher and School Effectiveness Project," which was provided with USD 100 million by the Global Partnership for Education (GPE).[32]

Lastly, in the Ugandan context, it is inevitable that the issue of inefficiency in public financing be mentioned. The first public expenditure tracking survey (PETS) was conducted in Uganda in 1996, which was before the introduction of UPE policy. It revealed that, on average, only 13% of the total yearly capitation grant spending reached the primary schools in the early 1990s (Reinikka and Svensson 2004).[33] This shocking evidence of excessive corruption in the education system motivated the government to start making the

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[32] GPE is an international organization which was established as EFA FTI in 2002. GPE currently works with various actors, including developing countries, civil society organizations, donors, the private sector, foundations, and international organizations, to support 60 developing countries mainly through providing GPE Grants (GPE 2015). The implementation of the Ugandan project started from September 2014, and is expected to end in June, 2018. The three year program tackles the quality issue through wide range of activities including classroom construction, distribution of textbooks, provision of teacher trainings, and capacity buildings (World Bank 2014b).

[33] Although a per-pupil amount was approximately a half, government was providing capitation grant to primary schools even before launching UPE policy in 1997.

information of released capitation funds public via national newspapers. The positive impact of this newspaper campaign was identified, and the leakage of the capitation grant dramatically reduced to 16% in FY2005/2006 (Reinikka and Svensson 2011; World Bank 2007).

However, the issue of inefficiency in the primary education sub-sector still requires considerable attention in Uganda. For instance, Winkler and Sonderqaard (2008) state that "at least one-third of the expenditures on primary education are wasted or used inefficiently" (Winkler and Sonderqaard 2008, 6), and teacher absenteeism is highlighted as one of the most important sources of these inefficiencies.[34] Relatively new survey data collected by Service Delivery Indicators (SDI) Initiative have revealed more shocking evidence. Based on the analysis of this data, Wane and Martin (2013) find that, in 2013, more than 27% of teachers in government-aided schools were absent, and 30% of those who were in school were not working.

2.3.2 Private Financing

Even under the UPE policy, public financing of education is significantly complemented by various types of private financiers in various ways. In addition to the contribution from households, which occupies the largest share of total private financing, there is a contribution from private entities, including NGOs, associations, religious institutions, communities, and private companies (Peano 2011). However, as it is almost impossible to capture the whole picture of private expenditure in Uganda owing to the lack of data, especially on various types of private entities, this subsection focuses on briefly analyzing

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[34] Winkler and Sonderqaard (2008) summarize that there are four major sources of inefficiency in Uganda education system: (1) leakage of resources between the central government and school (e.g. ghost teachers, misuse of UPE capitation grant), (2) leakage of resources within the school (e.g. teacher and head teacher absenteeism), (3) teacher deployment both across and within districts, and (4) allocation of resources within government-aided schools.

the recent trend on the contribution of households to financing primary education in Uganda.

Before the introduction of UPE policy, the study shows that 81.2% of costs in public schooling were financed by households (Mehrotra and Delamonica 1998). After UPE policy was launched, this extremely high degree of the burden on household finances was eased. However, its level is still very high compared with other countries in SSA.

Foko, Tiyab, and Husson (2012) find that the average educational household expenditure in 14 counties in SSA occupied 33% of total educational spending in 2004. In contrast, the share of household expenditure in Uganda, calculated by a similar formula to that used in Foko, Tiyab, and Husson (2012), was 44.8% in 2005/2006 as shown in Figure 2-6. Moreover, the figure shows that the share has exceeded the 50% level in 2011/2012, which might be attributable to the significant decrease in government expenditure, which is highlighted in the previous subsection, as well as the slight increase in household expenditure (see Table 2-3).

Figure 2-6: Trends on Proportions of Household Contribution and Public Current Expenditure for Primary Education, 2005/2006 and 2011/2012

Source: Created by the author based on MoES (2014a), UNHS 2005/2006, and UNPS 2011/2012.
Note: Since MoES (2014a) does not have current expenditure data in FY2005/2006, average of the expenditure in FY2003/2004 and FY2007/2008 is used. Estimation of household contribution is made basically following the methodology suggested by Tiyab and Ndabananiye (2013).

Table 2-3: Government and Household Expenditure on Primary Education as a Percentage of GDP per Capita, 2005/2006 and 2011/2012

	2005/2006	2011/2012
Government Current Expenditure per Pupil (Percentage of GDP per Capita)	6.84%	5.26%
Household Expenditure per Pupil (Percentage of GDP per Capita)	5.55%	5.67%

Source: Created by the author based on MoES (2014a), UBOS (2014b), UNHS 2005/2006, and UNPS 2011/2012.

Note: Since MoES (2014a) does not have current expenditure data in FY2005/2006, average of the expenditure in FY2003/2004 and FY2007/2008 is used. Estimation of household contribution is made basically following the methodology suggested by Tiyab and Ndabananiye (2013).

Table 2-4: Classification of Household Expenditure Related to Education

	School expenses	Expenses for goods related to education	Expenses for services related to education
Expenditure directly related to attending school	• Registration fees or any school or tuition fees • Examination fees • PTA contributions	• Uniforms • Sports clothing • Textbooks • Exercise books • School supplies	• Boarding fees • School feeding • Transportation
Expenditure not directly related to attending school		• Additional non-mandatory textbooks • Non-school publications • Computer • Educational games	• Special classes • Tutoring • Extracurricular activities
Terminology used in the questionnaires of UNHS 2005/2006 and UNPS 2011/2012	• School and registration fees (contribution to school development fund)	• Uniforms and sports clothes • Books and school supplies	• Costs to and from school • Boarding fees

Source: Created by the author based on Peano (2011), Tiyab and Ndabananiye (2013), UBOS (2006), and UBOS (2013b).

Note: Both UNHS 2005/2006 and UNPS 2011/2012 asked about the other expenses. UNHS 2005/2006 did not ask about costs to and from school.

Table 2-4 shows a general classification of household expenditure related to education. It starts with the distinction between the expenditure directly related to attending

school and the expenditure not directly related to attending school.[35] Then, there is another dimension of classification into school expenses, purchases of goods, and expenses for services related to education. The household survey data used in this study broadly cover all these three types of expenditure (see Table 2-4). However, strictly speaking, the data do not provide any information on the distinction based on its direct link with school attendance and its mandatory nature.[36]

Figure 2-7: Trends on Average Household Expenditure for Primary Education per Pupil as a Percentage of Gross Domestic Product per Capita, 2005/2006 and 2011/2012
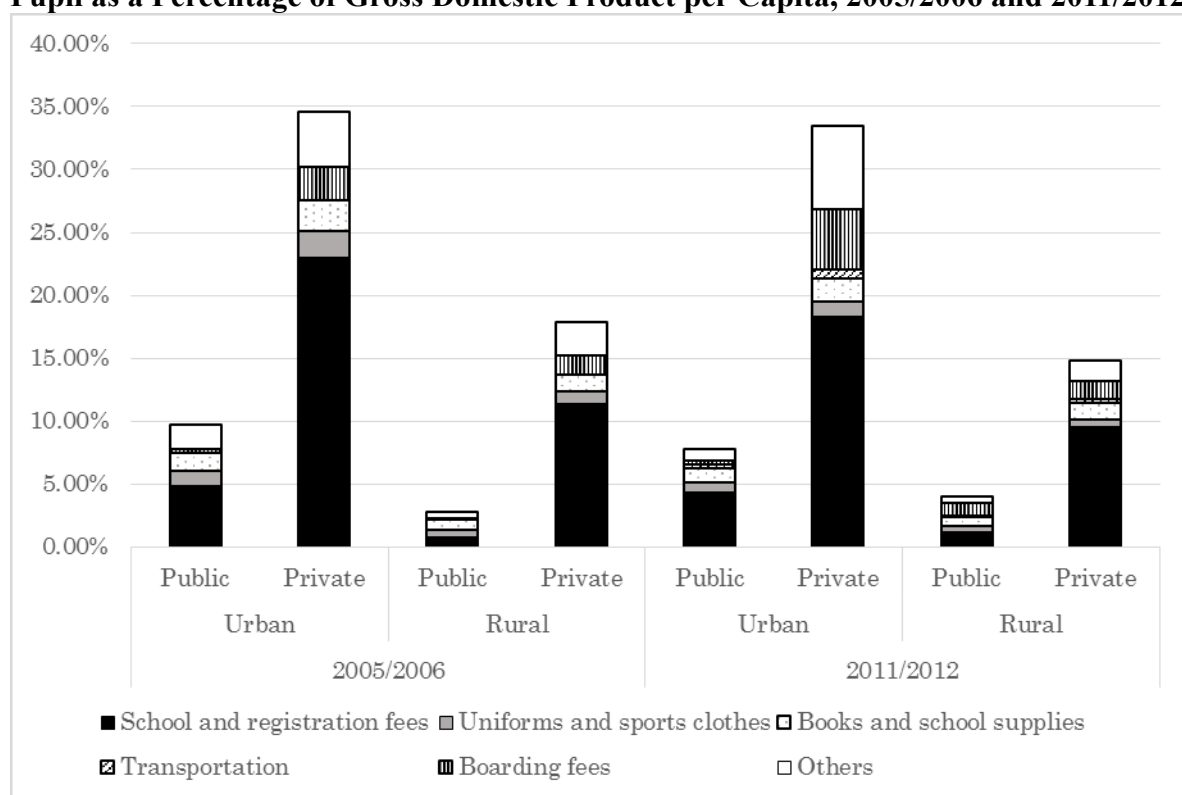
Source: Created by the author based on UBOS (2014a), UNHS 2005/2006, and UNPS 2011/2012.
Note: UNHS 2005/2006 does not ask about costs to and from school. This is the reason why the average household education expenditure for transportation is zero in 2005/2006. In UNHS 2005/2006, the expenditure for transportation might be regarded as a part of other expenditure.

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[35] Tiyab and Ndabananiye (2013) call the former and the latter education and non-education expenditure, respectively.

[36] This motivates this study to use supply-side information to quantify the amount of fees charged by the schools. However, since a questionnaire asks how much the household has spent during the past 12 months on schooling, it might make sense to assume that the data mostly capture the expenditure directly related to school attendance.

In addition to reviewing the breakdown by type of spending, it is important to look at the differences between urban and rural areas, as well as the differences for the public and for the private schools, to understand the context of this study.[37] Figure 2-7 shows that the largest share is generally occupied by the expenditure on school and registration fees. Moreover, spending on books, school supplies, uniforms, and sports clothes is commonly made regardless of the location and school type. The proportion of these types of spending other than school and registration fees is relatively high in rural public schools. There is also a significant amount of spending on other purposes, and its proportion is especially high when a household sends its children to urban private schools.

Moreover, the amount of household spending is higher in urban areas than in rural areas, and becomes much higher if the household sends their children to private schools than to public schools. In 2011/2012, households in urban areas spent 33.5% of GDP per capita on average in sending their children to private schools. Even in rural areas, household spending for private schooling was 14.8% of GDP per capita on average in 2011/2012. Figure 2-7 also clearly reveals that there is household spending on public schooling even under the UPE policy. Although the amount is relatively low compared with that in private schools, in 2011/2012, households sent their children to public schools in urban and rural areas by spending 7.8% and 4.0% of GDP per capita on average, respectively.

It is worth noting that, when we look at the time trend, the average of household expenditure for primary education per pupil increased only in rural areas from 2.8% of GDP per capita in 2005/2006 to 4.0% in 2011/2012, which was mainly attributable to the increase in expenditures on school and registration fees. Because of the fact that most of the pupils in Uganda are in rural public schools, this increase brought about the overall

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[37] By definition of this study, public schools are government-aided schools, and private schools contain all types of schools which do not receive any financial support from the government. The detail explanation of the definition of this study is provided in Subsection 2.5.3.

increase in household contributions to primary education depicted in Figure 2-6. Figure 2-8 gives us another aspect of information about the increase in the amount of average household spending for public rural schooling. It shows that the proportion of pupils in rural public schools who pay school and registration fees significantly increased from 35% in 2005/2006 to 63% in 2011/2012.

Figure 2-8: Trends on the Percentage of Pupils who Paid for Primary Schooling, 2005/2006 and 2011/2012
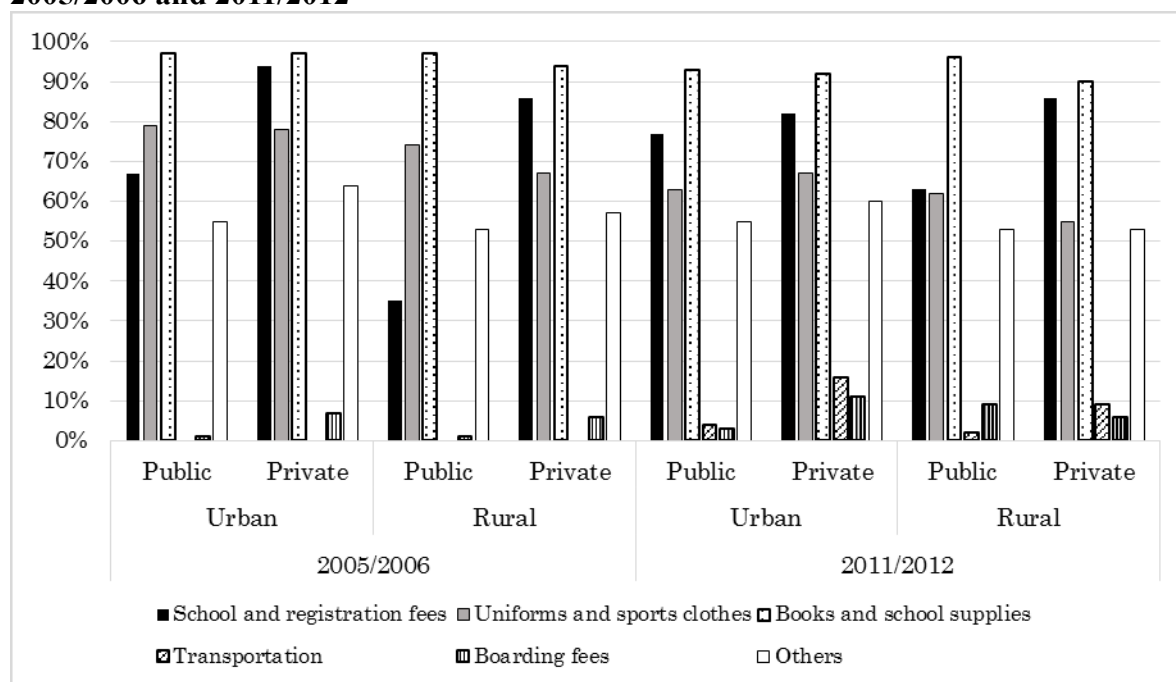
Source: Created by the author based on UNHS 2005/2006, and UNPS 2011/2012.
Note: UNHS 2005/2006 does not ask about costs to and from school. This is the reason why the percentage of pupils who paid is zero % in 2005/2006. In UNHS 2005/2006, the expenditure for transportation might be regarded as a part of other expenditure.

2.4 Decentralization and Informal User Fees

2.4.1 Decentralized Administration under Universal Primary Education Policy

Uganda is known as one of the first SSA countries which launched a political and fiscal decentralization process in the early 1990s (World Bank 2013b). The origin of the current five-level tiered Local Council (LC) system can be found in the Residence Council (RC)

system, which was introduced by NRM in 1986.[38] This system was first given a legal framework by the Local Government (Resistance Councils) Statute in 1993. Currently, the Local Government Act of 1997 and its amended version of 2006 provide the legal base for the decentralized delivery system of their social services, including education and health as well as agricultural extension, infrastructure and hygiene. Figure 2-9 shows the current structure of local governance both in urban and rural areas of Uganda.[39]

Figure 2-9: Structure of Local Governance in Uganda
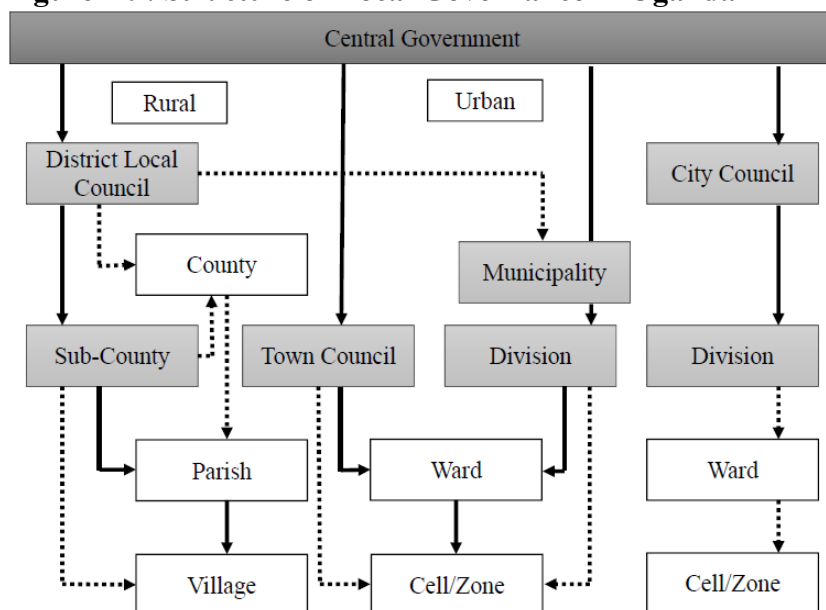
Source: Created by the author based on World Bank (2013b, 3).

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[38] NRM initially introduced RC system to effectively mobilize the support from grassroots people to continue bushfighting. Saito (2003) points out that NRM expanded public's participation in politics by decentralizing the system because they wanted to suppress the voice which asked for multiparty system. They justified their policy by arguing that it was a political party which had divided the country along ethnic and religious lines and caused the prolonged civil war.

[39] Kampala is the capital city, and the only city-level authority in Uganda. Municipalities and towns are the local governments in urban areas. Kampala and municipalities have lower local governmental units called divisions. In rural areas, district (local council 5 or LC5) is the highest local governmental unit, which has sub-county (local council 3 or LC3) below it. The other units painted in white in Figure 2-9 are administrative units, not local governments painted in gray. In rural areas, the highest administrative unit, called county (local council 4 or LC4) exists between the sub-county and the district. All the other administrative units can be found below the lowest local governmental units. In rural areas, the upper one is called parish (local council 2 or LC2), and the bottom one is called village (local council 1 or LC1). In urban areas and Kampala, the upper one is called ward, and the bottom one is called cell or zone. The council members at LC5, LC3 and LC1 levels are elected by the universal suffrage, while the council members at LC4 and LC2 levels are indirectly elected.

Naidoo (2002) made a comparative analyses of the degree of decentralization among the six SSA countries; he found that Uganda was the only county where a devolved form of decentralization was taken place at that time.[40] Although Uganda used to be popular as a country which undertook relatively authentic decentralization reforms, recent study have argued that a number of re-centralizing policies have been adopted in some sectors and the government needs to make substantial adjustment in their decentralization structures to deal with the rapidly increasing number of districts (World Bank 2013b).[41]

As a part of wider political reform, decentralization of the education service delivery was strengthened in 1998, which was soon after the introduction of UPE policy; overall administrative structure remains unchanged till now. As a result of this decentralization reform, the administrative roles of local governments at the district level were dramatically expanded, and School Management Committees (SMCs) started to be in charge of the management at the school level in the primary education sub-sector.

Figure 2-10 depicts the structure of central governance in Ugandan education sector after the decentralization reform in 1998. Overall, the central government is responsible for areas including national curriculum development, teacher development, national assessment, and higher education (Saito 2003; Namukas and Buye 2009; Eilor 2004). With the Permanent Secretary (PS) at the top, there are several departments including Pre-Primary and Primary Education in the MoES; each of the departments is headed by the

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[40] According to one of the most classic categorizations in the degree of decentralization by Rondinelli (1981), there are three forms of decentralization, namely deconcentration, delegation and devolution. In addition to the administrative and fiscal tasks, the authority including political and market responsibility is transferred to local governments when devolution, which is the most extreme form of decentralization, takes place.

[41] A number of districts in Uganda has been dramatically increasing. Although there were only 45 districts in 1997, 112 districts exist as of July 2012 according to UBOS (2014a). This phenomenon is sometimes called "district proliferation." Although it is said that it has been taken place in response to the rapid average population growth, many analysts point out that new district borders were intentionally drown by the ruling party in order to regain power in politically tough districts (World Bank 2013b).

Commissioner.[42] There are also several semi-autonomous institutions including UNEB and NCDC, which are established to handle special tasks in the education sector.

Figure 2-10: Structure of Central Government in Education Sector
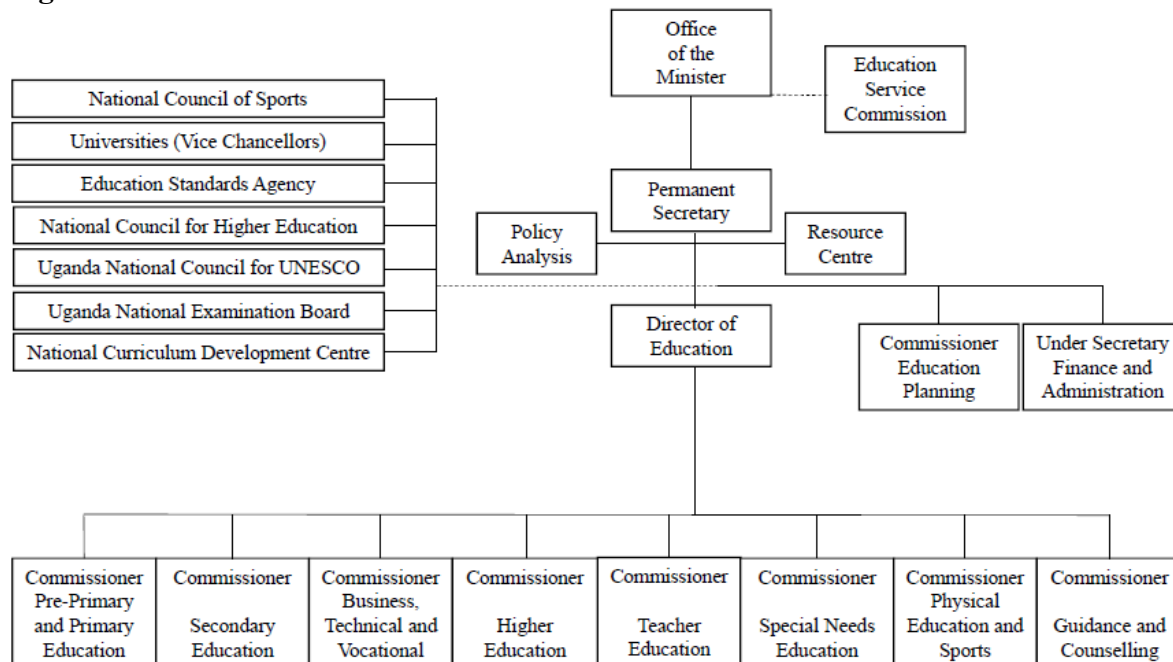
Source: Created by the author based on Namukas and Buye (2009, 184) and MoES (2014b, 32).

At the district level, there are political and administrative wings of the local council (see Figure 2-11). Under the chairperson, who is a head of the political wing of the local council, there are sector committees including education and sports committees, headed by the secretaries. On the other hand, the head of the administrative wing of the council is called the Chief Administrative Officer (CAO). The District Education Officer (DEO), who is the head of one of the administrative departments for the education sector in the council, is supervised by the CAO, and the head teachers in primary schools are answerable to the DEO. The District Inspector of Schools (DIS) is another key personnel in the district, whose role is extensive in the primary education sub-sector (Namukas and Buye 2009).

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[42] The name of the ministry has recently been changed to the Ministry of Education, Science, Technology and Sports (MoESTS).

Moreover, at the sub-county level, which is the lowest tier of the local government, sub-county chiefs represent CAO and visit each primary school on regular basis (Bategeka and Okurut 2006). Although the authority of the local governments has been extended as described above, Byamugisha and Nishimura (2008) point out that the capacity of these district officers to monitor and evaluate each school was considerably weakened owing to the reduced budget as well as the increased number of schools.

Figure 2-11: Structure of Local Government at the District Level
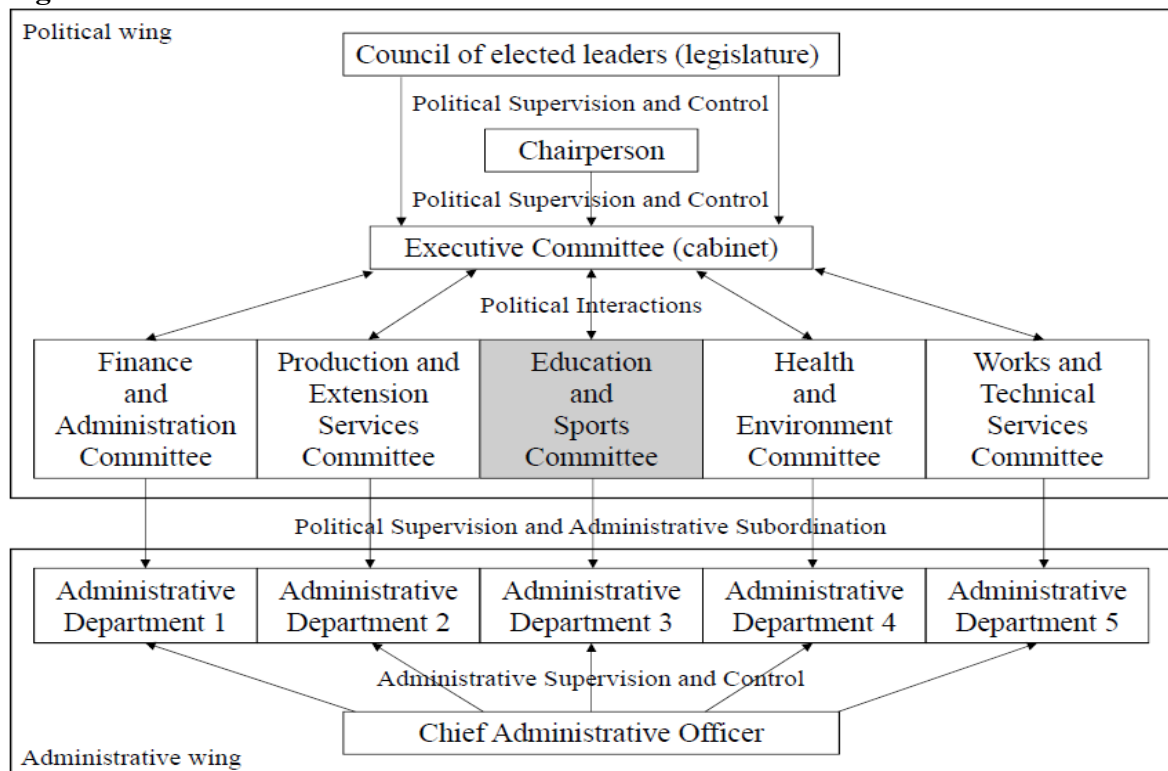
Source: Created by the author based on Saito (2003, 57).

At the school level, historically speaking, community involvement for school management was taking place through PTAs in Uganda's primary education system. After the introduction of UPE policy and the succeeding decentralization reforms, SMCs started to be primarily in charge of all the routine tasks in school management.[43] Currently, SMCs

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[43] SMCs themselves have long histories in Uganda. SMCs were established by the 1964 Education Act No. 228, which was amended under the statutory instrument No. 244 of 1969 (Najjumba, Habyarimana, and Bunjo 2013).

consist of six persons who are appointed by the foundation body of the school, and the head teacher serves as a secretary to the SMC.[44] Although head teachers are answerable to DEOs, they are also supposed to work closely with SMC members in managing their schools.

Their roles in managing schools as a representative of the government at the school level were further clarified by the Education Act of 2008. According to the review of key policy documents by Najjumba, Habyarimana, and Bunjo (2013), SMCs in Uganda have the following four distinct roles: "(1) financial management of the school, including budget approval and generation of new funding sources; (2) infrastructure and property development, management, and maintenance; (3) ensuring the discipline of learners and staff; and (4) school-level conflict resolution" (Najjumba, Habyarimana, and Bunjo 2013, 9). Among these four overall SMC roles, the first is particularly important because it is intended to ensure transparency, especially in the use of UPE grants from the central government as a terminal unit of the administrative organization under the current decentralized primary education system.

A recent study by Kayabwe and Nbacwa (2014) summarizes how SMC gets involved in the decision-making related to the overall budget planning and the use of the UPE capitation grant. At the beginning of the FY, a school development plan, which includes an annual budget plan, is prepared by a head teacher and the school finance committee (SFC) in each school.[45] The plan is submitted to the education office in local government after it is approved by SMC. When the UPE capitation grant is transferred to

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[44] According to the Article 3 (3) in the Second Schedule of Education Act of 2008, SMCs are consisted of six members, namely (1) local government representative nominated by district council; (2) representative of an executive committee at a parish council; (3) person elected by the lowest local government (see Figure 2-9); (4) representative of parents who are elected at the school annual general meeting; (5) representative of either teaching or nonteaching school staffs; and (6) representative of alumni and alumnae of the respective school (Najjumba, Habyarimana, and Bunjo 2013; Republic of Uganda 2008). The term of SMC is two years and one can serve two terms for four years as a SMC member.

[45] A typical rural public primary school in Uganda has two major finding sources: UPE capitation grants and the contribution from households. The details of the school-level decision-making processes related to the latter one will be reviewed in Subsection 2.4.2. Under the initiative of SMCs, some urban public schools found other funding sources: (1) contributions from the founding body, (2) leasing income from renting out their school grounds or halls, and (3) income-generating project (Kayabwe and Nbacwa 2014).

each school's UPE bank account from MoFPED through local governments, SFC formulates a plan for the actual spending based on the actual amount of the capitation grant and the requests from the heads of departments in each school. Head teachers undertake to spend the grant according to the SFC's plan approved by SMC.

It is worth noting that public schools have a certain level of autonomy in deciding the breakdown in spending the UPE capitation grants. According to the UPE Guidelines of 2008, the intended use of grants should primarily fall into one of the following four categories: (1) extra instructional/scholastic materials, (2) co-curricular activities, (3) school management, or (4) school administration (MoES 2008a).[46] Proportions of the distribution to these categories can be decided by schools if there is an agreement with the DEOs or Municipal Education Officers (MEOs).

2.4.2 Definition of Informal User Fees in This Study

This study focuses on the issue of user fees, which are informally collected in cash from households, at government-aided schools in rural Uganda. This subsection starts with clarifying the legal background behind the informality/illegality of user fee collection in rural Uganda. The subsection also provides the overall picture of this expanding phenomenon in the rural Ugandan context. The specific definition of informal user fees in this study is described in the last part.

In rural Uganda, it is officially not allowed for government-aided schools to collect any money from the parents and guardians (Najjumba et al. 2013). This is because the Education Act of 2008 has an Article 9, titled "Prohibition of charging for education in UPE or UPPET." It starts with Article 9 (1) saying: "No person or agency shall levy or

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[46] The proportion of distribution to these categories used to be determined in the guideline as follows: (1) 50% for extra instructional/scholastic materials, (2) 30% for co-curricular activities, (3) 15% for management, and (4) 5% for administration (Kayabwe and Nbacwa 2014). However, UPE Guidelines of 2008 removed these regulations. Under the new guideline, schools are also allowed to allocate up to 20% of UPE capitation grant for contingency expenditure (MoES 2008a).

order another person to levy any charge for purposes of education in any primary or post-primary institution implementing UPE or UPPET programme" (Republic of Uganda 2008, 14).

Article 9 (2) may give government schools a flexibility to collect or receive voluntary financial contributions from parents and other supporters. However, its purpose is limited to "contain a state of emergency or any urgent matter concerning the school" (Republic of Uganda 2008, 15). In addition, Article 9 (3) makes sure that "no pupil or student shall be sent away from a school or an institution or denied access to education for failure to pay any contribution" (Republic of Uganda 2008, 15) which schools ask parents/guardians to make, based on the Article 9 (2). The punitive clause specified in Article 9 (4) might fuel the fears of the stakeholders.[47]

Although collecting fees is generally prohibited, as an exception, urban schools are officially allowed to collect fees. Article 15 (5) in the Second Schedule of Education Act of 2008 clearly states that "a school in the area of jurisdiction of an urban council may levy a charge for administrative and utility expenses not exceeding 10,400/= per school year" (Republic of Uganda 2008, 56). It also states that "any school may levy a charge for mid-day meals as determined by the management committee in consultation with the district council" (Republic of Uganda 2008, 56). In other words, the SMC in urban government schools are officially allowed to make decisions on fee collection while the Education Act of 2008 only provides ambiguous rules on rural public schools.

There is nothing new in pointing out the existence of user fee collection from households in various forms in Ugandan public schools after the introduction of the UPE policy. In many cases, the PTA takes the initiative in collecting informal fees. Despite the fact that the PTA "was outlawed" (Najjumba et al. 2013, 43) by the Education Act of 2008,

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[47] Specifically, Article 9 (4) says: "A person who contravenes subsections (1), (2) and (3) commits an offence and is liable on conviction to a fine not exceeding fifty currency points or imprisonment not exceeding twelve months or both" (Republic of Uganda 2008, 15). 50 currency points is equivalent to USh 1 million.

PTAs are informally functioning in many public schools. The PTA is commonly composed of nine members, including the chairperson and one representative from the teachers (Kayabwe and Nbacwa 2014).

The amount of payment and its spending plans are agreed upon during the PTA's general meetings, and approved by the SMC.[48] Because of this common fundraising process, those fees are sometimes called "PTA fees" in Uganda. There are also cases where schools give names, including "development fee" or "exam fee," according to the purpose of their fee collection (Nishimura and Byamugisha 2007; Kisira 2008). The review by Kayabwe and Nbacwa (2014) shows that informal fees are charged mainly for (1) the salary of additional teachers who are not on the government payroll, (2) construction and maintenance of school buildings, (3) school feeding, (4) medical care, (5) salary for non-teaching staff, (6) teachers' accommodation and transportation, (7) top-up salary for teachers, and (8) meals and teas for teachers.

It is commonly found that the amount of fee varies by school location. Partly because of the existence of the clause in the Education Act of 2008 which officially allows urban public schools to levy charges, urban schools tend to charge higher fees than rural schools (see Figure 2-7). Kayabwe and Nbacwa (2014) find that the amount of household contribution in urban public schools are much higher than a ceiling on the amount prescribed in the Education Act of 2008.[49] It is also important to note that in-kind contributions or contribution by providing labor are common especially in rural public schools in addition to the cash contribution from the households. Typically, in-kind food

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[48] Schools generally charge higher amount of fee from the pupils in the higher grades.

[49] Kayabwe and Nbacwa (2014) find that, in urban public schools, the proportion of household contribution in the school budget revenue is 90% on average.

contributions enable school feeding in rural public schools in many cases (Najjumba et al. 2013).[50]

The compulsory nature of the fee collection in some rural schools is also found in Kayabwe and Nbacwa (2014). As mentioned above, the Education Act of 2008 strongly prohibits all public schools from sending pupils away because of their failures to make voluntary payments. However, Kayabwe and Nbacwa (2014) surprisingly find that all the 14 sampled schools located in either urban or rural areas have various indirect and direct tactics to make parents/guardians pay voluntary fees. For instance, they find that in one sampled rural school pupils whose parents/guardians fail to make the necessary fee payment are not allowed to be promoted to the next grade because they have not been handed their report cards at the end of the school term/year. In another sampled rural public school, they found that children whose parents/guardians failed to pay fees are simply sent back to their homes to collect money.

From a legal perspective, any child of primary school age in Uganda must not lose their access for schooling because they cannot afford to pay school expenses. In this sense, Ugandan UPE policy can be categorized as a free primary education policy. However, as explained in Subsection 2.3.2, public primary education in Uganda is not "free" in a precise sense, because, apart from school expenses, there are goods and services which households are supposed to purchase to send their children to school.

Among the several types of household expenditures related to public primary schooling categorized in Table 2-4, this study focuses on the issues of school expenses directly related to children's school attendance. In this study, the term, "informal user fee," is used to refer to a fee which rural government-aided schools charge from households through the PTA; it is equivalent to the "school expenses directly related to children's

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[50] According to Najjumba et al. (2013), schools ask parents/guardians to contribute 13 kilograms of maize and 8 kilograms of beans per child per term to have solid meals on average. To have semi-solid meals including porridge, parents/guardians are supposed to contribute 5 kilograms of maize per child per term on average. Additional cash contributions are normally required for food processing.

school attendance" from the demand-side perspective. The term "informal" is used because collection of fees by rural, government-aided schools is legally prohibited with the exception of collecting in an emergency situation. In addition, the study only covers the fees paid in cash by the households. Figure 2-12 visualizes the flows of funding for rural government-aided schools and the relationship among the key actors in the public education system to further clarify the definition.

Figure 2-12: Flows of Funding for a Public Primary School and Relationship among the Key Actors in Public Education System in Rural Uganda
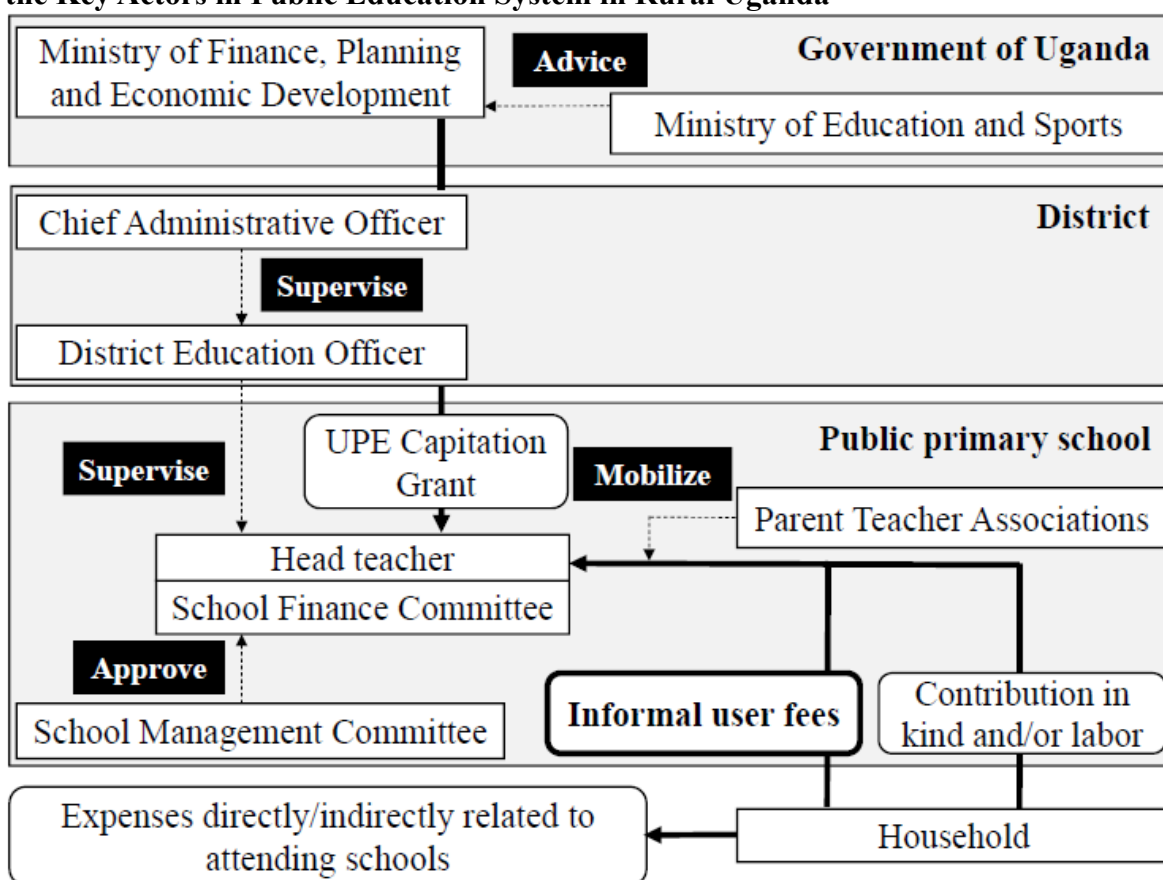
Source: Created by the author.

2.4.3 Relationship with Decentralization

Decentralization of primary education service delivery under the UPE policy was generally welcomed by people in Uganda, and there were many cases where collaboration among the stakeholders worked reasonably well to facilitate community involvement to deal with the

local needs of each school under effective leadership (Saito 2003). However, many recent studies point out that the new decentralized system has significantly weakened parents' participation in school operations (Najjumba, Habyarimana, and Bunjo 2013; Byamugisha and Nishimura 2008; Marphatia et al. 2010; Byamugisha and Nishimura 2015). Some studies argue that overemphasis on the free nature of UPE policy by politicians often adds momentum to the passive attitude of households toward making contribution (Byamugisha and Nishimura 2008). The issue of inadequate household participation under UPE policy is also highlighted in the government's report as a product of their "misconception" (MoES 2014b, 34) that only the central government is responsible for the implementation of UPE policy (MoES 2014b).

All in all, in the Ugandan context, UPE policy and decentralization in primary education service delivery are contradicting each other (Sasaoka and Nishimura 2010). While schools are granted basic autonomy under the decentralized system, UPE policy has outlawed PTAs and killed the formal fundraising function at the school level in rural public primary education system as was explained in the previous subsection. Dauda (2004) also finds that the accountability mechanism, which had been nurtured between PTAs and local governments, collapsed after the introduction of UPE policy. On the other hand, UPE policy has strengthened the role of the SMC to be in charge of monitoring the use of capitation grants as a representative of the government at the school level.

As a result, fiscal decentralization, in practice, becomes seriously dependent on the central government and donors. Parents/guardians' client power, which is indispensable to keeping the education service delivery accountable, has been diminished, and "SMC becomes closed-door business in the hands of local elites, and is restricted by central guidelines" (Sasaoka and Nishimura 2010, 91).[51] Sasaoka and Nishimura (2010) also

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[51] In the framework of accountability developed in World Bank (2003), this client power over providers is called "short route" (World Bank 2003, 6). On the other hand, another path, in which clients influence policymakers and policymakers influence providers, is called "long route" (World Bank 2003, 6). In Ugandan

highlight the fact that the vague specification of each stakeholder's role for policy implementation has undermined the situation.

In view of these circumstances, it is theoretically crucial for the Ugandan government to revive the client power of parents/guardians in the decentralized primary education service delivery system under the UPE policy. Moreover, the current expansion of informal user fee collection in rural public schools might be regarded as de facto fiscal decentralization, which is pioneered in some communities, outside the control of central government. However, what should not be forgotten is that the fee abolition policy has become a common response to the widening gap caused by the increasing community financing in SSA, in the 1980s and 1990s (Bray 1996). There is also a case study in Indonesia which finds that decentralization reform increases household expenditure on children's education and widens social disparities (Kristiansen and Pratikno 2006). The findings from this study might provide policy makers with important knowledge which is essential to formulate specific measures on appropriately reviving client power in primary school management under the UPE policy.

2.5 Privatization and Private Schools

2.5.1 Emerging Private Education

In the Ugandan context, the majority of primary schools were founded by religious bodies, and there are also "community schools" which were started by rural communities as self-help initiatives. After the introduction of UPE policy, the government took over many of the religious affiliated private schools and community schools (Kisira 2008). It is important to note that UPE policy has also been implemented alongside the liberalization of the

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case, a lowered capacity of district-level school inspections after UPE shows that even a long route of accountability has been weakened (see Subsection 2.4.1).

provision of education services, which enabled private schools to operate (Bategeka and Okurut 2006).[52, 53]

As a result, government-aided schools founded by religious organizations constitute the majority of the primary education provision in Uganda (see Figure 2-13).[54] There are not very many, but there are a certain number of government-aided primary schools founded by community and government. Regarding the private schools, the largest numbers are founded by entrepreneurs. The other private primary schools are founded by either the community or religious organizations in general.

Figure 2-13: Number of Schools by Founding Body and Funding Source, 2013
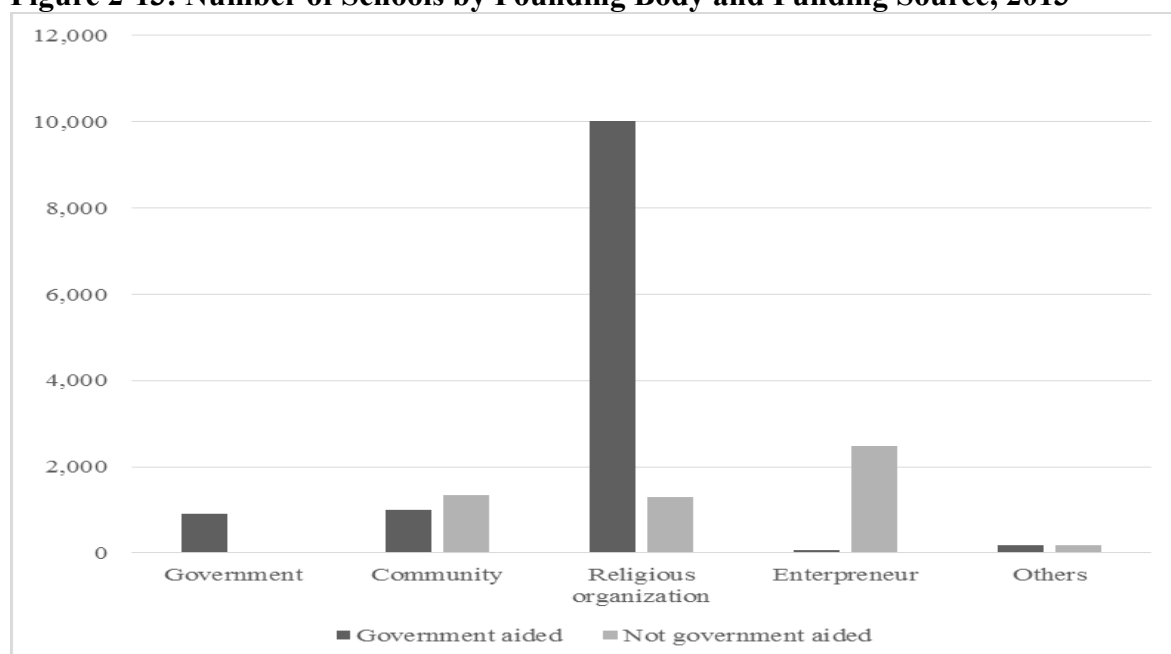
Source: Created by the author based on MoES (2014c).
Note: A number of schools founded by religious organizations is a total number of schools founded by Church of Uganda (COR), Catholic Church, Seventh-day Adventist (SDA) Church, and Islam. The number of schools founded by other religions or Christian denominations might be counted as others in this figure.

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[52] Strictly speaking, the growth of private schools in Uganda has its roots in the liberalization and privatization policy introduced as part of the structural adjustment policies by the World Bank and International Monetary Fund (IMF) from 1986 (Kisira 2008).

[53] Rondinelli, Nellis, and Cheema (1983) added privatization as one of the forms of decentralization.

[54] Almost half of them (48%) are founded by Church of Uganda (COR), which is a member church of the Anglican Communion, 43% of them are founded by Catholic Church, and 8% of them are founded by Islam (MoES 2014c).

Administrative data show that the percentage of pupils who enrolled in private schools has doubled from 8% in 2005 to 16% in 2014 (see Figure 2-14). However, it is pointed out that there are significant number of non-registered private schools, which do not join the annual school census conducted by the MoES (Kisira 2008). Given this limitation in administrative data, statistics calculated according to household survey data might capture a more realistic situation. As shown in Figure 2-15, while the percentage of children who enrolled in private school remained at around 43%–44% in urban areas, it increased from around 17% in 2005/2006 to 24% in 2011/2012 in rural areas.

Moreover, it is important to note that, among the non-government schools, there is a distinction between high-fee private schools, which include international schools, and low-fee private schools. According to Kisira (2008), high-fee private schools are usually located in urban areas in the central region. They typically have boarding sections, collect high fees from upper- and middle-class citizens to provide high-quality service, and have excellent academic reputations. In contrast, low-fee private schools collect relatively affordable fees from their clients.

The growth of low-fee private schools has been more or less brought about by the shortage of government-aided schools that can absorb increasing numbers of children as well as the increasing supply of newly trained teachers (Kisira 2008).[55] It could also be attributed by some informed parents/guardians to the dissatisfaction with the overall quality of education in government-aided schools, as well as the automatic promotion and local language education policies.

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[55] There is a trend in which newly trained teachers start their teaching careers from low-fee private schools although salary is relatively low compared with the one for the teachers on the government payroll (Kisira 2008).

Figure 2-14: Trends in Enrollment by Ownership in Ugandan Primary Education, 2004-2014
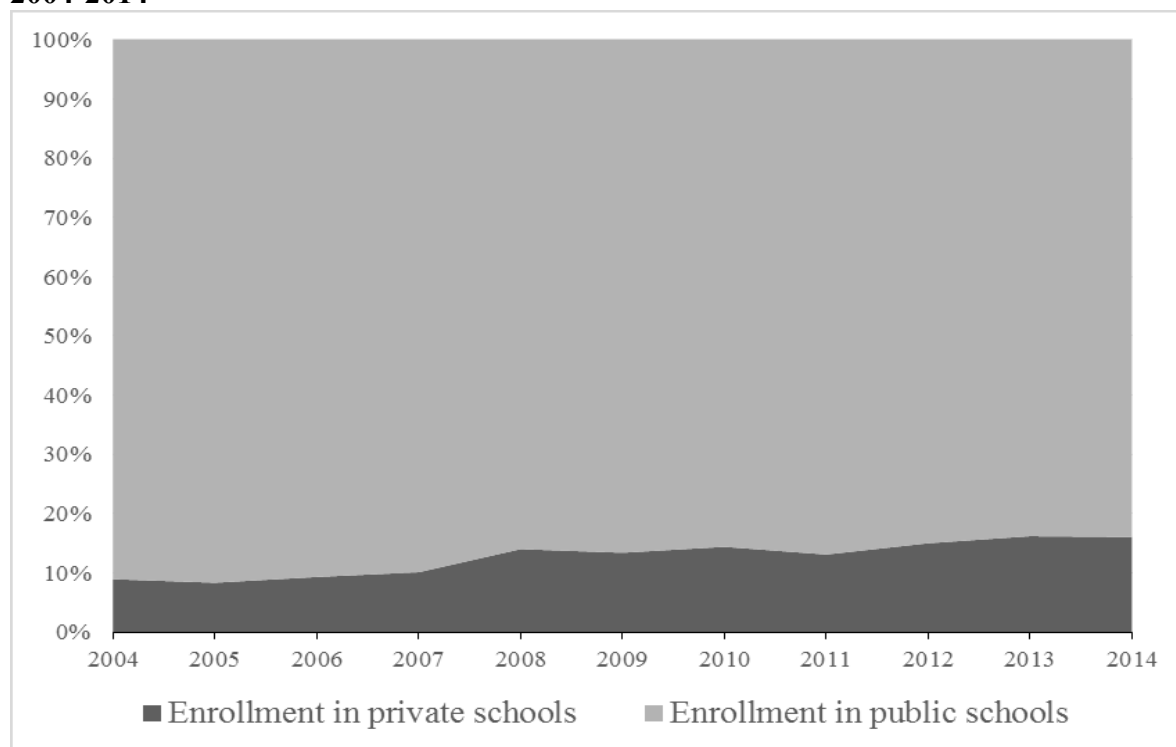
Source: Created by the author based on MoES (2014b).

Figure 2-15: Trends in School Enrollment and Choice of Children Aged 6-12 by School Location, 2005/2006 and 2011/2012
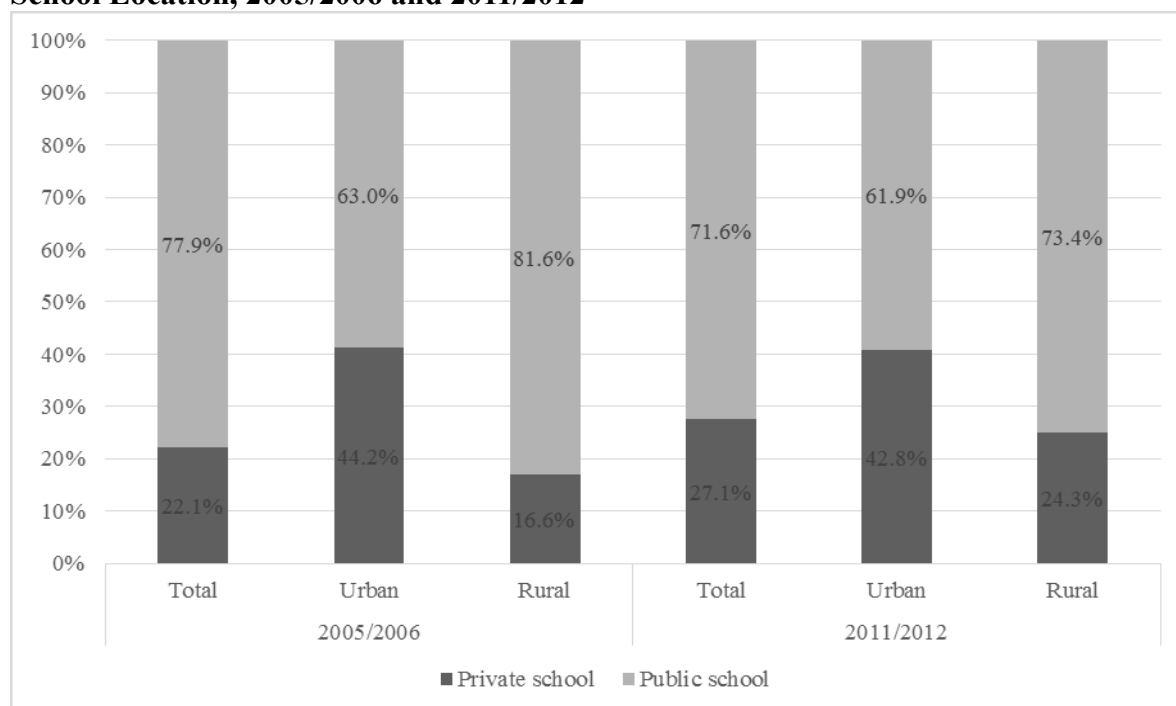
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

2.5.2 Public Regulation/Supervision Polices for Private Schools

Although there is no public funding for private primary schools in Uganda, all types of private schools are bound in principle by the same rules set by the MoES. This means that the same regulations are applied to both low-fee and high-fee private schools. There is a long list of minimum requirements because all private schools are required to meet the standard of the public schools. Kisira (2008) also highlights the fact that the bureaucratic registration process is painfully slow. Partly because of this inflexibility in the government's regulation policies for private schools, there are many low-fee private schools that remain unregistered and outside of the government's supervision.[56]

In order to account for the emerging roles of private sector in primary education provision, the MoES published a handbook entitled "Guideline for Establishment, Licensing, Registration, and Classification of Private Schools/Institutions in Uganda," which aimed at facilitating the smooth implementation of regulation/supervision policies for private schools, all of which are specified in the Education Act of 2008 (MoES 2014d). The guideline clarifies the following points: (1) all teachers in private primary schools must be registered and/or licensed with the MoES as a minimum requirement, (2) all private schools must follow the same syllabi as the one used in public schools, (3) the MoES is in charge of organizing seminars/workshops and in-service training courses for teachers from both public and private schools, (4) all private schools must have a functional SMC as a minimum requirement, and (5) all the school inspections by central and local governments target both public and private schools.[57, 58]

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[56] This might be one of the reasons why there is a gap between the statistics on the share of private schools from administrative data and from household survey data (see Figure 2-14 and Figure 2-15).

[57] License to teach in primary schools is issued by MoES even though an applicant has not yet completed or attended training courses. In contrast to this, only those who hold Grade III Teacher Certificate or Grade V Diploma by successfully completing training courses approved by MoES (see Section 2.1) are eligible to be registered with MoES. While license is issued to certify a person's eligibility to teach in primary schools, registration is one of the requirements to join the process of recruiting teachers in public schools.

A specific licensing and registration process for private primary school in rural areas is summarized in Figure 2-16. If a private school is not ready to go on to the registration process after two years of operation as a licensed school, a one year extension of license is allowed. However, the school must be closed if it fails to be registered in the third year. Besides, five years after the registration, all registered private schools must be inspected again by the Directorate of Education Standards (DES) to renew their registration status (MoES 2014d).[59] It is important to note that, in principle, all government-aided schools have fulfilled all the regulations for licensing and registration (Kisira 2008).

Any licensed and registered private schools, which meet additional requirements set by UNEB, are eligible to become an examination center for PLE, and are called "PLE Centre[s]" (UNEB 2010). However, even if a private school has not yet become a PLE Centre, that school can register its pupils as PLE candidates through a nearby PLE Centre (interview with a head teacher, September 30, 2014).[60]

In terms of the school management structure, a group of proprietors who set up a private school in Uganda is called the Board of Directors (BOD). The members of management committee of SMCs and PTAs are nominated by the BOD (Kisira 2008). According to the guidelines, all head teachers in private schools must be registered teachers with a certificate not below Grade V Diploma. In addition, he or she must work under the SMC and BOD as the technical and professional advisor, chief implementer, and

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[58] In Uganda, in-service trainings for qualified and untrained serving teachers (licensed teachers) are mainly provided through Coordinating Center Tutors (CCTs) system (World Bank 2012b; TISSA 2013). In this system, each core PTC is in charge of building a network of Coordinating Centers (CCs). Each CC covers 25 schools on average, and is managed by a CCT, who is usually a former PTC trainer and appointed by Education Service Commission. A management skill training for head teachers is also provided through CCTs system.

[59] In 2008, DES was established within the MoES to undertake the school inspections and set a quality assurance standards at the national level (Najjumba, Habyarimana, and Bunjo 2013; Macharia and Kiruma 2014; MoES 2012). The latest revision of the most comprehensive quality assurance standard in Uganda, namely the Basic Requirements and Minimum Standards (BRMS), was coordinated by DES (MoES 2010b).

[60] Interview by the author in a rural government-aided primary school in Bugiri District. The name of interviewee is withheld by mutual agreement.

accounting officer of the school (MoES 2014d). However, proprietors of low-fee private schools often hire less qualified teachers as head teachers to save the operating costs (interview with a head teacher, September 30, 2014).[61]

Figure 2-16: Licensing and Registration Process of Private Primary School

Licensing (Permission to operate a new school)	**Registration**
The proprietor prepares the forms and the supporting documents which proof that a new school meet the minimum requirements stipulated by MoES.	The proprietor prepares the forms six month before the expiry of the 2-year license.
DIS and DHI undertake inspection. Inspection report is endorsed by DEO.	DIS and DHI undertake re-inspection and issue inspection report.
	Regional DES officers undertake inspection to assess compliance to BRMS, and issue report.
CAO decides whether he/she approves or rejects the application based on all the submitted materials.	PS and CAO decide whether they approve or reject the application based on all the submitted materials.
2-year license is awarded.	5-year registration certificate is awarded.

Source: Created by the author based on MoES (2014d).
Note: BRMS=Basic Requirements and Minimum Standards. CAO=Chief Administrative Officer. DEO=District Education Officer. DES=Directorate of Education Standards. DHI=District Health Inspector. DIS=District Inspector of Schools. MoES=Ministry of Education and Sports. PS=Permanent Secretary. The case in rural areas is portrayed.

2.5.3 Definition of Private Schools in This Study

In this study, regardless of the foundation bodies, all primary schools which receive a capitation grant from the government under UPE policy are synonymously called public or

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[61] Interview by the author in a rural non-government primary school in Bugiri District. The name of interviewee is withheld by mutual agreement.

government-aided schools. On the other hands, all primary schools which do not receive any capitation grants from the government under UPE policy are synonymously called private or non-government schools. As indicated in the previous subsections, the non-government schools can be divided into high-fee and low-fee schools as well as registered and non-registered schools (see Table 2-5). As this study restricts its sample to the children in rural areas, private schools in the study may contain a significant number of non-registered schools founded by various types of institutions.

Table 2-5: Classification of Primary School Type in Uganda

	Funding source				
		Not government-aided			
		High-fee		Low-fee	
Founding body	Government-aided	Registered	Non-registered	Registered	Non-registered
Government Community Religious organization (Church of Uganda [COU], Catholic, Islamic, et al.) Entrepreneur NGO	"Public" or "Government-aided" (*Terminology used in this study*)	"Private" or "Non-government" (*Terminology used in this study*)			
Terminology used in the questionnaires of UNHS 2005/2006 and UNPS 2011/2012	Managed by "Government"	Managed by "Private," "NGO," or "Religious organization (Faith-based)"			

Source: Created by the author based on UBOS (2006), UBOS (2013b), and MoES (2014c).

2.6 Achievements and Challenges in Educational Outcomes

There is no doubt that UPE policy, initially, had an obvious impact in expanding access to primary education in Uganda. As shown in Figure 2-17, total school enrollment rose dramatically from around 3 million in 1996 to around 5.3 million in 1997 when UPE policy was introduced. Figure 2-17 also shows that total enrollment has almost tripled by now compared with the level in 1996, and the gender gap in enrollment disappeared in the late 2000s. The net enrollment ratio (NER) reported by the MoES, rose above 90% in 2004, and

hovers around 95% currently (see Figure 2-18). The NER was approximately 60% before the introduction of UPE policy (Nishimura and Byamugisha 2007; Appleton 2001a).

In Uganda, however, NERs calculated according to household survey data are significantly lower than those reported by the ministry.[62] In addition to the statics reported by the MoES, Figure 2-18 depicts the trends in NERs calculated on the basis of the major household surveys conducted since 2000. It shows that a significant percentage—more than 15%—of school-age children are still out of school under the UPE policy in Uganda. Moreover, it is worth noting that no sign of improvement in NER has been shown over the past ten years.

Figure 2-17: Growth in Primary School Enrollment by Gender, 1963-2014
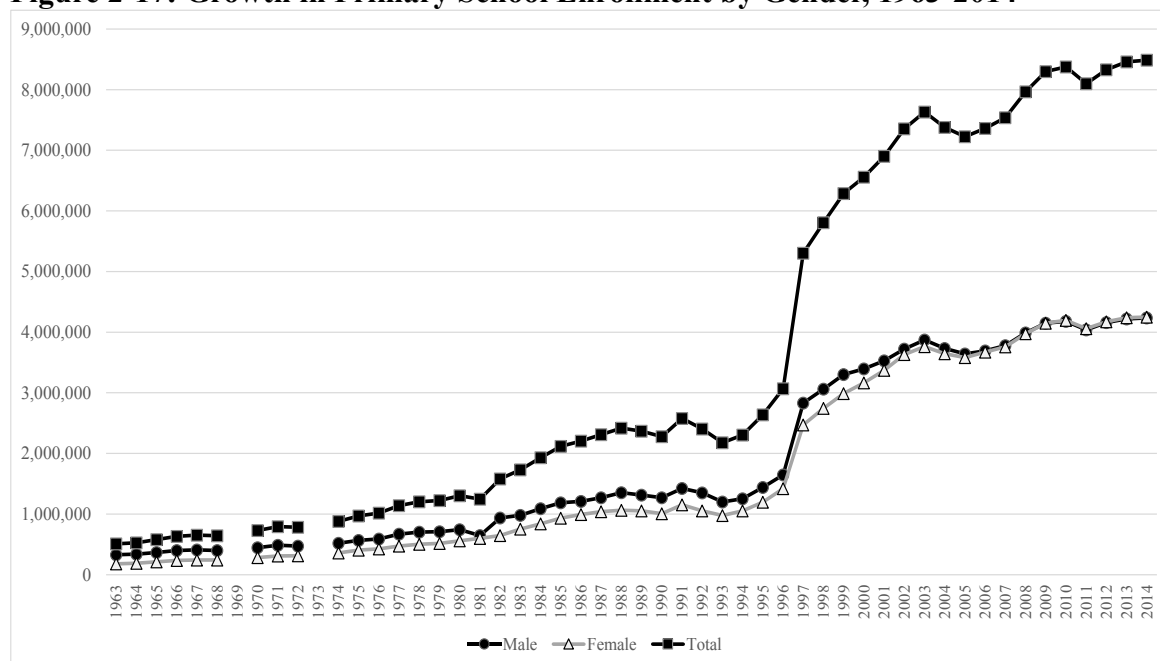
Source: Created by the author based on MoES (2009) and MoES (2014a).

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[62] There are several possible reasons behind this gap. First, it can be attributed to the difference between the concept of enrollment and attendance. Strictly speaking, household surveys collect information on school attendance. The administrative data might give us higher NER because there are significant number of pupils who enroll in school but do not attend school. Second, direct link to the level of funding might cause the inflation of NER in administrative data (UIS and UNICEF 2005). As is mentioned in the Section 2.2, the amount of grant for each school is decided based on the information collected through annual school census by MoES under the Education Management Information System (EMIS) in Uganda.

Figure 2-18: Trends in Net Enrollment Rate in Primary Education, 2000-2014
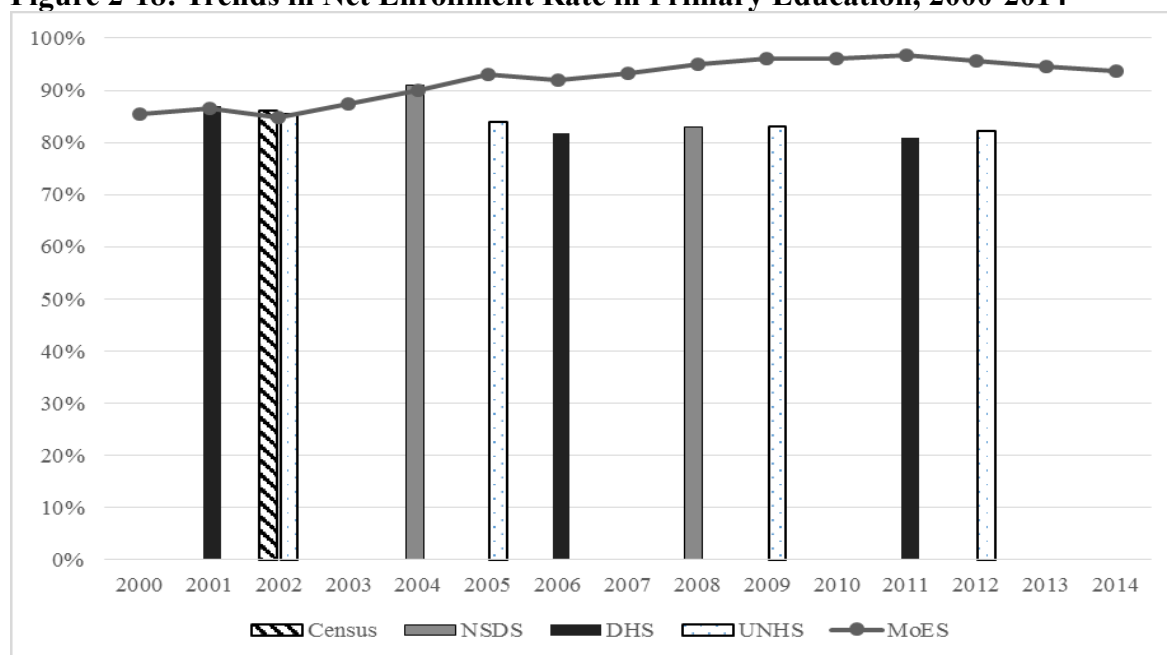
Source: Created by the author based on MoES (2011a), MoES (2014a), UBOS (2004), UBOS (2006), UBOS (2008b), UBOS (2010), UBOS (2014b), UBOS and ICF International (2012), UBOS and Macro International (2007) and UBOS and ORC Macro (2001).
Note: NSDS=National Service Delivery Survey; DHS=Demographic and Health Survey; UNHS=Uganda National Household Survey; MoES=Ministry of Education and Sports. NER calculated based on the Census in 2014 has not been released.

Figure 2-19 shows the estimates of NER by gender, location, and wealth quintile calculated on the basis of the latest household survey data. Rural areas had a lower NER (81.5%) compared with urban areas (85.5%). As Uganda is a country where more than 80% of the population dwells in rural areas, understanding the general mechanism of being out of school in a rural context is particularly important in achieving UPE.[63] There was also a disparity in primary school enrollment between rich and poor. The NER of children from the poorest quintile (77.0%) was lower than its counterparts. In addition, children in the Northern region are lagging behind in access to primary schooling.[64]

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[63] According to the provisional results from the census in 2014, 81.6% of population was living in rural area (UBOS 2014c).

[64] In addition to the conflict against the Lord's Resistance Army (LRA), Northern region had been facing the issues of refugees from Sudan and the Democratic Republic of Congo and cattle rustling in Karamoja.

Figure 2-19: Net Enrollment Rate in Primary Education by Gender, Location and Wealth Quintile, 2012/2013
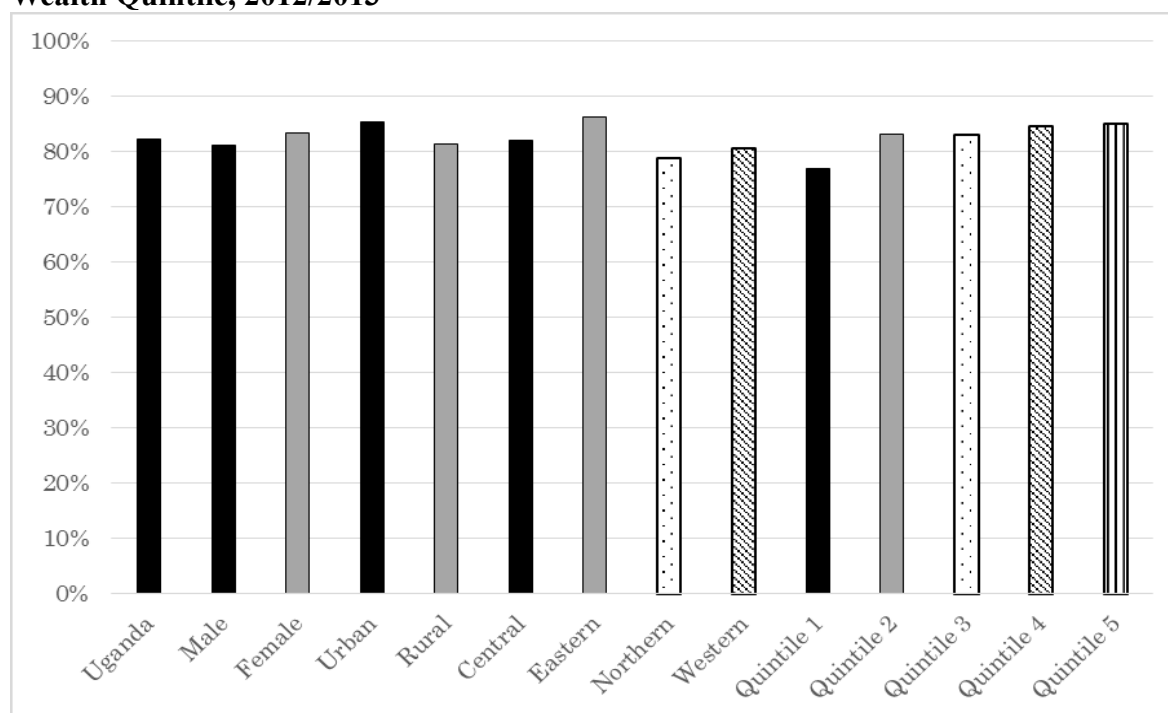
Source: Created by the author based on UBOS (2014b).

An important issues that made it difficult for Uganda to achieve the MDG goal of UPE is its outstandingly low completion rate. According to Nishimura and Byamugisha (2007), only 22% of children, who enrolled in grade one when UPE policy was introduced, reached grade seven in 2003. Although the primary completion rate has slightly improved over the last five years, it is still far from 100% (see Figure 2-20).[65] How to keep the children at primary schools until completion is still a salient challenge for Uganda. With regard to other indicators related to internal efficiency, the repetition rate has been kept at around 10% even though the automatic promotion policy was introduced in 2005 (see Figure 2-20). These high repetition rates may be linked to high dropout rates, which turn out to be low completion rates.

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[65] Completion rate is "the ratio of the total number of pupils who successfully complete (or graduate from) the last year of primary school in a given year to the total number of official graduation age in the population" (MoES 2014b, 10). MoES also reports the indicator called "survival rate to grade 7," which has been kept around 30%. UNESCO's EFA Global Monitoring Report uses the indicator called "primary cohort completion rate" as a proxy for primary school completion, which was 27.0% in Uganda in 2011 (UNESCO 2015).

Figure 2-20: Trends in Completion Rate and Repetition Rate in Primary Education, 2005-2014
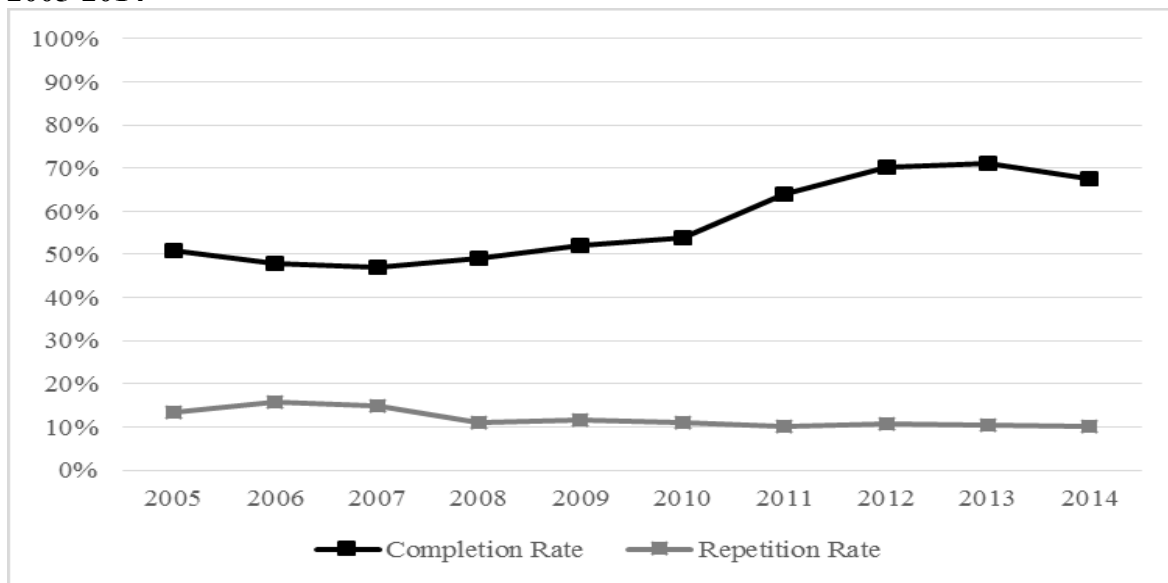
Source: Created by the author based on MoES (2014a).

Moreover, the learning outcomes of those who remain in school are seriously low, which might mean that Uganda has not yet recovered from the worsening quality of education service delivery after the massive expansion in quantity. Results from international learning assessments constantly show Uganda's low performance in comparison with other SSA countries. For instance, Uganda is fifth from the bottom in both reading and mathematics scores of primary six (P6) pupils out of 15 education systems which participated in the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) III project from 2005 to 2010 (Hungi et al. 2010). Results from a new type of learning assessment project, called Uwezo, were more disappointing.[66] Only 38% of children aged 10–16 in Uganda have grade two level literacy and numeracy competencies in 2012, which is much lower than the proportion in Kenya (63%) and Tanzania (50%) (Uwezo East Africa at Twaweza 2014).

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[66] Uwezo is a Swahili word, which stands for capability. Assessment tools were developed based on the ones used in Annual Status of Education Report (ASER) conducted by an influential NGO in India, Pratham. Unlike conventional international learning assessments including SACMEQ project, Uwezo collects larger data at the household-level using much simpler assessment kits. Another important unique feature is in allowing citizens to understand the current situation by letting them involved in the data collection processes.

The other consistent findings from standardized tests is the high performance of children in urban areas compared with their counterparts in rural areas, as well as the high performance of children in private schools compared with their counterparts in public schools (Uwezo Uganda at Twaweza 2012; Byamugisha and Ssenabulya 2005; Hungi et al. 2010). A national level learning assessment, called the National Assessment of Progress in Education (NAPE) Program, also confirms this trend.[67] As shown in Figure 2-21, a significant gap in test score continuously exists between pupils in urban and rural areas, as well as in public and private schools, although there has been an upward trend in general. In Uganda's context, there is no statistically significant gender gap. Regarding regional gaps, notable gaps exist especially between Kampala and other regions.

Figure 2-21: Trends on English Literacy Overall Score of P6 Pupils by Gender, School Location and School Ownership, 2006 and 2010
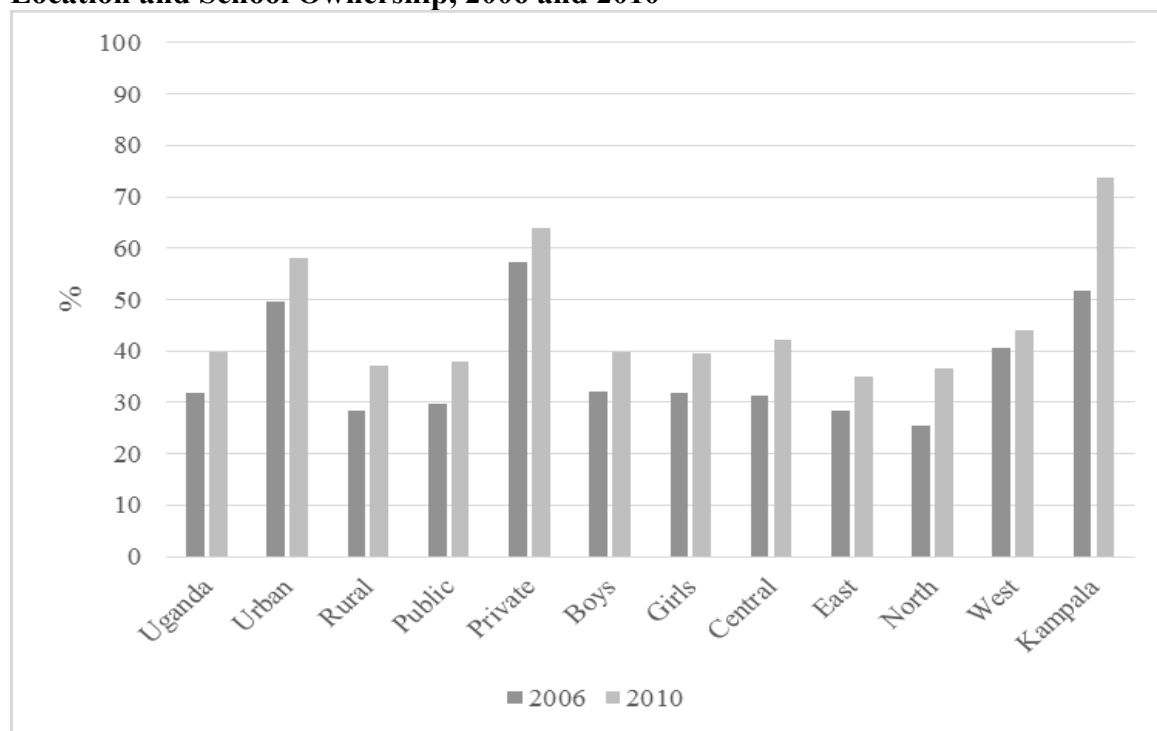
Source: Created by the author based on Najjumba and Marshall (2013).

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[67] NAPE program has been implemented by the UNEB since it was launched in 2003. The program annually assesses the literacy and numeracy proficiency of pupils in P3 and P6. In 2008, the program is extended to assess the learning achievement in English, mathematics, and biology of the students at senior two (S2) grade in lower-secondary education (Najjumba and Marshall 2013).

In addition to the outcomes, looking at the conditions of school inputs including teaching process is also important to understanding the quality of education.[68] Table 2-6 revisits the key information collected by the SDI Initiative in 2013. Interestingly, relatively small variations by school location and school ownership are observed in teaching equipment and the test scores of teachers. While most of the schools have minimum teaching equipment, the results show that the level of subject and pedagogical knowledge of teachers is low as an overall trend. Lack of knowledge on how to teach requires more attention; on average, only a quarter of questions about pedagogy are answered correctly by the P4 teachers.

Table 2-6: Quality in School Inputs by School Location and School Ownership, 2013

Indicator Name	Public	Private	Public Urban	Public Rural
Percentage of schools with minimum school infrastructure	60.0	41.7	66.0	56.5
Percentage of schools with minimum teaching equipment	94.2	95.7	95.3	93.5
Average of pupil-teacher ratio, all grades	46.2	19.4	37.6	48.9
Average of pupil-textbook ratio	12.4	100.2	7.1	16.8
Percentage of teachers who are absent from classrooms	56.5	40.3	49.8	59.5
Percentage of teachers who are absent from schools	26.9	14.0	18.7	30.6
Average of the percentage of questions in teacher test (English, mathematics, and pedagogy) answered correctly by P4 teachers	45.5	45.0	47.3	44.6
Average of the percentage of questions in teacher English test answered correctly by P4 English teacher	58.4	57.7	62.0	56.9
Average of the percentage of questions in teacher mathematics test answered correctly by P4 mathematics teacher	63.8	66.9	68.4	62.0
Average of the percentage of questions about pedagogy in teacher test answered correctly by P4 teachers	25.9	24.3	26.8	25.5
Percentage of P4 teachers with minimum subject knowledge	19.4	19.8	25.1	16.9
Average of time spent for teaching in minutes	175.3	260.0	213.1	163.9

Source: Created by the author based on Wane and Martin (2013).
Note: English teachers took teacher test about English and pedagogy, and mathematics teachers took teacher test about mathematics and pedagogy. The information on the absenteeism rates are collected during the unannounced second visits of the sampled schools in the survey (Wane and Martin 2013).

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[68] UNESCO (2004) sets a framework for understanding education quality with the five dimensions, namely (1) learner characteristics dimension; (2) contextual dimension; (3) enabling inputs dimension; (4) teaching and learning dimension; and (5) outcomes dimension.

In the comparison between urban public schools and rural public schools, the former perform better than their counterparts in all indicators. However, mixed trends are observed in the comparison between public and private schools. Public schools seem to be more equipped than private schools in terms of physical school resources. A considerable gap is observed especially in the number of textbooks per pupil. On the other hand, private schools may have smaller size classes with more disciplined teachers. Moreover, the average time spent on teaching in private schools is longer than that in their counterparts.

CHAPTER 3 :

LITERATURE REVIEW

3.1   Economic Role of the Private Sector in Education

There is growing attention being paid to the economic role of the private sector in education. This study focuses on the issues of user fee charge in public schools and parental choice of private schools, which can be categorized as one of the major forms of private financing to complement public financing in education. Before reviewing the literature about the specific research subjects, this section aims at sorting out the diversified forms of private sector involvement in education, as well as the theoretical background of this phenomenon from an economic perspective.

Historically, in the countries which are now being called developed countries, the government played an extraordinary role in building national education systems in the nineteenth and twentieth centuries to pursue their political, economic, and military goals (Plank and Davis 2010). The importance of government's strong initiatives and commitment to constructing education systems has also been emphasized throughout the recent international initiative to achieve EFA. In fact, in many countries in SSA, education is largely funded by the public sector, especially at the lower levels, including the primary education sub-sector (Nomura and Bruneforth 2011).

In the field of public economics, it is widely acknowledged that government spending is justifiable in the provision of public goods (Musgrave and Musgrave 1989; Stiglitz and Rosengard 2015).[69] However, as education is categorized as a private good,

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[69] The consumption of public goods is both non-rivalrous and non-excludable by definition; the amount consumed by one individual does not reduce the amounts available to consume by other individuals, and there is no way to exclude individuals from consumption. Price mechanism does not work properly in producing public goods because there is an incentive to make consumers free riders (Stiglitz and Rosengard 2015).

which can be exchanged in a competitive market in principle, there should be another economic rationale as to why the government should finance education.[70] The need for government involvement is explained as a result of the failure of the education market to provide optimal delivery.

From the economic point of view, there are several ways to explain why large public financing for delivering education has mass appeal. First, many economists acknowledge that we may fail to supply an optimal level of education service as a society because individual consumers make decisions without taking much account of several positive externalities of education which benefit other individuals.[71] In human capital theory, this phenomenon is explained as a case where social returns to education are higher than private returns to education.[72]

Market external benefits of education have been discussed by a vast amount of macroeconomic literature which analyzes the impact of education on economic growth. Early literature was based on neoclassical growth theory which stemmed from Solow (1956) (Barro 1991; Barro 1997; Mankiw, Romer, and Weil 1992). This classic growth model called the Solow-Swan model, was extended to explicitly capture endogenous factors, including human capital investment; the new theory is called endogenous growth theory (Romer 1994). A series of theoretical and empirical work on this topic generally supports the justification of public education financing. In addition, recent studies identify and quantify, various (albeit limited) nonmarket external benefits of education: fewer and

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[70] Education is both rival and excludable. There is a large unit cost in the provision of education, and there are lots of cases where individuals who do not pay for it are excluded from having access to education service (Stiglitz and Rosengard 2015).

[71] In economics, when the private actions of consumers/firms have positive or negative effects on others, there exist positive or negative externalities, respectively. Although education externalities can be either positive or negative, empirical evidence shows that they are predominantly positive (Mcmahon 2010).

[72] Rate of return studies have limitations because their social rate of return estimates are not able to include social benefits. Psacharopoulos and Patrinos (2004) find that social returns are lower than private returns. However, they also acknowledge that social rates of returns might get higher than private ones if we succeed in quantifying all the externality of education.

healthier children, increase in life expectancy, lower crime rate, higher degree of democratization, higher political and economic stability, and reduction in inequalities (Mcmahon 2006).

Moreover, there is economic literature which explains the need of public spending on education beyond the traditional arguments regarding externalities. For instance, the economics of uncertainty is applied by many scholars.[73] In addition, when applying contact theory, scholars argue that government involvement can be justified to address information asymmetry in an education system.[74] Economies of scale in education service delivery may also justify state action to prevent the monopoly of larger schools in the free market economy (Plank and Davis 2010).

As reviewed above, the need of public financing in education is well-supported by economic studies both theoretically and empirically. However, to what extent the government can take a role in funding, and especially in providing education is a long-standing contentious issue. Critique of public sector provision of education from the defenders of economic liberalism was stirred up by a series of work by Friedman (Friedman 1955; Friedman 1962). Since then, scholars have been making considerable effort to explain why it is justifiable to rely more on market mechanisms in the provision of education.

Many critics of state provision of education are armed with the theory of public choice, which does not place much reliance on the maximization of public interest by the

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[73] Consumers make choices about education under uncertainty; they do not know about their own or their children's ability and the future returns to schooling. As the insurance markets and the stock markets mitigate some of the risks in consumers' investment behavior, government runs schools to cover some of these risks (Brown 1992).

[74] In a complete competitive market, it is assumed that both buyers and sellers are fully informed about the quality of the goods and service exchanged there. However, in some markets, information is asymmetrically distributed between buyers and sellers, and this results in inefficient outcomes due to adverse selection and moral hazard (Jehle and Reny 2011). Like a well-known example of used-car market introduced by Akerlof (1970), there is a clear information asymmetry between parents (buyers) and schools (sellers) in education system.

government (Tullock 2002). They assume that government officials might attempt to maximize their own private interests. "Rent seeking" is perhaps one of the most well-known economic terms that derives from this theory.[75] For instance, widespread teacher absenteeism in public primary schools within many developing countries, which is also a serious issue in Uganda, might be regarded as a result of rent seeking behavior among public service providers (Duflo, Dupas, and Kremer 2012; Banerjee and Duflo 2006).

Although educational privatization is still a highly controversial topic, and education, especially at the basic level, remains mainly financed by the government, the role of the private sector in education has dramatically increased around the world over the last few decades (Patrinos, Barrera-Osorio, and Guaqueta 2009). Educational privatization has become one of the most important topics in education policy all over the world (Belfield and Levin 2005). Moreover, this phenomenon could be categorized as the application of public-private partnership (PPP) in the education sector, as well as an increase in school choice, which is mentioned in the following section.[76]

There is a variety of alternatives in the practice of PPP in education.[77] One useful way to categorize it is to separate provision and financing (see Figure 3-1). According to this categorization, user fee charge in public schools, can be regarded as one of the modes

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[75] According to Tullock (2002), the concept of "rent seeking" was developed by Tullock (1967), and Krueger (1974) coined the phrase "rent seeking." His definition of this term is "the use of resources for the purpose of obtaining rents for people where the rents themselves come from some activity that has negative social value" (Tullock 2002, 43).

[76] PPP has its origins in the public policy change in the United Kingdom (UK) and the United States of America (USA) over the 1980s (Mitchell-Weaver and Manning 1992). At that time, these countries were suffering from ballooning budget deficit and chronic economic stagnation. Thatcher and Reagan administrations push forward drastic reforms sharing similar doctrines in UK and USA, respectively: "cutbacks in public expenditures, privatization, deregulation, and public-private partnerships" (Mitchell-Weaver and Manning 1992, 47). This new mode of public management is called New Public Management (NPM) (Hood 1995). Governments in many both developed and developing countries all over the world have used PPP to provide public infrastructures and service in various sectors including health, transport, housing as well as education (Roehrich, Lewis, and George 2014).

[77] PPP could be generally defined as "a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance" (World Bank, ADB, and IDB 2014, 14).

of PPP, in which the public sector is in charge of the service provision while the private sector finances. On the other hand, it is important to note that the mode of PPP, which critics of state monopoly in education support, is mainly one in which the government leads policies and finance while the private sector delivers education services (Patrinos, Barrera-Osorio, and Guaqueta 2009). There are vast amounts of literature which have examined the impact of this mode of PPP's practices. Voucher systems in European countries such as Holland, and Latin American countries such as Chile are the well-known examples (James 1984; Shafiq and Myers 2014; McEwan and Carnoy 2000). In the USA, partly influenced by pressure from advocates such as Chubb and Moe (1990), many states have adopted the voucher system.[78]

Figure 3-1: Typology of the Public-Private Partnerships in Education

| | | Provision/Management | |
		Public	Private
Funding	Public	Public schools	Vouchers Charter schools Contracting out
	Private	User fees Student loans	Private Schools Home schooling Tutoring

Source: Created by the author based on Patrinos, Barrera-Osorio, and Guaqueta (2009, 3) and Chakrabarti and Peterson (2009, 4).

However, obviously, there are many cases where the private sector plays a significant role in education by both financing and providing education. Homeschooling

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[78] In USA, lots of unique and pioneering reforms have been made in promoting private provisions of publicly financed schools under a series of market-based school reforms. Charter schools, which are firstly established in 1992, are schools which receive public funding under a charter to meet some public requirements, but are provided greater autonomy than other public schools (Bifulco and Bulkley 2008). In terms of contracting out of school services, there has been an expansion of private firms, which are called educational management organizations (EMOs) and contract with public schools to manage them (Miron 2008).

might be one of the most extreme examples which can be classified in this category.[79] In addition, private schools are probably the most typical form of education both financed and provided by the private sector. In many countries, formal education began with private schooling for the elite, long before mass public education became prevalent.[80] Religious institutions played an important role in establishing these schools (Belfield and Levin 2010). As the role of the public sector in education has started shrinking, there have been a surge in the number of private schools in the higher education sub-sector all over the world, including Africa (Plank and Davis 2010; Levy 2006; Mabizela 2007).

Moreover, there has been increasing attention paid to the role of private schools in education sector development, particularly in developing countries. Those private schools, which serve the needs of poor children in poor income countries, are called "low-fee private schools" or "low-cost private schools," as distinguished from private schools for the elite or the middle class. The mushrooming of low-fee private schools in developing countries began to be exposed from the late 1990s, and there have been a body of empirical studies regarding their impact on several educational outcomes with mixed results (Tooley and Dixon 2005a; Heyneman and Stern 2013; Ashley et al. 2014).

3.2   Determinants of Access and School Choice in Primary Education

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[79] Homeschooling has recaptured the spotlight in USA. In the late 1960s and 1970s, radical critique for public education system, influenced by education critics including John Halt and Ivan Illich, started to demonstrate its policies by adopting homeschooling (Gaither 2009; Illich 1971; Maybery et al. 1995; Halt 1969). The advocates have won the right for the parents to choose homeschooling by the early 1990s in every state (Gaither 2009). NCES (2008) claimed that 2.9% of the school-age population in USA was homeschooled in 2007.

[80] Under "formal education," learning "occurs in an organised and structured environment and is explicitly designated as learning (in terms of objectives, time or resources)" (Werquim 2010, 21). In contrast, under "non-formal education," learning occurs "in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support)" (Werquim 2010, 22). Another type of education, called "informal education," is performed "in daily activities related to work, family or leisure" (Werquim 2010, 22).

In his review on the theories of school access, Marshall (2003) says that sociological approaches to this topic have more variety than do economic ones. He points out that the corner stone of the models created by sociologists is the emphasis on the intergenerational transmission of educational outcomes. Some of the key sociological concepts were created to clearly explain the mechanism of this phenomenon, which cannot be fully captured by economic theories according to the sociologists.

For example, Coleman (1988) introduces the concept of social capital, more simply the relations among persons, to incorporate social structures by showing the example of how we can use it in the analysis of high school dropouts. Another well-known sociological concept—cultural capital—is formulated by Bourdieu (1986) based on his research explaining the variation in educational outcomes among children from the different social classes. There is no doubt that the theories based on these concepts help us to understand the complicated mechanism working in the education sector, including the determinants of primary school enrollment in developing countries.

However, it is also true that most of the empirical studies about the determinants of primary school enrollment in developing countries start to set out their analytical framework according to one of the most dominant economic theories, namely, human capital theory. Human capital is the concept which refers to the intrinsic productive capabilities of human beings, most frequently measured as earnings. Typically, we can increase this capability by investing in education. The notion of human capital itself has already been referred to by the early economists such as Adam Smith, John Stuart Mill, and Alfred Marshall. In the late 1950s and early 1960s, theoretical and empirical works by the three modern economists played significant roles in establishing this theory (Becker 1964; Mincer 1958; Shultz 1963).

Human capital theory was originally applied to the analysis of schooling decisions by the youth. In developed countries, it is natural to assume that decision-making for schooling becomes a problem when adolescents attend college, and are concerned about the

labor market return from their education (Willis and Rosen 1979). However, in developing countries, we cannot ignore parental involvement in the decision-making process for schooling even at the compulsory education stage owing to weak law enforcement. Thus, for examining the determinants of primary school enrollment, we can assume that the rational parent makes decisions to maximize a utility function by comparing the expected benefits of sending their children to school with the cost (Glewwe 2002).

A great many studies about the determinants of primary school enrollment have been undertaken in developing countries. Most of these studies apply human capital theory, create a model wherein a households is viewed as a unitary actor, and assess the household's time allocation of primary school-age children using household survey data with household-level variables. Nevertheless, there are many arguments about the validity of this simple model. Considerable effort has been made to improve this modeling to capture more realistic and complicated household behavior within the framework of human capital theory, as well as beyond the bounds of economic theories (Baland and Robinson 2000; Basu and Van 1998; Cigno and Rossati 2005).

Besides, many other types of indicators can be set as dependent variables in applying this typical analytic framework. It is very common to examine, in one paper, the determinants of more than two variables related to children's schooling under a common analytical framework. As a special case of school enrollment, household decision-making mechanisms pertaining to their children's dropping out are very frequently analyzed, and some studies focus primarily on this topic (Ananga 2011; Hunt 2008; Sabates, Hossain, and Lewin 2013). The issue of high dropout rates is also prevalent in high income countries, especially at the level of upper-secondary education (De Witte et al. 2013; Rumberger 2010). Educational attainment, which refers to the highest degree of education an individual has completed, and is a common proxy for the accumulation of human capital, is also analyzed under a similar framework among both developing and developed countries (Johnson and Reynolds 2013; Oketch, Mutisya, and Sagwe 2012).

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It is worth noting that much of the previous literature about this topic has analyzed the trade-off between child labor and schooling. In developing countries, the efforts for ensuring school enrollment for all children and those for eliminating child labor are sometimes two sides of the same coin. Just as access to basic education with decent quality has been regarded as a fundamental human right and a key factor in the nation's economic growth, child labor has been regarded as a serious violation of labor rights and human rights, as well as a significant obstacle to national development.

Rosenzweig and Evenson (1977) are known as the authors of the first published empirical study about child labor in a developing country that used large-scale data to which the household time-allocative model, based on human capital theory, was applied. Their pioneering study examined the joint family decision in terms of fertility and the allocation of children's time to schooling and work, by fitting a simultaneous equation model to district-level data from the Indian rural population in 1961. They found that the motivation for having a large family can be attributed to the high return on using the raw labor power of children compared with investing in skills acquired at schools.

In addition to the global attention to the child labor issue and relatively firm theoretical foundation, the increasing availability of household survey datasets has fueled an explosion in the number of empirical child labor studies. Analyzing the trade-off between work and schooling, several types of variables have been used as a proxy for children's schooling. For example, Patrinos and Psacharopoulos (1995) compare the regression results for the different dependent variables, namely: enrollment, grade attainment, repetition, dropout, and working, using 1990 household survey data from Paraguay. Their main finding is that both school attainment and child labor are correlated with family background characteristics. Beyond enrollment, the relationship between child labor and several educational outcomes, including test scores and school completion, has been assessed by many previous studies (Akabayashi and Psacharopoulos 1999; Heady

2003; Ray 2003). Some studies, albeit few, attempt to examine the ultimate consequences of child labor, including wages, in the labor market (Beegle, Rakeev, and Roberta 2004).

Although the enrollment issues in primary education rarely become a research object in developed countries, parental choice of primary schools has become a hot topic both in developing and developed countries. In developed countries, the importance of this topic is growing partly because of the substantial increase in the school-choice options at the primary level. Although the most typical and important one is the parental choice of public schools vis-à-vis private, there has been progress made in the various types of alternative options in educational privatization/PPP as indicated in Section 3.1.

There has been a large body of empirical studies which investigate the determinants of parental school choice in high or middle income countries, advanced in terms of PPP in primary education service delivery. These studies commonly find that family socioeconomic status (SES), including parents' income and education level, and the child's ability are the important factors; in general, children from higher SES families and with higher ability are more likely to enroll in private schools instead of enrolling in public schools (Epple and Romano 1998; Hoyt and Lee 1998; Riedel et al. 2010; Epple and Romano 2008; Alves et al. 2015).

According to the literature review by Chakrabarti and Roy (2010), there are several other important factors for parents choosing schools: school demographics, academic performance, location, and school atmosphere. In particular, Chakrabarti and Roy (2010) highlight the fact that there have been surprisingly consistent findings from many previous studies conducted in various contexts on significant parent preferences toward school demographics. There is considerable empirical evidence to show that parents choose schools where their children interact with people who have similar characteristics on SES and ethnicity (Bifulco and Ladd 2007; Elacqua, Schneider, and Buckley 2006).

There has been an emergence of private education at the primary level even in developing countries. As a result, a growing number of studies about parental choice

between public and private primary schools has been conducted in lower income countries as well. As households in developing countries recently have more and more options on sending their children to school, we might have misleading results if we used binominal variables in representing their schooling decisions. For instance, as the following section shows, it has become very common to estimate price elasticity and parents' WTP for education by taking account of their school choice (Glewwe and Patrinos 1999; Lopez-Acevedo and Salinas 2000; Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006).

Many recent empirical studies have been focused on so-called low-fee private schools which cater to children from poor households. Although some argue that the emergence of private education is an urban phenomenon, there is much evidence which shows that this phenomenon has spread to rural areas as well (Heyneman and Stern 2013; Härmä 2011). One of the key questions researchers need to address is to what extent the SES of these households has an effect on parental school choice regarding this type of private school.

There is some literature which asserts that low-fee private schools can be accessed by the poor, so they have great potential to serve the needs of the poor. Tooley and Dixon (2005a) come to this conclusion based on descriptive analyses of the considerable amount of data collected in India and SSA, specifically from Ghana, Nigeria, and Kenya.[81] A series of related studies using the data collected through this global research project, generally support this finding (Tooley, Dixon, and Gomathi 2007; Tooley and Dixon 2005b; Tooley, Dixon, and Olaniyan 2005; Tooley, Dixon, and Amuah 2007; Tooley and Dixon 2006; Tooley, Dixon, and Stanfield 2008). A recent case study in Sierra Leone, which applies a similar research method, also highlights the affordability of low-fee private schools for the children from the poorest households (Tooley and Longfield 2013).

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[81] Surveys are conducted in selected low-income areas in each country; most of them are in urban areas (Tooley and Dixon 2005a). In India and Kenya, they select urban slum zones in Hyderabad and Nairobi, respectively. In Ghana, Ga District, which is a mixture of suburban and rural areas and surrounds the capital city of Accra, is selected. In Nigeria, both urban and rural areas of Lagos State including an urban slum zone are selected as their fields.

However, a rigorous review by Ashley et al. (2014) states that the overall strength of evidence on the affordability of low-fee private school for the poor is weak. In the Indian context, rich data from a longitudinal study in Andhra Pradesh, which is located in the southeastern region of India with 73% of rural population, unveils the fact that school choice is largely determined by SES (Singh and Bangay 2014). Härmä (2011) provides more counter evidence from quantitative analyses using relatively large-scale household survey dataset collected in remote and rural areas of Uttar Pradesh in Northern India. Her empirical result clearly shows that the children from the bottom two wealth quintiles are not able to afford low-fee private schools.

In SSA's context, Schirmer (2010) finds that poor households do not choose to send their children to low-fee private schools because of the high fees in South Africa. His analysis is conducted based on both quantitative and qualitative data, which were collected in selected urban and rural areas in three out of nine provinces of the country. There is also some, although relatively little, evidence based on quantitative analysis using large-scale data. Using the nationally representative data from household and community panel surveys in 2004 and 2007, Nishimura and Yamano (2013) find that more and more parents prefer to send their children to private primary schools even in rural areas in Kenya. They find that the probability of attending or transferring to private school is higher for girls and children from wealthier households.

Akaguri (2014) makes a substantial contribution by empirically demonstrating that educational cost influences the poor households' school choice between fee-free public and low-fee private schools for basic education in rural Ghana. Although his data analysis somewhat relies on descriptive data, his main findings show that private schools are not affordable for the poorest in rural areas. The study also shows that there is a significant amount of cost for public basic education which is high enough to become an obstacle for children from poor households to gain access to schools; this point is related to the topic reviewed in the following section.

Another key research question is to what extent quality of education affects parents' school choice between fee-free public and low-fee private schools. As Ashley et al. (2014) note, much evidence shows that the demand for private schools is driven by the high quality of education in private schools or, closely related to this, the low quality of education in public schools. Several other school characteristics, including the language of instruction, are also found to be the key determinants of this type of school choice in low-income countries (Ashley et al. 2014).

In terms of the Indian context, Baird (2009) finds that parents are less likely to send their children to private schools when public schools perform better and spend more on education, although his analysis relies on the state-level data which covers every region in the country. Baird (2009) also shows that language of instruction policies as well as religious/cultural factors significantly affect parents' school choice in India, even when all the other factors are held constant.

Regarding the context of SSA, Oketch et al. (2010) investigate the determinants of school choice between public and private schools under the free primary education policy in urban Kenya. Using unique household survey data with a large sample size, they find that there are more frequent pupil transfers among schools in favor of private schools in the slums than in the non-slum settings. Moreover, their quantitative analysis reveals that the quality of education in schools, defined as discipline and teacher performance, are found to be the main factors which explain the occurrence of these transfers.

Findings from a qualitative study in an urban slum of Kenya show that parents/guardians make choices to send their children to low-fee private schools because they have "several advantages, including a short journey to school, a better quality of education, small class sizes, scholarships, free meals, and friendly teachers" (Ohba 2013, 776). The study by Nishimura and Yamano (2013) in rural Kenya also makes a unique contribution by showing that children are more likely to be sent and transferred to private

schools if there is a higher quality of public education in their community, which is measured by the average pupil-teacher ratios of public schools in their study.

3.3 User Fees and Access for Primary Education

In general, the government is the principal provider of primary education in many countries all over the world. It is very common for developed countries to fund their primary education system mainly through taxation. In developing countries, however, public financing is to some extent complemented by user fees paid by households, which is the largest private financier. Besides, there has been a long-standing debate in terms of how to balance the positive and negative consequences of user fee payment for primary education in developing countries.

Before fee abolition policies became common in developing countries, there was a time when cost-sharing policies were popular even in the provision of basic education; this point is backed up by some influential studies. For example, Thobani (1984) analyzes how we can justify the policy option, namely charging user fees for social services, including education, from both theoretical and empirical points of view. He starts by arguing why the system of marginal cost pricing is not suitable in social sector services. He derives the efficient price for social sector services utilizing a partial equilibrium static framework, and also derives the optimal price from circumstances in which the government does not have enough resources to meet the demand. According to Thobani (1984), the case study on the education sector in Malawi shows that charging user fees is not only practicable and efficient, but also more effective for the children from poor households.

On the other hand, many arguments have been made by researchers who take a different position in terms of how the demand-supply gaps in providing social services in developing countries are to be met. Responding to Thobani (1984), Klees (1984) points out the problem in applying neoclassical economic theory in general, and various complex

aspects of the problems which exist in reality but are ignored by Thobani. Meanwhile, some researchers highlight the fact that fee payment is one of the essential forms of participation in educational development by households (Shaffer 1994). A classic review on this debate by Bray (1996) points out the importance of understanding the fact that the consequence of fee charges is significantly different in different contexts even within a country.

Effects of user fees on access to primary education can be examined by estimating the price elasticity of demand for primary education in large-scale datasets. Many of the early works on this topic are thoroughly reviewed by Jimenez (1987). The work of Gertler and Glewwe (1990) is known as one of the first rigorous empirical analyses on the price elasticity of demand for schooling in developing countries, which also estimates willingness to pay (WTP) for the improvement of education. Using the 1985/1986 Peru Living Standards Survey, Gertler and Glewwe (1990) find that schooling decisions by the poorer households are more sensitive to the fluctuation of the school price. In addition, the study finds that rural households in Peru have a willingness to pay fees which are high enough to cover the operating costs of new schools in their villages.

Building on the influential work by Gertler and Glewwe (1990), a body of empirical study on this topic has been conducted in developing countries, and has generally produced similar findings. They typically utilize parental reports on educational expenditure from cross-sectional data to create variables on school cost, as well as using distance to school as a proxy for the opportunity cost. Lavy (1996) also conducts a rigorous analysis on this topic to make a unique contribution. Using Ghanaian data collected in 1987, his study finds that increasing schooling cost in post-primary education as a consequence of prioritizing implementation of free primary education policy also affects the rural households' decision-making on sending their children to primary school.

There is a group of studies which goes further by accounting for the parental school choice between public and private schools. As the previous section shows, it becomes more

and more common to account for school choice by analyzing access to primary education in developing countries. For instance, Glewwe and Patrinos (1999) analyze the determinants of household education expenditure and school choice in Vietnam. They find a potentially small marginal cost for households to pay if they send their children to private schools instead of sending them to public schools. On the other hand, Lopez-Acevedo and Salinas (2000) estimate the marginal willingness to pay for public and private schooling in Mexico. Interpreting the results, they highlight the fact that higher privilege from the government's subsidies is reaped by the urban rich.

Applying a similar, but slightly modified identification strategy used by Gertler and Glewwe (1990), Alderman et al. (2001) explore which factors, including school cost, have a relationship to the poor households' decisions on whether they send their children to government schools, private schools, or no school. Using data from Pakistan, they generally find that even poor households largely make decisions to send their children to private school. Their estimates show that private school enrollment increases if private school costs are lower.

Glick and Sahn (2006) use the data collected in rural Madagascar to answer similar research questions set by Alderman et al. (2001). They confirm that price elasticity in demand for public school or overall primary schooling is higher for the poorer households. They highlight their finding on the negative effect of some public school characteristics, namely, the poor quality of the facility and the use of multi-grade teaching, on the demand for schooling.

When researchers use the information on household education expenditure to create a proxy variable for cost of schooling, estimates on its effect on school access can be biased because the level of household education expenditure may be determined by other factors. Although her study does not account for the choice between public and private schools, Lincove (2009) and Lincove (2012) make a notable contribution by addressing this type of bias. Specifically, these studies use predicted school cost to assess its effect on school

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enrollment: selection into schools and the possibility of receiving free primary education are simultaneously controlled in the model for estimating school cost by applying the double-selection model developed by Connelly (1992). The significance of her studies also lies in looking at the effect of school cost on school access under the free primary education policy.

Using cross-sectional household survey data from Nigeria, Lincove (2009) finds that costs still remain even after the policy has outlawed the collection of tuition and fees. However, her study shows that the remaining cost does not serve as a significant obstacle for schooling. Higher income elasticity for girls than boys, even after controlling for the cost factor, is highlighted as a key finding of her study. In contrast, Lincove (2012) applies a similar methodology using 2001 household survey data from Uganda. Contrary to the findings from Lincove (2009), her case study of Uganda finds that school enrollment is sensitive to school price under the UPE policy while the gender gap in price elasticity is very small. Another key finding is that, in the poor households, wealth has a negative effect on enrollment rather than school price.

Another recent study by Grenzke (2007) makes a unique contribution by modeling parents' sequential decision-making, namely, their child is enrolled in school or not, and remains in school or not, by applying the so-called Heckman selection model (Heckman 1976a). Using household survey data collected in 1996/1997 in rural Bangladesh, she finds that the annual cost does not significantly affect household decision-making on schooling, and points out that abolishing all school fees is not appropriate.

In the meantime, there is another group of studies which analyzes the effect of school fees on enrollment into education by assessing the impact of the fee reduction, or abolition policy. A growing number of studies makes use of repeated cross-section or panel data, and/or applies various statistical techniques to draw causal inferences. These studies typically use dummy variables for year to identify the nationwide policy impact. There are also studies which create variables on the presence of the policy or the amount of fees by

using school or municipality-level data, and utilize the heterogenetic fee abolition/reduction process within one nation.

Many of these studies target the tertiary education sub-sector in developed countries, such as the USA and European countries (Dearden, Fitzsimons, and Wyness 2011; Hemelt and Marcotte 2008; Hübner 2012; Bruckmeier and Wigger 2014). Although fee effects rarely becomes an issue at the primary and secondary education level in developed countries, Riphahn (2012) estimates the effect of school fees on educational attainment in West German upper-secondary schools using individual-level data from three annual surveys. Utilizing the variation in timing and the mode of fee abolition across states, she finds that upper-secondary school attainment is significantly increased as a result of fee abolition.

On the other hand, there are also many studies which identify the price effect on primary school enrollment in developing countries by applying this type of methodology. To begin with, it is worth noting that a series of related studies using randomized evaluations have identified the causal relationship between school fee and access to basic education in developing countries (Holla and Kremer 2009). Besides, the introductions of fee abolition policy under the EFA movement give opportunities to researchers, and their studies generally confirm the significant impact of fee reduction/abolition policies on improving access to primary education. Al-Samarrai and Zaman (2007) simply compare the enrollment ratios before and after the introduction of fee abolition policy in Malawi, calculated according to two household survey datasets. They find a remarkable increase in enrollment rates both in primary and secondary levels: greater increase is observed in poor quintiles than rich quintiles.

In the Ugandan context, Deininger (2003) used two nationally representative household survey datasets, collected before and after the introduction of UPE policy. His repeated cross-section estimates show that there is a significant and positive policy effect on primary school enrollment. The positive impact of user fee abolition on primary school

enrollment is also found in the recent rigorous analysis in terms of the launch of free primary education program in Kenya in 2003 (Lucas and Mbiti 2012). The evidence from Madagascar, which utilizes the abrupt user fee change due to the political turmoil, also confirms the large positive effect of fee elimination on primary school enrollment (Fafchamps and Minten 2006).

However, some case studies, especially from middle income counties, produce mixed results. For instance, Chyi and Zhou (2014) examine the effects of sequential tuition reforms which were implemented from 2000 to 2006 in rural China. Double-difference (DD) method is applied by using individual-level data collected in 2000, 2004, and 2006 from three annual surveys. Their finding shows that tuition waivers have significant and positive effects on primary and lower-secondary school enrollment. However, they also find that a tuition control policy has no statistically significant effect.

There is also a group of case studies from South Africa which assess the effects of stepwise introduction of school fee abolition policy since 2006. Under this intervention, school fees were eliminated only in the public schools which were located in the poor community. Specifically, a poverty score was calculated for each school based on the poverty status information of its neighborhood, and the poorest two quintiles of public schools were targeted at the initial stage. Utilizing this unique structure of the intervention, Borkum (2012) applies regression discontinuity (RD) design to investigate its impact on school enrollment. His findings show that there was no statistically significant policy impact on primary school enrollment. A modest positive impact on secondary school enrollment was found, but only among the poorer, targeted communities. More rigorous RD estimates using a richer dataset also confirm its modest policy impact on school enrollment (Garlick 2013).

In addition, although the targeted public schools were expanded to the poorest three quintiles in 2009, Nordstrum (2012b) points out that the frequency of non-attendance due to the existence of school fees increased between 2008 and 2009, particularly among

primary school age girls from poor households. His descriptive research reveals that this might be attributed to the fact that user fees are still charged even in the targeted public schools in South Africa. Several challenges in the implementation of this policy are also highlighted in Ahmed and Sayed (2009).

The unique structure of a municipal-level program in Bogota, Colombia, introduced in 2004, also provides the researchers with a chance to estimate the causal effect of fee reduction on school enrollment. Barrera-Osorio, Linden, and Urquiola (2007) apply an RD approach utilizing the fact that the program only targets the vulnerable households identified based on a certain scheme. In contrast to the findings from the case studies of nationwide fee abolition policy in South Africa, their findings show that the program had a significant impact on improving access to primary and secondary education, particularly among vulnerable children.

3.4   Case Studies in Uganda

Uganda is a country where some of the earliest empirical studies were conducted for showing the effectiveness of school on pupils' learning achievement in developing countries. A series of research studies in the 1970s by Heyneman asserts that there is a relationship between human and physical resources and pupils' educational outcomes using the data collected from Ugandan primary schools (Heyneman and Jamison 1980; Heyneman 1976; Heyneman 1977; Heyneman 1979). These Ugandan data are also used in Heyneman and Loxley (1983), a landmark study which provided new insight into the accepted notion at that time, which stemmed from the Coleman Report, that the effect of students' characteristics before entering school were substantially larger than those of school and teacher (Coleman et al. 1966). In short, Heyneman and Loxley (1983) found that the effect of school and teacher quality were relatively higher in lower income countries.

In Uganda, several empirical studies on school enrollment have been undertaken since a stable government started to conduct nationwide household surveys after they took over in the mid-1980s. Most of the early studies focus on the impact of UPE policy introduced in 1997. Deininger (2003) analyzes the impact of UPE policy using two nationally representative household survey datasets, namely, the Uganda Integrated Household Survey (UIHS) and the Uganda National Household Survey (UNHS), collected in 1992 and 1999/2000, before and after the intervention, respectively. He finds that the UPE policy significantly diminishes the importance of wealth as a determinant of school enrollment, as well as eliminating the gender gap. He also finds that UPE policy has dramatically reduced the cost of schooling particularly in rural areas. However, his regression result suggests that the increase in enrollment clearly has been achieved by sacrificing school quality.

Beyond analyzing the determinants of school enrollments, Grogan (2008) focuses on analyzing the effect of the UPE policy on the age of school entry using the nationally representative household survey data from the 2000 Uganda Demographic and Health Survey (DHS), and the 2001 Uganda DHS and Education Data Survey. She finds that school fee abolition has significant positive effects on timely school entry particularly for girls and children in rural areas.

The recent study by Lincove (2012) estimates the effect of school costs on enrollment in Uganda using the large cross-sectional household survey data from the 2001 Uganda DHS and Education Data Survey. In addition to examining whether the price of school still remains an obstacle to enrollment, this study examines whether the subsidies reduce the gender gap as hypothesized in Glick's model (2008). She applies a sophisticated econometric model, namely, a double-selection model developed by Connelly (1992) to take account of the possibility that the shadow price of school for the children who do not attend school may affect schooling decisions. This study finds that the gender gap in

enrollment is almost gone although school costs still inhibit enrollment. The study also finds that wealth affects enrollment rather than school price in the poor households.

Using the rural household survey data collected in 2003 and comparing the pre- and post-UPE cohorts, Nishimura, Yamano, and Sasaoka (2008) assess the impact of UPE policy on enrollment as well as overall educational attainment, and the determinants of the private cost of education. They find that UPE policy significantly reduced delayed enrollment and increased the completion rate of the fourth and fifth grades. They also find that the proportion of education expenditure out of total expenditure is very low for primary education, regardless of its expenditure levels.

Overall, this literature demonstrates that there is a positive initial effect to UPE policy on school enrollment and other educational attainment. Moreover, the empirical evidence from household survey data shows that UPE policy dramatically corrected inequality in primary school enrollment by SES, gender, and geographic locations. However, many studies also warn about the fact that internal inefficiency, low quality of education, and inequality in the quality of education have become substantial issues for Ugandan primary education. As the interest of the government and donors shifts to covering the shortcomings of UPE policy, a growing number of empirical studies has started to analyze these new issues. For example, Muvawala and Hisali (2012) focus on the issue of internal efficiency. They find that all primary schools in Uganda are technically inefficient according to parametric models based on panel data from 2001 to 2008. Quality issues are mainly analyzed using rich learning assessment datasets (Byamugisha 2010; Najjumba and Marshall 2013; Nannyonjo 2007).

Moreover, a recent study by Tamusuza (2011) finds that the enrollment issue is still substantial in Uganda. Using the four nationally representative household survey datasets, namely: Uganda DHS Education Data Survey 2001 and UNHS 2002/03, 2005/06, and 2009/10, he finds that median retention in primary school is less than five years. School non-attendance and dropout rates are significantly associated with SES, geographic

location of the school, age at initial enrollment, and child labor. Child labor significantly lowers school attendance, especially in rural areas.

There are also a group of studies which focus especially on school enrollment issues for Ugandan orphans, because the number of orphans is still increasing owing to the prevalence of human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) in SSA countries, and Uganda is not an exception. Using the same data as that used in Nishimura, Yamano, and Sasaoka (2008), Yamano, Shimamura, and Sserunkuuma (2006) examine the determinants of the living arrangements and school enrollments of marginalized children, namely, orphans in rural Uganda. They find that female adolescents aged 15–18, who are either double or virtually double orphans, are significantly less likely to enroll in secondary schools and slower in their grade progressions. However, they do not find any significant difference in school enrollment between orphans and non-orphans among children aged 7–14, which could be attributed to the result of UPE policy.

CHAPTER 4 :

METHODOLOGY

4.1 Analytical Framework

4.1.1 Theoretical Model

Human capital theory, whose applications to education issues are summarized in Becker (1964), has been providing a fairly comprehensive framework for understanding the various perspectives on observable behaviors related to education. Following this theoretical development, economic models, which show how rational forward-looking consumers choose years of schooling to maximize their lifetime satisfaction, are developed by Ben-Porath (1967) and Heckman (1976b) applying the traditional theory of intertemporal choice. Considerable theoretical literature has shown the various applications of these basic models in different contexts.[82] As summarized in the review by Lavy (1996), these models typically assume that consumers face a "trade-off between current earnings foregone and enhanced future earnings" (Lavy 1996, 293).

Under perfect capital markets, research findings might become consistent with a general optimal stopping rule, which is that "everything else being equal, one should continue investing in schooling until the rate of return to a given level of schooling falls below the market interest rate on alternative investment options" (Lavy 1996, 293). However, a growing amount of literature has demonstrated that poor households might not

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[82] Related to the topic of this study, a simple two-period model of schooling choice in basic education is developed by Glewwe (2002). Newhouse and Beegle (2006) also develop a two-period model to assess the determinants of school choice between secular and non-secular private schools in Indonesia. Asadullah, Chakrabarti, and Chaudhury (2012) apply this model in the context of rural Bangladesh.

be able to make an optimal level of investment because of imperfections in credit markets or borrowing constraints.[83] The necessity to consider several policy options, which provide public support for basic education, might be explained under the assumption that these credit market imperfections are operational. For instance, Eckstein and Zilcha (1994) investigate how free primary education policy, which is financed by proportional income tax, increases economic growth and equalizes the intra-generational income distribution.

In a developing country context, Jacoby (1994), using data from Peru, finds the evidence which shows that borrowing constraints have effects on children's progression through the primary education system. Jacoby (1994) also makes a significant contribution by modifying the Ben-Porath (1967) model to address the timing of schooling with borrowing constraints. Moreover, Behrman and Knowles (1999) provide a summary of the theoretical background which explains why schooling might be correlated with household income in the presence of borrowing constraints. In addition to their thorough literature reviews, Behrman and Knowles (1999) use data from Vietnam to show the considerable association between household income and children's school success.

The analytical framework of this study is established by borrowing key components of the economic model developed by Gertler and Glewwe (1990), which has been widely used to specify households' behavior on their children's schooling and school choice, taking account of school quality and school cost (Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006).[84] Although the model somewhat simplifies the formal two-period model, it inherits the most basic assumption: households are rational in making decisions as to whether they send their children to school and, if they send them, to what type of school they send them, given the cost comparisons and the future return from the investment in

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[83] In this study, the term "borrowing constraint" is used as a synonym of "liquidity constraint" and "credit constraint."

[84] Gertler and Glewwe (1990) adopt a general demand function model for obtaining price elasticity and WTP for social services in developing countries, which is created by Gertler and van der Gaag (1988). This model is firstly adopted to the health sector policy analyses (Gertler and van der Gaag 1988).

schooling. The goal of the following part of this section is to demonstrate how schooling price, which includes user fees paid to schools, differently affects poor and rich households' decisions about their children's school choice, by adopting the theoretical discussion for health sector analysis found in Gertler, Locay, and Sanderson (1987).

Let assume that the household, which sends its child to school j, derives utility from their consumption of goods and services (C_j), and the human capital of its child (H_j). Then, the utility function has the form

$$U_j = U(C_j, H_j). \qquad (4\text{-}1)$$

In addition, let Q_j be the quality of education they receive in school j, and H_0 be expected human capital of its child without schooling. Then, the production of human capital in school j has the form

$$H_j = Q_j H_0. \qquad (4\text{-}2)$$

In a formal two-period model, a future return from the investment for schooling is captured in the deflated value of the households' consumption in period two, which is the sum of the households' income in period two and the remitted child's income determined by years of schooling and quality of education he or she received (Glewwe 2002).

Moreover, let Y be the whole household income available for all types of expenditures. If the household makes a decision to send its children to a school j, it pays P_j which contains both the direct and indirect costs of schooling. Direct costs include user fees and all the other expenses directly/indirectly related to attending school j. The main indirect cost is the foregone household production by the child when school j is chosen. Then, household consumption can be derived from the budget constraint. It becomes

$$C_j = Y - P_j, \tag{4-3}$$

with a feasibility condition of $C_j \geq 0$. It is worth noting that the constraining level of income could be the present value of lifetime income if credit markets are perfect. However, if there is a borrowing constraint, the constraining income depends on the length of time over which households can possibly spend (Gertler, Locay, and Sanderson 1987). By substituting Equation 4-3 into Equation 4-1, the equation becomes

$$U_j = U (Y - P_j, H_j). \tag{4-4}$$

If the household decides not to send its child to a school ($j = 0$), its consumption simply becomes $C_0 = Y$ and human capital becomes H_0, which is produced only by inputs from the household.

Suppose the household has $j + 1$ alternatives with the $j = 0$ alternative being to keep its children out of school. The unconditional utility maximization problem is

$$U^* = \max (U_0, U_1, \ldots, U_j), \tag{4-5}$$

where U^* is the maximum expected utility across the $j + 1$ options, and $U_0, U_1, \ldots, U_j$ are the conditional utility functions specified in Equation 4-4, given the constraints specified in Equation 4-3.

Let us assume that the household is facing a choice between gaining a high human capital for its child through a "high price/high quality" school h ($H_h = Q_h H_0$) and gaining a low human capital for its child through a "low price/low quality" school l ($H_l = Q_l H_0$) in a discrete choice world. If the household's income is at a low level (Y_l), the choice becomes one between points A and B depicted in Figure 4-1: gaining higher human capital through higher quality of education ($H_h - H_l$) or gaining additional consumption by saving the cost

of schooling ($P_h - P_l$). The latter option is chosen by this low-income household as point B is on the indifference curve which gives the household higher utility.

On the other hand, if the household's income is at a high level (Y_h), the choice becomes one between points C and D depicted in Figure 4-1. It is important to note that, in the points C and D, the household faces the same tradeoffs between schooling and consumption which it faces in points A and B, respectively. However, the former, namely, option C, is chosen by this household with high income. This time, point C is on the indifference curve which gives higher utility to the household.

Figure 4-1: Discrete Choice Model
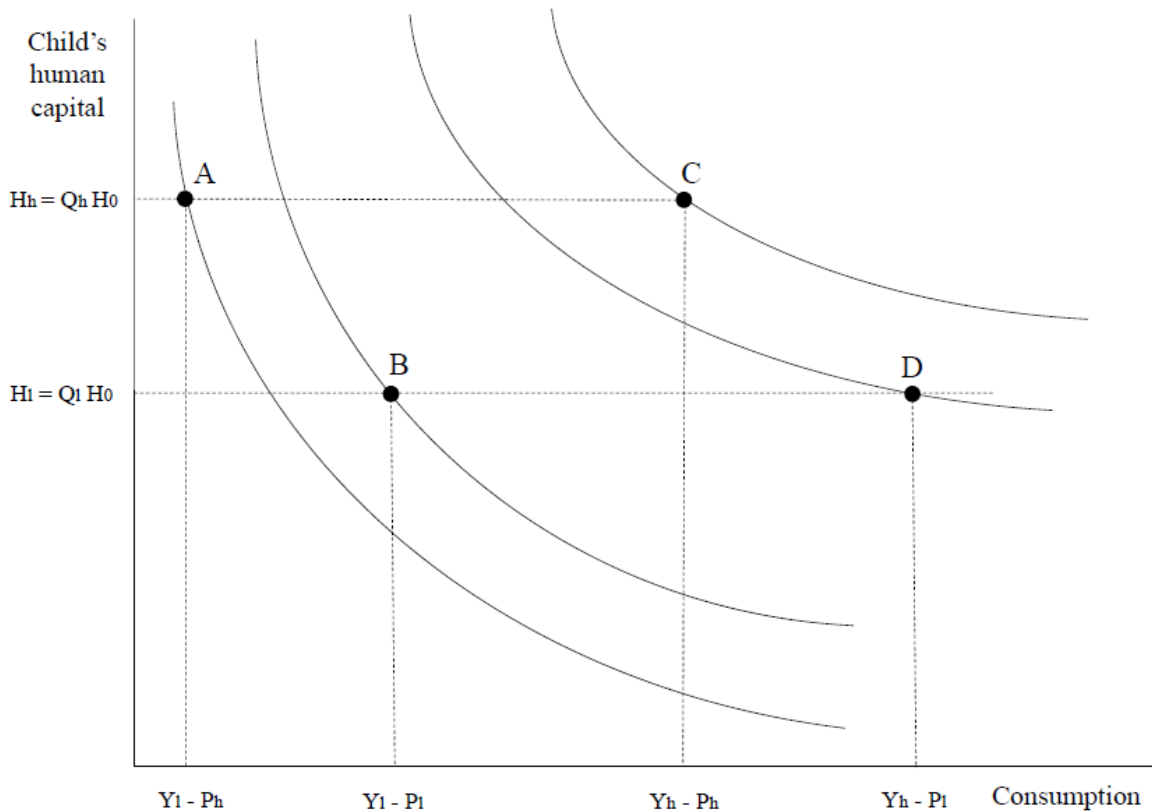
Source: Created by the author based on Gertler, Locay, and Sanderson (1987).

As is discussed in Gertler, Locay, and Sanderson (1987) in the case of the health sector, the key implication from this theoretical model is that, if human capital formulated through education is a normal good, households are more likely to choose the alternative with "high price/high quality" as income rises. In other words, in a discrete choice world,

price elasticity of demand for education declines as income increases. In the situation where significant amounts of fees are collected not only in private schools but also in public schools, the high price of attending public schools might affect poor households' schooling decisions as this theoretical model demonstrates. Moreover, the economic model might demonstrate that an option to send its child to a "high price/high quality" private school might be more likely taken by the rich household.

4.1.2   Conceptual Map

As shown in Figure 4-2, households in rural Uganda make a decision on whether they send their children to school or not, and make a decision as to which type of school they send their children. Related to Research Questions 1-1 through 1-4 and Research Questions 2-2 and 2-3, solid arrows in the figure show how demand-side and supply-side factors might affect households' decision-making on their children's schooling. Related to the Research Question 2-1, dashed arrows in the figure show how community-level factors affect rural public schools' decision on whether they informally collect user fees from households or not.

In this study, demand-side factors which might affect households' schooling decisions are categorized into three groups: individual characteristics, household characteristics, and community characteristics. Individual characteristics include a child's basic attributes, namely, age, gender, and his or her orphan status. Household characteristics include its level of wealth, its demographics, as well as the basic attributes of the household head, namely, his or her age, gender, and educational level.[85] Community characteristics include its contribution toward public primary education, proximity of the school to the community, and its location.

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[85] In addition to family income and parental occupation, social scientists generally include parental education as one of the major components of SES measure (Jeynes 2002).

The characteristics of rural public schools can be categorized as supply-side factors which might affect household's schooling decisions, and be operational through government's intervention. In addition to the existence of an informal user fee charge, the quality of education, including PTR and condition of the facility are contained in the characteristics of public schools. These public school quality factors are also regarded as the ones which might affect rural public schools' decisions on informal user fee charges. The study also set a group of community-level factors which might specifically affect rural public schools' decisions on informal user fee charges. These community's characteristics include its population, average wealth, average educational level, average school attendance, and expansion status of private school education.

Figure 4-2: Conceptual Map of the Factors on Households' Schooling Decision in Primary Education

Supply-side

Public School's Characteristics
- Informal user fee charge

- Quality of education
    - Pupil-teacher ratio
    - Condition of the facility

Community's Characteristics
- Population
- Average wealth
- Average educational level
- Expansion of private school education
- Community contribution
- Public/private school's proximity
- Location (region)

Demand-side

Attending School
- Attending Private School
- Attending Public School

Not Attending School

Individual Characteristics
- Age
- Gender
- Orphan status

Household's Characteristics
- Wealth
- Household demographics
- Household head's characteristics
    - Age
    - Gender
    - Educational level

Source: Created by the author based on Alderman, Orazem, and Paterno (2001) and Lincove (2012).

4.2   Hypotheses

This study identifies seven hypotheses corresponding to each of the seven sub-research questions outlined in Section 1.3. Related to the four sub-research questions under Research Question 1, the following four hypotheses are formulated.

Hypothesis 1-1: In rural Uganda, the probability of attending private school increases among children from non-poor households.

Hypothesis 1-2: In rural Uganda, the positive effect of household wealth on the probability of attending private school instead of attending public school increased among children from non-poor households.

Hypothesis 1-3: In rural Uganda, the low quality of public schools in the community has a positive effect on the probability of attending private school among non-poor households.

Hypothesis 1-4: In rural Uganda, the presence of community contributions for public schooling has a positive effect on the probability of attending public school among poor households.

Hypothesis 1-1 through 1-4 are formulated in terms of the determinants of primary school attendance and school choice. The first, second and fourth touch on the effects of demand-side factors, namely, households' wealth and the existence of a community contribution. The third one is related to supply-side factors, namely, the effects of public schools' quality on primary school choice in rural Uganda. These hypotheses are basically set in order to update the previous Ugandan studies on the determinants of primary school

attendance but go further by examining the determinants of primary school choice, using relatively fresh datasets.

As reviewed in Section 3.4, the effects of key demand-side factors on primary school attendance have been examined by estimating similar basic demand functions (Grogan 2008; Nishimura, Yamano, and Sasaoka 2008; Lincove 2012; Deininger 2003; Yamano, Shimamura, and Sserunkuuma 2006; Kasirye and Hisali 2010; Tamusuza 2011). Regarding the effects of key SES indicators, namely, wealth status, and parental education, Deininger (2003) finds that their effects on primary school attendance were significantly reduced after the introduction of UPE policy. Effects of wealth status were only found in boys in Nishimura, Yamano, and Sasaoka (2008), and not found in Lincove (2012). However, Lincove (2009) also highlights her finding on the significant effects of wealth status in the primary school attendance of children from poor households. Moreover, effects of parental education were only found in girls in Nishimura, Yamano, and Sasaoka (2008), but were found in both boys and girls in Lincove (2012).

While many previous studies, including some Ugandan case studies, have investigated the effects of SES indicators on primary school attendance under free primary education policies, little is known about the effects of SES indicators on school choice between public and private schools. One exception is a small sample in-depth qualitative study by Kisira (2008), which reveals that there are so-called low-fee private primary schools in rural Uganda, and even a poor household makes its school choice guided by several factors. As his study is cited in Heyneman and Stern (2013), this may imply that the Ugandan case provides evidence which shows that increasing private school attendance in rural areas may contribute to bridging a gap in the public sector's provision of primary schooling (Tooley and Dixon 2005a; Tooley and Longfield 2013; Alderman, Orazem, and Paterno 2001).

However, as the details reviewed in Section 3.2 show, there are also many recent studies in various developing countries which argue that the role of the private sector's

involvement in bridging the gap in the provision of primary schooling is limited (Ashley et al. 2014; Baird 2009; Nishimura and Yamano 2013; Ohba 2013; Oketch et al. 2010). Hypothesis 1-1 and Hypothesis 1-2 of this study are set based on a group of these previous studies. The hypotheses are also consistent with the scenarios which can be explained by the theoretical model used in this study (see Subsection 4.1.1).

Hypothesis 1-3　builds on Nishimura and Yamano (2013), which found that the quality of public schools in the community affects households' school choice between public and private schools. Using the household survey data collected in rural Kenya, they found that households are more likely to send their children to private school if the quality of the public school in their community is lower. In addition to the PTR in public schools, this study adds the facility condition of public schools as a variable. In addition, guided by the theory proposed by Gertler, Locay, and Sanderson (1987), the study hypothesizes that the quality of public schools especially affects the school choice made by the non-poor.

The study also expects to find that public school attendance by the poor is higher in the communities with higher voluntary contributions. Many studies point out that negative parental attitude toward schooling is one of the most serious issues under UPE policy in Uganda (MoES 2014b; Najjumba et al. 2013; Byamugisha and Nishimura 2008; Byamugisha and Nishimura 2015). Based on this finding, which mainly comes from the school official's perceptions, the study formulates Hypothesis 1-4.

Related to the three sub-research questions under Research Question 2, the following three hypotheses are formulated.

Hypothesis 2-1: In rural Uganda, the community with high average wealth and no community contribution are more likely to charge informal user fees and charge higher informal user fees.

Hypothesis 2-2: In rural Uganda, children from poor households are more likely to be out of school if a public school in their community charges high informal fees.

Hypothesis 2-3: In rural Uganda, the probability of attending public schools by children from non-poor households is not affected by the presence of a high informal fees charge in a public school in their community.

Hypotheses 2-1 is about the determinants of informal user charges under free primary education policy. This hypothesis covers an aggregate of demand-side factors. Although there have been few previous studies that directly investigate the determinants of informal user charges under free primary education policy according to the literature identified, the study has established this hypothesis based on some previous studies which may have links with the topic.

As mentioned in Hypothesis 2-1, the study expects to find that a public school in a community with higher SES is more likely to informally charge fees in rural Uganda. In general, many studies have found a positive relationship between household educational expenditure and SES in developing countries (Glewwe and Patrinos 1999; Gertler and Glewwe 1990; Lopez-Acevedo and Salinas 2000). Moreover, some studies find this trend in the Ugandan context (Nishimura, Yamano, and Sasaoka 2008; Lincove 2012; Deininger 2003). Although previous studies mainly conduct analyses at the individual or household level, this study assumes that public schools can charge more fees from a group of households which, on average, are richer and more educated.

Moreover, the study expects to find that a public school can charge fewer fees in a community if it has a higher active attitude toward local educational development in rural Uganda. As pointed out in Nordstrum (2012a), the introduction of free primary education policy can be regarded as a shift from user fee collection to community financing. Hypothesis 2-1 is formulated according to the assumption that reintroduction of the user fee

charge is spreading in communities where this shift in the mobilization of resources at the school level is not promoted very well.

Hypothesis 2-2 and Hypothesis 2-3 are created based on the findings from studies using qualitative research methods to find that informal collection of fees in public schools hinders poor children's access to primary education (Garde 2014; Byamugisha and Nishimura 2008). Most of the previous studies use the information on household educational expenditure to assess the effect of fee/payment on school attendance, and generally highlight in their findings the significant willingness among households to pay for education (Gertler and Glewwe 1990; Grenzke 2007; Alderman, Orazem, and Paterno 2001; Lincove 2009; Lincove 2012; Foko, Tiyab, and Husson 2012). On the other hand, this study directly assesses the effects of informal payment in public schools utilizing school-level information, and intends to provide empirical evidence which supports the findings from qualitative studies.

In addition, Hypothesis 2-2 and Hypothesis 2-3 expect to find that the presence of high fee charges in public schools does not affect school choice by the children from either poor or non-poor households. Although it is possible to assume that poor households can make a choice to send their children to private schools, the study expects to find that poor households' choices are limited as Hypothesis 1-1 to Hypothesis 1-3 indicate.

4.3 Model

4.3.1 Identification Strategy

One of the main goals of this study is to assess the effects of high informal user charges on the school attendance and school choice of primary school age children in rural Uganda. Ideally, it is crucial for the social science researcher to compare the treatment outcome with

the counterfactual, which is what the outcome would be without the treatment, if one wants to draw a conclusion about the causal link between the existence of the treatment and the change in the outcomes. However, it is physically impossible to transport the same treated unit of evaluation back to a time before treatment is undertaken, erase all of their experiences and measure their outcome values again, which would thus lead to the missing data problem (Murnane and Willett 2011). Generally speaking, the alternative is to compare the outcomes of treated members with those of untreated members who have similar characteristics in every aspect, except for their treatment status.

The gold standard of making causal inferences is to conduct randomized control trials (RCTs) in which a researcher simply compares the outcomes of the treatment and control groups in a similar manner in all observed and unobserved dimensions (Gertler et al. 2011). In practice, however, it is often difficult to implement researcher-designed RCTs because of high costs and the difficulty in overcoming ethical issues (Murnane and Willett 2011). As a result, researchers often utilize experiments which naturally occur, or appropriately combine methods which were developed to replicate randomization as much as possible in nonexperimental studies, including propensity score matching (PSM), DD method, instrumental variable (IV) method, and RD design (Khandker, Koolwal, and Samad 2010; Murnane and Willett 2011; Ravallion 2008).

The central challenge in our identification lies in how to account for the probably selective take up of the high informal user charge in rural public schools. If high informal user fees are not randomly charged in public schools and the selection is determined by either observable or unobservable factors, or both, the error term in the estimating equation contains variables which are correlated with the dummy variable for the presence of high informal user charges. In this case, the estimate of the effect of the high informal user charge is biased owing to the violation of one of the critical assumptions required in obtaining unbiased ordinary least squares (OLS) estimators: independence of explanatory variables from the error term, or having exogenous explanatory variables (Wooldridge

2013; Khandker, Koolwal, and Samad 2010). The mechanism of selection into high informal user charges in public schools is investigated as a first step of the empirical analyses for this study in order to check for the endogeneity problem as well as to understand the context of high informal user charges in rural Ugandan public schools.

This study applies the DD method utilizing the availability of the datasets from different time periods. The general idea of DD in this study is to measure changes in primary school attendance and school choice in both a community with public schools charging high informal fees and control communities over time, and take the difference in time variation between the two groups. Table 4-1 illustrates how the DD method is applied to achieve one of the primary goals of this study. In summary, the average impact of high informal user charges in a public school is given by calculating the difference between the differences in outcomes for the treatment group and the difference, namely, $(Y_1^T - Y_0^T) - (Y_1^C - Y_0^C)$ in Table 4-1.

Table 4-1: Illustration of the Application of Double-Difference Method in This Study

	First period (2005/2006)	Second period (2011/2012)	Difference
High user charge in a public school in a community (Treatment)	Y_0^T	Y_1^T	$Y_1^T - Y_0^T$
No high user charge in public school in a community (Control)	Y_0^C	Y_1^C	$Y_1^C - Y_0^C$
Difference	$Y_0^T - Y_0^C$	$Y_1^T - Y_1^C$	$DD = (Y_1^T - Y_0^T) - (Y_1^C - Y_0^C)$

Source: Created by the author based on Gertler et al. (2011, 98).
Note: Y_t^T and Y_t^C are the respective outcome of primary school age child in a community with public schools charging fees and a control community in time t ($t = 0$ for the first period and $t = 1$ for the second period).

Within a regression framework, the most basic equation for DD estimate can be specified as follows:

$$Y_{it} = \beta_0 + \beta_1 T_k t + \beta_2 T_k + \beta_3 t + \varepsilon_{it.} \qquad\qquad (4\text{-}6)$$

In Equation (4-6), t is a dummy variable which equals zero and one in the first and the second periods, respectively. Y_{it} denotes an outcome of a child i at time t, T_k denotes the presence of the high informal user charge in a public school located in a community k at the second period, and ε_{it} is an error term. It is well known that the coefficient β_1 on the interaction between the treatment variable (T_{it}) and time variable (t) gives an average impact of high informal user charge on outcomes, which is denoted as *DD* in Table 4-1.

One of the notable advantages of using DD method in identification is in subtracting the time-invariant heterogeneity between the treatment and control groups (captured by β_2) as well as the homogeneous time trend shared by the two groups (captured by β_3) from the total observed variation in the outcome variable (Y_{it}). This might alleviate some of the above-mentioned biases, which derive from the fact that high informal user charge may not take place at random, especially by controlling the general time-invariant heterogeneity between the two groups.

The simple implementation of the DD method using Equation (**4-6)** assumes that there is no variation in other variables. However, there is clearly a notable variation in the observable characteristics of sample children, as well as in the characteristics of their households and communities. Hence, several covariates at the individual, household, and community level are controlled for.

As the dataset used in this study is an individual-level panel, it is theoretically possible to control the child fixed effect by looking at how the school attendance status of a primary school age child changed after the introduction of high informal user charges in a public school in his or her community. However, this study does not exploit this advantage of the panel design for the following reason. As both a number of cases where public schools informally charge fees and their amounts have increased, especially after the introduction of USE policy in 2007, the study only uses the datasets from UNHS

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2005/2006 and the datasets from the latest wave of UNPS to maximize the time variation in the variable to do with the existence of the high informal user charge. In this case, in theory, only a primary school age child who was P1 in 2005/2006 and moved up to P7 without any grade repetition can appear in both datasets. For this reason, this study does not use the datasets as a pure panel at the individual level but as repeated cross-sections.

There is another possibility of conducting in-depth impact analyses at the community level, using several techniques which can be applied to panel or longitudinal datasets.[86] However, owing to the limited number of households sampled from each community, the estimates of gross and net attendance rates might not be representative at the community level. For this reason, in-depth impact analysis at the community level is not conducted in this study. Moreover, because of the analytical framework used in this study, it is important to note that the analysis applying the DD method yields intention-to-treat (ITT) estimates (Gertler et al. 2011).

However, the estimates are possibly still biased because of the selective take up of the informal user fee charged by public schools. To adjust for this bias and check the reliability of the estimates, this study combines the DD method with a matching method called PSM.[87] The basic idea of PSM in this study is to make the control group as similar as possible to the treatment group in terms of observable baseline community-level characteristics.

Specifically, the conditional probability, which is called the propensity score, of taking up the high fee charge given baseline characteristics, is estimated for all the sampled communities by a logit model.[88] After this, the sampled communities with high informal

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[86] The most typical ones are random effects methods and fixed effects methods (Wooldridge 2010).

[87] There are a number of previous studies which combine DD method with PSM (Buttenheim, Alderman, and Friedman 2011; Okoboi, Kuteesa, and Barungi 2013; Mu and van de Walle 2011).

[88] Propensity score is originally defined by Rosenbaum and Rubin (1983). This study uses logit model simply to maintain consistency with the other analyses for binary outcome.

fee charges in public schools are matched with the sampled communities with no or low informal fee charges in public schools which have the closest propensity score, applying the algorithm proposed by Becker and Ichino (2002).[89] In technical terms, the region of common support is defined throughout this process. Some of the sampled communities with no high fee charge in public schools are trimmed because they do not fall into the common support region. Balancing tests are conducted to check whether the average propensity score and the average of observed covariates are the same within each interval of the propensity score distribution.

To conduct analyses which investigate the determinants of the probability of the fee charge or school attendance occurring, a linear probability model (LPM) is applied as a base line. In LPM, a dichotomous response variable y can be specified as

$$\Pr(y = 1 \mid \boldsymbol{X}) = \boldsymbol{X\beta}, \tag{4-7}$$

where $\boldsymbol{X}$ is the vector of explanatory variables, and $\boldsymbol{\beta}$ is the vector of slope coefficients for each explanatory variable. Since y is a random variable with the Bernoulli distribution, the conditional mean and variance of y are written as

$$\mathrm{E}(y \mid \boldsymbol{X}) = \boldsymbol{X\beta}, \tag{4-8}$$

$$\mathrm{Var}(y \mid \boldsymbol{X}) = \boldsymbol{X\beta}(1 - \boldsymbol{X\beta}). \tag{4-9}$$

Equation 4-8 implies that heteroscedasticity occurs unless all of the slope coefficients equal to zero. Because of this, heteroscedasticity-consistent standard errors are used in the OLS regression for LPM (Wooldridge 2010).

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[89] In this study, the closest controls are defined based on the stratification of the propensity score (Becker and Ichino 2002).

It is known that LPM has some drawbacks in estimating binary response. The major one is the fact that the OLS fitted values can sometimes become less than zero or above one, which does not make sense as fitted values are theoretically the estimates of the conditional probability. Nevertheless, this study starts its analysis using LPM because there are some flexibilities in this simple model.[90] There are many previous studies which show that the issue of fitted values being outside the unit interval in LPM is not so serious as some researchers suggest (Wooldridge 2010; Angrist and Pischke 2009).

This study also uses a non-parametric model, and specifically a logit model, to check the reliability of the results from LPM's estimation. To overcome the major drawback of LPM, the predictions from Equation 4-8 are first constrained to the range from zero to one in the non-parametric model. Let assume that latent variable y^* follows

$$y^* = X\beta + e, \tag{4-10}$$

where e has a standard logistic distribution.[91] In this latent variable model, a binary variable which indicates the sign of y^* is observed instead of observing y^*, namely

$$y = 1 \qquad \text{if} \quad y^* > 0 \tag{4-11}$$

$$y = 0 \qquad \text{if} \quad y^* \le 0, \tag{4-12}$$

which can be equivalently described as $y = 1 \, [y^* > 0]$ using indicator function.

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[90] For instance, in the analysis applying LPM, unobservable factors which differ across units but are constant over time can be controlled simply by adding the set of dummy variables for each unit if the number of units is not very large. However, applying this method, sometimes called least squares dummy variable (LSDV), to the analysis using MLE may lead to an incidental parameters problem (Wooldridge 2010).

[91] This is because the study uses logit model. If e has a standard normal distribution, Equation 4-9 derives probit model. In general, similar results are yielded by the analyses using logit and probit models (Treiman 2009).

$$\Pr(y=1\mid X) = \Pr(y^* > 0 \mid X) = \Pr(e > -X\boldsymbol{\beta} \mid X) = 1 - \Lambda(-X\boldsymbol{\beta}) = \Lambda(X\boldsymbol{\beta}), \qquad (4\text{-}13)$$

where $\Lambda(\cdot)$ denotes the cumulative distribution function (CDF) of standard logistic distribution, e. This can be denoted as

$$\Lambda(X\boldsymbol{\beta}) = \exp(X\boldsymbol{\beta}) / \{1 + \exp(X\boldsymbol{\beta})\}. \qquad (4\text{-}14)$$

Unlike OLS used for LPM, the logit model is estimated by maximum likelihood estimation (MLE). As the density for a single observation i can be written as $\{\Lambda(X_i\boldsymbol{\beta})\}^{y_i} \{1 - \Lambda(X_i\boldsymbol{\beta})\}^{1-y_i}$, $\hat{\boldsymbol{\beta}}$, the MLE of $\boldsymbol{\beta}$, maximizes the log-likelihood function for a sample size of N:

$$\mathrm{L}(\boldsymbol{\beta}) = \sum_{i=1}^{N} \left[y_i \log \Lambda(X_i\boldsymbol{\beta}) + (1 - y_i) \log\{1 - \Lambda(X_i\boldsymbol{\beta})\} \right]. \qquad (4\text{-}15)$$

Moreover, it is important to note that marginal effects, or partial effects, are calculated to interpret the estimation results from logit model analyses in a straightforward way. By definition, marginal effects measure the change in the probability of an outcome for a change in one of the explanatory variables, x_k, holding all else constant at specific values. Specifically, marginal effects are calculated with a partial derivative in x_k specified as

$$\partial \Pr(y_i = 1 \mid X) / \partial x_k = \Lambda(X\boldsymbol{\beta})\{1 - \Lambda(X\boldsymbol{\beta})\}\beta_k. \qquad (4\text{-}16)$$

Standard errors of the marginal effects are usually obtained using the delta method (Wooldridge 2010). However, as this study weakens the assumption by allowing the non-identical distributions throughout the data analyses, a different standard-error calculation

based on Korn and Graubard (1999) is undertaken. To make inferences on the population, linearization is used to calculate the unconditional variance of the marginal means.

As each observation i has a different marginal effect of x_k, there are several approaches to get informative statistics which summarize this distribution of marginal effects. Among the several approaches, the study chooses to calculate average marginal effect (AME), following the suggestion by Hanmer and Ozan Kalkan (2013). AME of x_k is the mean of the marginal effects of x_k at the observed values X_i for all observations in the sample (Long and Freese 2014; Wooldridge 2010).

Because interaction terms are the variable of interest in some econometric models in this study, it is essential to compute their effects on outcome in an appropriate way.[92] There have been many discussions on this topic since Ai and Norton (2003) and Norton, Wang, and Ai (2004) satisfactorily pointed out that most of the applied researchers had misinterpreted the coefficient of the interaction term in nonlinear models. Puhani (2012) makes a contribution by explaining the interpretation of interaction effects in the case of the DD method.

Building on the extensive review and discussion by Karaca-Mandic, Norton, and Dowd (2012), this study applies the basic method proposed by Long and Freese (2014) to compute the interaction effects. Specifically, the study calculates the derivative with respect to one variable at different values of the other variable, and takes the difference. The null hypothesis that this difference equals zero is tested.

Non-parametric models are also used to investigate unordered and ordered responses related to the first and a part of the second research questions, respectively. In this study, unordered response is a school attendance and choice, namely, whether the household does not send its child to school, sends him/her to public school, or sends him/her to private school. Ordered response is a level of informal user fees, namely,

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[92] Precisely speaking, it is theoretically impossible to compute marginal effect for interaction term simply because the value of interaction term is depending on the values of the component terms (Williams 2012).

whether public school does not charge any informal fees, charges low informal fees, or charges high informal fees.

This study analyzes unordered multinomial responses using a multinomial logit (MNL) model. In the MNL model, a multinomial response variable y can be specified as

$$\Pr(y = j \mid X) = \exp(X\boldsymbol{\beta}_j) / \sum_{h=1}^{J} \exp(X\boldsymbol{\beta}_h), \qquad j = 1,\ldots, J, \tag{4-17}$$

where X is the vector of explanatory variables, and $\boldsymbol{\beta}$ is the vector of slope coefficients for each explanatory variable. This model ensures

$$0 < \Pr(y = j \mid X) < 1 \text{ and } \sum_{h=1}^{J} \Pr(y = j \mid X) = 1. \tag{4-18}$$

In order to ensure the model identification, $\boldsymbol{\beta}_1$ is set to zero for the base or reference category. Equation 4-16 can be simplified into

$$\Pr(y = 1 \mid X) = 1 / \left\{ 1 + \sum_{h=2}^{J} \exp(X\boldsymbol{\beta}_h) \right\} \tag{4-19}$$

$$\Pr(y = j \mid X) = \exp(X\boldsymbol{\beta}_j) / \left\{ 1 + \sum_{h=2}^{J} \exp(X\boldsymbol{\beta}_h) \right\}, \qquad j = 2,\ldots, J, \tag{4-20}$$

and coefficients can be interpreted with respect to the base category.

Like other non-parametric models, the MNL model is estimated by maximum likelihood estimation (MLE). In the MNL model, the MLE of $\boldsymbol{\beta}$, maximizes the log-likelihood function for a sample size of N:

$$L(\boldsymbol{\beta}) = \sum_{i=1}^{N} \sum_{j=1}^{J} 1[y_i = j] \log p_{ij}, \tag{4-21}$$

where p_{ij} denotes the response probability for each observation i who selects alternative j specified in Equation 4-19 and Equation 4-20. Indicator function, $1[y_i = j]$, becomes one only when $y_i = j$ and otherwise zero, so that it simply picks up the right response for each observation.

It is also necessary to compute marginal effects to interpret the estimation results from the MNL model. AME is known as the most informative summary of the marginal effects distribution as well (Long and Freese 2014). Mathematically, marginal effects for the MNL model can be specified as

$$\partial \Pr(y = j \mid \boldsymbol{X}) / \partial x_k = \Pr(y = j \mid \boldsymbol{X}) \left\{ \beta_{jk} - \sum_{h=1}^{J} \beta_{hk} \Pr(y = j \mid \boldsymbol{X}) \right\}, \tag{4-22}$$

where β_{jk} and β_{hk} are the kth element of $\boldsymbol{\beta}_j$ and $\boldsymbol{\beta}_h$, respectively. Interaction effects in the MNL model are calculated basically by applying the same strategy used in the logit model. Two-way interaction effect is analyzed by calculating and testing second difference.

In applying the MNL model, it is important to note that relative probabilities for any two alternatives are assumed be independent of the other alternatives in the model, and this important restriction is called the independence of irrelevant alternatives (IIA) assumption.[93] As is stated in McFadden (1973), overall, the MNL model should be applied only when "the alternatives can plausibly be assumed to be distinct and weighted independently in the eyes of each decision-maker" (McFadden 1973, 113). In the context of this study, it might make more sense to assume that sending children to public school and

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[93] IIA assumption is made not only for the MNL model but also for conditional logit and rank-ordered logit models.

private school are close substitutes. In other words, eliminating the option to send children to private school might increase the probability of sending children to public school more than it might increase the probability of children being out of school.

One of the most popular approaches to relaxing the IIA assumption is called the nested logit model, which can make a distinction between school attendance and school choice in households' decision-making and allow the errors in the models for school-choice alternatives to be correlated. Previous studies on school choice, which are reviewed in Subsection 3.2, typically apply a nested MNL model, and school characteristics are included in the model as alternative specific variables (Alderman, Orazem, and Paterno 2001; Glick and Sahn 2006; Gertler and Glewwe 1990).

Nevertheless, this study applies the MNL model and includes the public school characteristics as alternative-invariant variables following the approach used in Nishimura and Yamano (2013). Despite some drawbacks of the MNL model including the IIA assumption, it is useful because this study primarily assesses the correlation between the presence of informal fee charges in public school and the probability of choosing private school. As is pointed out in Nishimura and Yamano (2013), there are computation problems in the nested logit model which force us to simplify the econometric model to a level at which serious omitted variable bias might take place. Before applying the MNL model, the assumption of IIA is tested by one of the most common tests, namely, the Small-Hsiao test (Small and Hsiao 1985). However, it is worth noting that the usefulness of these tests to detect the violations of the IIA assumption has been questioned by some recent studies (Fry and Harris 1998; Cheng and Long 2007; Long and Freese 2014).

To analyze ordinal response categories, where the response categories can be ordered but where the distances between the categories are unknown, this study applies an ordered logit model. This model is presented as a latent variable model, which has been specified in Equation 4-9, where e has a standard logistic distribution. Let $\alpha_0 < \alpha_1 < \ldots < \alpha_J$ be cut points. The observed response categories correspond to the latent variable y^* as

$$y = 1 \qquad \text{if} \quad \alpha_0 < y^* \leq \alpha_1$$

$$y = 2 \qquad \text{if} \quad \alpha_1 < y^* \leq \alpha_2$$

$$\vdots \tag{4-23}$$

$$y = J \qquad \text{if} \quad \alpha_{J-1} < y^* \leq \alpha_J$$

where $\alpha_0 = -\infty$ and $\alpha_1 = -\infty$. Then, the conditional distribution of y given X can be written as

$$\Pr(y = j \mid X) = \Lambda(\alpha_j - X\beta) - \Lambda(\alpha_{j-1} - X\beta), \qquad j = 1,\ldots, J, \tag{4-24}$$

In an ordered logit model, the MLE of the parameters, namely α and β, maximizes the log-likelihood function for a sample size of N which can be written as a similar equation to that used in the MNL model (see Equation 4-21).

$$L(\alpha, \beta) = \sum_{i=1}^{N} \sum_{j=1}^{J} 1[y_i = j] \log q_{ij}, \tag{4-25}$$

where q_{ij} denotes the response probability for each observation i which selects alternative j as specified in Equation 4-25. Mathematically, marginal effects for the ordered logit model can be specified as

$$\partial \Pr(y = j \mid X) / \partial x_k = \beta_k \Pr(y = j \mid X). \tag{4-26}$$

4.3.2 Specification

The individual-level estimation equation for the school attendance model can be written as follows:

$$\Pr(a_{it} = 1) = \boldsymbol{\beta_0} + \boldsymbol{\beta_I I_{it}} + \boldsymbol{\beta_H H_{jt}} + \boldsymbol{\beta_S S_{kt}} + \boldsymbol{\beta_C C_{kt}} + \varepsilon_{it.} \qquad (4\text{-}27)$$

In Equation 4-27, $a_{it} = 0$ if child i is not attending any school at period t; $a_{it} = 1$ if child i is attending a school at period t; $\boldsymbol{I_{it}}$ is a vector of individual characteristics of child i at period t; $\boldsymbol{H_{jt}}$ is a vector of household characteristics of household j at period t; $\boldsymbol{S_{kt}}$ is a vector of public school characteristics of community k at period t; $\boldsymbol{C_{kt}}$ is a vector of community characteristics of community k at period t; and ε_{it} is a vector of error term.

For estimating the determinants of school choice at the individual level, the MNL model is used. Using the same set of explanatory variables used in the school attendance model, the estimation equation can be written as follows:

$$\Pr(a_{it} = c) = \boldsymbol{\beta_0} + \boldsymbol{\beta_I I_{it}} + \boldsymbol{\beta_H H_{jt}} + \boldsymbol{\beta_S S_{kt}} + \boldsymbol{\beta_C C_{kt}} + \varepsilon_{it}, \qquad (4\text{-}28)$$

where $a_{it} = 1$ if child i at period t is not attending any school; $a_{it} = 2$ if child i at period t is attending a public school; $a_{it} = 3$ if child i at period t is attending a private school. In the analyses of school choice applying the MNL model, we consider $a_{it} = 1$ (a child who is not attending any school) as a base group.

The estimation equations to answer a part of the sub-research questions under the first main research question can be written as

$$\begin{aligned} \Pr(a_{it} = 1) = {} & \boldsymbol{\beta_0} + \boldsymbol{\beta_I I_{it}} + \boldsymbol{\beta_H H_{jt}} + \boldsymbol{\beta_S S_{kt}} + \boldsymbol{\beta_C C_{kt}} + \boldsymbol{\beta_X X_{jkt}} \\ & + \boldsymbol{\beta_I X_{jkt}} \cdot \boldsymbol{t_{2011/2012}} + \boldsymbol{\beta_t t_{2011/2012}} + \varepsilon_{it}, \end{aligned} \qquad (4\text{-}29)$$

$$\Pr(a_{it} = c) = \boldsymbol{\beta_0} + \boldsymbol{\beta_I}\boldsymbol{I}_{it} + \boldsymbol{\beta_H}\boldsymbol{H}_{jt} + \boldsymbol{\beta_S}\boldsymbol{S}_{kt} + \boldsymbol{\beta_C}\boldsymbol{C}_{kt} + \boldsymbol{\beta_X}\boldsymbol{X}_{jkt}$$
$$+ \boldsymbol{\beta_I}\boldsymbol{X}_{jkt} \cdot \boldsymbol{t}_{2011/2012} + \boldsymbol{\beta_t}\boldsymbol{t}_{2011/2012} + \varepsilon_{it}, \qquad\qquad (4\text{-}30)$$

where $\boldsymbol{X}_{jkt}$ is a vector of selected household/public school characteristics of household j in community k at period t; and $\boldsymbol{t}_{2011/2012}$ is a year dummy variable which is 1 if observation is from 2011/2012 and 0 if it is from 2005/2006.

The empirical analysis for answering Research Question 2-1 is to unveil the determinants of charging user fees in public school in rural Uganda. The estimating equation for this community-level analysis can be written as follows:

$$\Pr(a_k = 1) = \boldsymbol{\beta_0} + \boldsymbol{\beta_S}\boldsymbol{S}_k + \boldsymbol{\beta_C}\boldsymbol{C}_k + \varepsilon_k, \qquad\qquad (4\text{-}31)$$

where $a_k = 0$ if a public school in community k does not charge fee; $a_k = 1$ if a public school in community k charges fee; $\boldsymbol{S}_k$ is a vector of public school characteristics of community k; $\boldsymbol{C}_k$ is a vector of characteristics of community k; and ε_k is a vector of error term.

The estimation equation for the ordered logit model to unveil the determinants of the level of user fee charge in public school in 2011/2012 can be written as follows:

$$\Pr(a_k = f) = \boldsymbol{\beta_0} + \boldsymbol{\beta_S}\boldsymbol{S}_k + \boldsymbol{\beta_C}\boldsymbol{C}_k + \varepsilon_k, \qquad\qquad (4\text{-}32)$$

where $a_k = 1$ if a public school in community k does not charge fee; $a_k = 2$ if a public school in community k charges a low-fee; $a_k = 3$ if a public school in community k charges a high fee.

The estimation equation for school attendance model applying LPM controlling for community fixed effects with the DD method to answer a part of Research Question 2-2 and Research Question 2-3 can be written as follows:

$$\Pr(a_{it} = 1) = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_I \boldsymbol{I}_{it} + \boldsymbol{\beta}_H \boldsymbol{H}_{jt} + \boldsymbol{\beta}_S \boldsymbol{S}_{kt} + \boldsymbol{\beta}_C \boldsymbol{C}_{kt}$$

$$+ \boldsymbol{\beta}_I \boldsymbol{T}_k \cdot \boldsymbol{t}_{2011/2012} + \boldsymbol{\beta}_T \boldsymbol{T}_k + \boldsymbol{\beta}_t \boldsymbol{t}_{2011/2012} + \sum_{k=2}^{N} \boldsymbol{\beta}_k \boldsymbol{D}_k + \boldsymbol{v}_i + \boldsymbol{\eta}_j + \boldsymbol{\mu}_{it}, \qquad (4\text{-}33)$$

where $\boldsymbol{D}_k$ is a vector of community dummy in community k; $\boldsymbol{v}_i$ is a vector of time-invariant unobserved individual characteristics of child i; $\boldsymbol{\eta}_j$ is a vector of time-invariant unobserved household characteristics of household j; and $\boldsymbol{\mu}_{it}$ is a vector of idiosyncratic error term.

The estimation equation for school attendance and school-choice model without controlling for community fixed effects with the DD method to answer a part of Research Question 2-2 and Research Question 2-3 can be written as follows:

$$\Pr(a_{it} = 1) = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_I \boldsymbol{I}_{it} + \boldsymbol{\beta}_H \boldsymbol{H}_{jt} + \boldsymbol{\beta}_S \boldsymbol{S}_{kt} + \boldsymbol{\beta}_C \boldsymbol{C}_{kt}$$

$$+ \boldsymbol{\beta}_I \boldsymbol{T}_k \cdot \boldsymbol{t}_{2011/2012} + \boldsymbol{\beta}_T \boldsymbol{T}_k + \boldsymbol{\beta}_t \boldsymbol{t}_{2011/2012} + \boldsymbol{\varepsilon}_{it}, \qquad (4\text{-}34)$$

$$\Pr(a_{it} = c) = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_I \boldsymbol{I}_{it} + \boldsymbol{\beta}_H \boldsymbol{H}_{jt} + \boldsymbol{\beta}_S \boldsymbol{S}_{kt} + \boldsymbol{\beta}_C \boldsymbol{C}_{kt}$$

$$+ \boldsymbol{\beta}_I \boldsymbol{T}_k \cdot \boldsymbol{t}_{2011/2012} + \boldsymbol{\beta}_T \boldsymbol{T}_k + \boldsymbol{\beta}_t \boldsymbol{t}_{2011/2012} + \boldsymbol{\varepsilon}_{it}, \qquad (4\text{-}35)$$

4.4　Data

4.4.1　Overview of the Data

This study relies on the nationally representative panel household survey data based on the UNHS 2005/2006 and UNPS collected by UBOS.[94] UNPS was designed to revisit a part of the households which took part in the UNHS 2005/2006, and the same sample was

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[94] UBOS has conducted nationally representative large sample surveys since 1989. UNHS 2005/2006 is the third in the series of household surveys carried out by UBOS since 1999. UNHS was also conducted in 2009/2010 and 2012/2013 as the fourth and the fifth in a series of them, respectively (UBOS 2014). However, the data collected in those rounds of UNHS can only be used for cross-sectional analysis.

maintained in 2009/2010, 2010/2011 and 2011/2012. UNPS was carried out by receiving financial and technical assistance from the Government of Netherland and the World Bank as a part of the Living Standard Measurement Study - Integrated Survey on Agriculture (LSMS-ISA) program.[95]

According to Ssewanyana and Kasirye (2012) and Azzarri et al. (2014), 7,421 households with 42,111 individuals from 783 enumeration areas (EAs) in all the districts of Uganda were covered in UNHS 2005/2006. As is common in most household surveys, a two-stage stratified random sampling design was used to construct the sample. First, 783 EAs were sampled by allocating an appropriate number to each stratum based on its population size.[96] Second, ten households were randomly sampled from within each of the EA. Each household was visited twice from May 2005 to April 2006 to collect information on both of the crop seasons.

In UNPS 2009/10, UBOS targeted 3,123 households in 322 EAs which participated in UNHS 2005/2006 to revisit. These EAs were selected from the UNHS 2005/2006's 783 EAs with equal likelihood and with implicit stratification by urban/rural and district within each stratum.[97] Consequently, the sample of UNPS gives us "reasonably reliable estimates for the rural portion of each region, and for the set of urban areas out of Kampala as a whole, as well as the best possible estimates for Kampala that can be expected from a subsample of the UNHS 2005/2006" (UBOS n.d., 6). As in the case of UNHS 2005/06, two

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[95] UNHS 2005/2006 was funded by the Government of Uganda and the World Bank as the second phase of the Economic and Financial Management Project (EFMP). It was also financially supported by the Department for International Development (DFID) (UBOS 2006).

[96] The Uganda Population and Housing Census Frame for 2002 was used for the selection. According to UBOS (2006), 600 EAs, which could be called clusters or primary sampling units (PSUs), were initially selected. Strictly speaking, the number of EAs was doubled in the Northern region to allow for attrition due to insecurity. Moreover, 153 EAs were additionally selected to ensure adequate sample size for each district. Additional sample of 30 EAs was also selected from the Internally Displaced People (IDPs) camps located in the Northern region.

[97] According to UBOS (n.d.), UNPS covered all the 34 EAs in Kampala visited by the UNHS 2005/2006, and 72 EAs (58 rural and 14 urban) in each of the four regions, namely Central region out of Kampala, Eastern region, Western region and Northern region. It is worth noting that UNPS did not cover EAs from IDPs camps since most of them were no longer occupied in 2009/2010.

visits were made to each household in conducting the UNPS to better capture the information on the agricultural products from the two cropping seasons in Uganda.

Among the various types of information collected through these multipurpose surveys, this study mostly relies on information which came from the questionnaires for the socioeconomic and community modules. The socioeconomic questionnaire questioned a household head and it covers key household characteristics, including the demographic features and wealth indicators of each household, as well as the basic individual characteristics of each household member.[98]

The community questionnaire enabled us to capture indispensable information for this study, including detailed primary school characteristics in each community as well as general community characteristics. In UNHS 2005/2006 and UNPSs, the administrative unit for collecting community-level information was mainly the LC1.[99] Enumerators visited a leader of each LC1 to collect general information on his or her community, including the availability of social services. To collect information for primary schools, they visited a head teacher or a person nominated by a head teacher (hereafter referred to as a school official). The study uses the information from a school official in the most common primary school sampled during UNHS 2005/2006 and in "the most popular and the nearest" (UBOS 2009, 74) primary schools sampled during UNPSs, which can be located out of the LC1.

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[98] Although there are several exceptions to this general rule and detailed instructions on how to deal with each of them were provided in the interview manuals, the common definition of household in the series of surveys is "a group of people who have normally been living and eating their meals together for at least 6 of the 12 months preceding the interview (UBOS 2009, 9).

[99] Technically, one EA may have more than one LC1. In that case, one LC1 was randomly sampled and the survey was conducted only within that LC1 (UBOS 2009). The details of Uganda's local government structure is reviewed in Subsection 2.4.1.

4.4.2 Variables

Table 4-2 shows the description of every variable used in the analyses of this study. Regarding the dependent variables, this study uses a binomial variable for children's current school attendance as well as a nominal variable with three alternatives on households' schooling decision: (1) not attending any schools, (2) attending public primary schools, and (3) attending private primary schools. These variables are created based on the responses to the questions by household heads about the education of all members of the household who are five years and above. In this study, if they responded that their child attended a school managed by the government, that child is regarded as attending a public school. In contrast, if they responded that he or she attended a school managed by the private sector, NGO or religious organizations, the child is regarded as attending a private school.

With regard to the dependent variables, an individual-level variable related to orphan status is created in addition to the basic ones, namely, gender and age. In addition to the information on whether the child lives with the biological parents or not, UNHS asked whether the child's biological parents are alive or not. However, the latter information is missing in the UNPS dataset. Because of this, this study creates the dummy variable which only indicates whether there is one or both of the child's biological parents in the household or no biological parent in the household. This variable does not distinguish the case in which the child does not live with the parent because he or she is dead, or the case in which the child does not live with the parent but he or she is alive.

Table 4-2: Variable Definitions

Variable	Definition
Individual characteristics	
School attendance	Dummy variable indicating whether the child attends primary school (base category = being out of school)
School choice	Variable with three nominal categories indicating whether the child attends school and, if he or she attends, what type of school he or she attends: 1 for being out of school; 2 for attending public primary school; 3 for attending private primary school
Age	Dummy variables for child's age (base category = 12 years old)
Female	Dummy variable for child's gender (base category = male)
Foster child	Dummy variable for orphan status indicating whether the child lives with one/both of the biological parents in the household (base category) or lives with no biological parent
Household characteristics	
Log (MPCE)	Natural logarithm of monthly household consumption expenditures per adult equivalent in USh
Poor	Dummy variable indicating whether the household is poor or not (base category = non-poor)
Number of children	Number of children aged between 6 and 17
Youth household head	Dummy variable for the household head who is less than 30 years old (base category = over 30 years old)
Female household head	Dummy variable for household head's gender (base category = male)
Household head's education	Year of education of the household head
Public school characteristics	
Level of informal user fees	Three dummy variables which classify school's level of informal user charge in no user charge, low-fee charge, and high-fee charge
High fee group	Dummy variable indicating whether the school does not charge high user fees in 2005/2006 but charges high user fees in 2011/2012 (base category = no high fee charge both in 2005/2006 and 2011/2012)
Pupil-teacher ratio	The number of pupils who enroll in the school divided by the number of teachers including untrained ones in the school.
Poor facility condition	Dummy variable for the condition of the school facility indicating whether it is good/fair (base category) or poor.
Community characteristics	
Number of households	The number of households reside in the community.
Log (Mean MPCE)	Natural logarithm of community average of monthly household consumption expenditures per adult equivalent in USh
Mean household head's education	Community average of the variable "household head's education"
Community contribution	Dummy variable indicating whether the community has made either monetary or non-monetary contribution to improve access to primary education in 2005/2006 (base category = No community contribution in 2005/2006)
Availability of public school	Dummy variable indicating whether a public school is present within the community or not (base category).
Availability of private school	Dummy variable indicating whether a private school is present within the community or not (base category).
New private school	Dummy variable indicating whether a private school became present within the community between 2005/2006 and 2011/2012 or not (base category).
Increase in private school attendance	Dummy variable indicating whether the net private school attendance rate in the community increased between 2005/2006 and 2011/2012 or not (base category).
Region	Dummy variables indicating whether the community is located in Central region (base category), Eastern region, Western region, or Northern region
Others	
Year 2011/2012	Dummy variable for year 2011/2012 (base category = Year 2005/2006)

Source: Created by the author.

The variables for household wealth, household demographics, and household head's characteristics are created at the household level. This study uses the variable on monthly per capita expenditure (MPCE) constructed by UBOS as a proxy for wealth.[100] The details of how UBOS constructed the MPCE variable is described in Ssewanyana and Kasirye (2012).[101]

According to Ssewanyana and Kasirye (2012), all the items, which were purchased, produced, or received in-kind by each household, were valued at the market price. Spatial price variation was taken into consideration by using market prices instead of farm-gate/producer prices for revaluation. In aggregating the values of all the sub-components of items, they were converted into 30 day monthly values according to the recall periods used for each subcomponent.[102] Non-consumption expenditures, including income tax, pension and social security payments, remittances, and interest on loans, were excluded from this calculation. In order to account for the price variation of different time periods, all money values are converted into 2005/2006 prices by using the consumer price index (CPI). The adult equivalent scale, proposed by Appleton (2001b), was used to account for household composition differences in terms of sex and ages. Following the approach proposed by Cowell and Victoria-Feser (2006), the observations which fall into the upper 1% of MPCE are simply trimmed to deal with the extreme values.

A poverty dummy variable is also created according to the official absolute poverty lines used by UBOS. A poverty dummy variable becomes one when MPCE is below the

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[100] There has been a common agreement among the researchers that consumption works as a more appropriate proxy than income in measuring wealth/welfare in the context of developing countries (Deaton 1997; Haughton and Khandker 2009).

[101] Ssewanyana and Kasirye (2012) examine the poverty and inequality dynamics in Uganda using the same panel data is used in this study.

[102] In all waves, there were three sub-components of items: 1) food, beverage, and tobacco, 2) non-durable goods and frequently purchased services, and 3) semi-durable goods and durable goods and services. The recall periods of 7 days, 30 days and 365 days were used for collecting information on the first, second and the third sub-components, respectively.

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official absolute poverty line. In Uganda, the official absolute poverty line is calculated based on the cost of basic needs, which include the minimum amount of calories and non-food requirements, applying the calculation methods proposed by Appleton (2001b). Because the staple food differs by location in Uganda, different poverty lines are set for urban and rural areas in each region.[103]

To capture the household demographics, the variables for the number of school-aged children were created. In analyzing the dataset of UNHS 2009/2010, UBOS (2010) calculates household size by counting the number of household members who have lived in the household for at least six months. Applying this criteria, household members who have lived for less than six months are excluded in the calculation of demographics variables for this study. However, in this study, the members who are regarded as usual members by the household head are counted even though they may have lived in their households for less than six months.

As most of the children in rural areas start their education from the primary level which ranges from 6 to 12 years of age, and any person who is below 18 years of age is defined as a child in the Ugandan context, household members aged between 6 and 17 who meet the above-mentioned criteria are counted to create the variable for the number of school-aged children.[104]

With respect to the informal user charges at schools, during UNHS 2005/2006, school officials were asked about the amount of two types of fees, namely, "school fees" and "PTA fees." As it is not officially allowed to collect any types of fees from households at rural public schools in principle, it is thought that fees are informally collected at schools

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[103] In terms of the monetary values as of 2005/2006, the official absolute poverty line is equivalent to USh 29,571.8, USh 28,642.07, USh 28,947.35, and USh 28,165.4 in rural Central, rural Eastern, rural Northern, and rural Western regions, respectively. According to Appleton et al. (1999), the official absolute poverty line is the lowest in Western region mainly because a staple food in the region, namely matooke, is more expensive to get adequate nutrition.

[104] This national definition of child comes from the Constitution of Uganda adopted in 1995 (MoES 2015).

if households are paying either a "school fee" or "PTA fee," or both. On the other hand, during UNPS, school officials are asked about the purposes of fee charges, including development/building, lunches, and school uniform. The study assumes that fees are informally collected at schools if households are charged any fee amount regardless of its purpose.[105]

Both UNHS 2005/2006 and UNPS collected information on the amount of fees charged to households. It is important to note that this amount is different from the amount of money which is actually collected from the households. While UNHS 2005/2006 asked the annual fee amount, UNPS asked the average amounts of fee for each charge and their frequencies. Those of UNPS are converted into annually based values according to the frequency of each fee charge, and are converted into 2005/2006 prices by using the CPI reported in UBOS (2014a).

Exploiting this information, the study also created a variable which distinguishes low and high amounts of informal user charges by applying the threshold sometimes used in defining low-fee private schools. Among the several definitions used, Barakat et al. (2012) employ "4% of a household budget as the definition of low-cost, as it is a commonly accepted education fee threshold for poor families" (Barakat et al. 2012, 13), and Lewin (2007) claims that 5% is the "typical allocation across different countries" (Lewin 2007, 10).[106]

This study uses annual consumption expenditure per rural household in 2005/2006 and 2012/2013 calculated by UBOS (2014b) based on UNHSs' data as proxies for rural households' annual budget in 2005/2006 and 2011/2012, respectively. Of the consumption expenditure 4% per household is then divided by five, which is the average number of

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[105] The fees collected for boarding are excluded in calculating the total amount of fees using UNPS data. However, there is no way to exclude boarding fees in the calculation using UNHS 2005/2006 data.

[106] There are other definitions for low-fee private schools. For instance, Heyneman and Stern (2013) define low-fee private schools as those whose fee is "lower than half the minimum wage" (Heyneman and Stern 2013, 5).

children in a rural household calculated in this study. Regional time variations in household budgets are also taken into consideration by using the statistics estimated for each region and in each period. Table 4-3 portrays the specific values of thresholds used in this study.

Table 4-3: Thresholds Used to Distinguish between Low and High Annual Informal User Fees by Region and Year (USh)

	2005/2006	2011/2012
Central	22,766.27	23,914.8
East	16,215.73	16,352
West	18,649.07	21,549.6
North	9,470.533	12,400.27

Source: Created by the author based on UBOS (2014b).
Note: Calculation was made using the values, which had been converted into 2005/2006 prices in UBOS (2014b).

A dummy variable for the condition of the school facility takes on the value one if respondents answer that the condition of their school facility is poor.[107] Total enrollment is divided by a total number of teachers, which include untrained/unlicensed ones, to create a continuous variable for PTR.

At the community level, a variable related to community awareness for primary education improvement was created. The community questionnaire in UNHS 2005/2006 asked whether the community has undertaken any activity/steps to increase the access to primary schooling. However, the community questionnaire in UNPS 2011/2012 does not have this type of question. Partly because of this technical issue, the variable for 2005/2006 is also used as the one for 2011/2012, which assumes that the variable might represent the time-invariant community characteristics in terms of awareness of primary schooling.

In addition, variables which represent the proximity to public school and private school were created at the community level. The community questionnaire in both UNHS 2005/2006 and UNPS 2011/2012 asked whether a public school is located within LC1 and

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[107] General condition of buildings was asked during UNHS 2005/2006. Although the condition of several types of facilities was asked during UNPS 2011/2012, answer to the question about the condition of classrooms is used to make a variable comparable with the one in 2005/2006.

whether a private school is located within LC1. Many of the values, which are missing in the UNPS 2011/2012 dataset, are simply imputed by the values observed in UNPS 2010/2011. If the values are still missing, they are imputed by the values observed in UNPS 2009/2010.

In the individual-level data analysis, the sample is restricted to the children who are 6–12 years old, living in a rural area, and day scholars. This sample is also used to conduct analysis for checking the robustness of the results. In all the analyses, the sample is further restricted to those in the community where public school information is collected both in 2005/2006 and 2011/2012 as well as there was no informal high fee charge in 2005/2006.

Table 4-4: Descriptive Statistics of Variables Used in Individual-Level Analyses, 2005/2006

Full, 2005/2006 (*n*=1,539)

	Mean	Standard deviation	Minimum	Maximum
Individual characteristics				
School attendance				
Attending School	0.889	0.314	0.000	1.000
School choice				
Public school	0.782	0.413	0.000	1.000
Private school	0.107	0.309	0.000	1.000
Age				
Age 6	0.131	0.338	0.000	1.000
Age 7	0.139	0.346	0.000	1.000
Age 8	0.157	0.364	0.000	1.000
Age 9	0.141	0.348	0.000	1.000
Age 10	0.153	0.360	0.000	1.000
Age 11	0.140	0.347	0.000	1.000
Age 12	0.139	0.346	0.000	1.000
Female	0.508	0.500	0.000	1.000
Foster child	0.213	0.410	0.000	1.000
Household characteristics				
Poor	0.373	0.484	0.000	1.000
Log (MPCE)	10.474	0.519	9.178	12.046
Number of children	4.934	1.970	1.000	13.000
Youth household head	0.092	0.289	0.000	1.000
Female household head	0.252	0.434	0.000	1.000
Household head's education	5.138	3.532	0.000	17.000
Public school characteristics				
Level of informal user fee				
Fee-free	0.623	0.485	0.000	1.000
Low-fee	0.377	0.485	0.000	1.000
High fee group	0.179	0.383	0.000	1.000
Pupil-teacher ratio	53.358	16.593	5.343	107.000
Poor facility condition	0.103	0.304	0.000	1.000
Community characteristics				
Community contribution	0.788	0.409	0.000	1.000
Availability of public school	0.426	0.495	0.000	1.000
Availability of private school	0.118	0.322	0.000	1.000
Region				
Central	0.246	0.431	0.000	1.000
Eastern	0.281	0.449	0.000	1.000
Western	0.222	0.415	0.000	1.000
Northern	0.251	0.434	0.000	1.000

Source: MPCE=monthly per capita expenditure. Created by the author using UNHS 2005/2006.

Table 4-5: Descriptive Statistics of Variables Used in Individual-Level Analyses, 2011/2012

Full, 2011/2012 (*n*=1,522)

	Mean	Standard deviation	Minimum	Maximum
Individual characteristics				
School attendance				
Attending School	0.855	0.352	0.000	1.000
School choice				
Public school	0.683	0.465	0.000	1.000
Private school	0.172	0.378	0.000	1.000
Age				
Age 6	0.141	0.348	0.000	1.000
Age 7	0.139	0.346	0.000	1.000
Age 8	0.154	0.361	0.000	1.000
Age 9	0.152	0.360	0.000	1.000
Age 10	0.136	0.343	0.000	1.000
Age 11	0.137	0.344	0.000	1.000
Age 12	0.140	0.347	0.000	1.000
Female	0.520	0.500	0.000	1.000
Foster child	0.252	0.434	0.000	1.000
Household characteristics				
Poor	0.414	0.493	0.000	1.000
Log (MPCE)	10.370	0.576	8.499	11.808
Number of children	5.068	2.276	0.000	16.000
Youth household head	0.049	0.215	0.000	1.000
Female household head	0.240	0.427	0.000	1.000
Household head's education	5.219	3.641	0.000	17.000
Public school characteristics				
Level of informal user fee				
Fee-free	0.196	0.397	0.000	1.000
Low-fee	0.636	0.481	0.000	1.000
High-fee	0.168	0.374	0.000	1.000
High fee group	0.168	0.374	0.000	1.000
Pupil-teacher ratio	53.765	17.521	18.649	98.889
Poor facility condition	0.186	0.389	0.000	1.000
Community characteristics				
Community contribution	0.796	0.403	0.000	1.000
Availability of public school	0.496	0.500	0.000	1.000
Availability of private school	0.212	0.409	0.000	1.000
Region				
Central	0.243	0.429	0.000	1.000
Eastern	0.273	0.446	0.000	1.000
Western	0.218	0.413	0.000	1.000
Northern	0.265	0.442	0.000	1.000

Source: MPCE=monthly per capita expenditure. Created by the author using UNPS 2011/2012.

Table 4-6: Descriptive Statistics of Variables Used in Community-Level Analyses by Year

Panel A: 2005/2006 (*n*=126)

	Mean	Standard deviation	Minimum	Maximum
Public school characteristics				
Level of informal user fees				
Fee-free	0.603	0.491	0.000	1.000
Low-fee	0.397	0.491	0.000	1.000
Pupil-teacher ratio	53.525	17.286	5.343	107.000
Poor facility condition	0.135	0.343	0.000	1.000
Community characteristics				
Number of households	135.746	86.277	31.000	730.000
Log (Mean MPCE)	10.734	0.305	9.944	11.599
Mean household head's education	5.039	1.347	2.300	8.667
Community contribution	0.810	0.394	0.000	1.000
Availability of public school	0.429	0.497	0.000	1.000
Availability of private school	0.103	0.305	0.000	1.000
Region				
Central	0.262	0.441	0.000	1.000
Eastern	0.230	0.423	0.000	1.000
Western	0.238	0.428	0.000	1.000
Northern	0.270	0.446	0.000	1.000

Panel B: 2011/2012 (*n*=126)

	Mean	Standard deviation	Minimum	Maximum
Public school characteristics				
Level of informal user fees				
Fee-free	0.206	0.406	0.000	1.000
Low-fee	0.603	0.491	0.000	1.000
High-fee	0.190	0.394	0.000	1.000
Pupil-teacher ratio	51.430	17.178	18.649	97.000
Poor facility condition	0.175	0.381	0.000	1.000
Community characteristics				
Number of households	236.500	285.189	25.000	3000.000
Log (Mean MPCE)	10.837	0.680	9.869	16.454
Mean household head's education	5.262	1.528	1.000	9.467
Availability of public school	0.484	0.502	0.000	1.000
Availability of private school	0.214	0.412	0.000	1.000
New private school	0.159	0.367	0.000	1.000
Increase in private school attendance rate	0.175	0.381	0.000	1.000
Region				
Central	0.262	0.441	0.000	1.000
Eastern	0.230	0.423	0.000	1.000
Western	0.238	0.428	0.000	1.000
Northern	0.270	0.446	0.000	1.000

Source: MPCE=monthly per capita expenditure. Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

4.4.3 Descriptive Analysis

This subsection presents the results of descriptive analyses conducted to check the relationships between key variables before conducting regression analyses. The sub-sample for this study, which is created in the manner explained in the previous subsection, is used in all the analyses. The subsection starts with presenting the variation in children's school attendance status by age and wealth level. It also presents the school attendance status of children in a community with a public school which charges different level of user fees. Difference in trends between among the poor and the non-poor is depicted for each analysis.

With respect to the age effect on school attendance status, Figure 4-3 and Figure 4-4 illustrate the proportions of children who attend public schools, attend private schools, and are out of school for each age group in 2005/2006 and 2011/2012, respectively. As reviewed in Section 2.1, official entrance age to primary education in Uganda is six years old. However, per age differences generally show that significant proportion of children at age six is out of school in rural Uganda.

These figures show that children become more likely to attend schools as they become older. Besides, there might be no significant variation in the proportion of being out of school among the children age from around nine to thirteen in general. However, the probability of being out of school might increase between ages thirteen and fourteen. Figure A-1 to A-4 in Appendices generally show that similar trends are seen regardless of children's poverty status. These results confirm the necessity to control for age effects using dummy variables in assessing the effects of key supply-side and demand-side factors on school attendance in rural Uganda, where late primary school entry is still common.

Figure 4-3: Percentage of Children Attending Public School, Attending Private School, and being Out of School by Age, 2005/2006
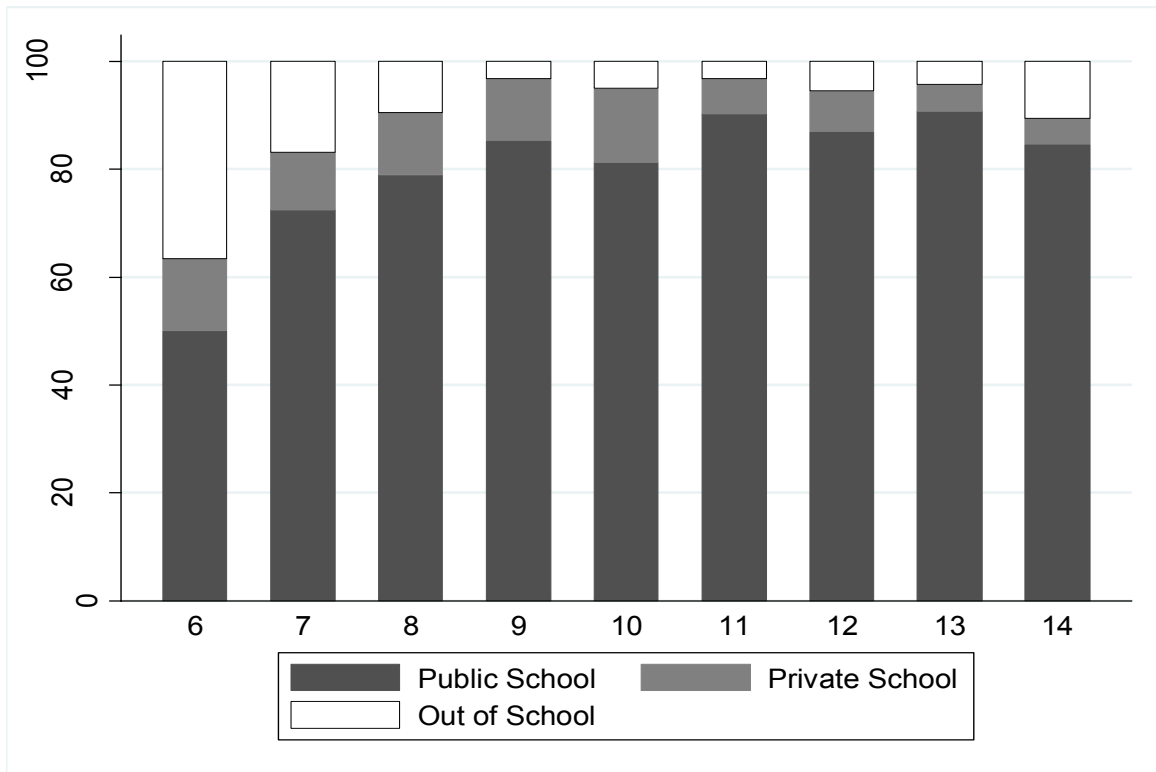
Source: Created by the author using UNHS 2005/2005.

Figure 4-4: Percentage of Children Attending Public School, Attending Private School, and Being Out of School by Age, 2011/2012
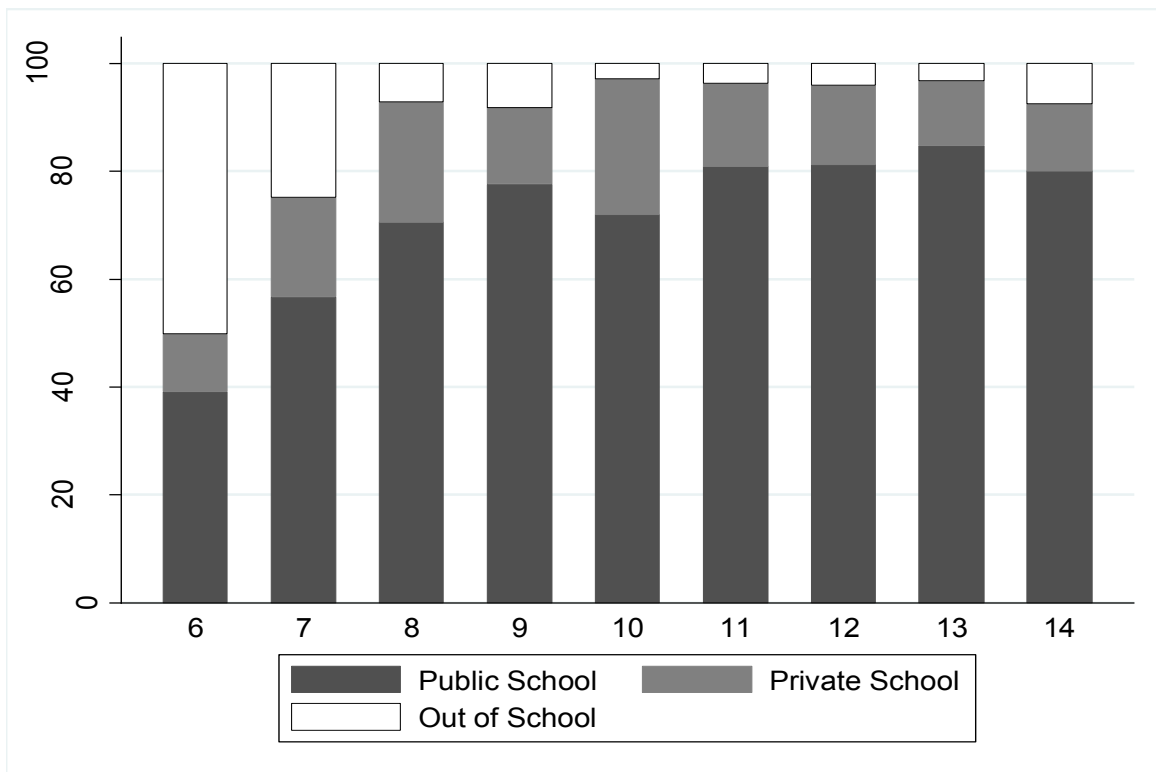
Source: Created by the author using UNPS 2011/2012.

Relating with Research Question 1-2 about the relationship between wealth and school attendance status, Figure 4-5 depicts the distributions of the logarithm of MPCE for primary school age children who attend public school, attend private school, and are out of school. The figure shows that there is an increase in the number of children who attend private school from 2005/2006 to 2011/2012. Between 2005/2006 and 2011/2012, the distribution for children who attend private schools becomes rightly skewed, which implies that private school attendance increases among the children from richer households in general. Moreover, interestingly, it also shows that distribution for out-of-school children seems to be pushed toward the right. This might imply that the overall effect of wealth status on school attendance has been diminished from 2005/2006 and 2011/2012.

Figure 4-5: Distributions of Logarithm of Monthly per Capita Expenditure of Children Attending Public School, Attending Private School, and Being Out of School, 2005/2006 and 2011/2012
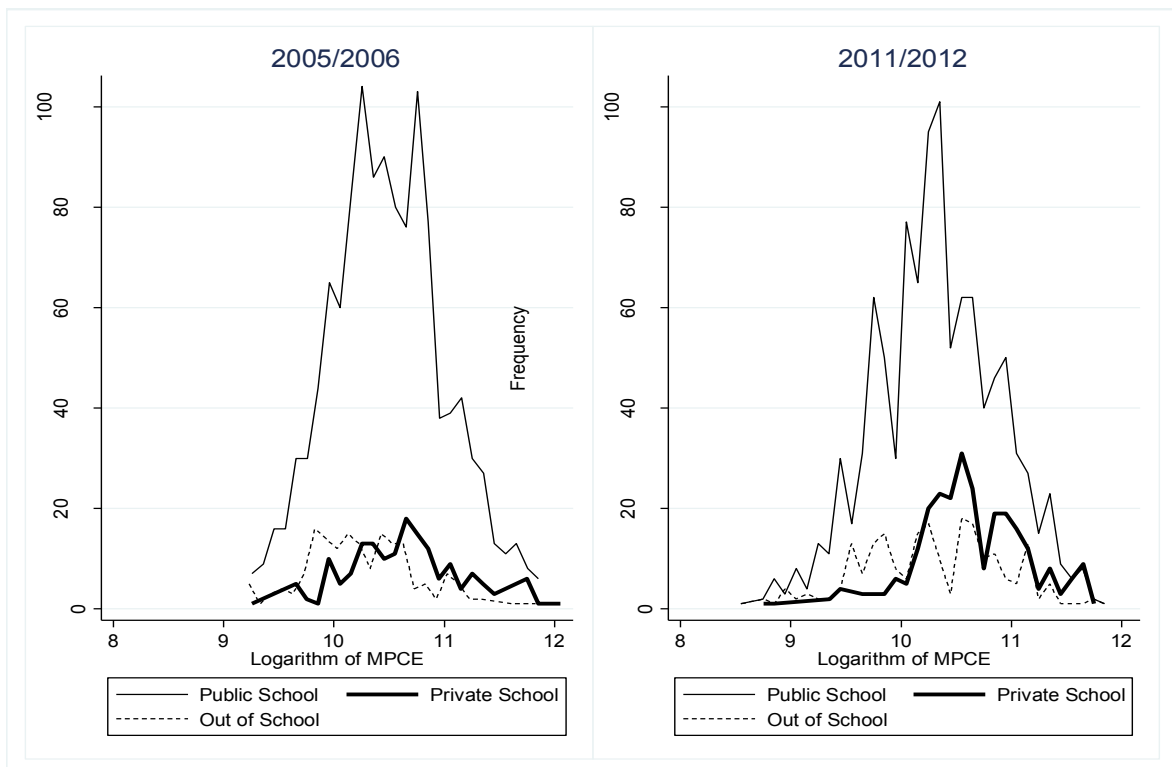
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure.

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Figure 4-6: Probability of Children Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2005/2006
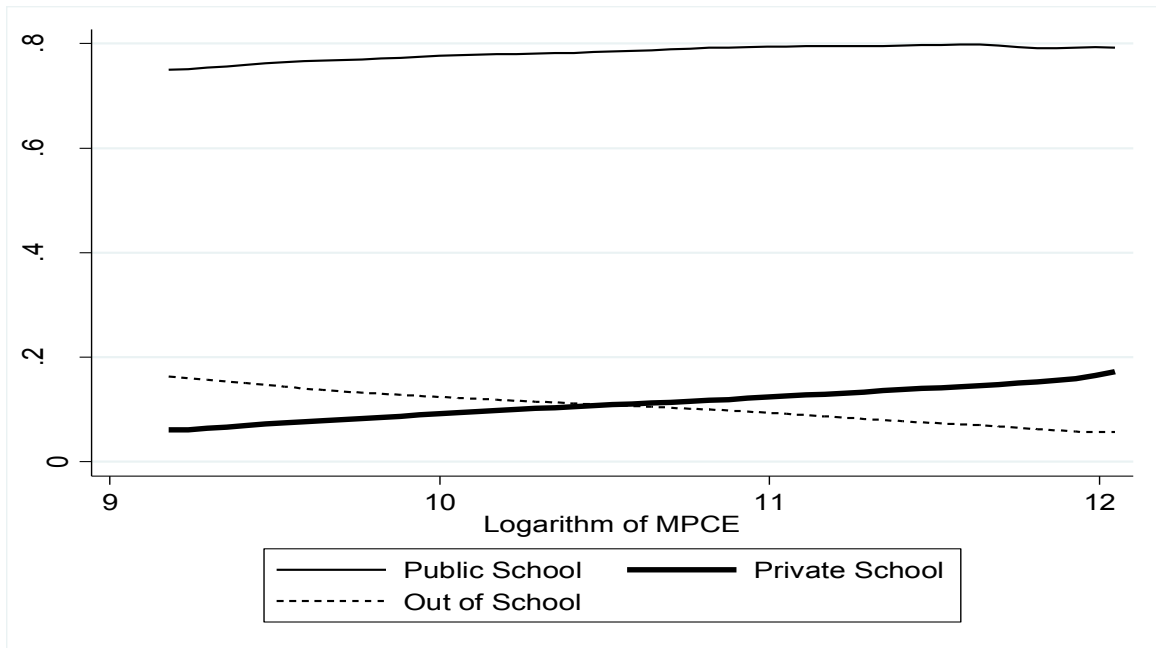
Source: Created by the author using UNHS 2005/2006.
Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

Figure 4-7: Probability of Children Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2011/2012
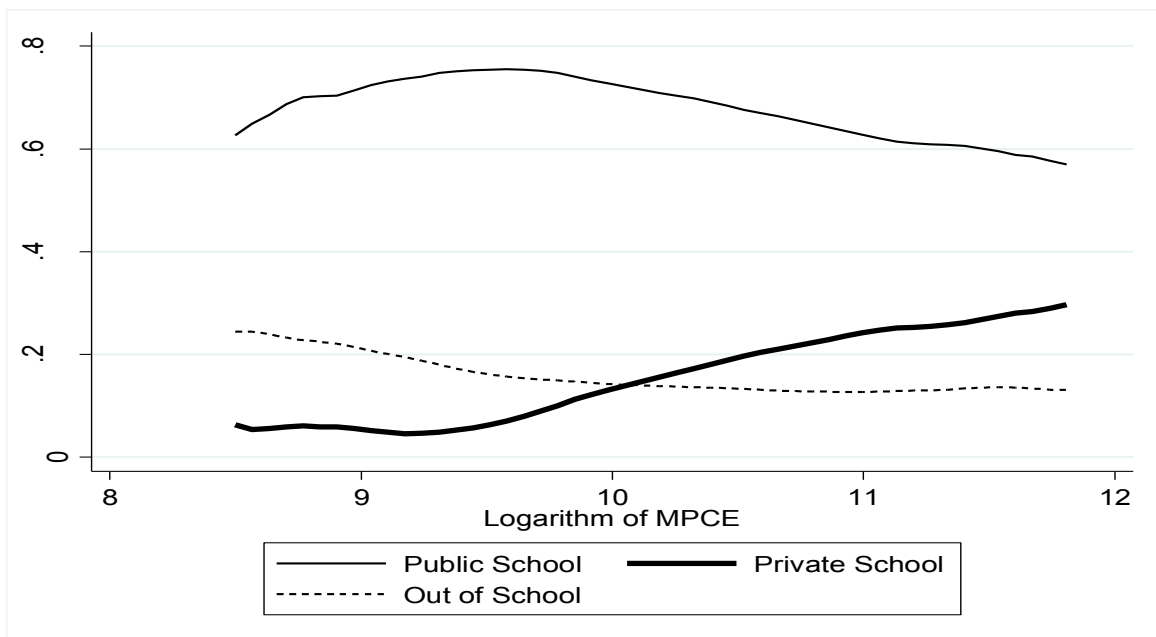
Source: Created by the author using UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

In addition to looking at the frequency of each school attendance status by the wealth level, it gives us an important insight to look at the probability of each school attendance by the wealth level. Figure 4-6 and Figure 4-7 show the graph of smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE in 2005/2006 and 2011/2012, respectively. This descriptive analysis clearly reveals that the school choice between public school and private school became common among the richer households between 2005/2006 and 2011/2012. It also reveals that effect of wealth on school attendance still remains among the children from the poor households in 2011/2012. This may be attributed to the fact that public school attendance of poor children became more sensitive to their wealth level between 2005/2006 and 2011/2012. Supplementary tables in Appendices highlight these differences in trend between children from the poor and the non-poor (see Table A-7, Table A-8, Table A-9, and Table A-10).

Before looking at the relationship between public school's user fee charge and children's school attendance status, the time series variation in the distribution of user fee amount is explored. Cumulative distributions for the total amount of fees charged per child per year in rural public schools show that informal user charges have been expanded in general from 2005/2006 to 2011/2012 in rural Uganda (see Figure 4-8). Both the frequency with which the informal user charge occurs and its amount have significantly increased. Table 4-7 gives us a more detailed picture of this expansion. The thresholds defined in Subsection 4.4.2 are applied to distinguish low and high amounts of user fee. While only about 40% of rural public schools were collecting fees in 2005/2006, about 80% of rural public schools had a user fee charge in 2011/2012. Moreover, although there was almost no rural public school which charged high informal fees in 2005/2006, almost 20% of rural public schools were collecting high fees in 2011/2012.

Figure 4-8: Distribution Functions of Total Amount of Fees Charged per Child per Year in Rural Public Schools, 2005/2006 and 2011/2012 (USh)
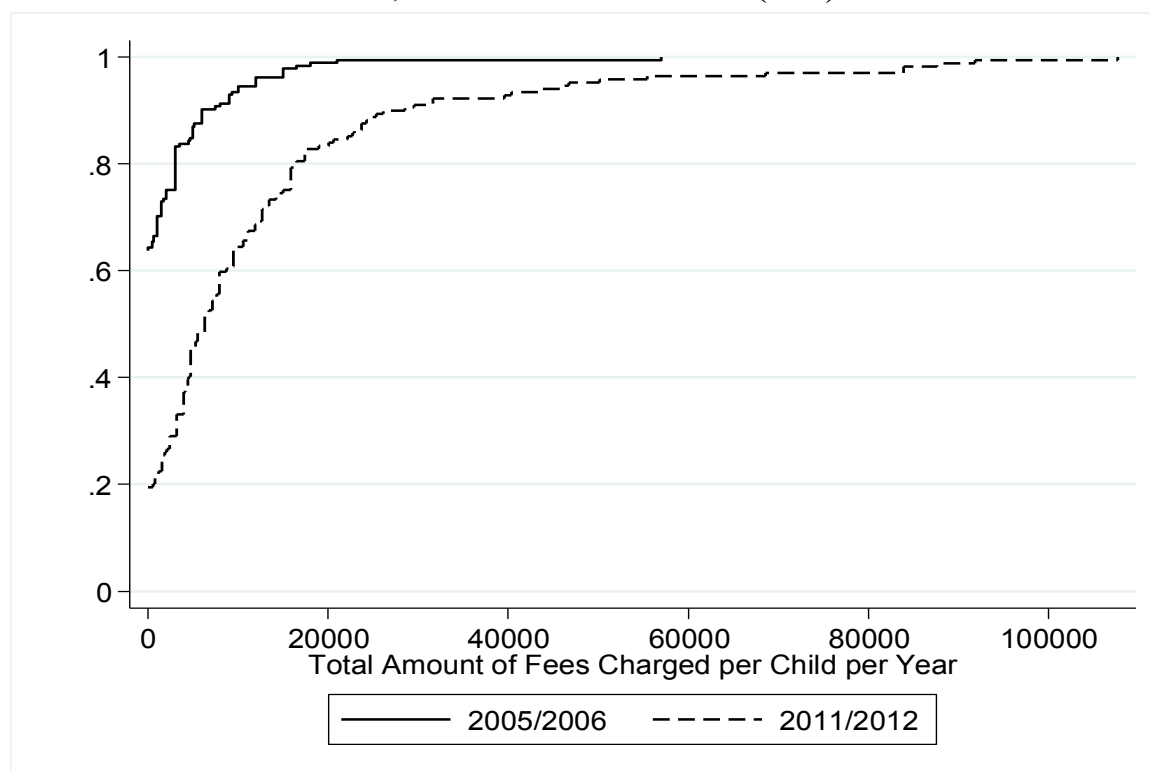
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Total amount of charged fees in 2011/2012 are converted into 2005/2006 prices by using Consumer Price Index reported in UBOS (2014a).

Table 4-7: Transition Probabilities from 2005/2006 to 2011/2012 for Existence and Level of Informal User Charge in Public Schools

	Number (%) of communities			
	No user charge in 2011/2012	Low user charge in 2011/2012	High user charge in 2011/2012	Total
No informal user charge in 2005/2006	22 (28.95)	46 (60.53)	8 (10.53)	76 (100.00)
Low user charge in 2005/2006	4 (8.00)	30 (60.00)	16 (32.00)	50 (100.00)
High user charge in 2005/2006	0 (0.00)	2 (100.00)	0 (0.00)	2 (100.00)
Total	26 (20.31)	78 (60.94)	24 (18.75)	128 (100.00)

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: The thresholds defined in Subsection 4.4.2 are applied to distinguish low and high amounts of user fee.

As is mentioned in Subsection 4.4.2, the information of the purpose of user fee charges is collected during UNPS. Table 4-8 shows that the informal user charges captured in this analysis were mainly made in order to improve school facility and/or provide school feeding, which corresponds to the definition of informal user charges in this study as clarified in Subsection 2.4.2. There were also a few schools which charged fees for the provision of uniforms. During UNPS 2011/2012, the questionnaire asked if a school charged fees to provide coaching services. However, there was no public school in rural areas which charged fees for this purpose. Previous studies find that there are many cases in developing countries in which teachers collect fees from the children who receive private tutoring at the same school where they receive formal education (Bray 2009; Jayachandran 2014). This result suggests that this type of fee charge in public schools may not be common in rural Uganda. At least, the informal user fees defined in this study does not include this type of fees for private tutoring.

Table 4-8: Purpose of Informal User Charge in Rural Public Primary Schools in 2011/2012 (USh)

	Percentage of schools which charge	*M*	*SD*	*Min*	*Max*
Development/building fees	59.46%	2725.41	3904.66	0	20000
Lunch	28.11%	3442.16	8336.62	0	50000
Uniform	6.49%	910.81	3659.62	0	25000
Exercise books	0.54%	59.46	808.74	0	11000
Others	2.70%	410.81	4473.82	0	60000

Source: Created by the author based on UNPS 2011/2012.
Note: Only one school in the sampled schools charged user fee for exercise book.

Figure 4-9 and Figure 4-10 depict how the level of informal user charge in the public school varies the schooling decision and school choice of poor and non-poor households, respectively. Figure 4-10 shows that generally there was little variation in schooling and school-choice decision of non-poor households by the level of informal user fee of the public schools in their communities either in 2005/2006 or 2011/2012. However,

as shown in Figure 4-9, among the children from poor households, the proportion of those who were out of school was obviously higher in the community where public schools charge higher fee than the one in the community where public schools charge no or low fees.

Figure 4-11 depicts how rural households' schooling decision and school choice differ between those who live in the treatment community, where high user fee charges in a public school started between 2005/2006 and 2011/2012, and the control community, where there was no high user fee charge in a public school either in 2005/2006 or 2011/2012. Figure 4-12 and Figure 4-13 depict the difference in households' decision-making for non-poor and poor households, respectively.

Figure 4-9: Percentage of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School by Level of Informal User Fee, 2005/2006 and 2011/2012
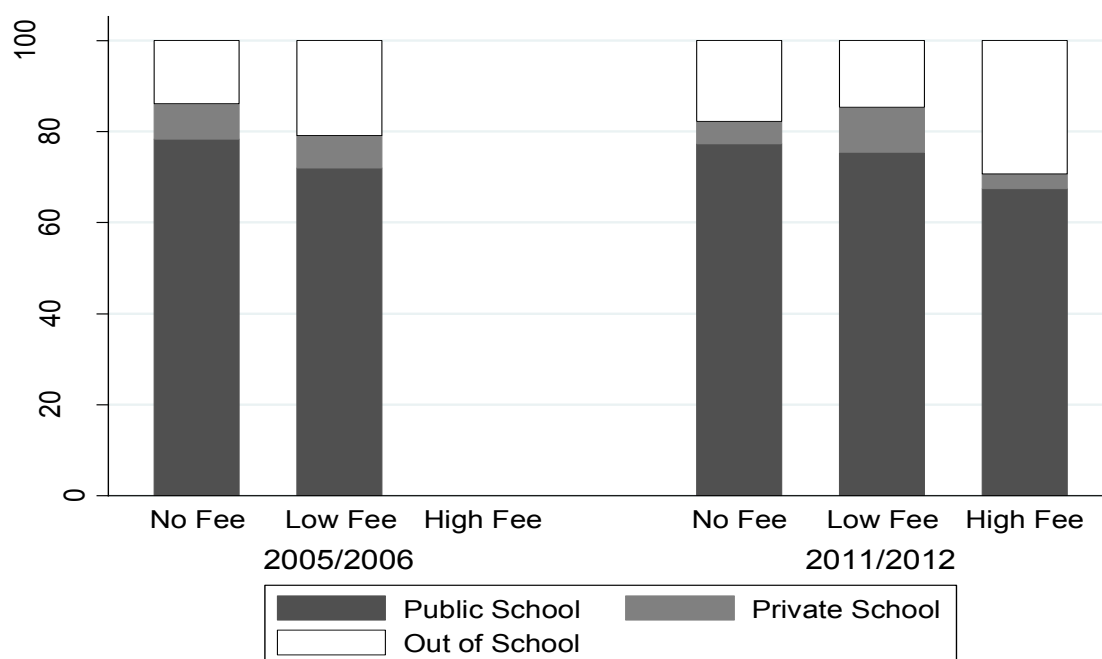
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Figure 4-10: Percentage of Children from Non-Poor Households Attending Public School, Attending Private School, and Being Out of School by Level of Informal User Fee, 2005/2006 and 2011/2012
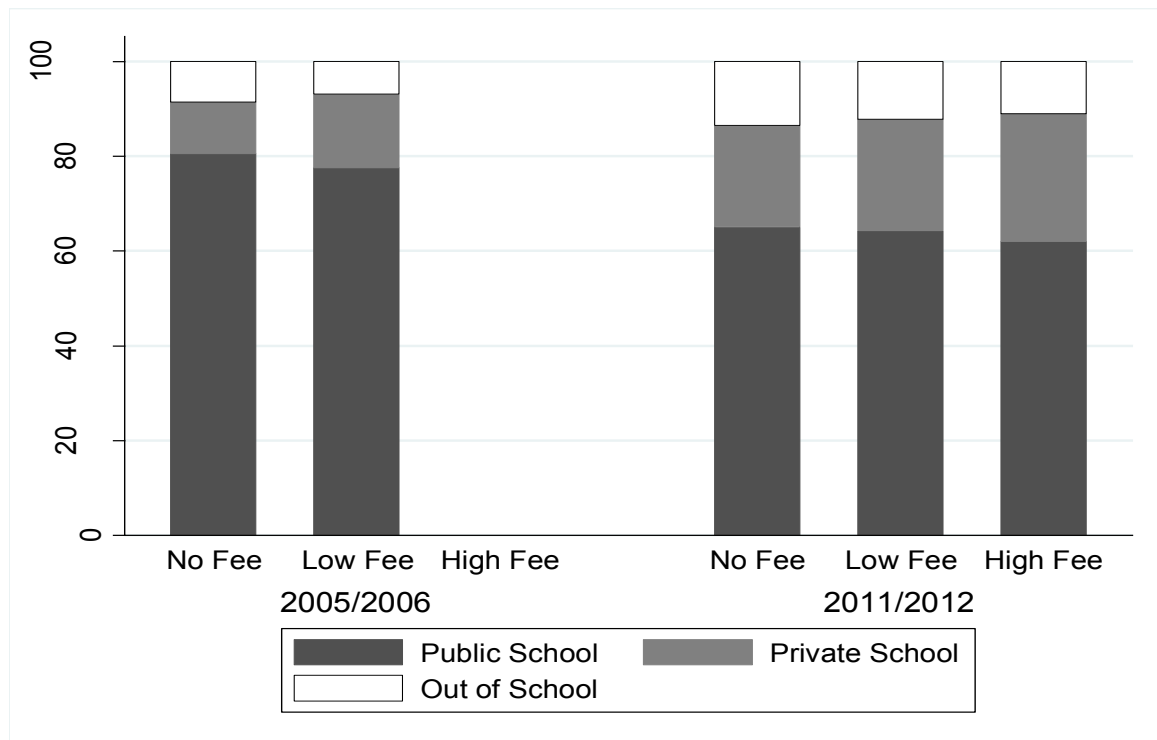
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Figure 4-11: Percentage of Children Attending Public School, Attending Private School, and Being Out of School by High Informal User Fee Coverage, 2005/2006 and 2011/2012
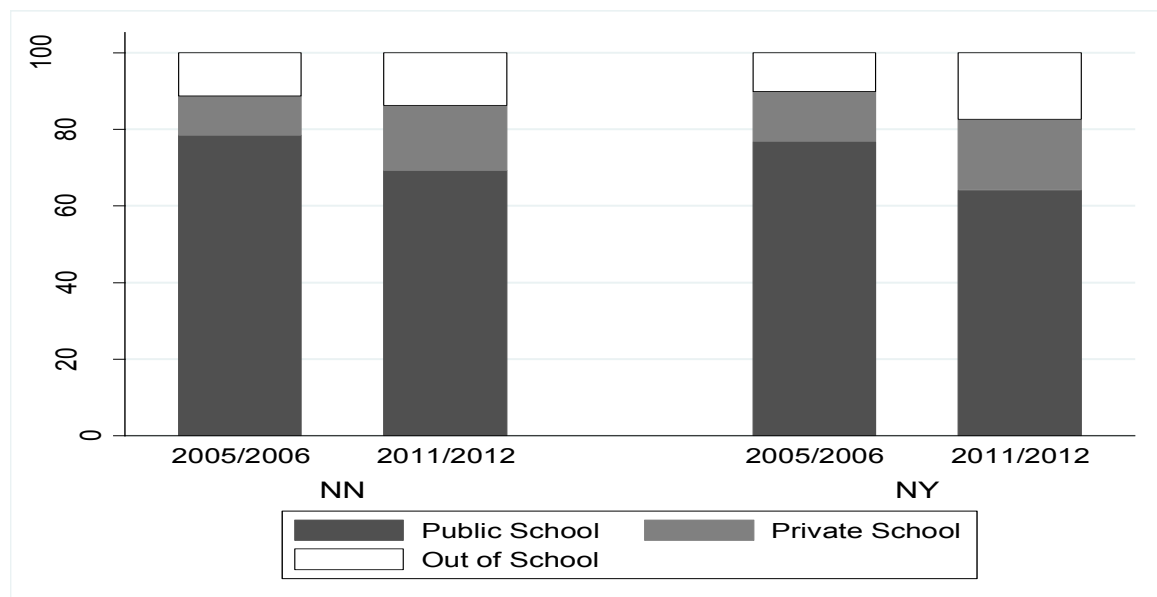
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: NN indicates the group of children in the community whose public school does not charge high informal user fee both in 2005/2006 and 2011/2012. NY indicates the group of children in the community whose public school does not charge high informal user fee in 2005/2006, but charges it in 2011/2012.

Figure 4-12: Percentage of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School by High Informal User Fee Coverage, 2005/2006 and 2011/2012
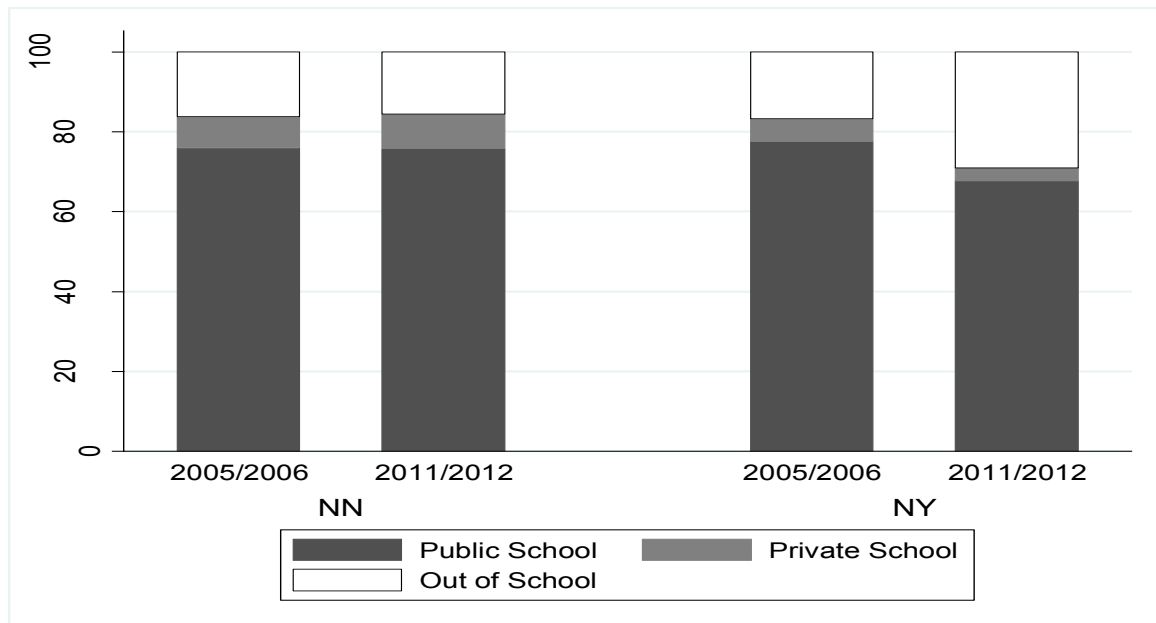
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: NN indicates the group of children in the community whose public school does not charge high informal user fee both in 2005/2006 and 2011/2012. NY indicates the group of children in the community whose public school does not charge high informal user fee in 2005/2006, but charges it in 2011/2012.

Figure 4-13: Percentage of Children from Non-Poor Households Attending Public School, Attending Private School, and Being Out of School by High Informal User Fee Coverage, 2005/2006 and 2011/2012
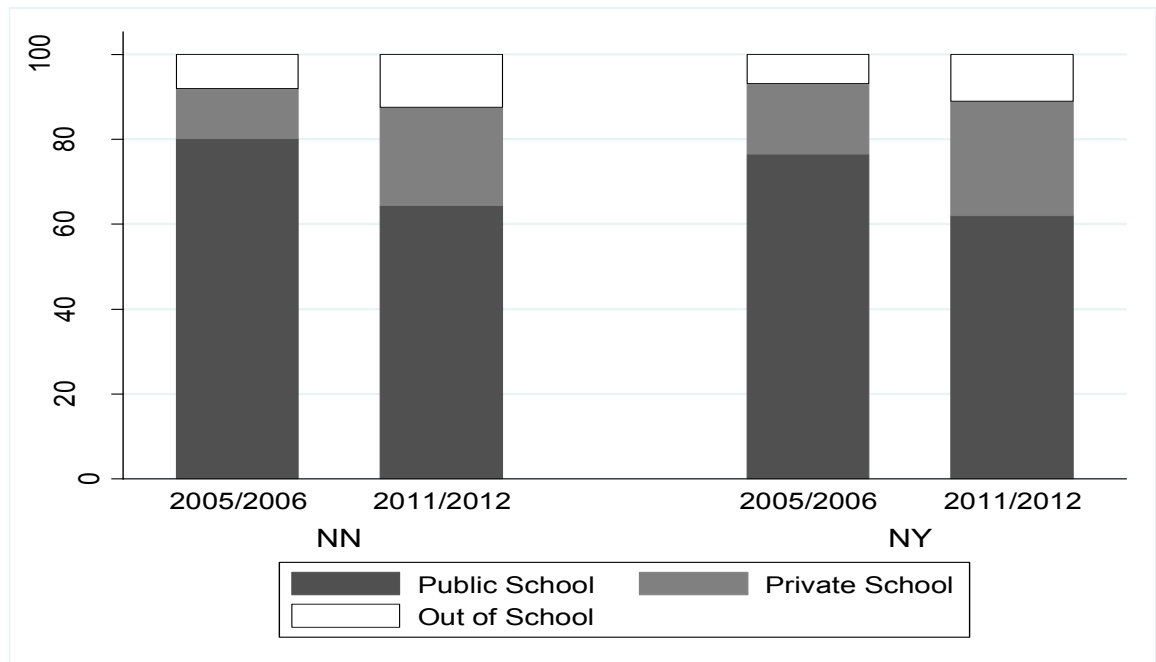
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: NN indicates the group of children in the community whose public school does not charge high informal user fee both in 2005/2006 and 2011/2012. NY indicates the group of children in the community whose public school does not charge high informal user fee in 2005/2006, but charges it in 2011/2012.

Moreover, Table 4-9 shows the results of t-tests to check whether time variations in the ratio of children attending school are statistically significant in control and treatment communities, as well as the unconditional DD results of the high informal fee charge. The results of the analyses using the sample restricted to the poor and the non-poor are presented in Panel B and Panel C, respectively. The result shows that high informal fee charge in public school is associated with 12.8 percentage point decrease in school attendance, and this effect is statistically significant at the 10% level. However, the results also show that the effects estimated using full sample and the sample restricted to the non-poor are not statistically significant even at the 10% level.

These results reveal that the ratio of children attending school might notably decreases by the presence of a high informal fee charge in public school especially among the children from poor households. However, the simple DD is implemented under the assumption that other covariates do not change between 2005/2006 and 2011/2012. In order to account for the variation in various covariates, the study extends the regression model by including the variables for them.

In addition, DD assumes that there is no time-varying difference between the communities where a public school introduces high-fee charge and the communities where a public school does not charge high fees. However, in rural Ugandan context, high-fee charge in public schools may not take place at random but by being affected by several factors. For instance, a public school in a community with relatively higher SES may more likely to charge high-fees from the parents/guardians. In this case, initial conditions may significantly differ between treatment and control communities, so that it becomes difficult to assume that the outcome in the treatment group would have moved in tandem with the one in the in the control group. As details are mentioned in Subsection 4.3.1, matching method is combined in order to mitigate this bias, which is not dealt with in the simple DD estimation.

Table 4-9: Unconditional Double-Differences in the Ratio of Children Attending School by High Informal User Fee Coverage

Panel A: Full

	2005/2006	2011/2012	Difference	
NN	0.887	0.862	-0.025	*
	(0.009)	(0.010)	(0.013)	
NY	0.898	0.824	-0.074	**
	(0.018)	(0.024)	(0.030)	
Double difference			-0.049	
			(0.033)	

Panel B: Poor

	2005/2006	2011/2012	Difference	
NN	0.837	0.844	0.006	
	(0.017)	(0.016)	(0.023)	
NY	0.831	0.710	-0.122	*
	(0.040)	(0.047)	(0.062)	
Double difference			-0.128	*
			(0.066)	

Panel C: Non-poor

	2005/2006	2011/2012	Difference	
NN	0.918	0.875	-0.043	***
	(0.010)	(0.012)	(0.016)	
NY	0.930	0.890	-0.041	
	(0.019)	(0.025)	(0.031)	
Double difference			0.002	
			(0.035)	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: NN indicates the group of children in the community whose public school does not charge high informal user fee both in 2005/2006 and 2011/2012. NY indicates the group of children in the community whose public school does not charge high informal user fee in 2005/2006, but charges it in 2011/2012. Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

CHAPTER 5 :

RESULTS

5.1 Determinants of School Attendance and Choice in Primary Education

5.1.1 Effects of Individual, Household, Public School and Community Factors on Primary School Attendance

This subsection shows the results of the analyses which investigate how individual, households, public school and community factors are related to children's primary school attendance in rural Uganda. The results of the analyses, which use pooled cross-sectional data to examine how some of these effects changed between 2005/2006 and 2011/2012, are also presented. The study conducts regression analysis for the full sample as well as separately for the poor and non-poor. The results of the regression analysis using the sample of children age 6–14 are displayed in Table A-7 and Table A-9, and those using the sample including the children in the communities with high-fee charge in public schools in 2005/2006 are presented in Table A-8 and Table A-10.

Table 5-1 displays the OLS estimation of LPM (Model 1 and Model 2) as well as the AMEs of logit model (Model 3 and Model 4) using the full sample. All the models are fit with a dichotomous outcome variable on whether a child attends school or not. In addition to the variables on individual, household, public school, and community characteristics, two-way interaction terms between the selected variables and a year dummy for 2011/2012 are included in Model 2 and Model 4.

Besides, Table 5-2 displays the OLS estimation of LPM using the subsample of the poor (Model 1) and the subsample of the non-poor (Model 2). It also displays the AMEs of the logit model using the subsample of the poor (Model 3) and the subsample of the non-

poor (Model 4). Two-way interaction terms between the selected variables and year dummy for 2011/2012 are included in all the models.

First, among the variables on individual characteristics, coefficients of age dummies show that the probability of attending school by the children who are six, seven, and eight years old is significantly lower than those who are twelve years old. Results from the full sample analysis applying the logit model show that children of age six, seven, and eight are 38.3%, 15.8%, and 3.7% points less likely to attend primary school compared with those of age twelve at 1% level. However, coefficients of age dummies for nine, ten, and eleven years do not show statistically significant effects when the age dummy for twelve-year-olds is set as a base group.

Besides, statistically significant difference in primary school attendance is found between boys and girls, as well as foster and non-foster children, especially among the children from non-poor households. Logit model estimates show that girls from non-poor households are 2.8% points more likely to attend primary school than boys, and foster children from non-poor households are 2.9% points less likely to attend primary school than non-foster children (see Model 4 in Table 5-2).

Second, with regard to household characteristics, MPCE, and household head's years of schooling are found to have a significant positive effect on the probability of attending school. The result from the full sample applying logit model shows that, holding all else constant, a 1% point increase in MPCE and a one point increase in the household head's years of schooling are related with the 3.9% points and 0.5% point increase in the probability of primary school attendance, respectively (see Model 3 in Table 5-1). Besides, it is worth noting that interaction effects between MPCE and year dummy for 2011/2012 are significant. The result from the logit model estimation using a full sample shows that the variation in the probability of attending school related to MPCE is almost diminished between 2005/2006 and 2011/2012, and the interaction term is statistically significant at the 5% level (see Model 4 in Table 5-1). On the other hand, none of the variables on the

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characteristics of household heads have a significant correlation with the probability of school attendance. It is also worth noting that the coefficients for this interaction term are also significant in the analysis using the sample for the non-poor, but not statistically significant in the analysis using the sample for the poor.

Third, with regard to public school characteristics, a statistically significant negative correlation is found between PTR and primary school attendance especially among the children from non-poor households. The result from the logit model estimates using the sample of non-poor children shows that, holding all else constant, a one point increase in the PTR of public primary school is related with a 0.1% point decrease in the probability of attending school, which is significant at the 5% level (see Model 4 in Table 5-2). Coefficients of interaction terms between the PTR and year dummy for 2011/2012 are not found to be significant.

In addition, a statistically significant positive correlation is found between poor facility conditions and primary school attendance, especially among the children from poor households. The result from the logit model estimates using the sample of poor children shows that, holding all else constant, poor facility condition is related with a 6.4% points increase to the probability of attending school, which is significant at the 5% level (see Model 3 in Table 5-2).

Fourth, with respect to community characteristics, the existence of community contributions and the availability of public primary school in LC1 are found to be strong predictors of pupils' primary school attendance. It is worth noting that the statistically significant effects of these factors are only found among the children from poor households. As shown in the results from the logit model result for the poor, holding all other factors constant, the existence of community contributions and availability of public primary schools in LC1 are related with 7.2% points and 5.8% points increases in the probability of primary school attendance, respectively; these coefficients are statistically significant at the 1% level (see Model 3 in Table 5-2). However, there is no statistically significant

relationship between the availability of private school in LC1 and the probability of school attendance.

Moreover, the Northern regional dummy consistently has a negative relationship with the probability of attending primary school among the poor. Holding all other factors constant, primary school age poor children in the Northern region are 6.6% points less likely to attend school compared with those in Central region, which is only statistically significant at the 10% level, according to the logit model estimate (see Model 3 in Table 5-2). With respect to the year dummy for 2011/2012, logit model estimates show that there was slight but significant decrease in the probability of attending primary school between 2005/2006 and 2011/2012 especially among the non-poor. The probability of attending primary school is 3.7% points lower in 2011/2012 than in 2005/2006 among the non-poor, holding all else constant (see Model 4 in Table 5-2). However, no statistically significant year effect is observed among the poor.

The results in Table A-8 and Table A-10 generally show a similar trend which is mentioned above. The results in Table A-7 and Table A-9 also show a similar trend, although there are some exceptions: for instance, full sample estimates show that children from the household with female household head are more likely to attend primary school.

Table 5-1: Determinants of School Attendance of Children Age 6-12: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled sample of children age 6-12				Logit model for pooled sample of children age 6-12			
	Full (1)		Full (2)		Full (3)		Full (4)	
Individual characteristics								
Female	0.021	*	0.021	*	0.021	*	0.020	*
	(0.011)		(0.011)		(0.011)		(0.011)	
Foster child	-0.023	*	-0.023	*	-0.020		-0.020	
	(0.014)		(0.014)		(0.014)		(0.014)	
Household characteristics								
Poor	-0.016		-0.015		-0.013		-0.008	
	(0.018)		(0.018)		(0.018)		(0.018)	
Log (MPCE)	0.040	***	0.059	***	0.039	**	0.048	***
	(0.017)		(0.020)		(0.017)		(0.018)	
Log (MPCE)×Year 2011/2012			-0.031				-0.045	**
			(0.021)				(0.021)	
Number of children	0.001		0.001		0.001		0.001	
	(0.003)		(0.003)		(0.003)		(0.003)	
Youth household head	-0.030		-0.031		-0.024		-0.023	
	(0.026)		(0.026)		(0.021)		(0.021)	
Female household head	0.020		0.020		0.021		0.021	
	(0.014)		(0.014)		(0.014)		(0.014)	
Household head's education	0.005	***	0.005	***	0.005	***	0.005	***
	(0.002)		(0.002)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	-0.001	*	-0.0003		-0.001	**	-0.001	*
	(0.0003)		(0.0005)		(0.0003)		(0.0003)	
Pupil-teacher ratio×Year 2011/2012			-0.0004				-0.0003	
			(0.001)				(0.001)	
Poor facility condition	0.030	*	0.028	*	0.028	*	0.027	*
	(0.016)		(0.016)		(0.016)		(0.016)	
Community characteristics								
Community contribution	0.030	**	0.029	**	0.028	**	0.029	**
	(0.014)		(0.014)		(0.013)		(0.013)	
Availability of public school	0.027	**	0.027	**	0.029	**	0.030	***
	(0.011)		(0.011)		(0.011)		(0.011)	
Availability of private school	0.004		0.006		0.006		0.008	
	(0.015)		(0.016)		(0.017)		(0.017)	
Region (base=Central)								
Eastern	0.046	***	0.045	***	0.048	***	0.046	***
	(0.016)		(0.016)		(0.017)		(0.017)	
Western	0.028	*	0.027	*	0.034	*	0.031	*
	(0.016)		(0.016)		(0.018)		(0.018)	
Northern	-0.033	*	-0.034	*	-0.021		-0.023	
	(0.019)		(0.019)		(0.018)		(0.018)	
Year 2011/2012	-0.029	***	0.315		-0.031	***	-0.030	***
	(0.011)		(0.230)		(0.011)		(0.011)	
Constant	0.494		0.292					
	(0.186)		(0.219)					
R-squared	0.1936		0.1943					
Pseudo R-squared					0.225		0.2279	
Log Pseudo Likelihood					-906.37371		-902.9286	
Number of observations	3,061				3,061			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=Monthly Per Capita Expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-2: Determinants of School Attendance of Children Age 6-12 by Poverty Status: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled sample of children age 6-12				Logit model for pooled sample of children age 6-12			
	Poor		Non-poor		Poor		Non-poor	
	(1)		(2)		(3)		(4)	
Individual characteristics								
Female	0.013		0.027	**	0.010		0.028	**
	(0.020)		(0.013)		(0.019)		(0.013)	
Foster child	-0.004		-0.030	*	0.000		-0.029	*
	(0.027)		(0.016)		(0.026)		(0.015)	
Household characteristics								
Log (MPCE)	0.105	*	0.039	*	0.079	***	0.012	
	(0.059)		(0.023)		(0.030)		(0.021)	
Log (MPCE)×Year 2011/2012	-0.026		-0.073	**	-0.033		-0.077	**
	(0.072)		(0.034)		(0.062)		(0.038)	
Number of children	0.006		-0.003		0.005		-0.002	
	(0.005)		(0.003)		(0.005)		(0.003)	
Youth household head	-0.021		-0.035		-0.010		-0.032	
	(0.044)		(0.030)		(0.037)		(0.024)	
Female household head	0.024		0.012		0.023		0.015	
	(0.025)		(0.017)		(0.025)		(0.017)	
Household head's education	0.007	**	0.004	*	0.007	**	0.004	**
	(0.003)		(0.002)		(0.004)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	-0.001		0.000		-0.001		-0.001	**
	(0.001)		(0.001)		(0.001)		(0.0004)	
Pupil-teacher ratio×Year 2011/2012	0.0004		-0.001		0.0005		-0.001	
	(0.001)		(0.001)		(0.001)		(0.001)	
Poor facility condition	0.066	**	-0.006		0.064	**	-0.003	
	(0.027)		(0.019)		(0.031)		(0.017)	
Community characteristics								
Community contribution	0.079	***	-0.013		0.072	***	-0.012	
	(0.028)		(0.015)		(0.023)		(0.016)	
Availability of public school	0.055	***	0.020		0.058	***	0.021	
	(0.021)		(0.013)		(0.021)		(0.013)	
Availability of private school	0.027		-0.007		0.028		-0.004	
	(0.032)		(0.018)		(0.040)		(0.017)	
Region (base=Central)								
Eastern	0.052	*	0.022		0.057		0.021	
	(0.031)		(0.019)		(0.036)		(0.018)	
Western	0.004		0.029	*	-0.003		0.038	**
	(0.039)		(0.016)		(0.041)		(0.018)	
Northern	-0.075	**	0.007		-0.066	*	0.012	
	(0.036)		(0.023)		(0.036)		(0.022)	
Year 2011/2012	0.227		0.789	*	-0.012		-0.037	***
	(0.720)		(0.366)		(0.021)		(0.013)	
Constant	-0.254		0.576	**				
	(0.599)		(0.253)					
R-squared	0.2095		0.1956					
Pseudo R-squared					0.2208		0.2545	
Log Pseudo Likelihood					-428.07981		-450.52598	
Number of observations	1,204		1,857		1,204		1,857	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

5.1.2 Effects of Individual, Household, Public School and Community Factors on Primary School Choice

This subsection shows the results of the analyses which investigate how individual, household, public school and community factors are related with rural households' school choice between public and private schools in Uganda. The results of the analyses, which use pooled cross-sectional data to examine how some of these effects changed between 2005/2006 and 2011/2012, are also presented. The study conducts regression analysis for the full sample as well as separately for the poor and non-poor. The results of the regression analysis using the sample of children age 6–14 are displayed in Table A-11 and Table A-13, and those using he sample including the children in the communities with high-fee charge in public schools in 2005/2006 are presented in Table A-12 and Table A-14.

Table 5-3 displays the AMEs from MNL model analyses using the full sample. All the models are fit with an unordered nominal outcome on whether a child does not attend school, attends public school or attends private school, setting not attending school as a base category. The same set of explanatory variables with the ones which are used in the school attendance model are basically used in the school-choice model. Two-way interaction terms between the selected variables and year dummy for 2011/2012 are included in Model 2.

Table 5-4 displays the AMEs from MNL model analyses using the subsample of the poor (Model 1) and the subsample of the non-poor (Model 2). Two-way interaction terms between the selected variables and year dummy for 2011/2012 are included in all the models.

First, with respect to individual characteristics, age dummies are found to have similar effects with those are found in the previous analysis about the correlation between age and the probability of overall school attendance. In contrast, a different trend is found in the effects of age dummies on the probability of attending private school. In summary,

the probability that attending private school does not vary by age, like the probability of attending public school, is significantly lower among the younger children. However, the full sample results from the logit model analysis show that eight- and ten-year-old children are 5.7% and 6.4% points more likely to attend private school compared with twelve-year-old children, holding all other factors constant.

No statistically significant gender effect is found either in public or private school attendance. However, a statistically significant relationship is found between being a foster child and the probability of attending private school, especially among the children from non-poor households. The result from the MNL model using the sample from non-poor children shows that a foster child is 5.8% points less likely to attend private school, holding all other factors constant, which is statistically significant at the 1% level (see Model 2 in Table 5-4). A weak but significant negative correlation between being a foster child and the probability of attending private school is also found among the poor. However, no statistically significant relationship is found between being a foster child and the probability of attending public school.

Second, regarding household characteristics, whether a child is from a poor household or not has a statistically significant positive correlation with the probability of attending private school, as well as a statistically significant positive correlation with the probability of attending public school. According to the prediction from the full sample with interaction terms, holding all else constant, being from a poor household is related to a 4.9% points decrease in the probability of attending private school (see Model 2 in Table 5-3).

Moreover, a significant and negative interaction effect between MPCE and year dummies for 2011/2012 shows that there had been a significant decrease in the effects of MPCE on public school attendance between 2005/2006 and 2011/2012. This significant negative interaction effect is also found when restricting the sample to the children from non-poor households, but not found among the children from poor households. Besides, a

full sample estimate also shows a significant increase in the effects of wealth on private school attendance.

With regard to other household characteristics, the household head's characteristics have a weak but significant relationship with school choice, especially among the children from non-poor households. For instance, estimates using the non-poor sample show that the probability of attending private school decreases by 4.1% points and the probability of attending public school increases by 5.6% points if a child is from a household with a female-headed household, holding all else constant (Model 2 in Table 5-4).

Third, with regard to the effects of public school characteristics on school choice, PTR seemed to have significant and negative relationship with the probability of attending private school, especially among children from poor households in 2005/2006. However, this negative relationship might be diminished among the poor between 2005/2006 and 2011/2012. In addition, the estimation results show that the effect of PTR on the probability of attending private school became positive between 2005/2006 and 2011/2012 among the children from non-poor households. Besides, there is a significantly negative interaction effect between PTR and the year dummy for 2011/2012 on the probability of attending public school, especially among the children from non-poor households.

On the other hand, the facility condition of public schools might have a significant relationship with school choice by the non-poor households. The estimation results show that non-poor households are 8.1% points more likely to send their children to a private primary school when a public school in their community has a poor facility condition, holding other factors constant (see Model 2 in Table 5-4). Besides, non-poor households are 8.5% points less likely to send their children to private primary school when a public school in their community has a poor facility condition, holding other factors constant (see Model 2 in Table 5-4).

Fourth, with respect to community characteristics, the existence of a community contribution for public school is positively related with the probability of attending public

school, especially among children from poor households. MNL estimates that using the sample of poor children shows that the presence of contribution for public schooling by the community is related with an 8.6% points increase in the probability of attending public school, which is statistically significant at the 1% level (see Model 1 in Table 5-4).

In addition, the availability of public school in LC1 significantly reduces the probability of attending private school and increases the probability of attending public school among children from both poor and non-poor households. On the other hand, if there is a private school in the community, non-poor households are more likely to send their children to the private school instead of sending them to a public school. There is also a statistically significant positive correlation between the availability of private school and the probability of attending private school by the children from poor households. However, the negative relationship with the probability of their attending public school is not statistically significant.

AMEs for regional dummies generally show that the probability of attending private school instead of attending public school is the highest in Central region, followed by the Western, Eastern and Northern regions in this order. According to the estimation results from full sample analyses with interaction terms, primary school age children in the Northern region are 17.0% points less likely to attend private school, as well as 14.7% points more likely to attend public school compared with those in Central region, which are statistically significant at the 1 % level (see Model 2 in Table 5-3).

Lastly, it is worth noting that, between 2005/2006 and 2011/2012, there was a significant decrease and increase in the probability of attending public school and private school, respectively. The estimation results from MNL model analysis using a full sample with interaction terms show that, holding all else constant, the probability of private school attendance significantly increased by 6.7% points, and the probability of public school attendance decreased by 9.5% points from 2005/2006 to 2011/2012 (see Model 2 in Table 5-3). It is worth noting that this trend is also found after restricting the sample to the

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children from non-poor households, but not found after restricting to the children from poor households.

The results in Table A-12 and Table A-14 generally show a similar trend which is mentioned above. However, positive interaction effects between PTR and a year dummy for 2011/2012 among the non-poor is not statistically significant in the analysis using the sample which includes the children in the communities with high-fee charge in public schools in 2005/2006. The results in Table A-11 and Table A-13 also show a similar trend, although there are some exceptions mainly in the effects of control variables. Moreover, the estimation result in Model 1 in Table A-13 shows a weak and positive year dummy effect on the probability of attending private school, which is statistically significant only at the 10% level.

Table 5-3: Determinants of School Choice of Children Age 6-12: Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)						
	MNL model for pooled sample of children age 6-12 Full (1)				MNL model for pooled sample of children age 6-12 Full (2)		
	Public school		Private school		Public school		Private school	
Individual characteristics								
Female	0.002		0.018		0.001		0.019	
	(0.015)		(0.012)		(0.015)		(0.012)	
Foster child	0.028		-0.047	***	0.030		-0.049	***
	(0.019)		(0.015)		(0.019)		(0.015)	
Household characteristics								
Poverty	0.036		-0.050	**	0.041	*	-0.049	**
	(0.025)		(0.020)		(0.025)		(0.020)	
Log (MPCE)	0.014		0.024		0.025		0.023	
	(0.022)		(0.017)		(0.023)		(0.018)	
Log (MPCE)×Year 2011/2012					-0.118	***	0.069	***
					(0.029)		(0.023)	
Number of children	0.001		-0.00003		0.001		0.000	
	(0.004)		(0.003)		(0.004)		(0.003)	
Youth household head	-0.063	**	0.037	*	-0.062	**	0.037	*
	(0.029)		(0.022)		(0.029)		(0.022)	
Female household head	0.032	*	-0.012		0.034	*	-0.013	
	(0.019)		(0.016)		(0.019)		(0.015)	
Household head's education	0.004	*	0.001		0.004	*	0.001	
	(0.002)		(0.002)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	0.001		-0.001	***	0.001	**	-0.002	***
	(0.0005)		(0.0004)		(0.0005)		(0.0004)	
Pupil-teacher ratio×Year 2011/2012					-0.002	**	0.002	***
					(0.001)		(0.001)	
Poor facility condition	-0.031		0.058	***	-0.033		0.059	***
	(0.021)		(0.016)		(0.021)		(0.016)	
Community characteristics								
Community contribution	0.054	***	-0.026	*	0.051	***	-0.022	
	(0.018)		(0.014)		(0.018)		(0.014)	
Availability of public school	0.079	***	-0.049	***	0.081	***	-0.051	***
	(0.015)		(0.013)		(0.015)		(0.013)	
Availability of private school	-0.093	***	0.091	***	-0.086	***	0.083	***
	(0.020)		(0.014)		(0.020)		(0.014)	
Region (base=Central)								
Eastern	0.140	***	-0.086	***	0.137	***	-0.086	***
	(0.022)		(0.018)		(0.022)		(0.018)	
Western	0.073	***	-0.034	**	0.069	***	-0.033	**
	(0.022)		(0.015)		(0.022)		(0.015)	
Northern	0.149	***	-0.170	***	0.147	***	-0.170	***
	(0.028)		(0.025)		(0.027)		(0.024)	
Year 2011/2012	-0.095	***	0.065	***	-0.095	***	0.067	***
	(0.015)		(0.012)		(0.015)		(0.012)	
Pseudo R-squared	0.1913				0.1971			
Log Pseudo Likelihood	-1894.8794				-1881.2443			
Number of observations	3,061				3,061			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-4: Determinants of School Choice of Children Age 6-12 by Poverty Status: Average Marginal Effects from Multinomial Logit Model

	Poor (1)				Non-poor (2)			
	Public school		Private school		Public school		Private school	

Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)

MNL model for pooled sample of children age 6-12

	Public school		Private school		Public school		Private school	
Individual characteristics								
Female	-0.002		0.012		0.002		0.026	
	(0.023)		(0.015)		(0.019)		(0.017)	
Foster child	0.040		-0.039	*	0.028		-0.058	***
	(0.031)		(0.021)		(0.024)		(0.021)	
Household characteristics								
Log (MPCE)	0.033		0.048		-0.007		0.020	
	(0.041)		(0.032)		(0.029)		(0.024)	
Log (MPCE)×Year 2011/2012	-0.062		0.026		-0.121	**	0.043	
	(0.081)		(0.062)		(0.054)		(0.047)	
Number of children	0.009		-0.004		-0.003		0.001	
	(0.006)		(0.004)		(0.004)		(0.004)	
Youth household head	-0.043		0.029		-0.077	**	0.043	
	(0.043)		(0.024)		(0.038)		(0.032)	
Female household head	-0.001		0.023		0.056	**	-0.041	*
	(0.029)		(0.018)		(0.025)		(0.023)	
Household head's education	0.007		0.000		0.002		0.002	
	(0.004)		(0.003)		(0.003)		(0.003)	
Public school characteristics								
Pupil-teacher ratio	0.001		-0.002	***	0.000		-0.001	**
	(0.001)		(0.001)		(0.001)		(0.001)	
Pupil-teacher ratio ×Year 2011/2012	-0.002		0.002	**	-0.003	**	0.002	*
	(0.001)		(0.001)		(0.001)		(0.001)	
Poor facility condition	0.042		0.020		-0.085	***	0.081	***
	(0.035)		(0.021)		(0.027)		(0.023)	
Community characteristics								
Community contribution	0.086	***	-0.013		0.017		-0.029	
	(0.027)		(0.017)		(0.023)		(0.020)	
Availability of public school	0.090	***	-0.034	**	0.087	***	-0.065	***
	(0.024)		(0.015)		(0.020)		(0.017)	
Availability of private school	-0.027		0.047	**	-0.120	***	0.107	***
	(0.040)		(0.018)		(0.023)		(0.019)	
Region (base=Central)								
Eastern	0.133	***	-0.067	***	0.123	***	-0.099	***
	(0.038)		(0.020)		(0.029)		(0.026)	
Western	0.041		-0.036	*	0.079	***	-0.037	*
	(0.044)		(0.022)		(0.025)		(0.021)	
Northern	0.049		-0.110	***	0.226	***	-0.219	***
	(0.041)		(0.025)		(0.038)		(0.036)	
Year 2011/2012	-0.029		0.018		-0.135	***	0.101	***
	(0.024)		(0.016)		(0.019)		(0.017)	
Pseudo R-squared	0.2007				0.198			
Log Pseudo Likelihood	-684.54675				-1156.0877			
Number of observations	1,204				1,857			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

5.2   Determinants of Informal User Fees in Public Primary Schools

This section illustrates the results of analyses in terms of the determinants of user charge existence in public schools in rural Uganda. Table 5-5 shows the OLS regression result of LPM (Model 1) as well as the result from the regression analysis applying the logit model (Model 2) using the subsample in 2005/2006. A binomial variable on whether a public school in the community charges low user fee in 2005/2006 is regressed with the community-level variables related to public school and community characteristics in the same time period.

Table 5-6 displays the result of ordered logit regression analysis using the subsample in 2011/2012. Both coefficients and average marginal effects are presented in the table. An ordinal outcome variable on whether a public school in the community does not charge fees, charges low fees, or charges high fees in 2011/2012 is predicted by the community-level variables. Table 5-7 presents the result of the logit regression analysis on the determinants of high informal fee charges in 2011/2012. However, in this analysis, a dichotomous variable on high fee charges in 2011/2012 is fit with the community-level variables in 2005/2006, which is also one of the essential steps to conducting PSM. Differences in the mean of community-level variables between control and treatment groups before matching and after matching are presented in Table 5-8 and Table 5-9, respectively. In addition, the distributions of the propensity scores for treated and untreated groups are presented in Appendices. The distributions of the propensity scores, before and after the matching, are plotted in Figure A-11 and Figure A-12, respectively.

In general, public school characteristics are not found to have a statistically significant relationship with the probability of charging a user fee by the public school in the community. Among the several independent variables on community characteristics, it is commonly found that community mean MPCE has a statistically significant relationship with the probability of public schools charging a fee. As shown in the result from Model 2

in Table 5-5, holding all else constant, a 1% point increase in community mean MPCE is related with the 33.6% points increase in the probability of a low-fee charge in public schools in 2005/2006, which is statistically significant at the 5% level. As shown in the result in Table 5-7, holding all else constant, a 1% point increase in community mean MPCE in 2005/2006 is also correlated with the 22.3% points increase on the probability of high fee charges in public schools, and the coefficient is statistically significant at the 10% level. On the other hand, the result in Table 5-6 shows that the 1% point increase in community mean wealth in 2011/2012 has a relationship with 9.2% points increase in the probability of high fee charge in public school, holding all other factors constant. Although this marginal effect on high fee charges is statistically significant at the 5% level, no statistically significant relationship is found in its marginal effect on low-fee charges. The community mean of household head's years of schooling and the total number of households in LC1 are not found to be significantly related with the probability of a fee charge in any of the models.

Interestingly, the presence of community support for public education in 2005/2006 is found to have a negative relationship with the probability of informal fee charges in public schools in 2011/2012. Estimates from the logistic regression analysis presented in Table 5-7 show that, holding all else constant, a public school which had community contributions at the baseline period is 19.0% points less likely to charge high fees. Moreover, an estimate from the ordered logistic regression analysis presented in Table 5-6 shows that the presence of community contributions for public schooling in 2005/2006 is related with the 14.3% points decrease in the probability of a high fee charge in public schools, holding all other factors constant; this coefficient is statistically significant at the 5% level. Table 5-6 also shows no statistically significant relationship between the existence of community contributions in 2005/2006 and the probability of low-fee charges in public schools in 2011/2012.

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With regard to regional factors, public schools in the Northern region are found to be more likely to charge informal fees from households. Results from Model 1 and Model 2 in Table 5-5 show that public schools in the Northern region are 28.3% points and 24.9% points more likely to charge low fees compared with those in the Central region in 2005/2006, respectively, holding all else constant. Similarly, a result presented in Table 5-7 shows that public schools in the Northern region are 24.2% points more likely to charge high fees compared with those in the Central region in 2011/2012, respectively, holding all else constant.

The variables related with the increase in the number of private schools and the private school attendance between 2005/2006 and 2011/2012 are included in the model used in the logistic regression analysis presented in Table 5-7. Although the signs of AMEs of these factors suggest that there may be positive relationships between these factors and the probability of charging high fees in public schools, they are not statistically significant even at the 10% level.

The results of balancing tests presented in Table 5-8 and Table 5-9 show that statistically significant differences in some community-level characteristics, which exist between control and treatment groups, disappeared after matching. Table 5-8 shows that the total number of households in the treatment community is significantly larger, and the ratio of the existence of contribution in the treatment community is significantly smaller, before matching, than in the control community. Table 5-8 also shows the community mean MPCE in the treatment community, before matching, is larger than in the control community. However, this difference, in both row and logarithmic forms, is not statistically significant even at 10% significance level. Moreover, Figure A-11 and Figure A-12 show that the densities of the propensity scores get more similar after matching, although the gap has not been diminished.

Table 5-5: Determinants of Low-Fee Charge in Public School in 2005/2006: Linear Probability Model and Logit Model

	LPM for 2005/2006 subsample		Logit model for 2005/2006 subsample (2)			
	(1)		Coefficient		Average marginal effect	
Dependent variable = 0 if public school does not charge user fees, 1 if it charges low user fees						
Public school characteristics						
Pupil-teacher ratio	0.003		0.016		0.003	
	(0.003)		(0.015)		(0.003)	
Poor facility condition	0.118		0.578		0.115	
	(0.149)		(0.609)		(0.120)	
Community characteristics						
Number of households	0.0001		0.001		0.0001	
	(0.0004)		(0.003)		(0.001)	
Log (Mean MPCE)	0.325	**	1.690	*	0.336	**
	(0.152)		(0.843)		(0.158)	
Mean household head's education	0.033		0.173		0.034	
	(0.035)		(0.169)		(0.033)	
Availability of public school	-0.055		-0.272		-0.054	
	(0.095)		(0.426)		(0.084)	
Availability of private school	-0.154		-0.854		-0.170	
	(0.147)		(0.807)		(0.158)	
Private school attendance rate	0.140		0.673		0.134	
	(0.289)		(1.164)		(0.230)	
Community contribution	0.016		0.020		0.004	
	(0.123)		(0.526)		(0.105)	
Region (base=Central)						
Eastern	-0.074		-0.441		-0.088	
	(0.150)		(0.718)		(0.142)	
Western	-0.011		-0.073		-0.014	
	(0.141)		(0.596)		(0.118)	
Northern	0.283	*	1.253	*	0.249	*
	(0.158)		(0.750)		(0.143)	
Constant	-3.486	**	-20.637	**		
	(1.607)		(9.157)			
R-squared	0.1673					
LR Chi-squared			22.76			
Pseudo R-squared			0.1345			
Log-likelihood			-73.25358			
Number of observations	126		126			

Source: Created by the author using UNHS 2005/2006.

Note: Numbers in parentheses are standard errors. Huber–White standard errors are calculated in OLS regression for LPM. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-6: Determinants of Low- and High-Fee Charge in Public School in 2011/2012: Ordered Logit Model

	Dependent variable = 1 if public school does not charge user fees, 2 if it charges low user fees, 3 if it charges high user fees		
	Ordered logit model for 2011/2012 subsample		
	Coefficient	Average marginal effect	
		Low-fee	High-fee
Public school characteristics			
Pupil-teacher ratio	-0.009	-0.0002	-0.001
	(0.013)	(0.0003)	(0.001)
Poor facility condition	0.222	0.004	0.025
	(0.523)	(0.011)	(0.059)
Community characteristics			
Number of households	0.001	0.00002	0.0001
	(0.001)	(0.00003)	(0.0001)
Log (Mean MPCE)	0.811 **	0.015	0.092 **
	(0.367)	(0.019)	(0.040)
Mean household head's education	0.147	0.003	0.017
	(0.145)	(0.004)	(0.017)
Availability of public school	-0.114	-0.002	-0.013
	(0.421)	(0.008)	(0.048)
Availability of private school	0.197	0.004	0.022
	(0.599)	(0.012)	(0.068)
Private school attendance rate	0.449	0.008	0.051
	(1.133)	(0.022)	(0.129)
Community contribution	-1.257 **	-0.024	-0.143 **
	(0.514)	(0.028)	(0.057)
Region (base=Central)			
Eastern	-1.288 *	-0.024	-0.146 *
	(0.670)	(0.025)	(0.080)
Western	-0.824	-0.016	-0.094
	(0.611)	(0.018)	(0.071)
Northern	1.721 *	0.033	0.196 **
	(0.721)	(0.039)	(0.078)
Cutting point 1	6.585		
	(4.076)		
Cutting point 2	10.414		
	(4.145)		
LR Chi-squared		47.41	
Pseudo R-squared		0.1988	
Log-likelihood		-95.548	
Number of observations		126	

Source: Created by the author using UNHS 2011/2012.

Note: Numbers in parentheses are standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-7: Determinants of High-Fee Charge in Public School in 2011/2012: Logit Model

Independent variables in 2005/2006	Dependent variable = 0 if public school does not charge user fees in 2011/2012, 1 if it charges high user fees in 2011/2012			
	Logit model for 2005/2006 subsample			
	Coefficient		Average marginal effect	
Public school characteristics				
Pupil-teacher ratio	0.002		0.0003	
	(0.016)		(0.002)	
Poor facility condition	-0.053		-0.007	
	(0.731)		(0.090)	
Community characteristics				
Number of households	0.003		0.0004	
	(0.004)		(0.0005)	
Log (Mean MPCE)	1.780	*	0.223	*
	(1.074)		(0.130)	
Mean household head's education	0.118		0.015	
	(0.221)		(0.028)	
Availability of public school	0.082		0.010	
	(0.548)		(0.069)	
Availability of private school	1.046		0.131	
	(0.952)		(0.118)	
New private school	0.647		0.081	
	(0.695)		(0.086)	
Increase in private school attendance	0.298		0.037	
	(0.668)		(0.083)	
Community contribution	-1.519	**	-0.190	**
	(0.651)		(0.076)	
Region (base=Central)				
Eastern	0.767		0.096	
	(0.886)		(0.110)	
Western	-1.808		-0.226	
	(1.169)		(0.144)	
Northern	1.937	*	0.242	**
	(0.994)		(0.119)	
Constant	-21.520	*		
	(11.494)			
Pseudo R-squared			0.1897	
Log-likelihood			-49.714	
Number of observations			126	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-8: Differences in Mean of Community-Level Variables in 2005/2006 between Control and Treatment Groups before Matching

	Control (*n*=102)	Treated (*n*=24)	Difference	
Public school characteristics				
Pupil-teacher ratio	53.198	54.913	1.715	
	(1.530)	(4.887)	(3.935)	
Poor facility condition	0.127	0.167	0.039	
	(0.033)	(0.078)	(0.044)	
Community characteristics				
Number of households	129.226	163.458	34.233	*
	(6.960)	(27.211)	(19.411)	
Mean MPCE	47446.93	51070.53	3623.604	
	(1434.436)	(4021.873)	(3536.24)	
Log (Mean MPCE)	10.724	10.778	0.054	
	(0.029)	(0.073)	(0.069)	
Mean household head's education	4.955	5.398	0.443	
	(0.131)	(0.285)	(0.191)	
Community contribution	0.843	0.667	-0.176	**
	(0.036)	(0.098)	(0.088)	
Availability of public school	0.431	0.417	-0.015	
	(0.049)	(0.103)	(0.062)	
Availability of private school	0.098	0.125	0.027	
	(0.030)	(0.069)	(0.070)	
New private school	0.147	0.208	0.061	
	(0.035)	(0.085)	(0.083)	
Increase in private school attendance rate	0.167	0.208	0.042	
	(0.037)	(0.085)	(0.087)	
Region				
Central	0.255	0.292	0.037	
	(0.043)	(0.095)	(0.100)	
Eastern	0.235	0.208	-0.027	
	(0.042)	(0.085)	(0.096)	
Western	0.284	0.042	-0.243	**
	(0.045)	(0.042)	(0.095)	
Northern	0.225	0.458	0.233	**
	(0.042)	(0.104)	(0.099)	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-9: Differences in Mean of Community-Level Variables in 2005/2006 between Control and Treatment Groups after Matching

	Control (*n=58*)	Treated (*n=24*)	Difference
Public school characteristics			
Pupil-teacher ratio	55.464	54.913	-0.551
	(2.296)	(4.887)	(4.748)
Poor facility condition	0.138	0.167	0.029
	(0.046)	(0.078)	(0.087)
Community characteristics			
Number of households	128.397	163.458	35.062
	(8.818)	(27.211)	(22.142)
Mean MPCE	49487.55	51070.53	1582.98
	(2083.508)	(4021.873)	(4140.339)
Log (Mean MPCE)	10.761	10.778	0.018
	(0.041)	(0.073)	(0.080)
Mean household head's education	5.196	5.398	0.202
	(0.168)	(0.285)	(0.319)
Community contribution	0.810	0.667	-0.144
	(0.052)	(0.098)	(0.102)
Availability of public school	0.448	0.417	-0.032
	(0.066)	(0.103)	(0.122)
Availability of private school	0.138	0.125	-0.013
	(0.046)	(0.069)	(0.084)
New private school	0.224	0.208	-0.016
	(0.055)	(0.085)	(0.102)
Increase in private school attendance rate	0.172	0.208	0.036
	(0.050)	(0.085)	(0.095)
Region			
Central	0.328	0.292	-0.036
	(0.062)	(0.095)	(0.114)
Eastern	0.224	0.208	-0.016
	(0.055)	(0.085)	(0.100)
Western	0.052	0.042	-0.010
	(0.029)	(0.042)	(0.053)
Northern	0.397	0.458	0.062
	(0.065)	(0.104)	(0.121)

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

5.3 Effects of Informal User Fees on School Attendance and Choice in Primary Education

5.3.1 Effects of High Informal User Fees on Primary School Attendance

Table 5-10 and Table 5-11 show the effect of high user fees on primary school attendance calculated by applying LPM and logit model, respectively, with the DD method for the sample trimmed by PSM. The key explanatory variable in these analyses applying the DD method is the interaction term between the year dummy for 2011/2012 and the treatment dummy which denotes whether a child's community has a public school that started to charge a high fee between 2005/2006 and 2011/2012, or not. Table 5-10 and Table 5-11 also display the results from the subsample of children from poor households and from the subsample of children from non-poor households. Moreover, as displayed in Appendices, several regression analyses are conducted applying different models as well as using different samples to check the robustness of the key interaction effect.

First, as shown in Table 5-10, the DD coefficient of Model 1 indicates that, holding all other factors constant, 7.2% points reduction of the probability of school attendance is related to the high-fee charge, which is statistically significant at the 5% level. Similarly, the result from Model 1 in Table 5-11 applying the logit model shows that the introduction of high-fee charges in public school is related with 7.8% points decrease in the probability of primary school attendance, holding all else constant, which is statistically significant at the 5% level. However, the result from Model 2 in Table 5-10 shows that the DD coefficient gets smaller (6.7% points) after controlling time-invariant community characteristics, although it is still statistically significant at the 10% level.

Moreover, the results of estimates in Appendices generally show that a negative DD coefficient is statistically significant in the regression analyses using untrimmed sample. However, a negative DD coefficient is insignificant in the analyses applying the model

without covariates (see Table A-15, Table A-16, Table A-17, and Table A-18). A negative DD coefficient also gets insignificant after controlling community fixed effects in LPM analyses using the sample of children age 6-14 (see Table A-16).

Second, the estimation result using the subsample of children from poor households generally shows its much stronger negative effects on primary school attendance. Estimates applying LPM with community fixed effects shows that 18.9% points reduction of the probability of school attendance is related to the high-fee charge, which is statistically significant at the 5% level (see Model 3 in Table 5-10). The logit model estimate shows that 17.4% points reduction of the probability of school attendance is related to the high-fee charge, which is statistically significant at the 1% level (see Model 2 in Table 5-11). It also shows that children from the poor households who live in communities whose public schools introduced high-fee charge are 7.1 % points less likely to attend primary school, which is statistically significant at the 5% level (see Model 2 in Table 5-11).

Third, estimation results using the subsample of children from non-poor households generally show that there is no statistically significant relationship between an informal high-fee charge in public schools and primary school attendance. Logit model estimate shows a weak and negative AME of year dummy for 2011/2012, which is only significant at the 10% level.

The results of estimates in Appendices consistently show that a negative DD coefficient is statistically insignificant in the regression analyses using the sample from the non-poor (see Table A-21, Table A-22, Table A-23, and Table A-24). In contrast, with a few exceptions, the results of estimates in Appendices consistently show that a negative DD coefficient is statistically significant in the regression analyses using the sample from the poor (see Table A-21, Table A-22, Table A-23, and Table A-24). A negative DD coefficient is statistically insignificant only in some analyses using the untrimmed sample of children age 6-14 (see Table A-22 and Table A-24).

Table 5-10: Impact of High Fee on School Attendance by Poverty Status: Linear Probability Model

	Full (1)		Full (2)		Poor (3)		Non-poor (4)	
	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled trimmed sample of children age 6-12							
High informal fee × Year 2011/2012	-0.072	**	-0.067	*	-0.189	**	-0.0002	
	(0.034)		(0.035)		(0.078)		(0.040)	
High informal fee	0.016		-0.176		0.439		-0.244	*
	(0.023)		(0.164)		(0.277)		(0.146)	
Year 2011/2012	-0.011		-0.005		0.008		-0.030	
	(0.018)		(0.018)		(0.036)		(0.024)	
Individual characteristics								
Female	0.027	*	0.024		0.003		0.032	*
	(0.015)		(0.015)		(0.027)		(0.018)	
Foster child	-0.029		-0.051	***	0.009		-0.075	***
	(0.018)		(0.004)		(0.039)		(0.022)	
Household characteristics								
Poor	-0.037		-0.033					
	(0.025)		(0.026)					
Log (MPCE)	0.029		0.032		0.017		0.027	
	(0.022)		(0.023)		(0.05)		(0.027)	
Number of children	-0.002		0.002		0.002		-0.0003	
	(0.004)		(0.004)		(0.010)		(0.005)	
Youth household head	-0.027		-0.013		0.006		-0.025	
	(0.032)		(0.033)		(0.065)		(0.037)	
Female household head	0.044	**	0.048	**	0.051		0.056	***
	(0.018)		(0.019)		(0.043)		(0.021)	
Household head's education	0.001		0.000		0.001		-0.002	
	(0.002)		(0.002)		(0.005)		(0.003)	
Public school characteristics								
Pupil-teacher ratio	-0.0001		-0.001		-0.002		-0.00005	
	(0.0004)		(0.001)		(0.002)		(0.001)	
Poor facility condition	0.039	**	0.025		0.026		0.032	
	(0.020)		(0.028)		(0.062)		(0.036)	
Community characteristics								
Community contribution	0.005		0.291		0.090		0.346	**
	(0.018)		(0.178)		(0.251)		(0.166)	
Availability of public school	0.038	**	0.019		0.038		-0.006	
	(0.016)		(0.037)		(0.073)		(0.047)	
Availability of private school	0.019		0.011		0.066		0.001	
	(0.020)		(0.029)		(0.065)		(0.034)	
Region (base=Central)								
Eastern	0.046	**	0.412	***	0.213		0.400	***
	(0.021)		(0.123)		(0.178)		(0.136)	
Western	0.037		0.217		0.474		0.222	
	(0.028)		(0.161)		(0.313)		(0.147)	
Northern	-0.012		0.021		-0.438	***	0.008	
	(0.023)		(0.115)		(0.139)		(0.062)	
Constant	0.628	***	0.412		0.631		0.480	
	(0.239)		(0.307)		(0.586)		(0.344)	
Community fixed effects	No		Yes		Yes		Yes	
R-squared	0.2070		0.2669		0.3341		0.2928	
Number of observations	1,736		1,736		688		1,048	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Numbers in parentheses are unconditional standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-11: Impact of High Fee on School Attendance by Poverty Status: Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school					
	Logit model for pooled trimmed sample of children age 6-12					
	Full		Poor		Non-poor	
	(1)		(2)		(3)	
High informal fee×Year 2011/2012	-0.078	**	-0.174	***	-0.018	
	(0.034)		(0.061)		(0.039)	
High informal fee	-0.022		-0.071	**	0.013	
	(0.017)		(0.031)		(0.020)	
Year 2011/2012	-0.031		-0.021		-0.034	*
	(0.016)		(0.028)		(0.018)	
Individual characteristics						
Female	0.025	*	0.022		0.030	*
	(0.014)		(0.025)		(0.017)	
Foster child	-0.025		0.028		-0.056	***
	(0.018)		(0.036)		(0.020)	
Household characteristics						
Poor	-0.032					
	(0.024)					
Log (MPCE)	0.030		0.016		0.021	
	(0.022)		(0.038)		(0.027)	
Number of children	-0.003		0.0004		-0.002	
	(0.004)		(0.007)		(0.004)	
Youth household head	-0.021		-0.010		-0.015	
	(0.026)		(0.045)		(0.033)	
Female household head	0.041	**	0.015		0.055	**
	(0.019)		(0.033)		(0.024)	
Household head's education	0.001		0.005		0.000	
	(0.002)		(0.004)		(0.003)	
Public school characteristics						
Pupil-teacher ratio	0.0002		-0.00004		-0.001	
	(0.0004)		(0.001)		(0.001)	
Poor facility condition	0.041	**	0.061	*	0.020	
	(0.020)		(0.036)		(0.025)	
Community characteristics						
Community contribution	0.006		0.028		-0.007	
	(0.018)		(0.033)		(0.020)	
Availability of public school	0.039	**	0.081	***	0.025	
	(0.016)		(0.028)		(0.019)	
Availability of private school	0.018		0.057		-0.004	
	(0.022)		(0.042)		(0.023)	
Region (base=Central)						
Eastern	0.049	**			0.027	
	(0.023)				(0.024)	
Western	0.069				0.031	
	(0.055)				(0.041)	
Northern	-0.008		-0.064	**	0.008	
	(0.023)		(0.032)		(0.028)	
Pseudo R-squared	0.2388		0.2526		0.2504	
Log Psuedo Likelihood	-518.21084		-241.45121		-260.61374	
Number of observations	1,736		688		1,048	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are unconditional standard errors. Age dummies are included in estimation. Only a dummy variable for Northern region is included as a regional dummy variable in the estimation for trimmed sample of children from poor households, since a dummy variable for western region perfectly predicts school attendance. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

5.3.2 Effects of High Informal User Fees on Primary School Choice

This subsection shows the results of the analyses which investigate the extent to which a high informal fee charge in a public school in the community is related with rural households' school choice between public and private schools in Uganda, applying the DD method. The study conducts regression analysis for the full sample as well as separately for the poor and non-poor. Furthermore, as displayed in Appendices, several regression analyses are conducted applying different models as well as using different samples to check the robustness of the key interaction effect.

Table 5-12 shows the AME of high user fees on school choice computed by MNL regression analysis using the full sample trimmed by PSM. Table 5-13 shows the AME of high user fees on school choice computed by MNL regression analysis using the subsample of the poor (Model 1) and the subsample of the non-poor (Model 2), which are trimmed by PSM as well. The key explanatory variable in these analyses applying the DD method is the interaction term between the year dummy for 2011/2012 and the treatment dummy.

First, the result for the full sample shows that the DD coefficient, which represents the impact of high fees on the probability of attending public school, is negative and statistically significant. The result, which uses the trimmed sample, indicates that the 9.1% points decrease in the probability of public school attendance can be attributed to the informal high-fee charge, holding all other factors constant (see Table 5-12). In contrast, the effect of high-fee charges on private school attendance is not found to be statistically significant. However, the results of estimates in Appendices show that this negative DD coefficient is not statistically significant in the regression analyses using untrimmed sample, as well as the ones without covariates (see Table A-19 and Table A-20).

Second, the result for the subsample of the poor shows the stronger and negative DD coefficient. Specifically, the result shows that the high informal fee charge in public school is related with the 21.2% points decrease in the probability of public school

attendance by the poor (see Model 1 in Table 5-13). Besides, the effect of high fee charges on private school attendance is not found to be statistically significant. It is worth noting that the existence of community contribution for public schooling still has significantly positive and negative effects on the probability of attending public school and the probability of attending private school, respectively, even after controlling for the existence of high-fee charge in public schools.

Third, the result for the subsample of the non-poor shows no statistically significant DD effect on either public or private school attendance. Although the interaction effect between the treatment dummy and year dummy for 2011/2012 is not found to be statistically significant, the result shows that the probability of attending private school is 4.6% points higher if a child lives in a community where a public school introduced a high-fee charge between 2005/2006 and 2011/2012 (see Model 2 in Table 5-13). It is worth noting that public school's poor facility condition still has significantly positive and negative effects on the probability of attending private school and the probability of attending public school, respectively, even after controlling for the existence of high-fee charge in public schools.

The results of estimates in Appendices show that a DD coefficient on the probabilities of both public school and private school attendance is statistically insignificant in all the regression analyses using the sample from the non-poor (see Table A-25 and Table A-26). The results of estimates in Appendices also consistently show the negative and significant DD coefficient on the probability of attending public school, as well as insignificant DD coefficient on the probability of attending private school, in the regression analyses using the sample from the poor. However, the negative DD coefficient on the probability of attending public school is not statistically significant in the analysis using untrimmed sample without covariates (see Table A-25 and Table A-26).

Table 5-12: Impact of High Fee on School Choice: Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for trimmed pooled sample of children age 6-12			
	Full			
	Public school		Private school	
High informal fee × Year 2011/2012	-0.091	**	0.017	
	(0.045)		(0.034)	
High informal fee	-0.032		0.012	
	(0.023)		(0.018)	
Year 2011/2012	-0.052	**	0.022	
	(0.020)		(0.016)	
Individual characteristics				
Female	0.004		0.021	
	(0.019)		(0.016)	
Foster child	0.024		-0.047	**
	(0.025)		(0.020)	
Household characteristics				
Poor	0.036		-0.070	**
	(0.033)		(0.028)	
Log (MPCE)	0.035		-0.006	
	(0.028)		(0.023)	
Number of children	0.001		-0.003	
	(0.005)		(0.004)	
Youth household head	-0.037		0.014	
	(0.038)		(0.030)	
Female household head	0.051	**	-0.009	
	(0.025)		(0.020)	
Household head's education	0.001		0.001	
	(0.003)		(0.003)	
Public school characteristics				
Pupil-teacher ratio	0.001	**	-0.002	***
	(0.001)		(0.001)	
Poor facility condition	-0.014		0.054	**
	(0.028)		(0.021)	
Community characteristics				
Community contribution	0.046	*	-0.040	**
	(0.024)		(0.019)	
Availability of public school	0.068	***	-0.028	
	(0.021)		(0.017)	
Availability of private school	-0.108	***	0.117	***
	(0.026)		(0.018)	
Region (base=Central)				
Eastern	0.141	***	-0.083	***
	(0.029)		(0.022)	
Western	0.093		-0.021	
	(0.058)		(0.032)	
Northern	0.153	***	-0.160	***
	(0.034)		(0.029)	
Pseudo R-squared		0.215		
Log Psuedo Likelihood		-1070.8308		
Number of observations		1,736		

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are unconditional standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5-13: Impact of High Fee on School Choice: Average Marginal Effects from Multinomial Logit Model

	Poor (1)				Non-poor (2)			
Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school) MNL model for trimmed pooled sample of children age 6-12								
	Public school		Private school		Public school		Private school	
High informal fee×Year 2011/2012	-0.212	***	0.040		-0.019		0.002	
	(0.070)		(0.039)		(0.058)		(0.051)	
High informal fee	0.001		-0.074		-0.033		0.046	*
	(0.043)		(0.037)		(0.029)		(0.025)	
Year 2011/2012	0.010		-0.032		-0.097	***	0.064	***
	(0.032)		(0.020)		(0.026)		(0.023)	
Individual characteristics								
Female	-0.001		0.020		0.001		0.030	
	(0.030)		(0.020)		(0.025)		(0.022)	
Foster child	0.061		-0.023		0.010		-0.065	**
	(0.042)		(0.026)		(0.031)		(0.027)	
Household characteristics								
Log (MPCE)	-0.011		0.032		0.048		-0.026	
	(0.053)		(0.042)		(0.037)		(0.032)	
Number of children	0.011		-0.009		0.001		-0.003	
	(0.009)		(0.006)		(0.006)		(0.005)	
Youth household head	-0.037		0.033		-0.018		-0.001	
	(0.054)		(0.030)		(0.054)		(0.048)	
Female household head	0.004		0.011		0.068	**	-0.013	
	(0.038)		(0.023)		(0.033)		(0.029)	
Household head's education	0.005		0.001		-0.001		0.001	
	(0.006)		(0.004)		(0.004)		(0.003)	
Public school characteristics								
Pupil-teacher ratio	0.001		-0.002		0.001		-0.001	*
	(0.001)		(0.001)		(0.001)		(0.001)	
Poor facility condition	0.027		0.027		-0.062	*	0.082	***
	(0.042)		(0.027)		(0.037)		(0.031)	
Community characteristics								
Community contribution	0.099	**	-0.067	**	0.035		-0.042	
	(0.041)		(0.029)		(0.030)		(0.027)	
Availability of public school	0.106	***	-0.016		0.061	**	-0.034	
	(0.033)		(0.021)		(0.027)		(0.023)	
Availability of private school	-0.011		0.082	***	-0.148	***	0.135	***
	(0.047)		(0.027)		(0.031)		(0.025)	
Region (base=Central)								
Eastern	0.153	***	-0.046	*	0.125	***	-0.094	***
	(0.049)		(0.024)		(0.036)		(0.031)	
Western	2.129	***	-0.795	***	0.032		-0.001	
	(0.146)		(0.101)		(0.053)		(0.041)	
Northern	0.094	*	-0.077	**	0.213	***	-0.208	***
	(0.053)		(0.033)		(0.044)		(0.042)	
Pseudo R-squared	0.256				0.214			
Log Psuedo Likelihood	-379.2605				-651.47431			
Number of observations	688				1,048			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are unconditional standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

CHAPTER 6 :

DISCUSSION AND CONCLUSION

6.1 Discussion

This section interprets the implications of the results presented in the previous chapter, with regard to each of the seven hypotheses developed in Section 4.2, guided by the theoretical framework and the literature review. Inferences are drawn from the results as well as based on the Ugandan context reviewed in Chapter 2.

6.1.1 Determinants of School Attendance and Choice in Primary Education

Before interpreting the result about the effects of key explanatory variables on school choice, this subsection starts with the discussion on the time variation in school choice, which is related to the first sub-research question. Research Question 1-1 asks what is the difference in the increase of the private school attendance probability between the poor and the non-poor. To answer this question, the study tests Hypothesis 1-1, namely, the probability of attending private school increases only among the children from the non-poor households. To come to the point, this hypothesis is, essentially, confirmed. The results show that overall increase in private school attendance in rural Uganda between 2005/2006 and 2011/2012 was mainly attributable to the fact that the children from non-poor households became more likely to send their children to private schools instead of sending them to public schools.

According to the estimation results of school-choice model using the full sample shown in Subsection 5.1.2, there was a significant overall decrease in public school

attendance and a significant overall increase in private school attendance between 2005/2006 and 2011/2012 in rural Uganda (see Table 5-3). However, the results of analysis for the poor show that there was no significant change in the probabilities of both attending public school and attending private school (see Table 5-4). On the other hand, the significant changes, which are the same as the ones from the full sample analysis, are found in the analysis restricting the data to the non-poor.

Research Question 1-2 asks what is the difference in the increase in the effect of wealth on school choice between the poor and the non-poor. Related to this research question is Hypothesis 1-2, namely, the positive effect of household wealth on the probability of attending private school instead of attending public school increased among the children from non-poor households. The results from the descriptive analysis displayed in Subsection 4.4.3 basically confirm this hypothesis. The significant change in the effects of wealth on school choice might occur as an overall trend, but more obviously occur especially among children from the non-poor households. Among the non-poor households, it seemed to become more common to make a school choice between public school and private school if a child is from a wealthier household.

The regression results of the school-choice model in Subsection 5.1.2 confirm that the decrease in the effect of wealth on public school attendance among the non-poor is statistically significant, while the increase in the effect of wealth on private school attendance among the non-poor is not found to be statistically significant. The regression result also confirms that there is no statistically significant time variation in terms of the relationship between wealth and school choice among the poor.

These results for answering Research Question 1-1 and Research Question 1-2 might imply that the increase in the provision of primary schooling by private sector in rural Uganda has a limited effect on poor households' decision-making for schooling. This might be explained by the fact that relatively high user fees are collected in Ugandan rural private schools on average, as shown in Subsection 2.3.2. As highlighted in the limited

sample case study in Kisira (2008), it must be true that there has been an increasing number of low-fee private schools which may cater for the needs of the poor in rural Uganda. However, the findings of this study may imply that a general trend is an expansion of expensive private schools in the Ugandan context.

As reviewed in Section 3.2, there is previous literature which highlights the role of private schools in increasing access for the children from poor households (Tooley and Dixon 2005a; Alderman, Orazem, and Paterno 2001; Tooley and Longfield 2013). However, the findings of this study may be more consistent with the previous studies which take a skeptical view on the role of private schools in increasing access to primary education, especially among poor households (Akaguri 2014; Ashley et al. 2014; Härmä 2011; Nishimura and Yamano 2013; Schirmer 2010; Singh and Bangay 2014). As is highlighted in the Kenyan case study by Bold et al. (2011), emergence of private education may bring another type of socioeconomic segregation within the primary education school system. These findings are also consistent with the scenarios explained by the theoretical model of this study described in Subsection 4.1.1.

While wealth becomes a more important predictor of school choice among the non-poor, the results show that the effect of wealth on primary school attendance has been dramatically reduced between 2005/2006 and 2011/2012, especially among the non-poor. However, it is worth noting that the estimation results show that a significant relationship between wealth and school attendance still remains among the poor.

In the context of Uganda, the previous studies find that the effect of wealth on school attendance was almost diminished after the introduction of the UPE policy (Nishimura, Yamano, and Sasaoka 2008; Deininger 2003). However, recent studies, including Lincove (2012), reveal that wealth still predicts the primary school attendance of children, especially among poor households. The result from the analysis is consistent with these findings and implies that this trend has continued until recently. This finding might be also explained by the fact that there was a gradual increase in the extent of the burden of

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educational household spending for public primary education between 2005/2006 and 2011/2012, especially in rural areas (see Subsection 2.3.2).

There are possible explanations why the probability of being out of school because of low wealth was significantly reduced by being absorbed by public schools between 2005/2006 and 2011/2012 among the non-poor. One of them is the government's continuous efforts to have UPE policy take root in society. As reviewed in Section 2.1, Uganda's government launched several measures to facilitate the implementation of UPE policy between 2005/2006 and 2011/2012. For instance, the automatic promotion policy was launched in 2005, and the thematically-oriented curriculum, under which mother tongue is used as the medium of instruction at the lower primary level, was introduced in 2006/2007. Moreover, the legal framework was improved by enforcing the Education Act of 2008, in which primary education first became compulsory, and created the UPE Guidelines of 2008.

To sum up, Hypothesis 1-2 is confirmed. The results show that only the increase in the negative effects of wealth on public school attendance among the non-poor is statistically significant. Besides, related to this hypothesis, the study reveals that wealth still serves as the predictor of primary school attendance among the poor in rural Uganda instead of being the predictor of school choice. The overall reduction in the effects of wealth on primary school attendance might be mainly attributed to the reduction among the children from non-poor households.

Research Question 1-3 asks what is the difference in the effect of the quality of education in the public schools on school choice between the poor and the non-poor. To answer this research question, the study tests Hypothesis 1-3, namely, whether the low quality of public school in the community has a positive effect on the probability of attending private school among the non-poor households.

The estimation result about the relationship between public school's facility condition and school choice apparently shows that only non-poor households are conscious

of the quality of public school in their community and use the option to send their children to private school. The estimation result may imply that poor households' school choice is not affected by the public school's facility conditions.

However, the estimation result about the relationship between public school's PTR and school choice is not very straightforward. Interestingly, children were more likely to attend public school instead of attending private school in 2005/2006, as the PTR of public school in the community became higher. This might be explained by the fact that parents/guardians simply had fewer options to send their children to private school if they lived in the communities with overcrowded public schools in 2005/2006. As the option to send children to private school became more common in 2011/2012 in rural Uganda, it may also have become common to make school choices between public and private schools based on public school quality information, especially among the non-poor households. The results basically confirm the same trends found by Nishimura and Yamano (2013) and Bold et al. (2011) in the case of rural Kenya.

As reviewed in Section 3.4, several previous studies found that Uganda experienced a decrease in quality of service soon after the introduction of UPE policy. Moreover, as shown in Section 2.6, despite the government's tremendous efforts, the issue of low quality of education remains critical especially in rural public schools. Under this situation, even in rural areas, the emerging role of private schools may bring another type of equity issue in terms of access to good quality education.

Research Question 1-4 asks what the difference is in the effect of the voluntary contribution on school choice between the poor and the non-poor. To answer this question, the study tests Hypothesis 1-4, namely, in rural Uganda, whether the presence of community contributions for public schooling has a positive effect on the probability of attending public school among the poor households; this hypothesis is confirmed.

According to the estimation results, there is a statistically significant positive relationship between the presence of a contribution for public schooling in the community

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and the probability of attending public primary school, as well as the overall probability of attending primary school. Moreover, schooling decisions and school choice by non-poor households might not be affected by the presence of a community contribution for public schooling. This might simply imply that primary school attendance by the children from the poor households is still affected by awareness of the importance of public education in the community.

With regard to the effects of other control factors, it is worth noting that the availability of private school in the village was not found to have a significant relationship with the probability of attending school; the result also clearly showed that children are more likely to attend private school in cases where there is a private school in their village. This may suggest that the presence of a private school in the community has little effect on improving overall access to primary education. This may provide evidence in support of the fact that the role of private schools in further including out-of-school children is very limited in the context of rural Uganda.

On the other hand, the result also shows that the availability of a public school in the village still has a significant relationship with the probability of attending school. This result suggests that there is still scope for the government to improve the overall access to primary schooling by ensuring accessibility to public school in rural areas, in addition to putting more efforts into ensuring and improving the quality of education. The importance of these measures remains the same because rural public schools have an increasing role as the ultimate place for ensuring access to basic learning for children from poor households who are not able to afford enrollment in private schools.

The result shows that the Northern region is still disadvantaged in its access to primary education. Besides, the study shows that the attendance rate in the highest in Eastern region. The study also reveals that the share of private schools in the primary education sub-sector is largest in the Central region, followed by the Western region, Eastern region, and Northern region. As touched on in Section 2.6, the Northern region in

Uganda faces particular security issues although the situation has become much more peaceful compared to the peak of the conflict, especially between the central government and the Lord's Resistance Army. The result confirms the fact that it is still justifiable for the government to take preferential measures for rural public schools to ensure not only quality of education but also access to primary schooling in the Northern region.

Higher attendance rate in the Eastern region than in the other regions has been found in many previous studies (Rutaremwa and Bemanzi 2013; Tamusuza 2011). IOB (2008) points out that this is because head teachers in the Eastern region are more active in inflating the number of registered pupils in their schools to receive more grant from the government. As touched in Section 2.6, there is a direct link between the school enrollment and the level of funding. However, the result from this study may confirm that there must be other reasons which explain the advantage of the Eastern region in access to primary education since it comes from the analysis using household survey data. As also pointed out in Tamusuza (2011), children in the Eastern region may be more likely to attend primary school because their parents/guardians in the region have a natural proclivity for education.

With regard to individual characteristics, the results interestingly show that girls are more likely to attend primary schools than boys. Gender parity in access to primary education is consistently noted as one of the remarkable achievements of the UPE policy by several previous studies (Deininger 2003; Nishimura, Yamano, and Sasaoka 2008; Tamusuza 2011). This study confirms that gender parity in access to primary education basically still holds, as well as newly revealing that there is no statistically significant gender gap in school choices between public school and private school. Needless to say, this does not mean that all the gender disparity issues in primary education sub-sector have disappeared in Uganda. For instance, Wells (2009) highlights his finding on the significant gender gap in age-appropriate enrollment in secondary education, which may have roots in the UPE policy. In addition, significant reverse gender gap may imply that there are more

job opportunities, such as motorcycle taxi, for boys which do not necessary require much formal education in rural Uganda.

Age is also found to have a similar effect on primary school attendance with that found in many previous studies which analyze the determinants of school enrollment in developing countries. The estimation results show that the probability of attending school increases with age up to a point, which suggests that delayed enrollment is still common in rural Uganda, as found in previous studies by Tamusuza (2011) and Nishimura, Yamano, and Sasaoka (2007).

The study also finds that being a foster child has no statistically significant relationship with the probability of attending school. Instead, the study finds that being a foster child has a statistically significant relationship with the probability of attending private school. This might imply that parents give their biological sons/daughters more chances to attend private schools than foster children, partly because parents can expect higher returns from an investment into their biological children. This might also imply that households have become more selective, not in terms of schooling decisions, but in terms of school choice in general.

6.1.2   Determinants of Informal User Fees in Public Primary Schools

Research Question 2-1 asks what are the determinants of informal fee charges in rural public schools. Related to this research question, the study tests Hypothesis 2-1, namely, that public schools in the community with high average wealth and no community contribution are more likely to charge informal user fees and charge higher informal user fees.

The results presented in Subsection 5.2 generally show that rural public schools in wealthier communities are more likely to charge fees as well as to charge higher fees.

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Previous studies find that there is an urban-rural gap in the household contribution for public schooling in Uganda, which is also confirmed by the result of descriptive analysis using UNHS 2005/2006 and UNPS 2011/2012 presented in Subsection 2.3.2 (Byamugisha and Nishimura 2008). As Subsection 2.4.2 shows, urban public schools are formally allowed to collect fees from households. In addition to the urban-rural gap, the result implies that even among the rural public schools, which are not allowed to charge any fees from parents/guardians in principle, there might be a gap in resources between poor and relatively rich communities in rural Uganda.

The results do not show a significant relationship between public school's quality and the informal fee charge. In addition, the results do not show a significant relationship between the penetration level of private schools in the community and the informal fee charge. Public schools may be more likely to make decision to charge fees if they have competitors in their community and parents/guardians have strong willingness to pay for education. Positive coefficients may imply that this scenario happens to some extent in rural Uganda.

On the other hand, the analysis interestingly reveals a negative correlation between the community contribution for public primary education and the informal fee charge in public schools. It may be possible to assume that parents/guardians in a community with a positive attitude in making voluntary contribution toward public primary education, are also proactive in paying higher user fees when they send their children to public schools. In fact, there was an insignificant but positive relationship between the existence of community contribution and low-fee charge according to the result from the analysis on the determinants of low-fee charge in public school in 2005/2006. However, the result shows that a public school which receives monetary and/or non-monetary contribution from a community in 2005/2006 is less likely to charge a high-fee in 2011/2012.

This may imply that public schools tend to charge high-fees when they receive little voluntary contribution from their communities. In other words, regardless of the overall

SES of their communities, they might be less likely to start collecting high amounts of fees if their communities have cooperative attitudes toward the public provision of primary education. There is a possibility that voluntary contribution from the community is lacking because its public school collects high fees from the parents/guardians. In this study, this problem is partly dealt with by regressing the probability of high-fee charge in 2011/2012 of the community characteristics in 2005/2006.

One possible interpretation of this result is that public schools without community contribution tend to charge high-fees because opinions of the local residents are not sufficiently reflected in their decision-making process. As reviewed in Subsection 2.4.2, informal fees are collected under the initiative of PTA in many cases. However, PTA is not recognized as an official entity in the decentralized system under UPE policy. Instead, SMC becomes the only official terminal unit of the administrative organization under the current system. In addition, as is mentioned in Subsection 2.4.3, SMC does not always reflect the will of the community residents, but can be largely controlled by local elites (Sasaoka and Nishimura 2010). High-fees may be charged in a public school whose governance is in the hands of relatively wealthy people in the community because of the lack of its cooperative attitude.

Lastly, there is another consistent and interesting result which shows that public schools in the Northern region are more likely to charge informal fees. Given the fact that other key community-level factors, including average SES and public school's quality are controlled, this might be interpreted to mean that public schools in regions such as Northern Uganda, where law enforcement mechanism is weak in general, tend to informally collect fees from households.

6.1.3 Effects of Informal User Fees on School Attendance and Choice in Primary Education

Related to the effects of informal user fees on households' schooling decision, Research Question 2-2 asks to what extent high informal fee charge in a public school has effects on the school attendance and choice by the poor households. Related to this research question, the study tests Hypothesis 2-2, namely, that children from poor households are more likely to be out of school if a public school in their community charges high informal fees. In addition, Research Question 2-3 asks to what extent high informal fee charges in a public school have effects on the school attendance and choice by non-poor households. Related to this research question, the study tests Hypothesis 2-3, namely, the probability of attending public schools by children from non-poor households is not affected by the presence of high informal fees charge in a public school in their community.

As shown in the result from the cross-sectional descriptive analyses presented in Subsection 4.4.3, charging fees in public school might not serve as an obstacle for attending primary school regardless of income level, if the amount does not exceed the one charged in low-fee private schools in 2005/2006. The result of simple descriptive analyses shows that the presence of a low-fee charge might not have an effect on primary school attendance in 2011/2012, either. However, the result from the cross-sectional descriptive analysis using the data in 2011/2012 indicates that the existence of an informal high fee charge in public school significantly inhibits the primary school attendance of children from poor households. In addition, this negative effect might be mainly attributed to the reduction of the probability of attending public school.

Although the finding from cross-sectional data analysis gives us an important insight into the link between informal high user fees and access to schooling, it is essential to apply methods which may deal with various biases as much as possible under the restriction of the amounts of information the dataset contains. Based on the argument made

in Subsection 4.3.1, this study applies the DD method for pooled cross-sectional datasets to explore the causal link between this high informal fee and access to primary schooling in rural Uganda.

To implement the DD method, the study starts with a descriptive analysis which simply compares the change in school attendance rate between treatment and control groups (see Subsection 4.4.3). It is known that the result of hypothesis testing for the so-called second difference is identical to the hypothesis testing for the coefficient of the interaction of the treatment dummy and the year dummy. The results of the OLS regressions applying the simplest DD model without covariates indicate that this second difference is statistically significant when the sample is restricted to the poor (see Table A-23). The study runs several regression models in order to check the robustness of these results from the simple implementation of the DD method. The results from the DD model with covariates basically show that there is no significant change in the effective size or the significance level.

It is worth noting that there is a reduction in the impact of informal high fee charges after controlling for community fixed effects in the regression model. This might imply that there are several unobservable and time-invariant community characteristics which have a relationship with the introduction of high informal fee charges in public school. For instance, it is possible that whether public schools charge high fees depends on the flexibility of school governance, as well as their community's governance. Moreover, the negative impact of informal high fee charges on primary school attendance is statistically significant even after controlling those community fixed effects.

As shown in the previous subsection, the result of the analysis for responding to Research Question 2-1 reveals that the probability of charging high informal fees in public school is determined by several factors. This means that the DD estimates might still be biased even after controlling covariates, as is pointed out in Subsection 4.3.1. Hence, the robustness of the result on the negative impact of a high fee charge on primary school

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attendance is also checked by running regressions for the sample which is trimmed based on the PSM technique, building on the discussion in Subsection 4.3.1. In general, the negative impact of a high fee charge on primary school attendance is still statistically significant in the analyses using a trimmed sample.

To sum up, Hypothesis 2-2, which is stated in terms of the impact of a high informal fee charge on school attendance and choice among the poor, is confirmed. There is no statistically significant impact of a high fee charge on the probability of attending private school by children from poor households. Instead, as the probability of attending public school decrease, the probability of being out of school increases, responding to the presence of the high informal fee charge for public school in the community. The overall negative impact of a high-fee charge on primary school attendance and its stronger impact for children from poor households, are basically consistent with the findings from a group of previous studies which examined the effect of user fees on enrollment, as well as the theory which is presented in Subsection 4.1.1 to explain the hypothesized relationships (Nishimura, Yamano, and Sasaoka 2008; Barrera-Osorio, Linden, and Urquiola 2007; Gertler and Glewwe 1990).

On the other hand, Hypothesis 2-3, which is stated in terms of the impact of a high informal fee charge on school attendance/choice among the non-poor, is confirmed. A greater share of non-poor households send their children to private school in general, as discussed in Subsection 6.1.1, and their schooling decision and school choice might not be affected by the informal high-fee charges in public schools. Besides, the estimation results show that a facility's condition in a public school in the community is still one of the key predictors of the probability of attending private school even after high-fee charge status in public schools is controlled.

This finding may imply that there is a scope for the government to ask for monetary contribution to non-poor households in providing public primary education in rural Uganda. As details are reviewed in Subsection 2.3.1, the Ugandan government's overall

commitment to the education sector has been weakened, and the priority placed on primary education sub-sector has been lowered, particularly after the introduction of USE policy in 2007, although they are still above the pre-UPE level. These significant changes in public financing may be partly attributed to the substantial decrease in the amount and sub-sector allocation of donor funding to education sector. In addition, the proportion of salary expenditure remains relatively high in Uganda. As a result, in recent years, there has been a decreasing trend in the amount of non-salary public expenditure per pupil received by public schools.

However, as previously shown, high-fee charge in public schools significantly reduces primary school attendance rate among the poor. Given this, it may be unrealistic to ask for monetary contribution to the non-poor by formalizing the user fee charge in rural public schools, which is also pointed out in Sasaoka and Nishimura (2010). On the contrary, it may be more realistic to ask for monetary contribution to the non-poor by strengthening the community financing, which is found to have positive correlation with the primary school attendance among the poor (see Subsection 6.1.1).

6.2   Limitations of the Study

Like all studies, this study contains some notable limitations. First, owing to the limitations of the data, this study cannot distinguish between the children who attend the sampled public school and the children who attend the other public school in their community. In other words, the study cannot exclude the possibility that some of the sampled children attend public schools with characteristics which differ from those captured in the survey.

Second, this study cannot not take account of the fact that there are various types/characteristics of private schools in Uganda. The small sample size of primary school age children who attend private school does not allow us to split them into more detailed

categories when investigating the determinants of school choice. Besides, owing to the significant shortage of information at the community-level, the study cannot include the variables on private schools' characteristics in all the regression analyses.

Third, this study still suffers from omitted variable biases, so that we cannot establish the causal direction between variables with certainty. As this study treats the dataset as a pooled cross-section with a panel feature at the community-level, individual and household-level unobservable time-invariant factors are not controlled in all the estimations. Although the community-level unobservable time-invariant factor is controlled in the analysis, which investigates the effects of high informal fees on school attendance, it is not controlled in the analysis on the effects on school choice because of technical issues. The study also cannot treat the possibility of violating the assumption of time-invariant unobserved heterogeneity at the community-level.

6.3   Conclusion

A view of education as an essential part of human capital investment, as well as relevant to a wide range of human and social development, is by now widely recognized among researchers and practitioners in international development. Partly inspired by work which showed a higher rate of return on education at the primary sub-sector in low-income countries, the international community has been making considerable effort to ensure UPE since the World Conference on EFA was held in Jomtien, Thailand, in 1990. Although the Education 2030 Framework for Action sets more holistic and comprehensive targets which are beyond UPE, we have to acknowledge the fact that the most important EFA target, namely, UPE, is still far from being reached, especially in SSA.

Under the encouragement of the EFA movement, school fee abolition policy has been introduced as a crucial step to achieving UPE in many developing countries. In SSA,

Uganda became one of the pioneers in introducing fee abolition policy. Since the UPE policy started in 1997, increased public financing brought a notable initial impact to expanding access to primary education. However, UPE has not been achieved because of both economic and non-economic factors, and there has been no progress in reducing the proportion of out-of-school children over the recent years. Besides, owing to insufficient public financing, the role of private financing in the provision of primary education is increasing in an informal way, especially in rural areas.

Although abolishing fees in public schools is at the heart of UPE policy in order to remove financial impediments to accessing education for the poor, in reality, some public schools charged various fees from parents/guardians even at the initial stages of UPE policy implementation. Besides, charging fees from households has recently become more and more common, even in rural public schools, although it is strictly prohibited by law. Moreover, the failures of public providers under UPE policy triggered the mushrooming of private schools in Uganda, as has been observed in many developing countries, especially in South Asia and SSA. In addition to the expensive private schools for the elites in urban areas, there has been an increasing role for private schools which appear to cater for the needs of children from poor households, in rural areas.

Under a situation where the replacement of abolished fees from the public financing is insufficient, there is a growing need for the government to undertake appropriate measures for making use of the increasing role of private financing, especially from households, to make educational financing sustainable. In fact, beyond its dominant role in paying tax, the role of the private sector in achieving UPE is receiving unprecedented attention in many developing countries around the world.

However, at the same time, the role of the state as a duty bearer in ensuring access to good quality basic education for all is explicitly re-emphasized in the Education 2030 Framework of Action. Adjustment of current UPE policies to fit this new situation should be planned according to the evidence about how the recently increased roles of private

financing affect access to primary schooling, especially among children from poor households in rural areas.

Regarding the debate on the role of fee charges in public primary schools, some empirical evidence shows that there is a strong willingness to pay for educational improvement even in poor households in developing countries. On the other hand, there are also studies which find that schooling costs still remain as an obstacle to primary school attendance. With regard to the issue of emerging private primary education, some studies highlight that the increasing share of private sector provision contributes to reducing the number of out-of-school children. However, there are also many studies which find that only wealthier household are able to make a school choice. The issues here must be resolved by examining empirical evidence.

Against this background, this study sets out to explore the following two major research questions: (1) what is the difference in the effects of the demand and supply factors which determine primary school attendance and choice between the children from poor and non-poor households in rural Uganda; and (2) what is the difference in the effects of high informal user fee charges in public schools on primary school attendance and choice between the children from poor and non-poor households in rural Uganda. The purpose of this study is to investigate the determinants of primary school attendance and choice in rural Uganda with special focus on assessing the effects of high informal user fee charges in public schools, by shedding light on the differences in effects between the children from poor and non-poor households.

This study is significant because it makes an academic contribution in the following respects. First, the study explicitly assesses the effect of informal fee collection in public primary schools under the fee abolition policy. There are many studies which identify the existence of this type of non-negligible payment in Uganda, and other developing countries where free primary education policy is implemented. However, few research studies have empirically examined the determinants and effects on access to primary education.

Second, the study sheds light on the school choice between public and private schools. A growing number of studies have accounted for the emergence of private school choice at the primary education level in developing counties. However, with a few exceptions, only a small number of studies have analyzed this in rural areas of SSA. Updating a series of Ugandan empirical studies about the determinants of access to primary education using a fresh large-scale household survey dataset, and using a panel dataset in assessing the effect of fees on access to basic education in SSA are the other significant contributions of this study.

The analytical framework of this study is drawn from human capital theory. It is assumed that households are rational in making decisions about whether they send their children to school and, if they do, to what type of schools they send their children, given the cost comparison and future return from the investment in schooling.

The study bases its analysis related to the first research question on the following hypotheses: (1-1) the probability of attending private school increases among the children from non-poor households; (1-2) the positive effect of household wealth on the probability of attending private school instead of attending public school increases among children from the non-poor households; (1-3) the low quality of public schools in the community have a positive effect on the probability of attending private schools among non-poor households; and (1-4) the presence of community contributions to public schooling have a positive effect on the probability of attending public school among the poor households.

The other hypotheses related to the second research question are as follows: (2-1) public schools in the community with high average wealth and no community contribution are more likely to charge informal user fees and charge higher informal user fees; (2-2) children from poor households are more likely to be out of school if a public school in their community charges high informal fees; (2-3) the probability of attending public schools by the children from non-poor households is not affected by the presence of high informal fees charged in a public school in their community.

This study applies a LPM and logit model to analyze the determinants of primary school attendance. In addition, determinants of primary school choice between public and private schools are investigated by applying a MNL model. To examine the impact of high informal user fee charges in rural public schools, the DD method is utilized combining a PSM technique. The study relies on the nationally representative panel household survey data, which was collected through the UNHS in 2005/2006 and the third wave of UNPS in 2011/2012. The subsample of primary school age children in rural areas is used for the analyses. The study treats the dataset as a pooled cross-section with a panel feature at the community-level.

The estimation results regarding the determinants of school attendance and school choice basically shows that the recent emergence of private education in rural Uganda mainly affects the decision-making of the non-poor households. While the effects of wealth on school attendance have diminished, wealth becomes the predictor of school choice between public and private schools even in rural areas. However, the study unveils the fact that this shift in the trend of wealth's effects took place only among the children from non-poor households. Probably because of the remaining schooling costs, wealth still remains as one of the predictors of school attendance among the children from poor households. In addition, the study finds that there was no significant increase in the likelihood of attending private school among poor children. The estimation results also reveal that the low quality of education in a public school seems to be one of the important factors which increases private school attendance, especially among children from non-poor households.

The estimation results on the determinants of high informal fee charges in public schools show that, on average, a high fee is more likely to be charged in a community with relatively rich households. In addition, the study interestingly finds that a high informal fee charge is more likely to take place in a community where there is little voluntary contribution to public schooling by the residents.

The estimation results on the impact of high informal fee charges in public schools on school attendance and school choice show that there is a strong negative impact on public school attendance among the children from poor households. In addition, the analysis reveals that private schools play a limited role in absorbing children from poor households who drop out of school because of the high fee charges in public schools. On the other hand, the study reveals that the presence of high informal fee charges in public school do not affect public school attendance, or overall school attendance, among the children from non-poor households. In addition, the study reveals that the high informal fee charge may have little effect on the school choices of children from non-poor households.

In Uganda, even after the introduction of USE in 2007, the government still maintains its relatively strong priority on primary education sub-sector development. Nevertheless, it is true that the priority given to the primary education sub-sector has been lowered. However, mainly because the Ugandan government's overall commitment to the education sector has been weakened, it is also true that the level of public investment in the primary education sub-sector has been gradually decreasing. So far, the government's efforts to refill the gaps in resources in the sector, mainly brought by a significant reduction in foreign aid, are not sufficient. In addition, due to the relatively high share of salary expenditure, non-salary expenditure per pupil has decreased and remains at low levels.

In these circumstances of public financing, it might be prudent for the government to formalize the fundraising function of rural public schools under the UPE policy. Additionally, it should continuously make efforts in raising the level of government commitment on education sector development as well as efficiency in resource allocation. From an administrative perspective, this policy change is also crucial in reviving the school-level accountability mechanism of the decentralized system under the UPE policy. Since the government has outlawed PTA and strictly prohibits the collection of user fees among rural public schools to emphasize the free nature of UPE policy, intrinsically high motivation to support public schooling by Uganda's rural community has been weakened.

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Reviving active community participation in public primary schooling is a key to breaking the bottleneck in service delivery under the UPE policy, thus leading to an improvement in education quality.

However, the findings of this study provide several important insights on how the government should adjust its UPE policy to reactivate community contribution for public primary education, including the financial aspect, in rural Uganda. As one of the key findings shows, when informal fee charges exceed the levels found in low-fee private schools, there is a negative effect on public school attendance rates for children from poor households, as well as a decrease in the overall school attendance rate in the community. This suggests that simply removing the prohibition on fee collection and giving public schools autonomy to collect user fees have a risk of making schools inaccessible for a significant number of children from poor households. Despite the progress in poverty reduction in recent years, a significant number of children in rural Uganda are still from the households whose economic level is below the official poverty line. Thus, as it was before the introduction of the UPE policy, the study confirms the fact that these poor households take high fee charges into consideration when making the decision as to whether or not to send their children to primary school.

On the other hand, the study finds that high-fee charges in public schools do not significantly affect primary school attendance of children from non-poor households. In addition, the study reveals the fact that fee charges that do not exceed the levels found in low-fee private schools may not affect primary school attendance of children from poor households. These findings may suggest that the government should introduce a progressive user-fee system in which public schools charge higher fees to those from better-off households and/or set a maximum chargeable amount in rural public schools. Nevertheless, these policies may not be very realistic in the context of rural Uganda, where law enforcement is still weak in general. High user fee charges in rural public schools are informally being demanded, even though it is strictly prohibited by the law. In addition, the

average amount of user fees charged in urban schools has exceeded the maximum chargeable amount set by the government.

Interestingly, one of the key findings of this study shows that use of high informal fee charges in public schools is expanding among relatively wealthy communities with no voluntary contribution from households. Besides, the study reveals that contributions for public schooling by the community do not inhibit primary school attendance by poor children but rather have a positive effect on increasing the probability of their overall school attendance. These findings may suggest that the government formalize and emphasize the households' active participation in public school's governance and allow the school to collect user fees only if parents/guardians of the children in the school reach a consensus on the fee collection. Realistically, this may reduce the risk that public school in a rural community, which consists of relatively rich households on an average, charge high user fees, which are unaffordable for the poor. This policy adjustment may also facilitate the voluntary financial contribution from the non-poor households in rural public schools.

Regarding another government key policy option for dealing with tight budget conditions, namely promoting the partnership with private schools, the study reveals that, in Uganda, attending private schools has become more and more common even in rural areas. This finding may suggest that the government explore the possibility of investing more on smoothing the process of regulation/supervision for private schools in rural areas. For instance, the same standards and procedures, which are mainly designed with urban private schools for elites in mind, are applied to all the non-government schools regardless of type. Although the government should be very careful in relaxing regulations in order to ensure the basic quality of education in all the private schools in the country, it is also true that there are a significant number of rural private schools, which are unregistered and out of the supervision of the government because of the painfully slow bureaucratic registration process.

Nevertheless, in the context of rural Uganda, the emergence of private education means that mainly the non-poor households are likely to send their children to private schools, particularly when they are relatively wealthy and the quality of public school education in their communities is low. In addition, consistent to this finding, the study reveals the fact that children from poor households in a community, where high fees are charged in a public school, might find attending both public and private schools financially unviable. In other words, access to primary education among children from poor households is continuously ensured by the public schools in rural Uganda. Combined with the measures to promote partnership with private primary schools, the government should strategically allocate the money made available by saving public spending through PPP to ensure access to a minimum quality of primary education for all children.

As a pioneer in introducing free primary education policy after the launch of the EFA movement, Uganda's experience is well known as one of the best practices, as quantity underwent a rapid expansion by boosting the public spending and significantly relieving the financial burden of the parents/guardians. Partly because the abolition of user fee charges is the core of UPE policy, few studies have been conducted to discuss the possibility of utilizing resources from the private sector, even though the latter's role has recently been increasing in an informal way. By utilizing national representative panel datasets, this study provides fresh empirical evidence that shows that there are several options which the government can take to facilitate financial contributions, particularly from the non-poor households, without deteriorating access, and maintaining the overall framework of the UPE policy. However, the study reveals the fact that excessive reliance on private sector contributions has deprived children, principally those of lower economic status, of their chance to receive primary education. As a duty bearer, the government should also take appropriate actions to regulate carefully the involvement of the private sector, which has already spread throughout the nation.

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APPENDICES

Appendix I: Supplementary Tables

Table A-1: Differences in Mean of Individual-Level Variables between 2005/2006 and 2011/2012

	2005/2006 Full (*n*=1,539)	2011/2012 Full (*n*=1,522)	Difference	
School attendance				
Attending School	0.889	0.855	-0.033	***
	(0.008)	(0.009)	(0.012)	
School choice				
Public school	0.782	0.683	-0.098	***
	(0.011)	(0.012)	(0.016)	
Private school	0.107	0.172	0.065	***
	(0.008)	(0.010)	(0.012)	
Individual characteristics				
Female	0.508	0.520	0.012	
	(0.013)	(0.013)	(0.018)	
Foster child	0.213	0.252	0.039	**
	(0.010)	(0.011)	(0.015)	
Household characteristics				
Poor	0.373	0.414	0.041	**
	(0.012)	(0.013)	(0.018)	
Log (MPCE)	10.474	10.370	-0.104	***
	(0.013)	(0.015)	(0.020)	
Number of children	4.934	5.068	0.133	*
	(0.050)	(0.058)	(0.077)	
Youth household head	0.092	0.049	-0.044	***
	(0.007)	(0.006)	(0.009)	
Female household head	0.252	0.240	-0.012	
	(0.011)	(0.011)	(0.016)	
Household head's years of schooling	5.138	5.219	0.082	
	(0.090)	(0.093)	(0.130)	
Public school characteristics				
Level of informal user fees				
Fee-free	0.623	0.196	-0.427	***
	(0.012)	(0.010)	(0.016)	
Low-fee	0.377	0.636	0.259	***
	(0.012)	(0.012)	(0.017)	
High-fee	0.000	0.168	0.168	***
	(0.000)	(0.010)	(0.010)	
Pupil-teacher ratio	53.358	53.765	0.407	
	(0.423)	(0.449)	(0.617)	
Poor facility condition	0.103	0.186	0.083	***
	(0.008)	(0.010)	(0.013)	
Community characteristics				
Availability of public school	0.426	0.496	0.070	***
	(0.013)	(0.013)	(0.018)	
Availability of private school	0.118	0.212	0.095	***
	(0.008)	(0.010)	(0.013)	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-2: Differences in Mean of Community-Level Variables between 2005/2006 and 2011/2012

	2005/2006 Full (*n*=126)	2011/2012 Full (*n*=126)	Difference	
Public school characteristics				
Level of informal user fees				
Fee-free	0.603	0.206	-0.397	***
	(0.044)	(0.036)	(0.057)	
Low-fee	0.397	0.603	0.206	***
	(0.044)	(0.044)	(0.062)	
High-fee	0.000	0.190	0.190	***
	(0.000)	(0.035)	(0.035)	
Pupil-teacher ratio	53.525	51.430	-2.095	**
	(1.540)	(1.530)	(2.171)	
Poor facility condition	0.135	0.175	0.040	
	(0.031)	(0.034)	(0.046)	
Community characteristics				
Number of households	135.746	236.500	100.754	***
	(7.686)	(25.407)	(26.544)	
Log (Mean MPCE)	10.734	10.837	0.103	
	(0.027)	(0.061)	(0.066)	
Mean household head's education	5.039	5.262	0.222	
	(0.120)	(0.136)	(0.181)	
Availability of public school	0.438	0.492	0.054	
	(0.044)	(0.044)	(0.062)	
Availability of private school	0.115	0.223	0.108	**
	(0.028)	(0.037)	(0.046)	

Source: Created by the author using UNHS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-3: Differences in Mean of Individual-Level Variables by School Attendance and School Choice, 2005/2006

	Out of school (*n*=171)	Attending school (*n*=1,368)	Difference		Public school (*n*=1,203)	Private school (*n*=165)	Difference	
Individual characteristics								
Female	0.462	0.514	0.052		0.509	0.552	0.043	
	(0.038)	(0.014)	(0.041)		(0.014)	(0.039)	(0.042)	
Foster child	0.222	0.212	-0.010		0.211	0.218	0.007	
	(0.032)	(0.011)	(0.033)		(0.012)	(0.032)	(0.034)	
Household characteristics								
Poor	0.550	0.351	-0.199	***	0.363	0.261	-0.103	***
	(0.038)	(0.013)	(0.039)		(0.014)	(0.034)	(0.040)	
Log (MPCE)	10.261	10.500	0.239	***	10.483	10.626	0.143	***
	(0.038)	(0.014)	(0.042)		(0.015)	(0.040)	(0.043)	
Number of children	4.649	4.970	0.321	**	4.976	4.927	-0.049	
	(0.134)	(0.054)	(0.160)		(0.058)	(0.143)	(0.166)	
Youth household head	0.129	0.088	-0.041	*	0.080	0.145	0.066	***
	(0.026)	(0.008)	(0.023)		(0.008)	(0.028)	(0.023)	
Female household head	0.240	0.254	0.014		0.252	0.267	0.015	
	(0.033)	(0.012)	(0.035)		(0.013)	(0.035)	'(0.036)	
Household head's years of schooling	4.339	5.238	0.898	***	5.206	5.467	-0.261	
	(0.244)	(0.096)	(0.286)		(0.102)	(0.292)	(0.296)	
Public school characteristics								
Level of informal user fees								
Fee-free	0.602	0.626	0.023		0.635	0.558	-0.078	*
	(0.038)	(0.013)	(0.039)		(0.014)	(0.039)	(0.040)	
Low-fee	0.398	0.374	-0.023		0.365	0.442	0.078	*
	(0.038)	(0.013)	(0.039)		(0.014)	(0.039)	(0.040)	
Pupil-teacher ratio	55.980	53.030	-2.950	**	54.175	44.683	-9.492	***
	(1.226)	(0.450)	(1.344)		(0.486)	(0.931)	(1.358)	
Poor facility condition	0.088	0.105	0.018		0.085	0.255	0.170	***
	(0.022)	(0.008)	(0.025)		(0.008)	(0.034)	(0.025)	
Community characteristics								
Community Contribution	0.801	0.787	-0.015		0.786	0.788	0.002	
	(0.031)	(0.011)	(0.033)		(0.012)	(0.032)	(0.034)	
Availability of public school	0.333	0.437	0.104	***	0.450	0.345	-0.104	**
	(0.036)	(0.013)	(0.040)		(0.014)	(0.013)	(0.041)	
Availability of private school	0.064	0.124	0.060	**	0.099	0.309	0.210	
	(0.019)	(0.009)	(0.026)		(0.009)	(0.036)	(0.027)	
Region								
Central	0.152	0.258	-0.106	***	0.215	0.570	0.354	***
	(0.028)	(0.012)	(0.035)		(0.012)	(0.039)	(0.035)	
Eastern	0.187	0.292	-0.105	***	0.316	0.121	-0.195	***
	(0.030)	(0.012)	(0.036)		(0.013)	(0.025)	(0.037)	
Western	0.222	0.221	-0.001		0.225	0.194	-0.031	
	(0.032)	(0.011)	(0.034)		(0.012)	(0.031)	(0.034)	
Northern	0.439	0.228	0.211	***	0.244	0.115	-0.128	***
	(0.038)	(0.011)	(0.035)		(0.012)	(0.025)	(0.035)	

Source: Created by the author using UNHS 2005/2006.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-4: Differences in Mean of Individual-Level Variables by School Attendance and School Choice, 2011/2012

	Out of school (*n*=220)	Attending school (*n*=1,302)	Difference		Public school (*n*=1,040)	Private school (*n*=262)	Difference	
Individual characteristics								
Female	0.477	0.528	0.050		0.524	0.542	0.018	
	(0.034)	(0.014)	(0.036)		(0.015)	(0.031)	(0.035)	
Foster child	0.245	0.253	0.007		0.262	0.218	-0.044	
	(0.029)	(0.012)	(0.032)		(0.014)	(0.026)	(0.030)	
Household characteristics								
Poor	0.505	0.399	-0.106	***	0.452	0.187	-0.265	***
	(0.034)	(0.014)	(0.036)		(0.015)	(0.024)	(0.033)	
Log (MPCE)	10.268	10.387	0.119	***	10.324	10.636	-0.312	***
	(0.043)	(0.016)	(0.042)		(0.017)	(0.031)	(0.038)	
Number of children	5.305	5.028	-0.277	*	4.999	5.141	0.142	
	(0.171)	(0.062)	(0.166)		(0.067)	(0.155)	(0.154)	
Youth household head	0.077	0.044	-0.033	**	0.042	0.050	0.007	
	(0.018)	(0.006)	(0.016)		(0.006)	(0.013)	(0.014)	
Female household head	0.250	0.238	-0.012		0.247	0.202	-0.045	
	(0.029)	(0.012)	(0.031)		(0.013)	(0.025)	(0.029)	
Household head's years of schooling	4.736	5.301	0.565	**	5.162	5.855	-0.693	***
	(0.234)	(0.102)	(0.265)		(0.111)	(0.241)	(0.253)	
Public school characteristics								
Level of informal user fees								
Fee-free	0.214	0.194	0.020		0.204	0.153	-0.051	*
	(0.028)	(0.011)	(0.029)		(0.012)	(0.022)	(0.027)	
Low-fee	0.582	0.645	0.063	*	0.639	0.668	0.029	
	(0.033)	(0.013)	(0.035)		(0.015)	(0.029)	(0.033)	
High-fee	0.205	0.161	-0.043		0.157	0.179	0.023	
	(0.027)	(0.010)	(0.027)		(0.011)	(0.024)	(0.025)	
Pupil-teacher ratio	55.989	53.389	-2.600	**	54.058	50.733	-3.324	***
	(1.096)	(0.491)	(1.276)		(0.555)	(1.031)	(1.221)	
Poor facility condition	0.186	0.186	-0.0005		0.188	0.179	-0.008	
	(0.026)	(0.011)	(0.028)		(0.012)	(0.024)	(0.027)	
Community characteristics								
Community Contribution	0.705	0.812	0.107	***	0.831	0.737	-0.094	***
	(0.031)	(0.011)	(0.029)		(0.012)	(0.027)	(0.027)	
Availability of public school	0.441	0.505	0.064	*	0.509	0.492	-0.016	
	(0.034)	(0.014)	(0.036)		(0.016)	(0.031)	(0.035)	
Availability of private school	0.214	0.212	-0.002		0.163	0.408	0.246	***
	(0.028)	(0.011)	(0.030)		(0.011)	(0.030)	(0.027)	
Region								
Central	0.286	0.236	-0.051		0.192	0.408	0.216	***
	(0.031)	(0.012)	(0.031)		(0.012)	(0.030)	(0.029)	
Eastern	0.245	0.278	0.033		0.290	0.229	-0.061	**
	(0.029)	(0.012)	(0.032)		(0.014)	(0.026)	(0.031)	
Western	0.114	0.236	0.122	***	0.220	0.298	-0.078	***
	(0.021)	(0.012)	(0.030)		(0.013)	(0.028)	(0.029)	
Northern	0.355	0.250	-0.104	***	0.297	0.065	0.232	***
	(0.032)	(0.012)	(0.032)		(0.014)	(0.015)	(0.029)	

Source: Created by the author using UNHS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-5: Differences in Mean of Individual-Level Variables by Treatment Status, 2005/2006 and 2011/2012

	Before matching				After matching			
	Control (*n*=2530)	Treatment (*n*=531)	Difference		Control (*n*=1,240)	Treatment (*n*=496)	Difference	
Individual characteristics								
Female	0.517	0.501	-0.016		0.532	0.510	-0.022	
	(0.010)	(0.022)	(0.024)		(0.014)	(0.022)	(0.027)	
Foster child	0.220	0.290	0.070	***	0.240	0.296	0.057	**
	(0.008)	(0.020)	(0.020)		(0.012)	(0.021)	(0.023)	
Household characteristics								
Poor	0.404	0.343	-0.061	***	0.410	0.361	-0.050	*
	(0.010)	(0.021)	(0.023)		(0.014)	(0.022)	(0.056)	
Log (MPCE)	10.403	10.511	0.108	***	10.409	10.478	0.069	**
	(0.010)	(0.028)	(0.026)		(0.016)	(0.028)	(0.030)	
Number of children	4.990	5.051	0.061		5.035	5.079	0.043	
	(0.042)	(0.095)	(0.102)		(0.059)	(0.098)	(0.111)	
Youth household head	0.070	0.073	0.003		0.080	0.073	-0.007	
	(0.005)	(0.011)	(0.012)		(0.008)	(0.012)	(0.014)	
Female household head	0.236	0.296	0.060	***	0.246	0.300	0.054	**
	(0.008)	(0.020)	(0.021)		(0.012)	(0.021)	(0.023)	
Household head's education	5.096	5.573	0.477	***	5.494	5.405	-0.088	
	(0.070)	(0.169)	(0.171)		(0.099)	(0.172)	(0.191)	
Public school characteristics								
Pupil-teacher ratio	53.746	52.675	-1.071		56.374	52.711	-3.663	***
	(0.314)	(0.961)	(0.814)		(0.469)	(1.006)	(0.977)	
Poor facility condition	0.132	0.203	0.071	**	0.165	0.218	0.053	***
	(0.007)	(0.017)	(0.017)		(0.011)	(0.019)	(0.020)	
Community characteristics								
Community Contribution	0.825	0.638	-0.186	***	0.804	0.639	-0.165	***
	(0.008)	(0.021)	(0.019)		(0.011)	(0.022)	(0.022)	
Availability of public school	0.445	0.533	0.088	***	0.398	0.522	0.125	***
	(0.010)	(0.022)	(0.024)		(0.014)	(0.022)	(0.026)	
Availability of private school	0.152	0.224	0.072	***	0.234	0.179	-0.054	**
	(0.007)	(0.018)	(0.018)		(0.012)	(0.017)	(0.022)	
Region								
Central	0.225	0.337	0.112	***	0.297	0.298	0.002	
	(0.008)	(0.021)	(0.020)		(0.013)	(0.021)	(0.024)	
Eastern	0.294	0.194	-0.100	***	0.261	0.208	-0.054	**
	(0.009)	(0.017)	(0.021)		(0.012)	(0.018)	(0.023)	
Western	0.260	0.028	-0.232	***	0.044	0.022	-0.022	**
	(0.009)	(0.007)	(0.019)		(0.006)	(0.007)	(0.010)	
Northern	0.220	0.441	0.221	***	0.398	0.472	0.074	***
	(0.008)	(0.022)	(0.021)		(0.014)	(0.022)	(0.026)	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Standard errors are in parentheses. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-6: School Attending Children Age 6-14 by Education Level, 2005/2006 and 2011/2012

	2005/2006			2011/2012		
	Pre-Primary	Primary	Secondary	Pre-Primary	Primary	Secondary
6	34	132	0	41	118	0
	(20.48)	(79.52)	(0.00)	(25.79)	(74.21)	(0.00)
7	16	187	0	20	177	0
	(7.88)	(92.12)	(0.00)	(10.15)	(89.85)	(0.00)
8	5	228	0	10	231	0
	(2.15)	(97.85)	(0.00)	(4.15)	(95.85)	(0.00)
9	2	225	1	2	234	2
	(0.88)	(98.68)	(0.44)	(0.84)	(98.32)	(0.84)
10	2	238	0	0	226	0
	(0.83)	(99.17)	(0.00)	(0.00)	(100.00)	(0.00)
11	0	221	1	1	224	0
	(0.00)	(99.55)	(0.45)	(0.44)	(99.56)	(0.00)
12	0	217	2	0	236	2
	(0.00)	(99.09)	(0.91)	(0.00)	(99.16)	(0.84)
13	0	211	12	0	202	11
	(0.00)	(94.62)	(5.38)	(0.00)	(94.84)	(5.16)
14	0	180	22	0	181	19
	(0.00)	(89.11)	(10.89)	(0.00)	(90.50)	(9.50)

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Percentages are in parentheses.

Table A-7: Determinants of School Attendance of Children Age 6-14: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled sample of children age 6-14				Logit model for pooled sample of children age 6-14			
	Full (1)		Full (2)		Full (3)		Full (4)	
Individual characteristics								
Female	0.011		0.011		0.010		0.010	
	(0.009)		(0.009)		(0.009)		(0.009)	
Foster child	-0.027	**	-0.027	**	-0.025	**	-0.025	**
	(0.012)		(0.012)		(0.012)		(0.012)	
Household characteristics								
Poor	-0.011		-0.010		-0.008		-0.003	
	(0.016)		(0.016)		(0.016)		(0.016)	
Log (MPCE)	0.039	***	0.051	***	0.038	**	0.044	***
	(0.015)		(0.017)		(0.015)		(0.016)	
Log (MPCE)×Year 2011/2012			-0.021				-0.034	*
			(0.018)				(0.018)	
Number of children	0.001		0.001		0.001		0.001	
	(0.002)		(0.002)		(0.002)		(0.002)	
Youth household head	-0.037		-0.037		-0.029		-0.028	
	(0.024)		(0.024)		(0.019)		(0.019)	
Female household head	0.029	**	0.029	**	0.029	**	0.030	**
	(0.012)		(0.012)		(0.013)		(0.013)	
Household head's education	0.004	***	0.004	***	0.005	***	0.005	***
	(0.001)		(0.001)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	-0.001	**	0.0003		-0.001	**	-0.001	**
	(0.000)		(0.0004)		(0.0003)		(0.0003)	
Pupil-teacher ratio×Year 2011/2012			-0.001				-0.001	
			(0.001)				(0.001)	
Poor facility condition	0.031	**	0.030	**	0.030	**	0.028	**
	(0.013)		(0.013)		(0.014)		(0.014)	
Community characteristics								
Community contribution	0.032	**	0.031	**	0.031	***	0.030	***
	(0.013)		(0.013)		(0.011)		(0.011)	
Availability of public school	0.022	**	0.023	**	0.025	**	0.025	***
	(0.010)		(0.010)		(0.010)		(0.010)	
Availability of private school	0.004		0.006		0.007		0.009	
	(0.013)		(0.013)		(0.015)		(0.015)	
Region (base=Central)								
Eastern	0.043	***	0.043	***	0.045	***	0.044	***
	(0.014)		(0.014)		(0.015)		(0.015)	
Western	0.025	*	0.024	*	0.029	*	0.027	*
	(0.013)		(0.014)		(0.015)		(0.016)	
Northern	-0.033	**	-0.034	**	-0.021		-0.022	
	(0.017)		(0.017)		(0.015)		(0.015)	
Year 2011/2012	-0.020	**	0.233		-0.021	**	-0.021	**
	(0.010)		(0.200)		(0.010)		(0.010)	
Constant	0.513	***	0.368	*				
	(0.164)		(0.190)					
R-squared	0.1794		0.29035					
Pseudo R-squared					0.2122		0.2142	
Log Pseudo Likelihood					-1072.0832		-1069.2934	
Number of observations	3,806				3,806			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-8: Determinants of School Attendance of Children Age 6-12: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model Analysis Using the Sample Including the Children in the Communities with High-Fee Charge in Public Schools in 2005/2006

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled sample of children age 6-12				Logit model for pooled sample of children age 6-12			
	Full		Full		Full		Full	
	(1)		(2)		(3)		(4)	
Individual characteristics								
Female	0.020	*	0.020	*	0.020	*	0.020	*
	(0.011)		(0.011)		(0.011)		(0.011)	
Foster child	-0.022		-0.022		-0.019		-0.019	
	(0.014)		(0.014)		(0.014)		(0.014)	
Household characteristics								
Poor	-0.018		-0.016		-0.014		-0.009	
	(0.018)		(0.018)		(0.018)		(0.018)	
Log (MPCE)	0.039	**	0.055	***	0.039	**	0.046	***
	(0.017)		(0.020)		(0.017)		(0.018)	
Log (MPCE)×Year 2011/2012			-0.027				-0.040	*
			(0.021)				(0.021)	
Number of children	0.001		0.001		0.001		0.001	
	(0.003)		(0.003)		(0.003)		(0.003)	
Youth household head	-0.031		-0.031		-0.024		-0.024	
	(0.025)		(0.025)		(0.021)		(0.021)	
Female household head	0.022		0.022		0.022		0.023	
	(0.014)		(0.014)		(0.014)		(0.014)	
Household head's education	0.005	***	0.005	***	0.005	***	0.005	***
	(0.002)		(0.002)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	-0.001	*	-0.0003		-0.001	**	-0.001	**
	(0.0003)		(0.0005)		(0.0003)		(0.0003)	
Pupil-teacher ratio×Year 2011/2012			-0.0005				-0.0004	
			(0.001)				(0.001)	
Poor facility condition	0.031	*	0.029	*	0.029	*	0.028	*
	(0.016)		(0.016)		(0.016)		(0.016)	
Community characteristics								
Community contribution	0.029	**	0.028	*	0.027	**	0.028	**
	(0.014)		(0.014)		(0.013)		(0.013)	
Availability of public school	0.025	**	0.026	**	0.028	**	0.029	**
	(0.011)		(0.011)		(0.011)		(0.011)	
Availability of private school	0.005		0.007		0.007		0.008	
	(0.015)		(0.016)		(0.017)		(0.017)	
Region (base=Central)								
Eastern	0.047	***	0.046	***	0.048	***	0.047	***
	(0.016)		(0.016)		(0.017)		(0.017)	
Western	0.026	*	0.024		0.031	*	0.028	
	(0.016)		(0.016)		(0.018)		(0.018)	
Northern	-0.033	*	-0.033	*	-0.021		-0.022	
	(0.019)		(0.019)		(0.018)		(0.018)	
Year 2011/2012	-0.029	***	0.277		-0.030		-0.030	***
	(0.011)		(0.228)		(0.011)		(0.011)	
Constant	0.504	***	0.325					
	(0.185)		(0.218)					
R-squared	0.1947		0.1952					
Pseudo R-squared					0.2255		0.2279	
Log Pseudo Likelihood					-924.74478		-921.86255	
Number of observations	3,114				3,114			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-9: Determinants of School Attendance of Children Age 6-14 by Poverty Status: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school			
	LPM for pooled sample of children age 6-14		Logit model for pooled sample of children age 6-14	
	Poor	Non-poor	Poor	Non-poor
	(1)	(2)	(3)	(4)
Individual characteristics				
Female	-0.001	0.021 *	-0.003	0.021 *
	(0.017)	(0.011)	(0.017)	(0.011)
Foster child	-0.006	-0.034 **	-0.004	-0.034 ***
	(0.023)	(0.014)	(0.023)	(0.013)
Household characteristics				
Log (MPCE)	0.084	0.036 *	0.073 ***	0.013 *
	(0.053)	(0.021)	(0.026)	(0.019)
Log (MPCE)×Year 2011/2012	0.005	-0.062 **	-0.009	-0.067 **
	(0.064)	(0.030)	(0.054)	(0.033)
Number of children	0.004	-0.002	0.003	-0.001
	(0.004)	(0.003)	(0.004)	(0.003)
Youth household head	-0.023	-0.043	-0.011	-0.037 *
	(0.041)	(0.029)	(0.033)	(0.021)
Female household head	0.036	0.018	0.036	0.021
	(0.022)	(0.014)	(0.023)	(0.015)
Household head's education	0.007 **	0.003 **	0.007 **	0.004 **
	(0.003)	(0.002)	(0.003)	(0.002)
Public school characteristics				
Pupil-teacher ratio	-0.001	-0.0003	-0.001	-0.001 **
	(0.001)	(0.001)	(0.0005)	(0.0004)
Pupil-teacher ratio×Year 2011/2012	0.000	-0.001	0.0001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Poor facility condition	0.069 ***	-0.002	0.069 **	-0.0004
	(0.023)	(0.016)	(0.027)	(0.015)
Community characteristics				
Community contribution	0.078 ***	-0.007	0.070 ***	-0.006
	(0.024)	(0.014)	(0.020)	(0.014)
Availability of public school	0.044 **	0.019	0.046 **	0.019
	(0.018)	(0.012)	(0.018)	(0.012)
Availability of private school	0.016	0.001	0.015	0.003
	(0.027)	(0.015)	(0.034)	(0.015)
Region (base=Central)				
Eastern	0.041 *	0.025	0.047	0.025
	(0.026)	(0.017)	(0.031)	(0.016)
Western	0.001	0.025 *	-0.005	0.032 **
	(0.033)	(0.015)	(0.035)	(0.016)
Northern	-0.079 **	0.007	-0.069 **	0.011
	(0.031)	(0.020)	(0.031)	(0.019)
Year 2011/2012	-0.057	0.689 **	-0.004	-0.027 **
	(0.642)	(0.324)	(0.018)	(0.011)
Constant	-0.025	0.587 ***		
	(0.539)	(0.226)		
R-squared	0.2040	0.1737		
Pseudo R-squared			0.2241	0.2257
Log Pseudo Likelihood			-492.96439	-549.08014
Number of observations	1,487	2,319	1,487	2,319

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-10: Determinants of School Attendance of Children Age 6-12 by Poverty Status: Coefficients from Linear Probability Model and Average Marginal Effects from Logit Model Analysis Using the Sample Including the Children in the Communities with High-Fee Charge in Public Schools in 2005/2006

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	LPM for pooled sample of children age 6-12				Logit model for pooled sample of children age 6-12			
	Poor (1)		Non-poor (2)		Poor (3)		Non-poor (4)	
Individual characteristics								
Female	0.013		0.025	**	0.012		0.026	**
	(0.019)		(0.013)		(0.019)		(0.013)	
Foster child	-0.004		-0.029	*	0.0002		-0.028	*
	(0.026)		(0.016)		(0.026)		(0.015)	
Household characteristics								
Log (MPCE)	0.105	*	0.039	*	0.077	**	0.011	
	(0.058)		(0.023)		(0.030)		(0.021)	
Log (MPCE)×Year 2011/2012	-0.030		-0.072	**	-0.036		-0.076	**
	(0.071)		(0.033)		(0.061)		(0.037)	
Number of children	0.006		-0.002		0.005		-0.001	
	(0.005)		(0.003)		(0.005)		(0.003)	
Youth household head	-0.025		-0.032		-0.014		-0.029	
	(0.044)		(0.030)		(0.036)		(0.024)	
Female household head	0.021		0.017		0.020		0.019	
	(0.025)		(0.017)		(0.025)		(0.017)	
Household head's education	0.007	**	0.004	**	0.007	**	0.004	**
	(0.003)		(0.002)		(0.003)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	-0.001		-0.0004		-0.001		-0.001	**
	(0.001)		(0.001)		(0.001)		(0.0004)	
Pupil-teacher ratio×Year 2011/2012	0.000		-0.001		0.0002		-0.001	
	(0.001)		(0.001)		(0.001)		(0.001)	
Poor facility condition	0.069	**	-0.005		0.066	**	-0.002	
	(0.027)		(0.019)		(0.031)		(0.017)	
Community characteristics								
Community contribution	0.078	***	-0.014		0.072	***	-0.013	
	(0.028)		(0.015)		(0.023)		(0.016)	
Availability of public school	0.052	**	0.019		0.055	***	0.019	
	(0.020)		(0.013)		(0.020)		(0.013)	
Availability of private school	0.030		-0.007		0.031		-0.004	
	(0.032)		(0.018)		(0.040)		(0.017)	
Region (base=Central)								
Eastern	0.054	*	0.023		0.058		0.022	
	(0.031)		(0.019)		(0.036)		(0.018)	
Western	0.007		0.025		-0.001		0.033	*
	(0.038)		(0.016)		(0.041)		(0.018)	
Northern	-0.077	**	0.011		-0.069	*	0.015	
	(0.036)		(0.023)		(0.036)		(0.022)	
Year 2011/2012	0.277		0.783	**	-0.016		-0.034	***
	(0.714)		(0.363)		(0.020)		(0.013)	
Constant	-0.247		0.572	**				
	(0.591)		(0.255)					
R-squared	0.2161		0.1902					
Pseudo R-squared					0.2274		0.2455	
Log Pseudo Likelihood					-435.2807		-463.27173	
Number of observations	1,228		1,886		1,228		1,886	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. Coefficients calculated by logit model are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-11: Determinants of School Choice by Children Age 6-14: Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)							
	MNL model for pooled sample of children age 6-14 Full (1)				MNL model for pooled sample of children age 6-14 Full (2)			
	Public school		Private school		Public school		Private school	
Individual characteristics								
Female	-0.003		0.014		-0.004		0.014	
	(0.013)		(0.010)		(0.013)		(0.010)	
Foster child	0.017		-0.041	***	0.017		-0.042	***
	(0.016)		(0.013)		(0.016)		(0.013)	
Household characteristics								
Poverty	0.042	*	-0.050	***	0.045	**	-0.048	***
	(0.022)		(0.018)		(0.022)		(0.018)	
Log (MPCE)	0.024		0.014		0.031		0.014	
	(0.020)		(0.015)		(0.020)		(0.015)	
Log (MPCE)×Year 2011/2012					-0.092	***	0.053	***
					(0.025)		(0.020)	
Number of children	0.001		-0.0004		0.001		0.000	
	(0.003)		(0.002)		(0.003)		(0.002)	
Youth household head	-0.059	**	0.028		-0.059	**	0.029	
	(0.026)		(0.020)		(0.026)		(0.020)	
Female household head	0.038	**	-0.009		0.039	**	-0.009	
	(0.017)		(0.013)		(0.017)		(0.013)	
Household head's education	0.004	*	0.001		0.003	*	0.001	
	(0.002)		(0.002)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	0.001	**	-0.002	***	0.001	**	-0.002	***
	(0.0004)		(0.0004)		(0.0004)		(0.0004)	
Pupil-teacher ratio×Year 2011/2012					-0.002	***	0.002	***
					(0.001)		(0.001)	
Poor facility condition	-0.021		0.049	***	-0.024		0.051	
	(0.019)		(0.014)		(0.019)		(0.014)	
Community characteristics								
Community contribution	0.048	***	-0.019		0.048	***	-0.018	
	(0.015)		(0.012)		(0.015)		(0.012)	
Availability of public school	0.065	***	-0.040	***	0.066	***	-0.040	***
	(0.014)		(0.011)		(0.014)		(0.011)	
Availability of private school	-0.088	***	0.086	***	-0.087	***	0.086	***
	(0.017)		(0.012)		(0.017)		(0.012)	
Region (base=Central)								
Eastern	0.130	***	-0.080	***	0.127	***	-0.078	***
	(0.020)		(0.016)		(0.020)		(0.015)	
Western	0.064	***	-0.030	**	0.058	***	-0.027	**
	(0.019)		(0.013)		(0.019)		(0.013)	
Northern	0.130	***	-0.152	***	0.128	***	-0.152	***
	(0.024)		(0.021)		(0.023)		(0.021)	
Year 2011/2012	-0.088	***	0.068		-0.086	***	0.067	***
	(0.013)		(0.011)		(0.013)		(0.011)	
Pseudo R-squared	0.1874				0.1900			
Log pseudo Likelihood	-2239.3455				-2232.2805			
Number of observations	3,806				3,806			

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-12: Determinants of School Choice by Children Age 6-12: Average Marginal Effects from Multinomial Logit Model Analysis Using the Sample Including the Children in the Communities with High-Fee Charge in Public Schools in 2005/2006

	MNL model for pooled sample of children age 6-12 Full (1)				MNL model for pooled sample of children age 6-12 Full (2)			
	Public school		Private school		Public school		Private school	
Individual characteristics								
Female	0.002		0.018		0.001		0.018	
	(0.014)		(0.012)		(0.014)		(0.011)	
Foster child	0.029		-0.047	***	0.031		-0.048	***
	(0.019)		(0.015)		(0.019)		(0.015)	
Household characteristics								
Poverty	0.034		-0.049	**	0.038		-0.048	**
	(0.024)		(0.020)		(0.024)		(0.020)	
Log (MPCE)	0.012		0.025		0.022		0.024	
	(0.022)		(0.017)		(0.023)		(0.017)	
Log (MPCE)×Year 2011/2012					-0.118	***	0.073	***
					(0.028)		(0.023)	
Number of children	0.001		-0.0003		0.002		-0.001	
	(0.004)		(0.003)		(0.004)		(0.003)	
Youth household head	-0.063	**	0.036		-0.061	**	0.036	
	(0.028)		(0.022)		(0.028)		(0.022)	
Female household head	0.035	*	-0.014		0.037	*	-0.015	
	(0.019)		(0.015)		(0.019)		(0.015)	
Household head's education	0.004	*	0.001		0.004	*	0.001	
	(0.002)		(0.002)		(0.002)		(0.002)	
Public school characteristics								
Pupil-teacher ratio	0.001	*	-0.001	***	0.001	**	-0.002	***
	(0.0005)		(0.0004)		(0.0005)		(0.0004)	
Pupil-teacher ratio×Year 2011/2012					-0.002	**	0.002	***
					(0.001)		(0.001)	
Poor facility condition	-0.029		0.057	***	-0.032		0.058	***
	(0.021)		(0.016)		(0.021)		(0.016)	
Community characteristics								
Community contribution	0.052	***	-0.025	*	0.049	***	-0.021	
	(0.018)		(0.014)		(0.018)		(0.014)	
Availability of public school	0.076	***	-0.048	***	0.078	***	-0.050	***
	(0.015)		(0.012)		(0.015)		(0.012)	
Availability of private school	-0.092	***	0.090	***	-0.084	***	0.082	***
	(0.020)		(0.014)		(0.020)		(0.014)	
Region (base=Central)								
Eastern	0.139	***	-0.084	***	0.136	***	-0.083	***
	(0.022)		(0.018)		(0.022)		(0.018)	
Western	0.068	***	-0.031	**	0.064	***	-0.030	**
	(0.022)		(0.015)		(0.022)		(0.015)	
Northern	0.148	***	-0.169	***	0.146	***	-0.169	***
	(0.027)		(0.024)		(0.027)		(0.024)	
Year 2011/2012	-0.097	***	0.068	***	-0.097	***	0.069	***
	(0.015)		(0.012)		(0.015)		(0.012)	
Pseudo R-squared	0.1938				0.1992			
Log pseudo Likelihood	-1921.7055				-1908.8662			
Number of observations	3,114				3,114			

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)

Table A-13: Determinants of School Choice by Children Age 6-14 by Poverty Status: Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)						
	MNL model for pooled sample of children age 6-14						
	Poor (1)				Non-poor (2)		
	Public school		Private school		Public school		Private school
Individual characteristics							
Female	-0.014		0.011		0.003		0.018
	(0.020)		(0.013)		(0.016)		(0.014)
Foster child	0.028		-0.032 *		0.017		-0.052 ***
	(0.027)		(0.018)		(0.021)		(0.018)
Household characteristics							
Log (MPCE)	0.034		0.040		0.007		0.007
	(0.036)		(0.028)		(0.025)		(0.021)
Log (MPCE)×Year 2011/2012	-0.070		0.059		-0.106 **		0.038
	(0.072)		(0.056)		(0.047)		(0.040)
Number of children	0.007		-0.004		-0.002		0.001
	(0.005)		(0.003)		(0.004)		(0.003)
Youth household head	-0.042		0.029		-0.071 **		0.033
	(0.039)		(0.022)		(0.034)		(0.029)
Female household head	0.013		0.022		0.054 **		-0.034 *
	(0.026)		(0.016)		(0.022)		(0.019)
Household head's education	0.006		0.001		0.002		0.002
	(0.004)		(0.003)		(0.003)		(0.002)
Public school characteristics							
Pupil-teacher ratio	0.001		-0.002 ***		0.001		-0.001
	(0.001)		(0.0004)		(0.001)		(0.0005)
Pupil-teacher ratio×Year 2011/2012	-0.001		0.001 *		-0.003 ***		0.002 **
	(0.001)		(0.001)		(0.001)		(0.001)
Poor facility condition	0.053 *		0.015		-0.072 ***		0.071 ***
	(0.031)		(0.019)		(0.023)		(0.020)
Community characteristics							
Community contribution	0.078 ***		-0.008		0.018		-0.024
	(0.024)		(0.015)		(0.020)		(0.017)
Availability of public school	0.062		-0.017		0.079 ***		-0.058 ***
	(0.021)		(0.013)		(0.018)		(0.015)
Availability of private school	-0.057		0.063 ***		-0.109 ***		0.103 ***
	(0.035)		(0.017)		(0.020)		(0.016)
Region (base=Central)							
Eastern	0.095 ***		-0.042 **		0.128 ***		-0.101 ***
	(0.033)		(0.018)		(0.025)		(0.022)
Western	0.016		-0.017		0.071 ***		-0.037 **
	(0.038)		(0.020)		(0.022)		(0.018)
Northern	0.016		-0.084 ***		0.207 ***		-0.199 ***
	(0.036)		(0.023)		(0.033)		(0.031)
Year 2011/2012	-0.029		0.026 *		-0.118 ***		0.093 ***
	(0.021)		(0.014)		(0.017)		(0.015)
Pseudo R-squared	0.1974				0.1885		
Log Pseudo Likelihood	-803.90211				-1384.8024		
Number of observations	1,487				2,319		

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-14: Determinants of School Choice by Children Age 6-12 by Poverty Status: Average Marginal Effects from Multinomial Logit Model Analysis Using the Sample Including the Children in the Communities with High-Fee Charge in Public Schools in 2005/2006

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for pooled sample of children age 6-12			
	Poor (1)		Non-poor (2)	
	Public school	Private school	Public school	Private school
Individual characteristics				
Female	-0.0004	0.012	0.002	0.025
	(0.022)	(0.014)	(0.019)	(0.016)
Foster child	0.040	-0.039 *	0.029	-0.057 ***
	(0.031)	(0.020)	(0.024)	(0.021)
Household characteristics				
Log (MPCE)	0.031	0.048	-0.010	0.022
	(0.040)	(0.031)	(0.028)	(0.024)
Log (MPCE)×Year 2011/2012	-0.065	0.026	-0.130 **	0.053
	(0.080)	(0.061)	(0.054)	(0.046)
Number of children	0.010	-0.004	-0.002	0.001
	(0.006)	(0.004)	(0.004)	(0.004)
Youth household head	-0.046	0.028	-0.073 *	0.041
	(0.042)	(0.023)	(0.038)	(0.032)
Female household head	-0.003	0.022	0.061 **	-0.043 *
	(0.029)	(0.017)	(0.025)	(0.023)
Household head's education	0.007	0.000	0.002	0.002
	(0.004)	(0.003)	(0.003)	(0.003)
Public school characteristics				
Pupil-teacher ratio	0.001	-0.002 ***	0.001	-0.002 ***
	(0.001)	(0.0005)	(0.001)	(0.001)
Pupil-teacher ratio×Year 2011/2012	-0.002	0.002 **	-0.002 *	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Poor facility condition	0.044	0.020	-0.083 ***	0.080 ***
	(0.034)	(0.021)	(0.027)	(0.023)
Community characteristics				
Community contribution	0.086 ***	-0.014	0.014	-0.027
	(0.027)	(0.016)	(0.023)	(0.020)
Availability of public school	0.088 ***	-0.035 **	0.083 ***	-0.063 ***
	(0.023)	(0.015)	(0.020)	(0.017)
Availability of private school	-0.023	0.046 **	-0.118 ***	0.105 ***
	(0.040)	(0.018)	(0.023)	(0.019)
Region (base=Central)				
Eastern	0.133 ***	-0.066 ***	0.121 ***	-0.096 ***
	(0.038)	(0.020)	(0.028)	(0.026)
Western	0.045	-0.037 *	0.068 ***	-0.033
	(0.044)	(0.021)	(0.025)	(0.021)
Northern	0.047	-0.110 ***	0.228 ***	-0.218 ***
	(0.041)	(0.025)	(0.038)	(0.036)
Year 2011/2012	-0.034	0.019	-0.136 ***	0.105 ***
	(0.024)	(0.016)	(0.019)	(0.017)
Pseudo R-squared	0.2061		0.1959	
Log Pseudo Likelihood	-692.35313		-1177.1613	
Number of observations	1,228		1,886	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: MPCE=monthly per capita expenditure. Coefficients are average marginal effects in the probability. Numbers in parentheses are linearized standard errors. Age dummies are included in estimation. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-15: Impact of High Informal Fee on School Attendance of Children Age 6-12: Summary of Coefficients from Linear Probability Model

Dependent variable = 0 if a child does not attend school, 1 if he or she attends school

	LPM for pooled sample of children age 6-12			
Untrimmed sample	Full	Full	Full	Full
High fee group × Year 2011/2012	-0.049	-0.068 **	-0.058 *	-0.068 **
	(0.033)	(0.0300)	(0.034)	(0.032)
High fee group	0.011	0.033	0.137 **	0.007
	(0.020)	(0.021)	(0.060)	(0.081)
Year 2011/2012	-0.025 *	-0.018	-0.014	-0.008
	(0.013)	(0.012)	(0.013)	(0.013)
Covariates	No	Yes	No	Yes
Community fixed effects	No	No	Yes	Yes
R-squared	0.0035	0.1951	0.1109	0.2759
Number of observations	3,061	3,061	3,061	3,061
Trimmed sample	Full	Full	Full	Full
High fee group × Year 2011/2012	-0.057	-0.072 **	-0.061	-0.067 *
	(0.037)	(0.034)	(0.037)	(0.035)
High fee group	0.019	0.016	0.139 **	-0.176
	(0.024)	(0.023)	(0.061)	(0.164)
Year 2011/2012	-0.011	-0.011	-0.007	-0.005
	(0.019)	(0.018)	(0.019)	(0.018)
Covariates	No	Yes	No	Yes
Community fixed effects	No	No	Yes	Yes
R-squared	0.0031	0.2070	0.0728	0.2669
Number of observations	1,736	1,736	1,736	1,736

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are Huber–White standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-16: Impact of High Informal Fee on School Attendance of Children Age 6-14: Summary of Coefficients from Linear Probability Model

Dependent variable = 0 if a child does not attend school, 1 if he or she attends school

	LPM for pooled sample of children age 6-14			
Untrimmed sample	Full	Full	Full	Full
High fee group × Year 2011/2012	-0.029	-0.045 *	-0.030	-0.038
	(0.029)	(0.0266)	(0.030)	(0.028)
High fee group	-0.007	0.010	0.098 *	-0.021
	(0.018)	(0.019)	(0.050)	(0.069)
Year 2011/2012	-0.019 *	-0.012	-0.009	-0.003
	(0.011)	(0.010)	(0.011)	(0.011)
Covariates	No	Yes	No	Yes
Community fixed effects	No	No	Yes	Yes
R-squared	0.0023	0.1803	0.1012	0.2534
Number of observations	3,806	3,806	3,806	3,806
Trimmed sample	Full	Full	Full	Full
High fee group × Year 2011/2012	-0.037	-0.050 *	-0.031	-0.037
	(0.032)	(0.030)	(0.032)	(0.031)
High fee group	0.0001	-0.004	0.100	-0.135
	(0.022)	(0.021)	(0.050)	(0.130)
Year 2011/2012	-0.002	-0.002	0.0002 **	0.004
	(0.017)	(0.016)	(0.017)	(0.016)
Covariates	No	Yes	No	Yes
Community fixed effects	No	No	Yes	Yes
R-squared	0.0017	0.1869	0.0618	0.2386
Number of observations	2,138	2,138	2,138	2,138

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are Huber–White standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-17: Impact of High Informal Fee on School Attendance of Children Age 6-12: Summary of Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school			
	Logit for pooled sample of children age 6-12			
Untrimmed sample	Full		Full	
High fee group × Year 2011/2012	-0.403		-0.066	**
	(0.285)		(0.0285)	
High fee group	0.118		-0.003	
	(0.218)		(0.015)	
Year 2011/2012	-0.229	*	-0.032	***
	(0.121)		(0.011)	
Covariates	No		Yes	
Pseudo R-Squared	0.0044		0.2273	
Log Pseudo Likelihood	-1164.3278		-903.62123	
Number of observations	3,061		3,061	
Trimmed sample	Full		Full	
High fee group × Year 2011/2012	-0.057		-0.078	**
	(0.037)		(0.0345)	
High fee group	-0.009		-0.022	
	(0.018)		(0.017)	
Year 2011/2012	-0.027		-0.031	**
	(0.016)		(0.016)	
Covariates	No		Yes	
Pseudo R-Squared	0.0038		0.2388	
Log Pseudo Likelihood	-678.19188		-518.21084	
Number of observations	1,736		1,736	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Numbers in parentheses are unconditional standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-18: Impact of High Informal Fee on School Attendance of Children Age 6-14: Summary of Average Marginal Effects from Logit Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school			
	Logit for pooled sample of children age 6-14			
Untrimmed sample	Full		Full	
High fee group × Year 2011/2012	-0.029		-0.047	*
	(0.029)		(0.0256)	
High fee group	-0.020		-0.014	
	(0.013)		(0.013)	
Year 2011/2012	-0.024	**	-0.022	**
	(0.010)		(0.010)	
Covariates	No		Yes	
Pseudo R-Squared	0.0031		0.2138	
Log Pseudo Likelihood	-1356.5971		-1069.8708	
Number of observations	3,806		3,806	
Trimmed sample	Full		Full	
High fee group × Year 2011/2012	-0.037		-0.057	*
	(0.032)		(0.0310)	
High fee group	-0.018		-0.032	**
	(0.015)		(0.014)	
Year 2011/2012	-0.013		-0.017	
	(0.014)		(0.014)	
Covariates	No		Yes	
Pseudo R-Squared	0.0021		0.2174	
Log Pseudo Likelihood	-791.58352		-620.79326	
Number of observations	2,138		2,138	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Numbers in parentheses are unconditional standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-19: Impact of High Informal Fee on School Choice of Children Age 6-12: Summary of Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for pooled sample of children age 6-12			
	Full		Full	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.034	-0.01508	-0.049	-0.013
	(0.043)	(0.034)	(0.039)	(0.032)
High fee group	-0.032	0.021	-0.023	0.022
	(0.021)	(0.016)	(0.020)	(0.016)
Year 2011/2012	-0.098 ***	0.065 ***	-0.096 ***	0.065
	(0.016)	(0.013)	(0.015)	(0.012)
Covariates	No		Yes	
Pseudo R-squared	0.0096		0.1928	
Log Psuedo Likelihood	-2320.473		-1891.2217	
Number of observations	3,061		3,061	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.065	0.009	-0.091 **	0.017
	(0.048)	(0.037)	(0.045)	(0.034)
High fee group	-0.007	-0.002	-0.032	0.012
	(0.024)	(0.019)	(0.023)	(0.018)
Year 2011/2012	-0.072 ***	0.045 ***	-0.052 **	0.022
	(0.021)	(0.017)	(0.020)	(0.016)
Covariates	No		Yes	
Pseudo R-squared	0.0053		0.2149	
Log Psuedo Likelihood	-1356.7997		-1070.8308	
Number of observations	1,736		1,736	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are unconditional standard errors. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-20: Impact of High Informal Fee on School Choice of Children Age 6-14: Summary of Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for pooled sample of children age 6-14			
	Full		Full	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.031	0.002	-0.048	0.004
	(0.038)	(0.030)	(0.035)	(0.028)
High fee group	-0.044 **	0.024 *	-0.039 **	0.027 *
	(0.017)	(0.013)	(0.018)	(0.014)
Year 2011/2012	-0.092 ***	0.068 ***	-0.086 ***	0.065 ***
	(0.014)	(0.011)	(0.013)	(0.011)
Covariates	No		Yes	
Pseudo R-squared	0.0103		0.1869	
Log Psuedo Likelihood	-2727.6302		-2240.8875	
Number of observations	3,806		3,806	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.061	0.02306	-0.083 **	0.029
	(0.042)	(0.033)	(0.040)	(0.030)
High fee group	-0.018	-0.001	-0.043 **	0.013
	(0.021)	(0.016)	(0.020)	(0.016)
Year 2011/2012	-0.062 ***	0.049 ***	-0.039 **	0.024 *
	(0.019)	(0.015)	(0.018)	(0.014)
Covariates	No		Yes	
Pseudo R-squared	0.0051		0.204	
Log Psuedo Likelihood	-1598.1564		-1278.3087	
Number of observations	2,138		2,138	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are unconditional standard errors. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-21: Impact of High Informal Fee on School Attendance of Children Age 6-12 by Poverty Status: Summary of Coefficients from Linear Probability Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school			
	LPM for pooled sample of children age 6-12			
Untrimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group × Year 2011/2012	-0.128 *	0.002	-0.155 ***	-0.023
	(0.066)	(0.035)	(0.059)	(0.033)
High fee group	-0.006	0.012	0.045	0.033
	(0.043)	(0.021)	(0.041)	(0.023)
Year 2011/2012	0.006	-0.043 ***	0.004	-0.031 **
	(0.023)	(0.016)	(0.022)	(0.014)
Covariates	No	No	Yes	Yes
Community fixed effects	No	No	No	No
R-squared	0.0086	0.0053	0.2154	0.1944
Number of observations	1,204	1,857	1,204	1,857
Untrimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group × Year 2011/2012	-0.206 ***	0.005	-0.190 ***	-0.015
	(0.073)	(0.037)	(0.073)	(0.035)
High fee group	0.392 **	0.042	0.007	-0.091
	(0.152)	(0.056)	(0.114)	(0.093)
Year 2011/2012	0.024	-0.043 **	0.015	-0.027 *
	(0.026)	(0.017)	(0.026)	(0.016)
Covariates	No	No	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes
R-squared	0.1960	0.1234	0.3399	0.2993
Number of observations	1,204	1,857	1,204	1,857
Trimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group × Year 2011/2012	-0.151 **	0.009	-0.178 ***	-0.016
	(0.071)	(0.039)	(0.064)	(0.038)
High fee group	0.003	0.020	0.016	0.026
	(0.048)	(0.025)	(0.045)	(0.025)
Year 2011/2012	0.030	-0.037	0.018	-0.030
	(0.033)	(0.023)	(0.032)	(0.022)
Covariates	No	No	Yes	Yes
Community fixed effects	No	No	No	No
R-squared	0.0151	0.0047	0.2492	0.1907
Number of observations	688	1,048	688	1,048
Trimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group × Year 2011/2012	-0.209 ***	0.016	-0.189 **	-0.0002
	(0.079)	(0.042)	(0.078)	(0.040)
High fee group	0.003	0.035	0.439	-0.244 *
	(0.227)	(0.057)	(0.277)	(0.146)
Year 2011/2012	0.027	-0.045 *	0.008	-0.030
	(0.040)	(0.024)	(0.036)	(0.024)
Covariates	No	No	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes
R-squared	0.1375	0.29982	0.3341	0.2928
Number of observations	688	1,048	688	1,048

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are Huber–White standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-22: Impact of High Informal Fee on School Attendance of Children Age 6-14 by Poverty Status: Summary of Coefficients from Linear Probability Model

	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school			
	LPM for pooled sample of children age 6-14			
Untrimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group×Year 2011/2012	-0.078	0.005	-0.102 **	-0.017
	(0.056)	(0.031)	(0.051)	(0.030)
High fee group	-0.023	-0.005	0.024	0.010
	(0.038)	(0.020)	(0.037)	(0.021)
Year 2011/2012	0.008	-0.033 **	0.005	-0.023 *
	(0.020)	(0.013)	(0.019)	(0.012)
Covariates	No	No	Yes	Yes
Community fixed effects	No	No	No	No
R-squared	0.0057	0.0030	0.2072	0.172
Number of observations	1,487	2,319	1,487	2,319
Untrimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group×Year 2011/2012	-0.115 *	0.010	-0.107	-0.007
	(0.066)	(0.034)	(0.066)	(0.033)
High fee group	0.286 **	0.028	-0.021	-0.099
	(0.138)	(0.045)	(0.099)	(0.078)
Year 2011/2012	0.019	-0.032 **	0.010	-0.020
	(0.023)	(0.014)	(0.022)	(0.014)
Covariates	No	No	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes
R-squared	0.1826	0.0935	0.3254	0.2518
Number of observations	1,487	2,319	1,487	2,319
Trimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group×Year 2011/2012	-0.106 *	0.013	-0.127 **	-0.007
	(0.061)	(0.035)	(0.055)	(0.035)
High fee group	-0.013	0.0003	-0.006	0.004
	(0.042)	(0.024)	(0.040)	(0.024)
Year 2011/2012	0.034	-0.025	0.023	-0.021
	(0.028)	(0.020)	(0.028)	(0.019)
Covariates	No	No	Yes	Yes
Community fixed effects	No	No	No	No
R-squared	0.0109	0.0015	0.2270	0.1671
Number of observations	850	1,288	850	1,288
Trimmed sample	Poor	Non-poor	Poor	Non-poor
High fee group×Year 2011/2012	-0.127 *	0.025	-0.117 *	0.013
	(0.071)	(0.038)	(0.069)	(0.037)
High fee group	0.044	0.020	0.423 *	-0.162
	(0.184)	(0.046)	(0.226)	(0.122)
Year 2011/2012	0.031	-0.034	0.017	-0.022
	(0.034)	(0.021)	(0.031)	(0.020)
Covariates	No	No	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes
R-squared	0.1078	0.0817	0.3009	0.2499
Number of observations	850	1,288	850	1,288

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are Huber–White standard errors. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-23: Impact of High Informal Fee on School Attendance of Children Age 6-12 by Poverty Status: Summary of Average Marginal Effects from Logit Model

	Poor		Non-poor		Poor		Non-poor	
	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	Logit model for pooled sample of children age 6-12							
Untrimmed sample	Poor		Non-poor		Poor		Non-poor	
High fee group × Year 2011/2012	-0.128	*	0.002		-0.143	***	-0.022	
	(0.066)		(0.035)		(0.054)		(0.032)	
High fee group	-0.062	**	0.014		-0.036		0.017	
	(0.028)		(0.019)		(0.028)		(0.018)	
Year 2011/2012	-0.013		-0.042	***	-0.017		-0.036	***
	(0.022)		(0.014)		(0.021)		(0.013)	
Covariates	No		No		Yes		Yes	
Pseudo R-squared	0.0083		0.0081		0.2281		0.2518	
Log Pseudo Likelihood	-544.83369		-599.41547		-424.07474		-452.19259	
Number of observations	1,204		1,857		1,204		1,857	
Trimmed sample	Poor		Non-poor		Poor		Non-poor	
High fee group × Year 2011/2012	-0.151	**	0.009		-0.174	***	-0.018	
	(0.071)		(0.039)		(0.061)		(0.039)	
High fee group	-0.068	**	0.025		-0.071	**	0.013	
	(0.031)		(0.022)		(0.031)		(0.020)	
Year 2011/2012	-0.010		-0.035	*	-0.021		-0.034	*
	(0.029)		(0.019)		(0.028)		(0.018)	
Covariates	No		No		Yes		Yes	
Pseudo R-squared	0.0146		0.0072		0.2526		0.2504	
Log Pseudo Likelihood	-318.31883		-345.16091		-241.45121		-260.61374	
Number of observations	688		1,048		688		1,048	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Numbers in parentheses are unconditional standard errors. Only a dummy variable for Northern region is included as a regional dummy variable in the estimation for trimmed sample of children from poor households, since a dummy variable for western region perfectly predicts school attendance. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-24: Impact of High Informal Fee on School Attendance of Children Age 6-14 by Poverty Status: Summary of Average Marginal Effects from Logit Model

	Poor		Non-poor		Poor		Non-poor	
	Dependent variable = 0 if a child does not attend school, 1 if he or she attends school							
	Logit model for pooled sample of children age 6-14							
Untrimmed sample	Poor		Non-poor		Poor		Non-poor	
High fee group × Year 2011/2012	-0.078		0.005		-0.097	**	-0.017	
	0.056		0.031		0.047		0.030	
High fee group	-0.056	**	-0.002		-0.034		-0.003	
	0.023		0.015		0.024		0.015	
Year 2011/2012	-0.004		-0.032	***	-0.007		-0.027	**
	0.019		0.012		0.018		0.011	
Covariates	No		No		Yes		Yes	
Pseudo R-squared	0.0060		0.0049		0.2291		0.2221	
Log Pseudo Likelihood	-631.57875		-705.66711		-489.81803		-551.68259	
Number of observations	1,487		2,319		1,487		2,319	
Trimmed sample	Poor		Non-poor		Poor		Non-poor	
High fee group × Year 2011/2012	-0.106	*	0.013		-0.127	**	-0.010	
	0.061		0.035		0.054		0.036	
High fee group	-0.062	**	0.007		-0.070	***	-0.004	
	0.027		0.018		0.026		0.017	
Year 2011/2012	0.006		-0.021		-0.003		-0.023	
	0.025		0.017		0.025		0.016	
Covariates	No		No		Yes		Yes	
Pseudo R-squared	0.0117		0.0024		0.2385		0.2197	
Log Pseudo Likelihood	-370.99758		-407.07793		-285.86441		-318.41592	
Number of observations	850		1,288		850		1,288	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.
Note: Numbers in parentheses are unconditional standard errors. Only a dummy variable for Northern region is included as a regional dummy variable in the estimation for trimmed sample of children from poor households, since a dummy variable for western region perfectly predicts school attendance. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-25: Impact of High Informal Fee on School Attendance of Children Age 6-12 by Poverty Status: Summary of Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for pooled sample of children age 6-12			
	Poor		Non-poor	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.097	-0.031	0.014	-0.012
	(0.071)	(0.035)	(0.054)	(0.048)
High fee group	-0.014	-0.049 *	-0.028	0.041 *
	(0.036)	(0.028)	(0.026)	(0.022)
Year 2011/2012	-0.016	0.003	-0.153 ***	0.112 ***
	(0.025)	(0.015)	(0.020)	(0.018)
Covariates	No		No	
Pseudo R-squared	0.0072		0.0212	
Log Psuedo Likelihood	-850.30911		-1411.119	
Number of observations	1,204		1,857	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.120 *	-0.021	-0.012	-0.006
	(0.061)	(0.034)	(0.051)	(0.047)
High fee group	0.010	-0.046	-0.033	0.051 **
	(0.038)	(0.031)	(0.026)	(0.023)
Year 2011/2012	-0.030	0.014	-0.134 ***	0.100 ***
	(0.024)	(0.016)	(0.019)	(0.017)
Covariates	Yes		Yes	
Pseudo R-squared	0.2025		0.1963	
Log Psuedo Likelihood	-683.00889		-1158.6585	
Number of observations	1,204		1,857	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.174 **	0.023	0.013	-0.004
	(0.077)	(0.041)	(0.060)	(0.053)
High fee group	-0.005	-0.065 **	0.004	0.022
	(0.040)	(0.030)	(0.030)	(0.026)
Year 2011/2012	0.032	-0.041 *	-0.140 ***	0.107 ***
	(0.033)	(0.021)	(0.027)	(0.024)
Covariates	No		No	
Pseudo R-squared	0.0175		0.017	
Log Psuedo Likelihood	-501.05249		-814.71042	
Number of observations	688		1,048	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.212 ***	0.040	-0.019	0.002
	(0.070)	(0.039)	(0.058)	(0.051)
High fee group	0.001	-0.074 **	-0.033	0.046 *
	(0.043)	(0.037)	(0.029)	(0.025)
Year 2011/2012	0.010	-0.032	-0.097 ***	0.064 ***
	(0.032)	(0.020)	(0.026)	(0.023)
Covariates	Yes		Yes	
Pseudo R-squared	0.256		0.2141	
Log Psuedo Likelihood	-379.2605		-651.47431	
Number of observations	688		1,048	

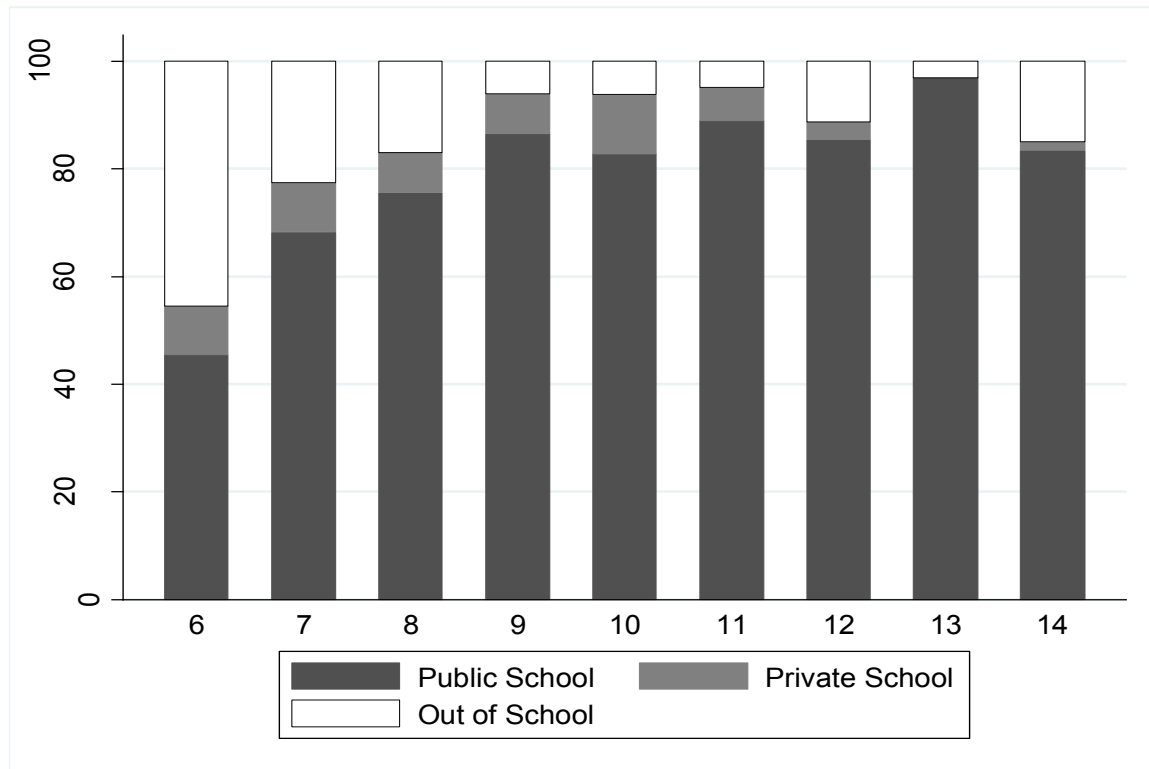*Source:* Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are unconditional standard errors. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table A-26: Impact of High Informal Fee on School Attendance of Children Age 6-14 by Poverty Status: Summary of Average Marginal Effects from Multinomial Logit Model

	Dependent variable = 1 if a child does not attend school, 2 if he or she attends public school, and 3 if he or she attends private school (base = out of school)			
	MNL model for pooled sample of children age 6-14			
	Poor		Non-poor	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.073	-0.006	0.001	0.004
	(0.061)	(0.032)	(0.048)	(0.042)
High fee group	-0.030	-0.026	-0.044 **	0.042 **
	(0.030)	(0.021)	(0.022)	(0.018)
Year 2011/2012	-0.022	0.018	-0.138 ***	0.107 ***
	(0.022)	(0.014)	(0.017)	(0.015)
Covariates	No		No	
Pseudo R-squared	0.0053		0.020	
Log Psuedo Likelihood	-996.23836		-1672.5553	
Number of observations	1,487		2,319	
Untrimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.101 *	0.006	-0.024	0.010
	(0.053)	(0.031)	(0.046)	(0.041)
High fee group	-0.010	-0.023	-0.052 **	0.051 ***
	(0.032)	(0.025)	(0.023)	(0.019)
Year 2011/2012	-0.030	0.024 *	-0.117 ***	0.091
	(0.021)	(0.014)	(0.017)	(0.015)
Covariates	Yes		Yes	
Pseudo R-squared	0.1976		0.1867	
Log Psuedo Likelihood	-803.65329		-1387.9061	
Number of observations	1,487		2,319	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.142 **	0.036	-0.0004	0.014
	(0.067)	(0.037)	(0.054)	(0.047)
High fee group	-0.017	-0.046 *	-0.010	0.017
	(0.034)	(0.025)	(0.027)	(0.023)
Year 2011/2012	0.027	-0.021	-0.122 ***	0.101 ***
	(0.029)	(0.018)	(0.024)	(0.021)
Covariates	No		No	
Pseudo R-squared	0.0119		0.014	
Log Psuedo Likelihood	-588.18513		-968.64972	
Number of observations	850		1,288	
Trimmed sample	Public school	Private school	Public school	Private school
High fee group × Year 2011/2012	-0.172 ***	0.044	-0.030	0.022
	(0.062)	(0.034)	(0.052)	(0.044)
High fee group	-0.018	-0.051 *	-0.045 *	0.041 *
	(0.037)	(0.031)	(0.025)	(0.022)
Year 2011/2012	0.013	-0.019	-0.080 ***	0.057 ***
	(0.028)	(0.018)	(0.023)	(0.020)
Covariates	Yes		Yes	
Pseudo R-squared	0.2378		0.2000	
Log Psuedo Likelihood	-453.70054		-785.86867	
Number of observations	850		1,288	

Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Note: Numbers in parentheses are unconditional standard errors. Small-Hsiao test indicates that the specification of school choice in the above estimated equations does not violate the IIA assumption. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Appendix II: Supplementary Figures

Figure A-1: Percentage of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School by Age, 2005/2006
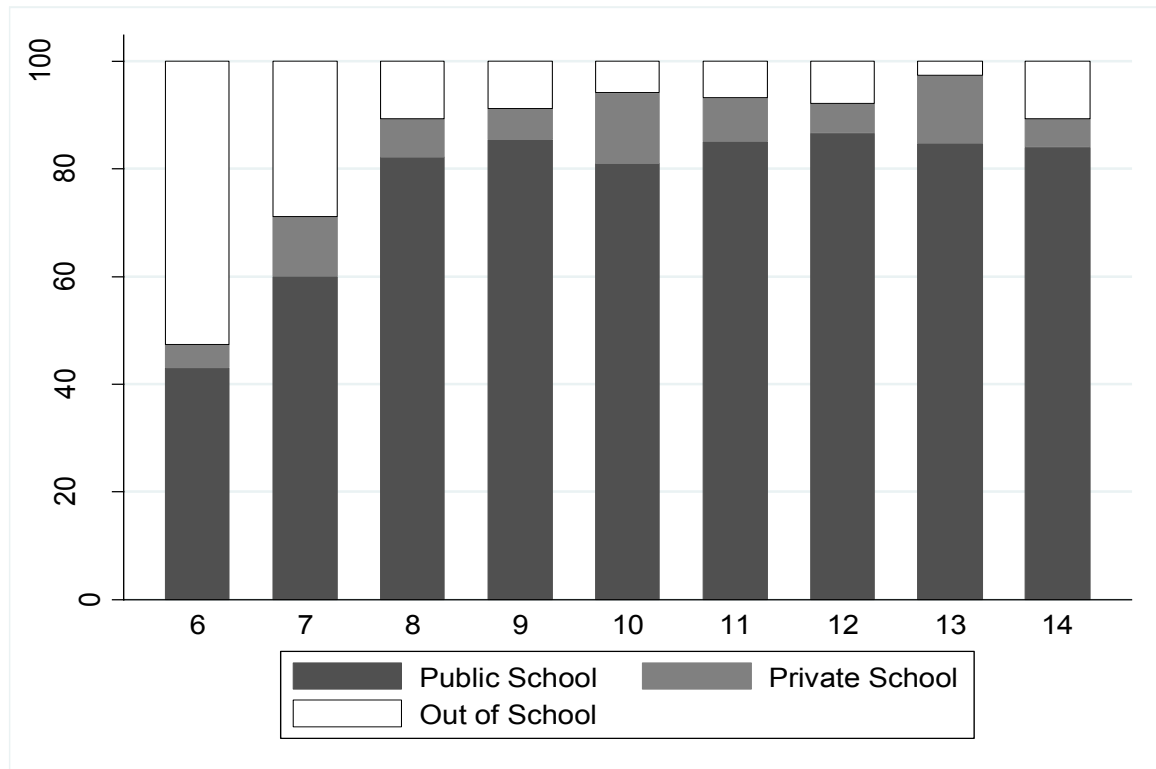
Figure A-2: Percentage of Children from Non-Poor Households Attending Public School, Attending Private School, and being Out of School by Age, 2005/2006
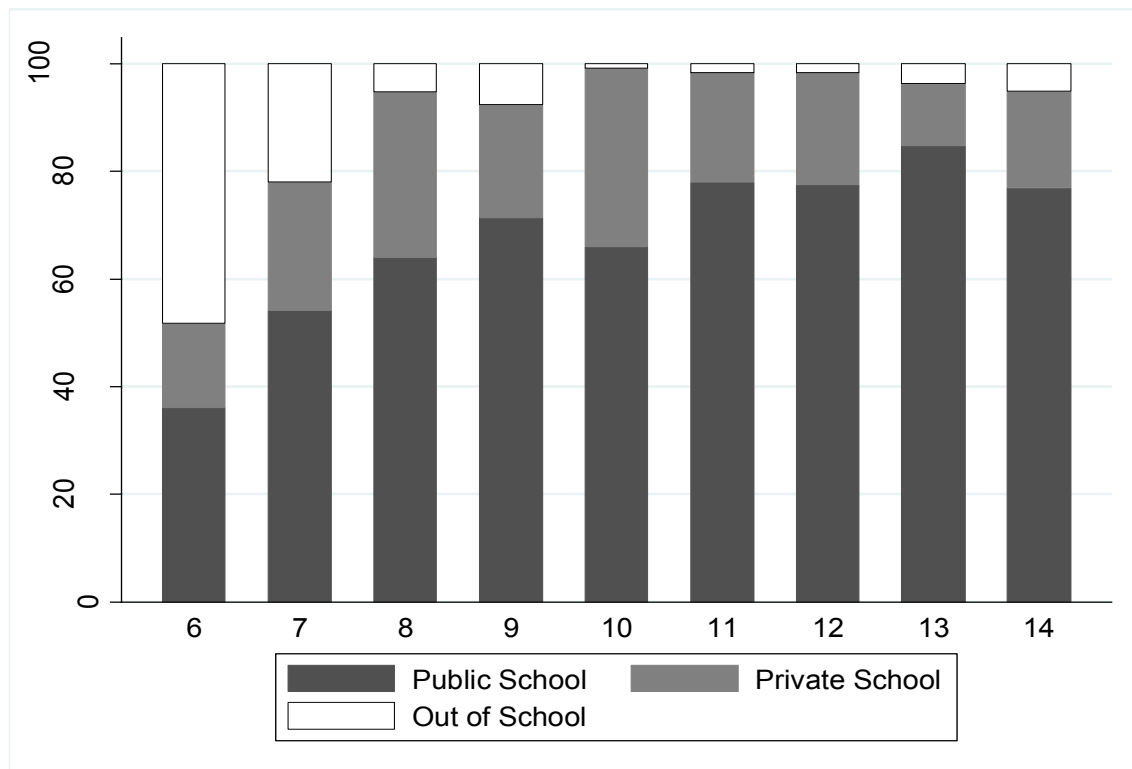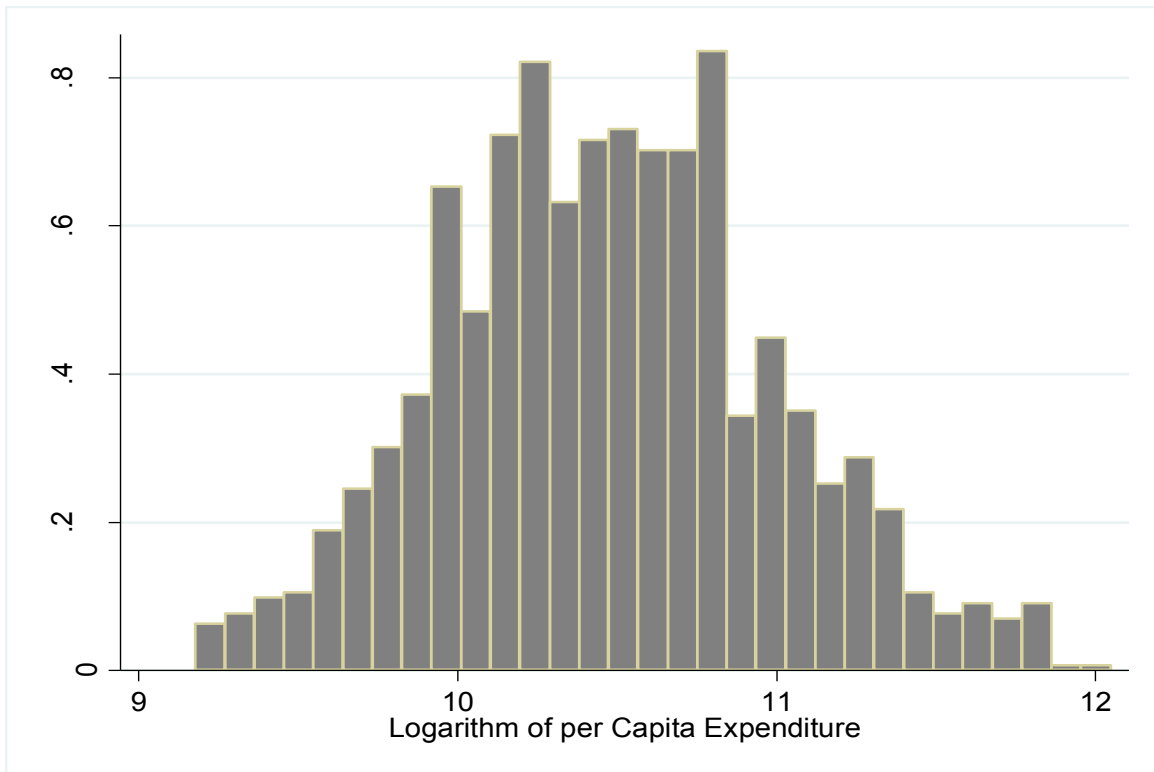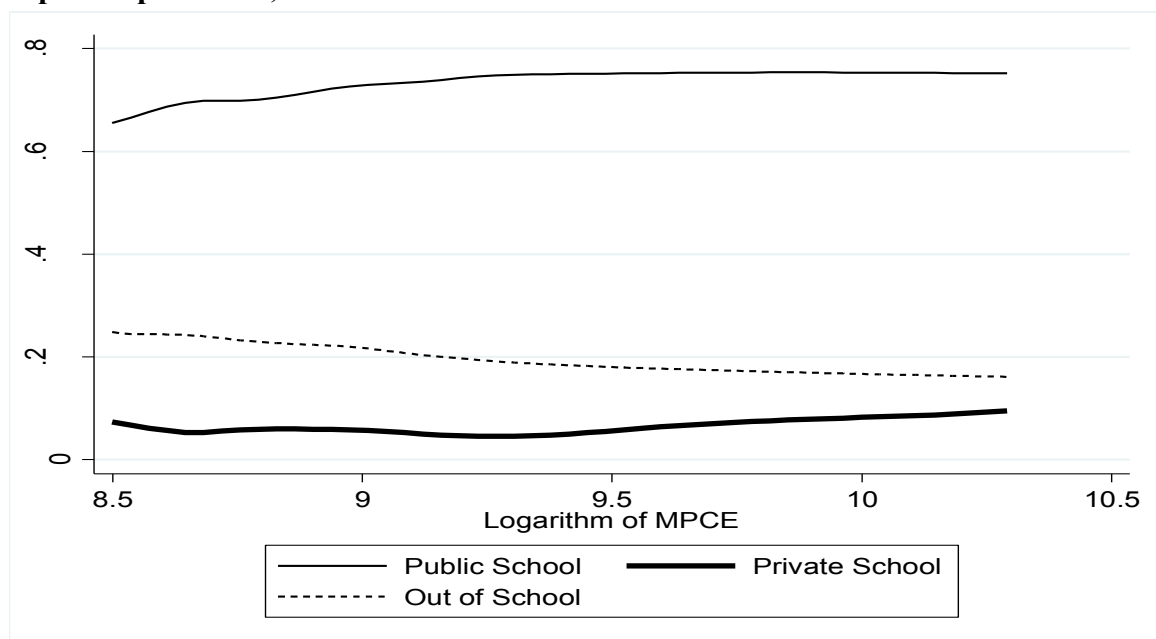
Figure A-3: Percentage of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School by Age, 2011/2012

Figure A-4: Primary School Attendance and School Choice of Children from Non-Poor Households by Age, 2011/2012

Figure A-5: Distributions of Logarithm of Monthly per Capita Expenditure, 2005/2006

Source: Created by the author using UNHS 2005/2006.

Figure A-6 Distributions of Logarithm of Monthly per Capita Expenditure, 2011/2012
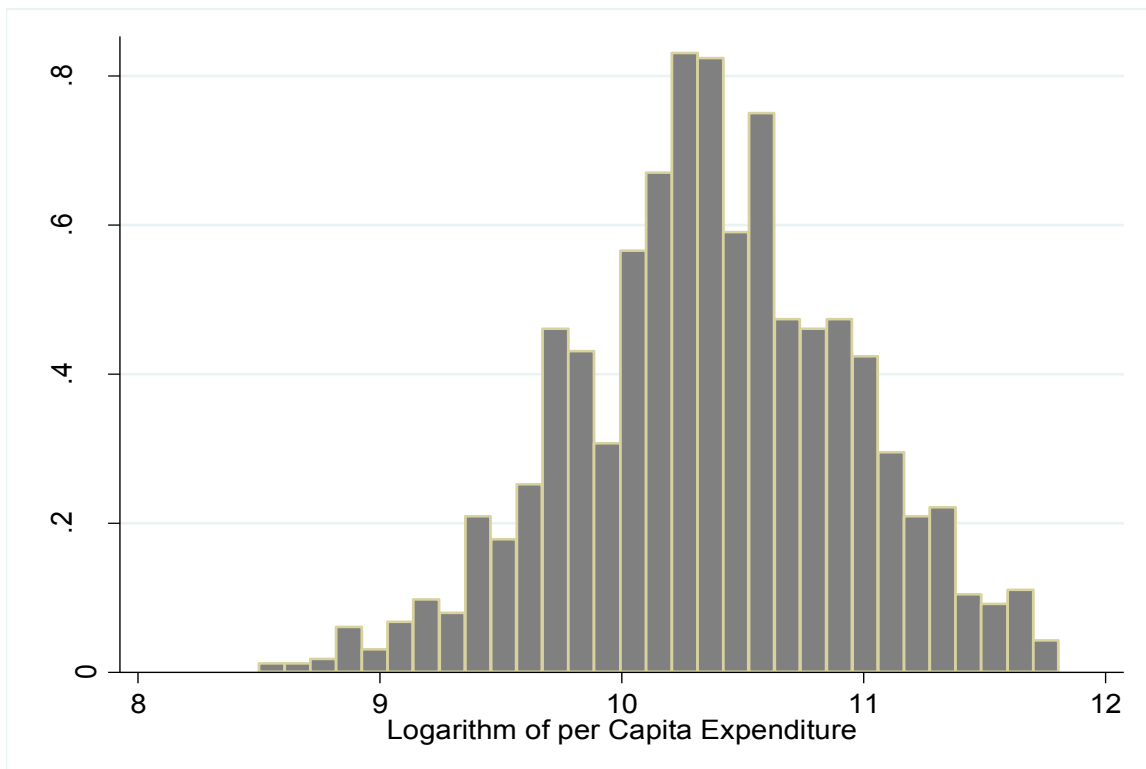
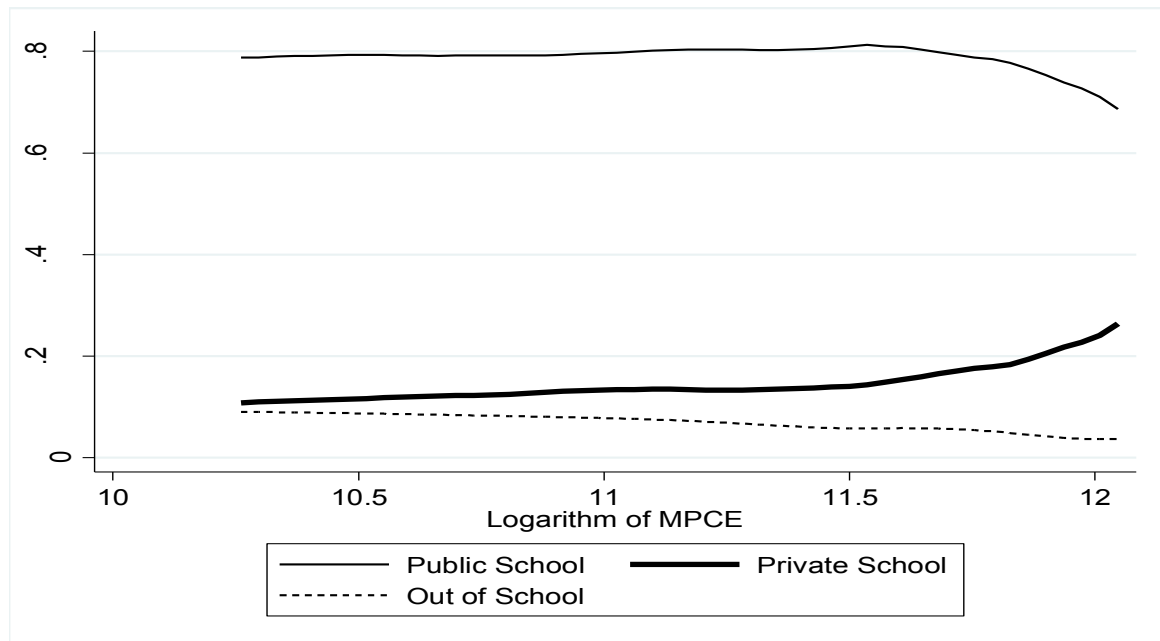*Source:* Created by the author using UNHS 2011/2012.

Figure A-7: Probability of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2005/2006
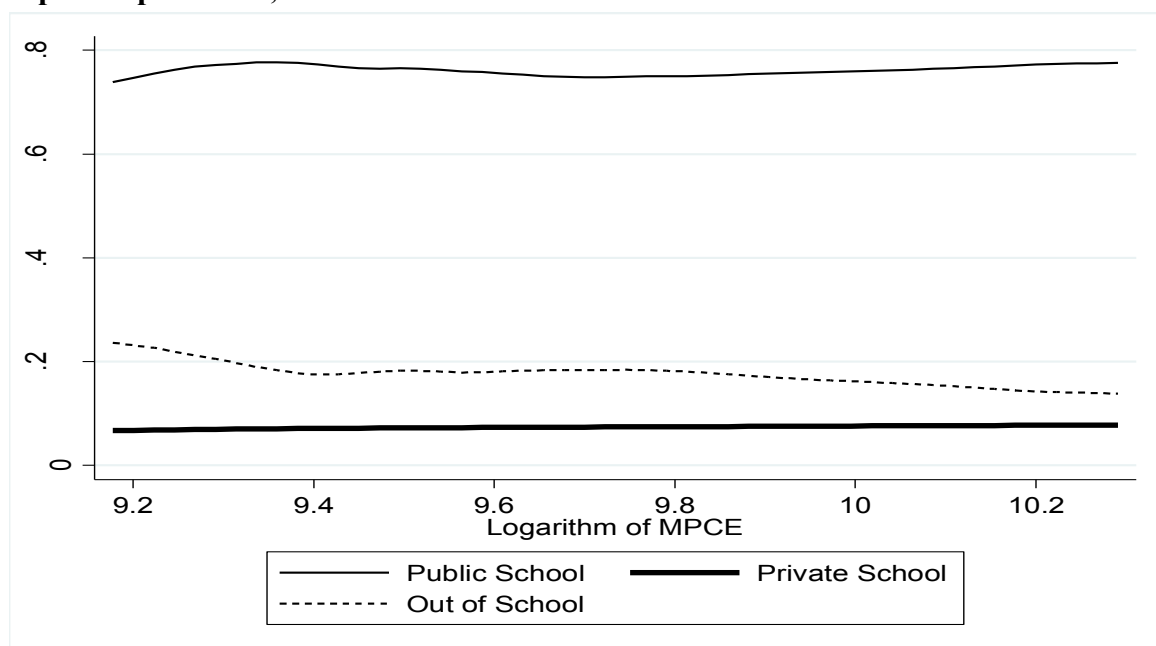
Source: Created by the author using UNHS 2005/2006.
Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

Figure A-8: Probability of Children from Poor Households Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2011/2012

Source: Created by the author using UNPS 2011/2012.
Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

Figure A-9: Probability of Children from Non-Poor Households Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2005/2006

Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

Figure A-10: Probability of Children from Non-Poor Households Attending Public School, Attending Private School, and Being Out of School across Logarithm of Monthly per Capita Expenditure, 2011/2012
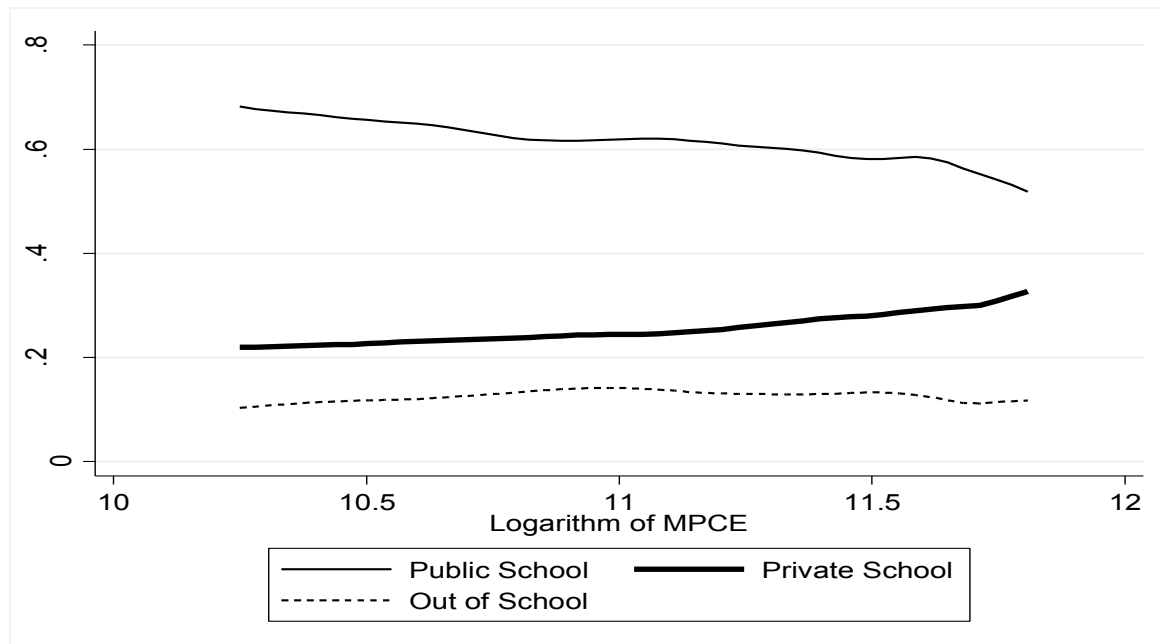
Note: MPCE=monthly per capita expenditure. The smoothed values calculated by a kernel-weighted local polynomial regression of the probabilities of public school attendance, private school attendance, and non-school attendance on logarithm of MPCE are presented.

Figure A-11: Distribution of Propensity Score, Before Matching
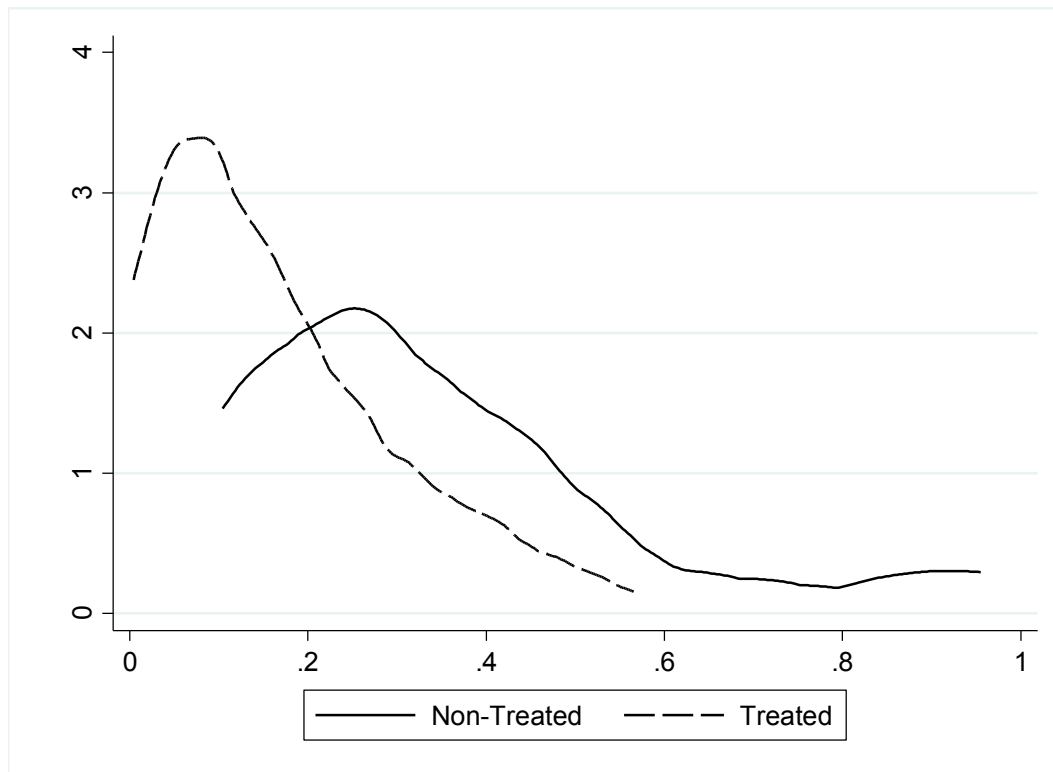
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Figure A-12: Distributions of Propensity Score, After Matching
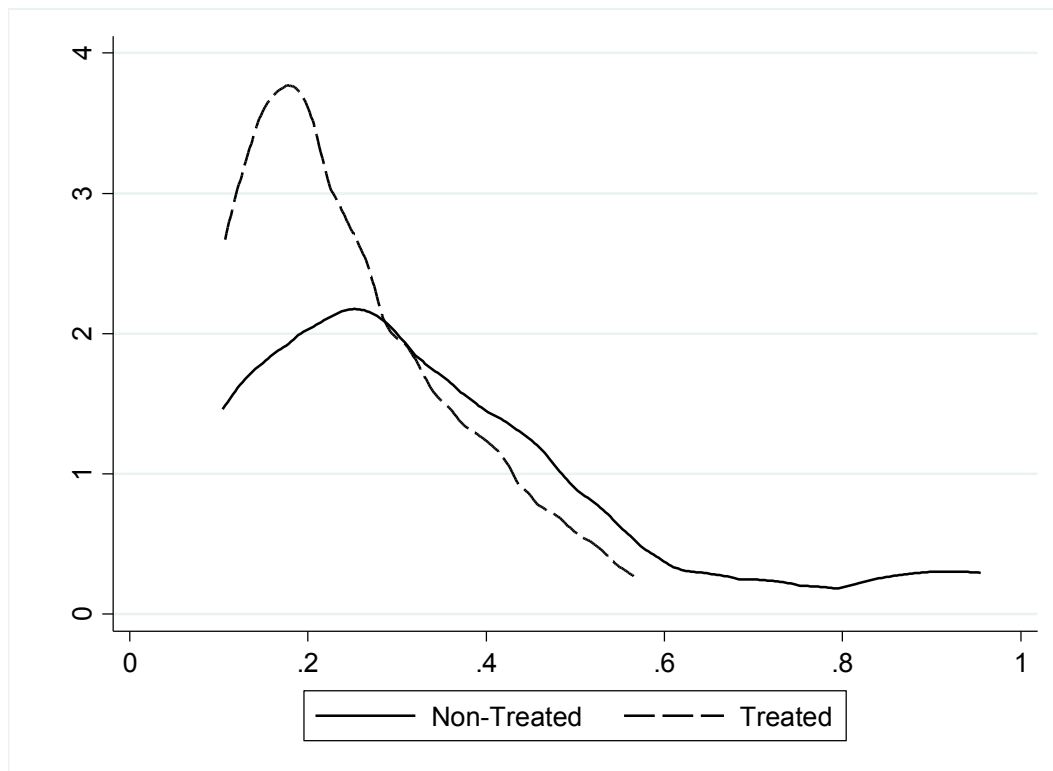
Source: Created by the author using UNHS 2005/2006 and UNPS 2011/2012.

Appendix III: Map of Uganda

Source: MoES (2010a, ii).
Note: Central region covers Central 1, Central 2 and Kampala; Eastern region covers Eastern and East Central; Northern region covers West Nile and Northern; Western region covers Southwest and Western.