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Fee-Free Educational Policy for Social Development: Examining the Conditions and the Social Benefits of Cost Elimination at the Upper-Secondary Level in Sub-Saharan Africa

DOCTORAL SCHOOL OF INTERNATIONAL RELATIONS AND POLITICAL SCIENCE

CORVINUS UNIVERSITY OF BUDAPEST

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DOCTORAL DISSERTATION

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Budapest, Hungary
2023

An article-based doctoral dissertation in accordance with § 31 of the Doctoral Regulation of Corvinus University Budapest, September 2021 (JISZ-SZ/8/2021), based on the following publications:

Article 1: **Asante, G.** (2023). The politics of social policy in Sub-Saharan Africa: A Configurational Approach to Fee-Free Policies at the High School level. *SAGE Open*, https://doi.org/10.1177/21582440231184970

Article 2: **Asante, G**. (2022). The effects of cost elimination on secondary school enrolment in Sub-Saharan Africa. *Educational Review*, *Epub*(Ahead of print). https://doi.org/10.1080/00131911.2022.2028732

Article 3: **Asante, G**., & Bartha, A. (2022). The positive externality of education on crime: Insights from Sub-Saharan Africa. *Cogent Social Sciences*, *8*(1), 1–24. https://doi.org/10.1080/23311886.2022.2038850

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LIST OF ABBREVIATIONS

2SLS	Two-Stage Least Squares
CCTV	Closed-Circuit Television
CREATE	Consortium for Research on Education Access, Transition and Equity
CSOs	Civil Society Organisations
DEM	Democracy
ECO	Economy
EFA	Education for All
EIU	Economic Intelligence Unit
ELC	Electoral Competition
FE	Fixed Effects
fsQCA	Fuzzy Set Qualitative Comparative Analysis
GDP	Gross Domestic Product
ISCED	International Standard Classification of Education
IV	Instrumental Variable
LEFT	Leftist Political Party
LSE	Lower Secondary School Enrolment Rate
MDGs	Millennium Development Goals
NIBRS	National Incident-Based Reporting System
OLS	Ordinary Least Squares
R4D	Results for Development Institute
RE	Random Effects
RIGHT	Rightist Political Party
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
UIS	UNESCO Institute of Statistics
UNDP	United Nations Development Programme
UNESCO	United Nations Education Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime

ACKNOWLEDGEMENTS

I want to thank my PhD advisors and co-authors, who will always be mentors, Prof. György Gajduschek and Prof. Attila Bartha. I only count myself lucky to have met you in my academic life. The opportunities given to me during the training, the opportunity to lecture and supervise masters students, publish together and above all, expose me to a broad range of lessons in research and peer-review process. During the toughest times of COVID-19, when academic life changed overnight, you were there to motivate and encourage me. I will forever be grateful for the laughs we shared, the parties and the get-togethers. Not forgetting the 60th birthday anniversary of György, where I was specially invited. I remember the purse I misplaced that contained all my official documents but was eventually found by György. The joy and enthusiasm we shared will forever remain in me.

I am also grateful to Prof. Zoltán Balázs and Prof. Réka Várnagy, head of our doctoral school and program director, respectively, for their support throughout my studies. They specially made sure they provided the needed recommendations to apply for the several funding opportunities to participate in Summer and Winter Schools and Scientific Conferences that shaped my scientific research and communication skills. Their constant positive approvals and encouragement about my academic progression were handy. Thank you, Professors.

It is extremely important to mention Prof. György Hajnal, who integrated me into the wonderful family of Public Policy and Management (PUMA). The maximum administrative support during my data collection activities and tenure as the President of the Ghana Students Association in Hungary (GASH) is highly appreciated. Not forgetting Dr. Tamás Gábor. The encounter with you and your advice to focus on publishing about my topic during my PhD studies were extremely helpful. To Prof. Zsófia Papp, for the rigour methodological training, the time to review my initial thesis proposals that finally exposed me to “what I want to do”, and the time to peer-review some of my articles before submission to journals. I am most grateful.

I am grateful for the several friendships I gained during this PhD program. I will forever be grateful to my friend and coursemate, Godfred Bonnah Nkansah. We shared all the depression and the difficult times together. I am happy we have been able to challenge ourselves to achieve more than we planned. To my bosom friend, Dominic Offei, who served as a second eye to many of my writings, thank you, buddy. I am

happy you are also beginning your journey. I will be there for you. I thank all the reviewers and editors of the journals that contain all the published papers that make up this article-based dissertation. Without your helpful comments, I could not have achieved that level of academic output. To Hon. Dr. Yaw Osei Adutwum and Mr. Kofi Ofosu Nkansah, I thank you for your support to pursue the highest level of academic training. To Dr. Kingsley Agyemang and the Ghana Scholarships Secretariat, and the Stipendium Hungaricum Scholarship of Tempus Public Foundation, Hungary, thank you for the scholarship opportunity.

Lastly, I would like to thank my family for all their encouragement. To my father, Mr Solomon Asante, of blessed memory, who had many plans for his children but left all of us before I turned five. I adore you, Daddy. To my auntie, Madam Adwoa Fremah, in blessed memory, who raised me with an expectation that I always reach my full potential, encouraged my adventurous spirit, and never lost patience with my seemingly never-ending pursuit of academic life. I feel sad you could not live to see the apex of what you supported me to achieve and left us just five years ago. May you continue to rest, Auntie. I am happy I have achieved what you wished for me, even without your presence. To my mother, Madam Akua Sarfowaa, I cannot thank you enough for the hard work and dedication to support my education. To my children, David, Casey and Cyril, your luck for daddy is appreciated. For my brothers, sisters, nieces and nephews, who understood when I was swamped with PhD obligations and did not ask too many times, "when are you going to be done?" And for my encouraging and loving partner, Dora Afrang, whose support during the admission process, coursework and the final stages of this PhD was pivotal. I know I have denied you many days, months, and years of companionship because I had to leave you and the family to study outside, but you never gave up on me. I am so excited to share the next phase in life with you. Thank you.

DEDICATION

To the Asante's family and the youth and people of Behenase, Bosomtwe District, Ashanti Region, Ghana.

ABSTRACT

This study examines the simultaneity of the conditions necessary and sufficient for adopting cost-elimination policies, commonly known as fee-free educational policies, at the upper-secondary level, and the social benefits of these policies in Sub-Saharan Africa (SSA). Some conclusions are reached subject to a review of the theoretical and empirical literature related to these subjects. 1) That there is no consensus about the socio-political factors that drive the adoption of expansionary social policies such as fee-free education; 2) that despite the related challenges and criticisms, the adoption of cost-elimination policies has a significant positive effect on access to education at the basic level in SSA; and, 3) that Western sociology and economics literature identifies educational policies that increase access to education as having a positive externality in terms of crime reduction. However, the understanding of the education-crime nexus in SSA and the role of educational policies is virtually non-existent. Again, the effects of fee-free policies on upper-secondary school enrolment have received very little attention across the region. Another critical area yet to be understood is the mechanisms that drive the adoption of fee-free policy changes.

Based on these gaps, the study aimed to explore, understand, and explain the necessary and sufficient conditions that drive the adoption of fee-free policies in SSA through a case study design that uses qualitative comparative analysis to achieve the first research objective. Subsequently, the study examined the effect of fee-free policies on upper-secondary school enrolment rates. Last, the study investigated the impact of the macro-level rate of school enrolment on crime rates. The main components of the empirical analysis of the last two research objectives consist of panel data analysis of SSA countries from 2003 to 2018.

Overall, the results of the three articles that comprise the article-based dissertation make the following theoretical contribution: the manifestations of fee-free policies on the agenda and their subsequent formulation and adoption are strongly embedded in political parties' striving for political power through competitive electoral politics. The results challenge some core explanations of social policy provision, such as the partisan theory of policy outcomes and the economy. Notwithstanding this, fee-free policies have the utility of positively impacting social variables. These include the intended effect of increasing the rate of school enrolment to improve human capital development, and the unintended effect of reducing the property-related crime rate in

society. Therefore, the study suggests that for achieving the desired fee-free policy outcome and its impact, these policies should be encouraged within broader national social-policy-development planning.

Keywords: *Upper secondary education; Fee-free education; Electoral competition; Human capital; Crime reduction; QCA; Panel-data; Sub-Saharan Africa*

CHAPTER 1: INTRODUCTION

1.1 Motivation and research problem

Human rights issues have been an interesting and fascinating area of my studies since my undergraduate days, and this interest intensified during my education at the master's level. My focus was the management of prisoners' rights in Ghana. Two prison centres were selected as the study area. The research exposed me to many interesting areas worthy of further investigation. Most of the prison population were youth between the ages of 18 to 25 years who had no education, or education below the upper-secondary level (high school). They were mostly males. Most of them had been convicted of stealing (Asante, 2016). These findings attracted my curiosity and presented me with exciting puzzles such as what is the relationship between the level of education and crime on the one hand, and what are the measures or policies that may be effective at increasing school participation on the other. In addition, I was curious to understand the conditions that drive the adoption and implementation of such measures or policies aimed at increasing school enrolment.

A review of the literature was completed (summarised in Table 1.1) when I began my PhD studies. The following major conclusions were derived. First, there is a relationship between cost-elimination policies (popularly called fee-free education) and the rate of school enrolment in the Sub-Saharan Africa (SSA) region (Al-Samarrai & Zaman, 2007; Blimpo, Gajigo, & Pugatch, 2019; Duflo, Dupas, & Kremer, 2017; Garlick, 2013; Godda, 2018; Morgan, Petrosino, & Fronius, 2014; Psacharopoulos & Arriagada, 1987). Second, policies that encourage and increase educational participation at the upper-secondary level (or high-school level) have the social benefit of reducing the rate of criminal engagement among youth (Bell, Costa, & Machin, 2016, 2018; Bennett, 2018; Hjalmarsson & Lochner, 2012; Lochner, 2004). Upper-secondary education was the dominant level of education examined in this literature because the youth enrolled in this level of education (i.e., age 14-19 years) are theoretically more inclined to engage in criminal activities compared to other cohorts in society, hence keeping them in school reduces the inclination to commit more crimes (Bell et al., 2018). Third, some countries in the region (SSA) have rolled out cost-elimination policies at the high-school level (Republic of Ghana, 2017; Republic of Namibia, 2015; Republic of Sierra Leone, 2018).

The literature review, however, revealed some gaps. Despite the vast literature on the theoretical expectations about the rise of expansionary social policies, current empirical studies about the conditions necessary and sufficient for adopting fee-free policies at the upper-secondary level are largely lacking. Notwithstanding this, understanding the drivers of cost-elimination policies is an appropriate way to better appreciate the source of these social policy changes within the academic literature. The puzzle here is due to the contradictory theories about the evolution of expansionary social policy: researchers have identified the role of growth in democratisation (Brown & Hunter, 1999; Lake & Baum, 2001), electoral competition (Altman & Castiglioni, 2020; Harding & Stasavage, 2014), the ideological orientation of ruling political parties (Ha, 2015; Huber, Mustillo, & Stephens, 2008), the level of economic development (Islam & Clarke, 2002; Sen, 1976) and the social context. Here, the ambition is to contribute to developing pre-existing theory in a way which enables us to account for the condition(s) that drive and explain the adoption of cost-elimination policies as a component of social policy at the upper-secondary level in SSA.

Another observation derived from the review was that the effects of fee-free policies on enrolment have been mixed. While some argue that there is a positive relationship (Al-Samarrai & Zaman, 2007; Blimpo et al., 2019; Duflo et al., 2017; Godda, 2018; Psacharopoulos & Arriagada, 1987), others find no significant or a negative association (Branson & Lam, 2017; Ponce & Loayza, 2012). These mixed findings may be explained by the variation in the countries that were selected, control variables, timeframe, or the analytical technique that was used. Additionally, these studies are either concentrated at the primary level or lower-secondary school level (Al-Samarrai & Zaman, 2007; Deininger, 2003; Godda, 2018) or focus on only one or a few selected countries for analytical purposes (Branson & Lam, 2017; Duflo et al., 2017; Garlick, 2013; Mamba, 2020). However, it is critical to examine the SSA region from a broader perspective concerning the relationship between fee-free policies at the upper-secondary level and the rate of enrolment.

The final piece of the puzzle is related to the several fragmented theoretical positions and the numerous empirical studies that investigate the sources of crime and how crime is reduced. For example, Agnew's (1985) general strain theory views the source of crime as strain experienced by individuals. Sutherland and Cressey's (1966) differential association theory holds that criminal behaviour is learned through

Table 1.1: Summary of relevant literature and limitations

Study	Area related to dissertation	Origin	Type of source	Research design	Key findings	Research gap/limitations
Huber, Mustillo and Stephens (2008)	**Expansionary social policy**	18 Latin America countries	Journal article	Panel data regression	Long record of democracy is associated with higher spending on social policies, with repressive authoritarian regimes retrenching health and education spending. Partisanship (leftist and rightist) does not matter in social policy expansion	General in perspective. Broad concerning educational expansion and not specific to fee-free policy
Ha (2015)	,,	Less developed countries	Journal article	Panel data regression	More democratic nations spend a greater amount on social security and welfare (SSW), while leftist governments spend more on education	Gap in population. Broad focus on all less developed countries
Altman and Castiglioni (2020)	,,	Latin America	Journal article	Panel data regression	The level of political competition, the strength of civil society, and wealth are the key factors behind the expansion of equitable social policy	Focus on Latin America
Stasavage (2005)	,,	44 African countries	Journal article	Panel data regression	Increased electoral competition increases total education spending	Gap in perspective. No focus on fee-free education at the upper-secondary level
Nelson (2007)	,,	Global	Journal article	Systematic Review, narrative synthesis	The rise to and maintenance of political office through competitive elections is the primary mechanism which binds democratic leadership to social service provision	Gap in population. Literature cited from Africa either applies to other sectors or when about education, limited to primary school
Al-Samarrai and Zaman (2007)	**Fee-free education and enrolment**	Malawi	Journal article	Now-standard benefit incidence	Enrolment rate increases dramatically at the primary level, with the abolishing of primary school fees of greatest benefit for the poor	Gap in perspective. Limited to primary level of education. Single-country analysis
Duflo, Dupas and Kremer (2017)	,,	Ghana	Research report	Randomised control trial	Assigning scholarships to support access to secondary education increases educational attainment	Single-country study. Subject not a government policy
Deininger (2003)	,,	Uganda	Journal article	Regression	Dispensing of fees at the primary level dramatically increased primary school attendance	Limited to primary school level

Branson and Lam (2017)	,,	South Africa	Research Report	Geo-linking data construction	No discernible impact of no-fee school policy on enrolment or educational attainment and completion of secondary school	Single-country study Uses school-level data
Moussa and Omoeva (2020)	,,	Ethiopia, Malawi, and Uganda	Research Report	Instrumental variables design	Universal primary education policies were effective at increasing educational attainment in all three countries	Focus on educational attainment as the outcome variable
Groot and Van den Brink (2010)	**Education and crime**	Netherlands	Journal article	Descriptive and inferential quantitative	The probability of committing crimes like shoplifting, vandalism and threat, assault and injury decrease with years of education	Focus on micro-level data. Western literature
Anderson (2014)	,,	US	Journal article	Regression	Minimum dropout age requirements have a significant negative effect on property and violent crime arrest rates for individuals 16-to-18 years old	Focus on different educational policy; i.e., minimum dropout rate
Austin and Kim (1999)	,,	Sub-Saharan Africa	Journal article	Regression	Increase in educational development leads to increase in homicide rate in Sub-Saharan Africa	Gap in methodology (Conflates the operationalisation of educational development. Focus on only one matrix of crime - i.e., homicide).
Åslund, Grönqvist, Hall and Vlachos (2018)	,,	Sweden	Research Report	Regression	Prolonged and more general education lead to a reduction in property crime, but no significant decrease in violent crime. Being in school reduces opportunity to commit crime	Focus on micro-level data. Western literature
Bell, Costa and Machin (2018)	,,	US	Research Report	Regression	Educational policies to increase schooling change the shape of crime-age profile and are reflected in longer-term crime-reducing effect.	Western literature
Hjalmarsson and Lochner (2012)	,,	US and Western Europe	Journal article	Literature review	Policies designed to encourage schooling among more crime-prone groups are likely to produce the greatest benefits in terms of crime reduction	No literature from the global South or Sub-Saharan Africa
Lochner and Moretti (2004)	,,	US	Journal article	Regression	A 10-percentage point increase in high school graduation rates reduces arrest rate by 7-9 percent	Focus on micro-level data Western literature

Notes: Author's construction

association. Cullen (1994) takes a bold theoretical step in arguing that crime is due to a lack of social support, hence extending social support – such as education – to people can reduce the aggregate crime rate. Recent empirical literature has investigated the effects of education on crime and how policies to promote educational participation may affect criminal engagement (Bell et al., 2016; Bennett, 2018; Hjalmarsson & Lochner, 2012; Lochner, 2004). However, this abundant literature is concentrated in the Western world and uses micro-level data. The few studies that have attempted to investigate this subject in SSA have not incorporated the role of educational policies or have conflated levels of education (Austin & Kim, 1999; Muchwanju, Chelule, & Mung'atu, 2015). Consequently, the nexus between education and aggregated crime in general and specifically in SSA has not been vigorously examined. Is there any empirical evidence to suggest an association between the rate of educational participation and the crime rate in SSA? Do fee-free policies play any role in the education-crime nexus in the region? In relation to the foregoing, the following research questions (RQ) were defined and addressed in this dissertation:

RQ1) Under what condition(s) are fee-free policies adopted in SSA?
RQ2) What is the effect of cost elimination on secondary-school enrolment in SSA?
RQ3) What is the effect of the high-school enrolment rate on the crime rate in SSA?

1.2 Background

Education and educational policies have become a central socio-political issue around the world. The importance of education in socioeconomic development has caused it to be one of the dominant themes within the public policy domain. Therefore, it is not surprising that politicians, policy actors, citizens, civil society organisations (CSOs), and international development partners, including the World Bank and the United Nations, are all interested in educational issues. In relation to the Millennium Development Goals (MDGs)[1], Goal 2 focuses on achieving universal primary education (United Nations, 2000). According to the United Nations Education Scientific and Cultural Organisation (UNESCO) Institute of Statistics (UIS), at the end of the MDGs in 2015 many regions had recorded a remarkable improvement in universal primary education, with Sub-Saharan Africa (SSA) having the best record of improvement with a 20 percentage point increase in the rate of enrolment from the year 2000 to 2015 (Lewin, 2009; Little & Lewin, 2011; United Nations, 2015) Subsequently, Sustainable Development Goal (SDG)[2] 4 emphasised "Ensur[ing] inclusive and equitable quality education and promote lifelong learning opportunities for all." Goal 4 Section 1 in the SDGs extends the idea in MDG 2 to cover secondary education. It states: "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes" (United Nations, 2015, p. 17).

However, scholars argue that the region about which there is doubt about achieving SDG 4 section 1 is SSA (Chikoko & Mthembu, 2020; Husson, 2018). According to them, apart from the region having the world's lowest upper-secondary-school enrolment rate (UNESCO Institute for Statistics [UIS], 2021), there has been limited investment in improving this level of education (Babasanya, 2018; Husson, 2018). The region is comprised of 48 countries, according to the United Nations Development Programme (UNDP, n.d.). It is geographically located below the Sahara Desert and distinguished from the Northern African countries that are part of the Arab World. SSA makes up the bulk of the African continent, consisting of deserts, Sahel,

[1] The Millennium Development Goals (MDGs) were eight goals with measurable targets for the year 2015 that were established following the Millennium Summit of the United Nations in 2000, aimed at improving the lives of the world's poorest people.

[2] The Sustainable Development Goals are a collection of 17 interlinked global goals designed to be a "shared blueprint for peace and prosperity for people and the planet, now and into the future". The SDGs were constructed in 2015 by the United Nations General Assembly and are intended to be achieved by 2030.

savanna, swamps, rainforests, plateaus, mountains, rivers, and lakes, and has enormous diversity of flora and fauna. Today, the region has a combined population of about 1.14 billion (Statista, 2022).

The region's lowest rate of school enrolment raises significant concern for the international community, local-level policy actors, politicians, and academics. According to UIS (2021) estimates, in 2020 the world's gross enrolment ratio for upper-secondary education stood at 69%. The following values in percentages represent all UIS regions: the Arab States, 61%; Central and Eastern Europe, 102%;[3] Central Asia, 89%; East Asia and the Pacific, 78%; Latin America and the Caribbean, 85%; North America and Western Europe, 108%; South and West Asia, 64%; and Sub-Sharan Africa, 35%. Figure 1.1 illustrates the 18-year enrolment trends for all the regions.

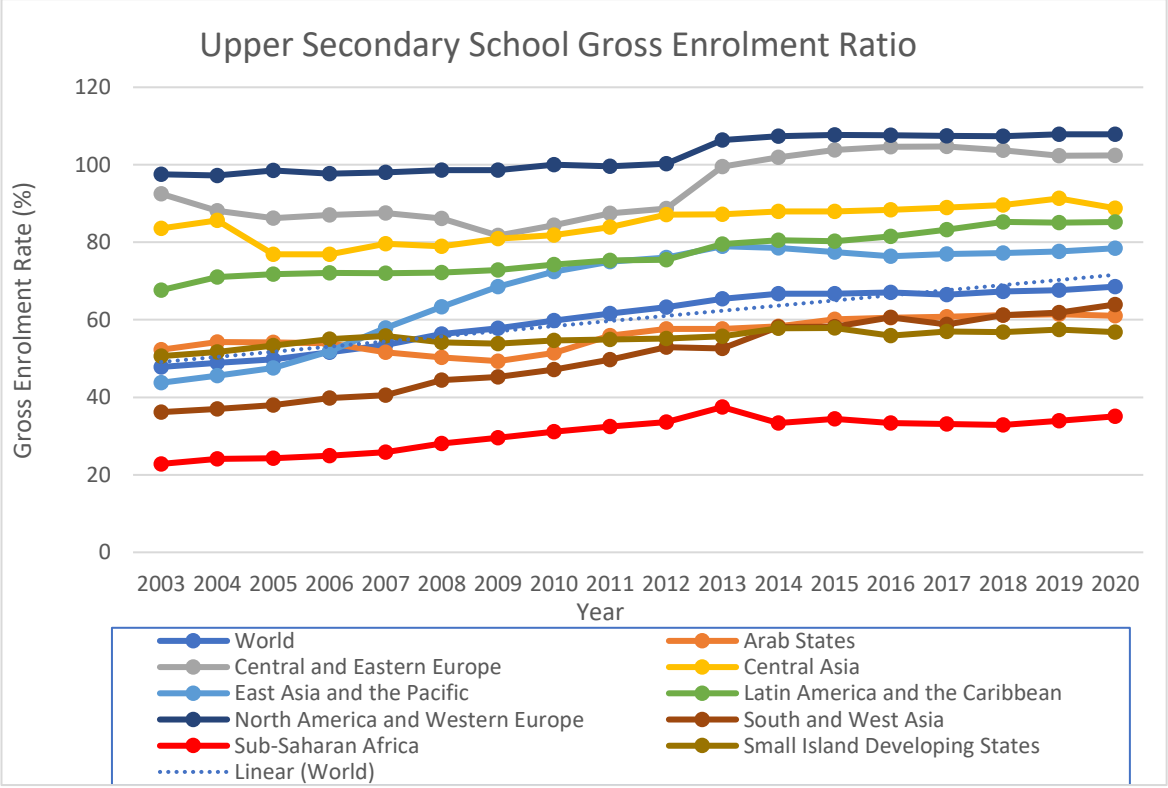

Figure 1.1: Gross enrolment ratio of UIS regions from 2003 to 2020

[3] Due to the presence of the over-aged in enrolment, the values can exceed 100%.

1.3 Policy direction of policy actors in relation to increasing access to education in SSA

Notwithstanding the lowest enrolment rate in SSA, new priorities of governments, politicians, and policy actors have emerged at the upper-secondary level to increase access to this level of education. The emergence of this focus stems from the global consensus about the enormous social benefits of education, including its relationship with increased human capital, long-term improvements in productivity, economic growth and development, and the reduction of inter-generational cycles of poverty and inequality (Acemoglu & Angrist, 2000; Adedeji & Campbell, 2013; Adejumo, Asongu, & Adejumo, 2021; Becker, 1962, 1993; Schultz, 1999). A key policy focus of politicians and policy actors in terms of increasing access, including access to the upper-secondary level, is the provision of cost-elimination policies popularly called fee-free education as a social policy intervention (Koski et al., 2018; Lucas & Mbiti, 2012; Morgan et al., 2014; Moussa & Omoeva, 2020). According to the World Bank (2009, p. 1), cost elimination refers to access-oriented intervention policies and legal frameworks designed to offer free education to children and youth at different levels of education.

The positive shift in providing fee-free education in some countries in the region, including Ghana, Kenya, Malawi, Namibia, Sierra Leone, South Africa, and Uganda, have confronted scholars, policymakers, and citizens with as many questions about the source of the conditions driving the adoption of these educational policies as questions about how these changes affect enrolment and impact other social variables. It is therefore important to address these empirical and theoretical gaps in the literature, hence this dissertation's design and the subsequent questions that are raised.

To the best of my knowledge, the research questions raised herein have not been addressed holistically by previous literature and are at the core of this dissertation. The ambition is to provide new insights and perspectives in this broad area of research – education as social policy. The general research area is education as social policy. The specific research area is fee-free education policies at the upper-secondary-school level in SSA. Overall, we have a lot of empirical and theoretical explanations concerning the provision of social policies, but these theories are too fragmented to identify and clarify the motivation for adopting fee-free policies at the upper-secondary level. Therefore, the theoretical relevance of this topic comes from the attempt to clarify a few elements of this fragmented field. The idea is to contribute to

the theoretical explanations for the development of expansionary social policies using the emerging fee-free policy changes at the upper-secondary level in SSA. Additionally, it contributes to the theoretical understanding of endogenous growth of public polices as agent for human development. The practical relevance of the topic is its policy recommendations for achieving secondary education for all – in accordance with SDG 4.1 – amid the existence of widespread fee-free policies, and suggestions for how to promote the idea of fee-free policies in other countries in SSA. The results could be useful to policy actors and key decision makers who are interested in the social benefits of adopting fee-free policies and thereby make all practical efforts to improve such policies in the region.

1.4 Organisation of the dissertation

The following dissertation is presented as a portfolio/article-based thesis. Each of the three research questions that is posed constitutes one academic paper that is published in a high-ranking peer-reviewed journal. Each article constitutes one chapter of this dissertation. The dissertation is amended with an introductory chapter at the beginning and a conclusion chapter at the end. Each paper contains a distinctive theoretical argument, and all are connected to the central theme of fee-free education as social policy. The conclusion focuses on proposing and discussing the theoretical proposition that this dissertation contributes. Structurally, research question one focuses on identifying and understanding the conditions that facilitate the adoption of fee-free policies, whereas questions two and three investigate the effects of fee-free policies on social variables (enrolment and crime rate, respectively).

In the remaining sections of Chapter 1, I present the overarching theoretical framework and fundamental concepts used throughout the articles and position them within the relevant academic literature. In doing so, I organise the ideas systematically according to the order of the three research questions. After that, the research approach is presented, which summarises the main variables, analytical techniques, and how results were generated.

1.5 Conceptual and theoretical framework - Expansionary social policy

The dissertation is embedded in social policy in education and investigates the conditions necessary and sufficient for adopting fee-free policies and their effects on social variables. Specifically, it focuses on education at the upper-secondary level. Upper secondary education relates to level 3 of the educational ladder (ISCED 3) based on the International Standard Classification of Education (ISCED) (UNESCO Institute for Statistics, 2012). This level of education completes secondary education. Apart from its formal name, common terms are used to represent this level of education in different countries, including "secondary school" (stage two or upper grades), "senior secondary school", "senior high school", and "high school education".

Indeed, the role of education as social policy is complex and multifaceted in its own right, and there is a general consensus that social policy is a multidisciplinary field (Aravacik, 2018). It is not surprising that the field of education as social policy has grown. This development is because of the inclusive nature of the social policy discipline and the cross-cutting interaction of various disciplines in the field of education and social policy. Over the years, the topic of social policy – or the welfare state in a broader sense – and specifically, education as social policy have attracted the attention of sociologists (Hallinan, 2006; Mayer & Solga, 2007), economists (Becker, 1962, 1993), and political scientists (Bartha, 2013; Busemeyer, 2015; Busemeyer & Trampusch, 2012; Grindle, 2004; Tillin & Duckett, 2017).

Sociologists and economists have extensively investigated the returns from education, such as employment opportunities, crime reduction in society, skills development, career mobility, and earnings (Allmendinger, 1989; Becker, 1962, 1993; Bills, 2004; Hout, 2012; Shavit & Park, 2016); as well as the social inequalities in educational attainment (Breen, Luijkx, Muller, & Pollak, 2010; Jackson, 2013; Van de Werfhorst & Mijs, 2010), and educational transitions through educational systems and related challenges (Hillmert & Jacob, 2010). On the part of political scientists, extensive research has been done on private and public spending on education (Boix, 1997; Wolf & Zohlnhöfer, 2009); the evolution of educational institutions (Busemeyer & Trampusch, 2012; Thelen, 2004), and the politics of educational policies at the macro-level (Busemeyer, 2015). Other scholars have tried to include the global South in mainstream social policy literature (Adésínà, 2007; Aspalter, 2017; Mkandawire, 2004, 2007).

Despite the growing interest in education as social policy and social policy in general in the global South, the ever-growing spread of fee-free policies at the upper-secondary level in SSA have received less attention. These obvious limitations highlight the need for more comparative research in this field of study in the region, a concern shared by Künzler and Nollert (2017). This dissertation aims to make this happen.

1.5.1 Evolution of social policy

Historically, as early as the eighteenth-century, Europe had some forms of social policy measures, including compulsory elementary education and work safety laws in the nineteenth century. The idea developed further after World War II from a narrower spread of measures to protect workers due to the dangers of the Industrial Revolution to a broader scope that covered all segments of society. Indeed, this expanded scope encompassed measures to prevent unemployment, eliminate injustice in income distribution, provide a minimum wage, improve working conditions, and ensure social justice – notable among these measures is the provision of education to all citizens. For example, in the US, the high-school revolution fostered by the high-school movement to provide free public high schools in the early 1900s led to a massive increase in the productivity of American workers, which contributed to economic growth and social equality (Putnam & Garrett, 2020, p. 33). Social policy, therefore, "refers to all policies that ensure the welfare of the state and individuals and the dynamic practices that constantly change" (Aravacik, 2018, p. 13).

In Sub-Saharan Africa, the crisis of social development and widespread poverty make the issue of social policy pervasive. After colonial rule, mainly in the 1960s, many citizens were living in poverty (below the poverty line at $US 1.9 a day), and social development outcomes such as primary, secondary, and tertiary school enrolment rate were weak (Adésínà, 2007). The probability of individuals surviving until the age of 65 years was the lowest of all the regions in the world (United Nations, 2019). In effect, social policy development trajectories in post-colonial Sub-Saharan African states deviated from those in highly industrialised countries. Pursuing social policies was seen as part and parcel of decolonisation. However, social policies could not be divorced from economic policies because widening the resource base through economic diversification is an important component in ensuring sustainable social policy financing. Nevertheless, several countries embarked on remarkable social

policy drives including free primary, secondary, and, in some instances, free university education to create the needed human capital to drive the affairs of these new nations (Adésínà, 2007; Gumede, 2018).

However, post-colonial restructuring and subsequent structural adjustment programmes in response to the 1980s debt crisis, together with the contemporary era of market liberalisation driven by economic liberation, made the pursuit of social policy interventions challenging in a turbulent environment (Mkandawire, 2004). Many countries had to forgo some social policy interventions such as free education and implemented user-fee (cost-sharing or cost-recovery) policies during these periods (Adésínà, 2007). Notwithstanding this, scholars believe that despite the intractable challenges that the region faces in its developmental agenda, robust social policies will go a long way to ensuring effective and inclusive social and economic development (Gumede, 2018).

The dissertation has adopted an interdisciplinary approach to contribute and expatiate the broad subject matter of education as social policy. It situates fee-free education at the high-school level as a social policy, and utilises more simplified theories in each analytical chapter. The aim is to achieve the following: to explore and understand the conditions within the socio-political environment under which fee-free policies evolve, and to examine the effect of these policies on social variables (enrolment and crime). The overarching aim is to contribute to the empirical and theoretical positions in the respective field of study. To achieve this, it is important to highlight the core idea that runs throughout the dissertation – cost-elimination policy or fee-free education.

1.5.2 Cost-elimination policy (Fee-free education)

The central concept employed throughout the dissertation is cost-elimination policy or fee-free education. Different terms are used in the literature to represent this concept, with the same underlying interpretation. Common among the latter are “school fee abolition initiative”, “free education”, “fee-free education”, “fee-free policy”, and “free education policy”. In this dissertation, however, the term “fee-free education” and “fee-free policy” are commonly used, together with the formal expression (“cost elimination”).

1.5.3 Typologies of fee-free policies

Many questions arise in an attempt to contextualise and subsequently operationalise the concept of cost-elimination policy as broadly defined by the World Bank and United Nations Children's Fund (UNICEF) (2009). This is due to the lack of formal consensus on what constitutes cost elimination or fee-free education. Which cost is eliminated? For whom? These are questions that immediately come to mind when one talks about cost elimination. In answering these questions, I developed two typologies of fee-free education – holistic fee-free policy and partial fee-free policy – based on the scope and coverage of the fee-free policy. To achieve this, I first introduce the cost items associated with schooling. After that, I describe the constituents of the scope and coverage that was introduced which led to the development of our two typologies of fee-free education.

According to research by Results for Development Institute (2015), different cost items are identified with schooling, ranging from monetary to non-monetary costs. These cost items are summarised in Table 1.2.

Table 1.2: Types of educational costs

Monetary cost			**Non-monetary cost**
School Fees/Direct cost	**School Suppliers**	**Ancillary Services**	**Opportunity Cost**
Registration Fees	School Uniform	Boarding Fees	Parents' time, labour income
Tuition Fees	Sports Clothes	Cafeteria/Meals	Students' time, labour income
Examination Fees	Textbooks	Transportation	
Teachers' Salaries/ Fees	Writing materials and suppliers	Tutoring/private coaching	
Parent Teacher Association Fee	Other compulsory suppliers	Additional/Special classes	
Other Enrolment-associated Fees		Students' fieldtrips/excursions	

Source: Adapted from Results for Development Institute (2015)

The scope of a fee-free social intervention policy may eliminate all the direct costs of schooling, other school supplies, and ancillary costs – for example, the Free Senior High School Policy in Ghana (Abdul-Rahaman, Basit Abdul Rahaman, Ming, Ahmed, & Salma, 2018). On the other hand, the policy may be limited to certain direct costs only, such as tuition fees and registration fees, commonly described as the "big bang" approach (Morgan et al., 2014) – for example, Free Day Secondary School in Kenya (James, Simiyu, & Riechi, 2016). In relation to the coverage, the policy may have a country-wide geographical character. In contrast, the policy may have limited coverage through a targeting or phasing-in approach by region or grade/age level, or be limited to some selected deprived geographical areas, vulnerable students, or a specific gender. Examples include the No-Fee Policy in South Africa, and the Girls' Scholarship Programme in The Gambia (Blimpo et al., 2019; Branson & Lam, 2017). Based on this understanding, I specify two types of fee-free policies: holistic fee-free policies, and partial fee-free policies.

1.5.3.1 Holistic fee-free policy

Fee-free policies that eliminate all direct costs of schooling and have a national geographical character (i.e. cover the entire country) can be considered holistic fee-free policies. They are holistic because they remove the immediate financial impediment to access – that is, direct costs, especially registration fees and tuition fees (Bray, 2007), and cover all eligible people who are qualified and want access throughout the country. Some holistic fee-free policies may even cover school supplies and ancillary services. A classic example in SSA is Ghana's Free Senior High School policy, adopted in 2017.

1.5.3.2 Partial fee-free policy

Fee-free policies that cover some direct cost items (for example, only tuition fees or registration fees), and with or without national geographical character, are considered partial fee-free policies. They are partial because students must pay for other critical direct costs such as registration fees and additional enrolment-associated fees, which are considered a hindrance to access. Classic examples include the No-fee Policy adopted in 2007 in South Africa, the Free Day Secondary School policy adopted in 2006 in Kenya, and the Progressive Free Senior High School policy adopted in 2015 in Ghana. In this dissertation I have considered both holistic and partial fee-free policies. The rationale is that, be they holistic or partial fee-free policies, these

initiatives may be essential for promoting access to education in developing economies (Bray, 2007).

In the subsequent sections, I discuss the theoretical arguments advanced in each analytical chapter.

1.6 Article: conditions that drive fee-free policies

The provision of fee-free education as a form of social support is considered a social policy (Marshall, 1967). Indeed, it is an expansionary social policy because it involves direct government spending that promoted social justice through providing knowledge and skills to citizens rather than leaving matters to the market. In the field of political science, the literature has long developed some theoretical expositions that promote the adoption of expansionary social policies around the world, including education (Grebe, 2015; Ha, 2015; Keefer & Khemani, 2005). Surprisingly, despite the growth in research into education in social policy, the socio-political conditions conducive to promoting the recent expansion of fee-free policies from the basic level to the high-school level in SSA are not explored nor understood. Therefore, in analytical Study 1 (i.e., in Chapter 2) of the dissertation, I have relied on the most prominent socio-political theories identified in the literature that are conducive to social policy provision to explore and understand the context of the provision of fee-free education in SSA. Accordingly, I considered the regime type (Dornbusch & Edwards, 1991), electoral competition (Altman & Castiglioni, 2020; Stasavage, 2005; Ward, Kim, Graham, & Tavits, 2015), the partisan theory of policy outcome (Huber et al., 2008), size of the economy and economic growth (Islam & Clarke, 2002; Sen, 1976), and the societal context.

Scholars argue that democratic regimes respond to popular demands, including the provision of social policies, more sensitively than authoritarian regimes due to the more competitive nature of accessing power in a democracy (Brown & Hunter, 1999; Dornbusch & Edwards, 1991). However, due to the complexity of the ideal-type democracy-authoritarian dichotomy, scholars have further investigated more specific concepts, such as electoral competition, that influence social policy provision. Indeed, electoral competition plays a critical role in social policy provision as governments decision-making cannot be divorced of politics (Downs, 1957). This is attributed to the influence or driving factor of political parties in the agenda-setting of public

policies with the overall ambition of obtaining a political advantage over their competitors during electoral campaigns or maximising their political power (Boda & Patkós, 2018; Dragu & Fan, 2016; Kovács & Hajnal, 2013; Ward et al., 2015). Literature from SSA in particular that attempts to explain the provision of universal free primary education has identified the significant influence of electoral competition in triggering the adoption of fee-free policies (Avenstrup, Liang, & Nellemann, 2004; Harding & Stasavage, 2014; Stasavage, 2005). I expect this to hold for fee-free policies at the upper-secondary level.

Furthermore, the traditional partisan theory of policy outcomes argues that leftist governments are more liable to increase the provision of social policies due to their ambition of reducing social inequalities compared to their counterparts on the right (Ha, 2015). Within the political economy, the increase in the wealth of a country is argued to spur the provision of social welfare (Islam & Clarke, 2002; Sen, 1976). Last, the social context, such as the demographic structure associated with a strong demand for education, may necessitate the need to provide specific social policy.

Notwithstanding the above propositions, other scholars have challenged the universal applicability of these theories. For instance, Altman and Castiglioni (2020) and Tavits and Letki (2009) have questioned ideological leanings concerning social policy provision. They argue that social policies are not the exclusive domain of the left since right-wing parties engage in equal expansionary social policies. Moreover, Grindle's (2004) study in Latin America makes a strong case that economic conditions and electoral cycles are not associated with educational changes but rather the interest of political executives in advancing their political interests. Despite the foregoing contrary evidence, I address all the five highlighted prominent explanations for expansionary social policy in Study 1 to explore and understand the condition(s) necessary and sufficient for adopting fee-free policies at the high-school level in SSA. As Downs (1957) argued, it is problematic to explain government decision making such as the adoption of social policies with a single theory. Therefore, attempting to explain the conditions necessary and sufficient for the adoption of fee-free by exploring prominent advanced theories provides an opportunity for a holistic overview and understanding of the evolution of the concept. The study challenges the dominant idea of the partisan theory of policy outcome and the economy in the provision of social policy. I argue that in fragile democracies such as SSA, social policies such as

fee-free policies are primarily influenced by electoral politics that result from domestic electoral competition.

1.7 Article: fee-free policies and school enrolment/access

School enrolment refers to the extent of physical access and enrolment in education (Lewin, 2015). In principle, a higher level of school enrolment means a high level of access. In the contemporary world, education is built on four main principles: access, quality, relevance, and equity (Lewin, 2015; Stromquist, 2012; UNESCO, 2009). Although each of the four principles is fundamental in education, quality, relevance, and equity can be pursued when people have physical access. For this reason, access or enrolment can be considered a prerequisite for quality, relevance, and equity. However, meaningful and sustained access goes beyond enrolment to include the other fundamentals of modern education (Consortium for Research on Education Access, Transition and Equity [CREATE, 2021]). However, more than 50% of children of school-going age are without access to education in SSA (World Bank, 2018). Many people are excluded from education right from the beginning of the educational cycle and between transitions (Lewin, 2007).[4]

As expected, many reasons have been assigned for the inability of children to enrol in formal school. These factors have been categorised according to the demand and supply frameworks of school participation (Hunt, 2008). The demand-driven factors include socioeconomic status (for example, poverty, inequality and unemployment), sex, a low level of family support, poor academic achievement, pregnancy, and substance use. They could also be due to living in a low-income neighbourhood, having peers with a weak educational background, and having friends and siblings who drop out (Akyeampong, Djangmah, Oduro, Seidu, & Hunt, 2007; Hunt, 2008). Demand-driven factors affect enrolment, as students lack the means to enrol in school.

Supply-driven factors include high student-to-teacher ratios, the low socioeconomic status of the school population, academic tracking, a lack of support between grade transition, conflict, racial or ethnic segregation, and location (Bradshaw, O'Brennan, & McNeely, 2008; Bronfenbrenner & Morris, 1998; De

[4] See Appendix 1 for the Zones of Exclusion developed by Lewin (2007).

Witte, Cabus, Thyssen, Groot, & van den Brink, 2013; Jimerson, Egeland, Sroufe, & Carlson, 2000). Supply-driven factors affect enrolment when the consumption power for schooling exists but other factors inside or outside school pull or push children out of school (Hunt, 2008). In sub-Saharan Africa, recent studies support the idea that these factors affect school participation (Amagnya, 2020; Bertoni, Di Maio, Molini, & Nisticò, 2019; Duflo et al., 2017) and further point to the lack of school supply due to a woefully inadequate school infrastructure for accommodating students (Akyeampong et al., 2007; Ananga, 2011a).

Nevertheless, in contemporary SSA, access to basic education (pre-school, primary and lower secondary school) has improved. A key policy alternative to increasing the rate of participation at the basic level is fee-free policies. (Little & Lewin, 2011). However, the transition rate from lower secondary to upper secondary education (necessary to complete the full cycle of secondary education) remains low, leading to a high exclusion rate from the upper-secondary level.

The supposed success of fee-free education at the basic level is not without debate. Scholars have argued about the cost efficiency of fee-free policies and their resultant effects on enrolment. One strand of this argument is that the acute resource constraints of developing countries make it challenging to provide free or subsidised education (World Bank & UNICEF, 2009). In addition, if cost elimination is implemented, it will lead to poorer quality provision because governments cannot adequately provide funds to sustain the policies, which tends to affect the poor who cannot afford other alternatives (Bhalotra, Harttgen, & Klasen, 2014). Last, fee-free policies may be associated with administrative issues within the education system due to factors inherent to resource redistribution (Walton, 2019). The other side of the argument is the "rights-based" one, which emphasises the positive externalities of education to society and encourages the elimination of user fees (Collin & Ferrare, 2015; Morgan et al., 2014). Proponents argue that with the substantial long-term gains from schooling, the political will (Little, 2011) and international support for relaxing resource constraints make it possible to eliminate the direct cost of education (Bray, 1987, p. 127). These contradictions make the elimination of fees as a policy option and its effects on education complex to explain.

Nevertheless, recent studies have concluded that policy interventions that reduce or eliminate direct costs at the primary level, especially registration fees and tuition fees, should be encouraged and sustained due to their role in human capital formation

(Becker, 1993). In brief, there may be significant gains in school enrolment from fee-free policies at the lower levels of education (Al-Samarrai & Zaman, 2007; Bray, 2007; Deininger, 2003; Hermida, 2014; World Bank, 2009). Again, there have been claims of the significant long-term economic and social gains from fee-free education (Bhalotra et al., 2014; Koski et al., 2018; Putnam & Garrett, 2020; World Bank, 2018; World Bank & UNICEF, 2009). Beyond the basic level of education, studies in individual countries have also found that interventions that reduce the cost of schooling at the upper-secondary level increase enrolment (Blimpo et al., 2019; Brudevold-Newman, 2017; Duflo et al., 2017). The limitations, however, involve the focal areas of these studies, which are associated with individuals or a few selected countries in the region. It is important to understand the broader effect of fee-free policies on enrolment across the region.

1.7.1 Poverty

In considering all the factors associated with demand and supply frameworks that contribute to the low enrolment rate, the literature identifies poverty, especially economic poverty, as the main reason that households and individuals are unable to afford educational fees (Psacharopoulos & Arriagada, 1987). Adding to this effect is the fact that economic poverty interacts with other factors on the demand and supply sides to cause low enrolment (Hunt, 2008). For example, poverty reduces the ability to afford other indirect costs, the inability to manage opportunity costs, increases the pressure on children to work, and harms health (Farah & Upadhyay, 2017; Iddrisu, 2014; Patel, Singh, Chandra, Khanna, & Mehra, 2018). Additionally, schools that serve poorer communities are often lower quality, with teachers less likely to want to work in them, and having fewer resources, heightening the negative association between poverty and school participation (Abotsi, Yaganumah, & Obeng, 2018; Huisman & Smits, 2015; Hunt, 2008; Kabubo-Mariara & Mwabu, 2007; Sabates, Akyeampong, Westbrook, & Hunt, 2010). Poverty is associated with under-enrolment, which seems to be an important predictor of access to basic education in developing countries (Akyeampong et al., 2007). Hence, an analysis of the fee-free policy-enrolment nexus should consider poverty as well.

In relation to the foregoing, Chapter 3 (analytical Study 2) of this work asked the following research question: What is the effect of cost elimination on upper-secondary-school enrolment in SSA? I proposed that the provision of fee-free

education positively affects the high school enrolment rate. Notwithstanding this, since the provision of fee-free education may not eliminate all schooling costs, including some direct costs (the existence of partial fee-free policy), the presence of a high rate of economic poverty at the country level will make the provision of fee-free policies irrelevant if not checked.

1.8 Article: education and crime reduction

1.8.1 Crime

Despite the seemingly easy-to-understand term "crime", conceptualising crime has not been an easy endeavour for academic scholars. The concept of crime changes from one geographical context to another, and over time, making the creation of a universal definition difficult. The lack of uniformity means that what may be termed a crime in one jurisdiction may not be considered a crime in another. In the same way, what may constitute a crime at one time in a particular place may not be considered a crime in another period within the same jurisdiction and vice versa. According to Nigam (1965), in order to know what constitutes a crime, one must first understand the law, since the two concepts are interrelated. However, in broad terms, a crime is a wrongful act or offence the enforcement of which is entrusted to the state (Hermalin, 2005). This enforcement or punishment can be a fine, imprisonment, probation, community service, or even the death penalty (Becker, 1968).

The literature argues that the cost of crime to society is enormous, and covers economic, social, and psychological harm (Wickramasekera, Wright, Elsey, Murray, & Tubeuf, 2015). For this reason, crime reduction is a prime concern of all societies. The literature proposes two main frameworks for reducing the incidence or rate of crime: control and prevention (Waller, 2006). The two means are not mutually exclusive. On the one hand, "crime control or in other terms repression involves the use of the police to deal with criminal activities, imposing harsher punishment [by attorneys or judges] to serve as a deterrent, the use of correctional facilities and in extreme cases, imposing the death penalty" (Welsh & Farrington, 2012, p. 1). Crime prevention, on the other hand, refers to efforts to avoid crime or criminal offenses in the first instance before any act has been committed. It is "the total of all private initiatives and state policies - other than the enforcement of criminal law - aimed at

the reduction of damage caused by acts defined as criminal by the state" (van Dijk & de Waard, 1991, p. 483).

In summary, crime control uses the formal justice system, including the police, the courts, and prisons, as a means of punishment to deter crime (Levitt, 1996; Machin & Marie, 2011), whereas crime prevention takes place outside the confines of the formal justice system (Waller, 2006). In other words, control deals with offences that have already occurred, whereas prevention deals with anticipated crime. Chapter Four of the dissertation (analytical Study 3) focuses on the idea of crime prevention.

1.8.2 Crime prevention

Van Dijk and de Waard (1991) provide a classic two-dimensional typology of crime prevention mechanisms. However, other potential ways of classifying crime prevention strategies have been identified by other scholars such as Brantingham and Faust (1976), Ekblom (1994), and Tonry and Farrington (1995). Despite this, Van Dijk and de Waard's ability to distinguish offender-related crime prevention from situation-related and victim-related crime prevention makes it easier to justify how education may be helpful in crime prevention – the focus of this section of the dissertation. Van Dijk and de Waard's typology was developed from Brantingham and Faust's (1976) three developmental stages of crime prevention: primary, secondary, and tertiary. Van Dijk and de Waard add offenders, situations, and victims as three separate target groups, creating the second layer of their typology.

With the roots of the approach based in preventive medicine, Johnson (1987) observed the function of primary prevention as an attempt to lower the rates of illness recorded in the first place. This is done by initiating measures directed at the general public to counteract perceived harmful circumstances before the onset of illness. Secondary prevention involves interventions directed at groups or individuals diagnosed with early symptoms of illness, and tertiary prevention targets those already suffering from the disease. Accordingly, Brantingham and Faust (1976) applied this model to crime prevention. They defined the primary level as the identification of physical and social environmental conditions that provide opportunities for or precipitate criminal acts. Secondary prevention involves the early identification of potential offenders and seeks to intervene. Tertiary crime prevention deals with actual offenders and involves intervening in a way that they will not commit further crimes.

The second layer of typology that focuses on target groups (offenders, situations, and victims) introduced by Van Dijk and de Waard (1991) provides a robust understanding of crime prevention. Offender-oriented crime prevention targets the general public as potential offenders at the primary level. Hence, prevention mechanisms such as strong social bonds and education for the general public may be appropriate. At the secondary level, however, people with a greater propensity to commit a crime, such as teen youth, are targeted. Linking this to Lochner's (2004) and Bell, Costa, and Machin's (2018) argument about why education is helpful in crime reduction is the idea that crime peaks when individuals are in their late teens, thus 16 to 19 years of age. However, upper secondary education keeps late teens in school, leaving them with relatively little time to engage in crime, and helping them make better decisions in life and equipping them with the potential for future legitimate work. According to Van Dijk and de Waard's (1991) idea, this is a means of preventing potential offenders from committing crimes at the secondary level. The tertiary-level offender group targets the actual offenders who are already criminals through rehabilitation mechanisms such as schooling and training programmes.

Situational crime prevention involves improvements in security provisions in all houses and buildings. At the primary level, this can be done at the whole community level to make crime difficult for the offender. For example, protecting homes using locks, closed-circuit television (CCTV), and access control. Security measures in high-crime areas such as malls, banks, and schools are appropriate means at the secondary level. At the tertiary level, the areas already cited and witnessing frequent crimes are secured. Finally, the third target group is related to victims. Victim-oriented crime prevention targets the general public at the primary level through advice on safety precautions, and offering training to high-risk groups (secondary level) such as bank clerks or captains of industry. The tertiary level involves providing advice and counselling to actual victims of crime. Having elaborated on the typologies of crime prevention, it is essential to note that part of the dissertation targets offenders at the secondary level using education and education policies. This group includes those teens who are at risk of engaging in crime. Table 1.3 summarises the two-dimensional typology of crime prevention.

Table 1.3: A two-dimensional typology of crime prevention

Target group	**The developmental stage of crime prevention**		
	Primary level (General Public)	**Secondary Level (Risk Group)**	**Tertiary Level (Core group)**
Offenders	1 Schooling and socialisation programmes.	2 Keeping adolescents in school and jobs, and increasing availability of training for youth.	3 Rehabilitation programmes for offenders (schooling, skills training, and counselling)
Situations	4 Protection of properties	5 Redesign of highly afflicted crime areas.	6 Crime mapping by the police to identify "hot spot" areas.
Victims	7 Public campaign specifying common precautions against crime.	8 Protection of high crime areas, individuals vulnerable to criminal victimisation.	9 Offering support to victims of crimes.

Source: Adapted from Van Dijk & de Waard (1991)

1.8.3 Fee-free policies and crime prevention

According to social support theory (Cullen, 1994), instrumental or expressive support provided by families, interpersonal relations, or states through social programmes can reduce aggregated crime. In this case, the provision of fee-free education as a form of social policy to youth at their peak crime age – that is, at the theoretical age of upper secondary education – can be considered an unintended crime reduction strategy (through prevention). Cullen's normative theory draws on the weaknesses of earlier theorists who emphasised crime reduction through punishment. These theorists viewed crime as due to individuals' own shortcomings on account of strain (Agnew, 1985) or learned through their own associations (Sutherland & Cressey, 1966). These theorists emphatically linked the control of crime as a means of reducing crime in society.

Notwithstanding this, the empirical Western literature has extensively investigated the role of education and educational policies in crime reduction in society at the individual level. In the early nineteenth century in France, Adolphe Quetelet demonstrated that the crime level in France peaks for individuals in their late teens, at an age where they should be in school (Quetelet, 1984). Economists such as

Becker (1968) demonstrated that the more one is educated, the less one will engage in crime. Becker situated his argument in human capital theory. He argues that acquiring knowledge and skills increases the opportunity cost of engaging in crime relative to education, thereby reducing individuals' motivation to commit crime. Bell, Costa, and Machin (2016, 2018), Hjalmarsson and Lochner (2012), Lochner (2004), and Lochner and Moretti (2004) extended the theoretical propositions of Becker and investigated in detail the causal effect of education on crime. They concluded that education has unobserved positive externalities, making it less likely that educated people engage in crime. The latter include the fact that 1) education increases the opportunity cost of crime by increasing future returns to legitimate work; 2) education has the capacity to help individuals to make better decisions in life, and is likely to reduce engagement in risky behaviour such as criminal behaviour. Finally, education has an incapacitation effect by keeping youth at the peak crime age out of criminality. Therefore, policies that encourage schooling at the typical peak crime age help to reduce crime in society.

However, in this dissertation I take a further step to investigate the macro-level effect of the rate of schooling on the crime rate in SSA. To achieve this, I utilise the rate of high-school enrolment and investigate any association with the rate of crime in the region. The enrolment rate is investigated alongside government fee-free policies aimed at increasing education as an instrument that has been identified as valid and relevant in relation to school enrolment. The utility of Cullen's (1994) social support theory as an organising idea rests on the argument that social support provided by any societal agent, such as the family, interpersonal relations, or government, reduces the national aggregate crime. This is because social support strengthens social structures and impacts the aggregated social variables. Accordingly, to investigate this phenomenon in SSA, I asked the following research question: What is the effect of the rate of high-school enrolment on the crime rate in Sub-Saharan Africa? As argued, the central proposition of this chapter is that increasing the rate of high-school enrolment has a negative effect on 1) the rate of property crime proxied by the theft rate; and, 2) the rate of violent crime proxied by the homicide rate.

In conclusion, the overall theoretical proposition of this dissertation (combining all three analytical studies) is that the provision of fee-free education at the upper-secondary level as a social policy has some positive impact on social variables. However, the dominant mechanism that facilitates the drive for the provision of fee-free policies is electoral competition, not the social need for a policy solution. The

argument is that although there is a social need to provide fee-free policies due to the low rate of school enrolment, the motivation to do so is not social need per se, but the mechanisms of elections. This assumption is considered valid due to the influence of domestic electoral politics and dynamics concerning how to extract the maximum political capital from initiating and adopting fee-free policy. Although these policies have immediate intended and unintended positive effects on social variables, the manifestations of the latter are strongly embedded in political parties' strive for political power. I summarise the logic of the entire dissertation in Figure 1.2.

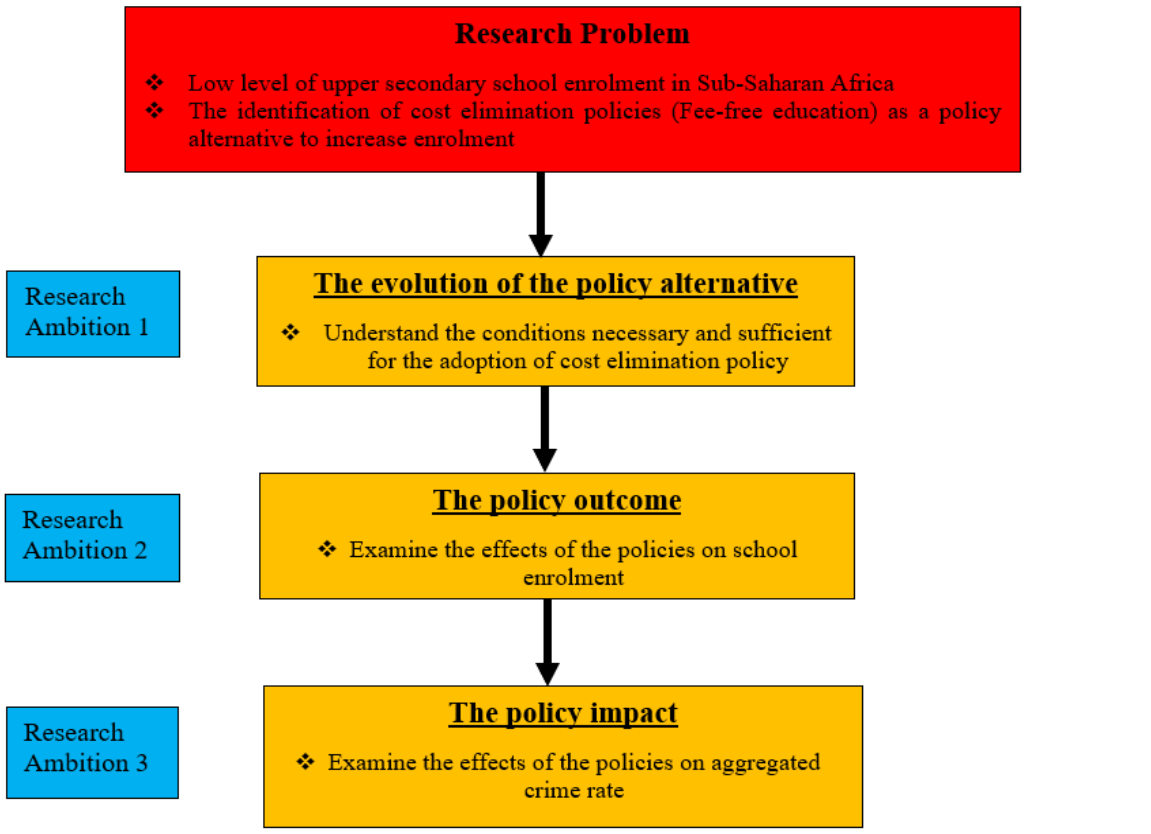

Figure 1.2: Conceptual map

Source: Author's construction

1.9 Research approach, methods, and data

In the previous sections of the introductory chapter, I elaborated the research problem and the empirical gap informing this dissertation. I further conceptualise the study's key concepts and detail the overarching theoretical framework by which this thesis is organised. In this section, I provide an overview of the methodological approach.

My approach was a mixed-methods, iterative one that drew on multiple sources and employed different data collection methods to enable the triangulation of findings. The triangulation process was completed through cross-verification from more than two sources, resulting in more valid and reliable conclusions. Accordingly, this section explains how I achieved this goal and specifies the link between the different parts of the dissertation and the data needed to answer them. In addition, it describes how the data was collected and analysed. The dissertation's ambition is to uncover the conditions facilitating the adoption of fee-free policies at the upper-secondary level and the social benefits of these policies concerning the school enrolment rate and the crime rate in SSA. The study started with a qualitative case study design in Study 1, as presented in Chapter 2. Afterwards, *large-N* designs using panel data analysis in Studies 2 and 3 (as presented in Chapters 3 and 4, respectively), were employed.

1.9.1 Qualitative case study design

For article one, I employed diverse case study designs. I approached the topic in the following way. First, countries in SSA that have adopted either a holistic or a partial fee-free policy at the high-school level between 2010 and 2020 were selected. From these countries, cases were derived for an exploration of the necessary and sufficient conditions for adopting fee-free policies, or otherwise. I employed the methodological approach of fuzzy set qualitative comparative analysis (fsQCA). QCA is a case-oriented research method based on a configurational approach that examines set relations between cases rather than the correlation between variables (Ragin, 2008). In investigating this, I was interested in two main outcomes: 1) Condition(s) necessary and sufficient for the presence of fee-free policy; and, 2) condition(s) necessary and sufficient for the absence of a fee-free policy.

Three main reasons informed the timeframe chosen (2010 to 2020) for the analysis during which cases were identified. One, since the Education For All (EFA) initiative in 2000, which was supposed to be achieved by 2015 according to Millennium Development Goals (MDGs), enrolment at the primary and lower

secondary level improved significantly (Little & Lewin, 2011). Practically, the externality of this effect is the creation of another social 'problem' – the fact that the number of youths seeking to complete high-school education increased. Hence, governments needed to pay attention to this level of education. Two, the conditions selected for the analysis are associated with recent data (until 2020, during the writing of the manuscript). Finally, the issue of fee-free education at the high-school level was highly contentious in the political space during this period in many SSA countries. The timeframe was utilised as a means of "build[ing] narratives of process" (Porta, 2008, p. 207), not for panel data structuring.

Seven countries were identified as having adopted a fee-free policy (other than a legal framework) for at least one year within the specified period. These countries include Ghana, Kenya, Malawi, Namibia, Sierra Leone, South Africa, and Uganda. As a result, and based on the selected timeframe (2010 to 2020, involving 11 time periods), 11 cases were identified for each country leading to 77 cases in total. Taken together, 48 cases had the outcome "presence of a fee-free policy" (holistic or partial), while 29 cases had the outcome "absence of a fee-free policy".

Five potential conditions were analysed. These are regime type, electoral competition, ideological lineage, economic conditions, and social context. Regime type was defined as a democratic regime or an authoritarian regime using the Economic Intelligence Unit (EIU) Democracy Index and cases were classified as high (strong) democracy or low (weak) democracy. Furthermore, electoral competition was defined as either the political party in power promised to offer fee-free education during the electoral campaign, or did not. Ideological lineage was measured based on the leftist-rightist ideological continuum. Economic condition was measured as the level of economic development measured in gross domestic product per capita or growth in wealth. Finally, the social context was conceived through the educational system using the rate of school participation at the lower secondary level. The data were sourced from the EIU democracy index, official national sources, political parties' documents (mainly their manifestos) and their websites, knowledge about international ideological groupings, World Bank development indicators, and the UNESCO Institute of Statistics (UIS). The results were presented as configurations in tables, followed by qualitative discussions (narratives) through which configurations were applied to the cases to test the validity and robustness of the results.

1.9.2 Quantitative large-n designs

The following two articles used a quantitative method through implementing a panel data analysis of SSA countries, with country-year as the unit of analysis. Panel data analysis is a statistical tool wherein the same entities (i.e., countries) are measured repeatedly over time (Wooldridge, 2016). The period selected was from 2003 to 2018. The decision to select this timeframe was informed by the availability of data concerning the main variables of interest for many of the countries in the region. The sources used for the data collection have data available from 2003. Before this period there were no available data for many countries, and the current values during the writing of the manuscripts were for 2018.

The main dependent variable in Study 2 was upper secondary school enrolment and male and female enrolment rates. The inclusion of the gender enrolment parameter was to check the consistency of the results and to assess the effect of fee-free policies on enrolment according to gender dimensions. Cost-elimination policy and poverty rate were the independent variables. Cost-elimination policy was measured as a national policy intervention or legal framework that eliminates registration fees and tuition fees. A dummy of "1" was created for a country-year associated with this policy according to the working definition; otherwise, "0". The poverty rate was measured as the number of those living under the poverty rate of $1.90 per day. This variable was analysed to estimate its moderating effect in the cost elimination-enrolment nexus.

In the same way, the main dependent variable in Study 3 was the rate of property crime and violent crime. The rate of theft and homicide are used as proxies for property crime and violent crime, respectively. These matrixes are measured as the log of the number of crimes (theft or homicide) per 100,000 population in a year. The main independent variable was upper-secondary-school enrolment measured as the gross enrolment rate for upper secondary school, regardless of age, as a proportion (%) of the official total population of the corresponding age group in a year.

In articles two and three, other variables identified to have plausible effects on the dependent variables such as unemployment rate, effective rule of law, conflict, death penalty, inequality rate, national income, and GDP per capita growth were controlled to avoid confounding effects. The data were collected from recognised international institutions, including the United Nations Office on Drugs and Crime (UNODC) (2018), the UNESCO Institute of Statistics (UIS) (2021), World Bank Development Indicators (2021), World Governance Indicators (2019), and official

national sources. In the analysis, fixed-effects (FE) panel data analysis complemented with instrumental variable (IV) two-stage least squares (2SLS) estimates were used to generate the results. The results were presented in tables and graphs, followed by interpretations and discussions. Before this, descriptive statistics and pooled ordinary least squares (pooled OLS) estimates were initially generated to understand the pattern of the data before carrying out the main analysis.

1.10 The relations between the chapters and outline of the rest of the dissertation

The articles that make up this dissertation are embedded in fee-free educational policies as a component of expansionary social policy. They aim to increase understanding of the mechanisms driving these policies and their social impact. Each article addresses an aspect of this broad ambition to provide a comprehensive picture of fee-free policies in SSA. The three analytical papers are introduced in separate chapters in a systematic order. Analytical Study 1 in Chapter Two, Study 2 in Chapter Three, and Study 3 in Chapter Four. The dissertation closes with a conclusion in Chapter Five, which outlines the study's relevance, the key findings, and implications for theory, policy, and future empirical research. Finally, some limitations are also highlighted. Table 1.4 summarises all the major parts of each analytical chapter.

Table 1.4: Map (summary) of the analytical chapters

Chapter	**Chapter 2**	**Chapter 3**	**Chapter 4**
Article title	The politics of social policy in Sub-Saharan Africa: A Configurational Approach to Fee-Free Policies at the High-school level	The effects of cost elimination on secondary school enrolment in Sub-Saharan Africa	The positive externality of education on crime: Insights from Sub-Saharan Africa
Research questions	Under what condition(s) are fee-free policies adopted in SSA?	What is the effect of cost elimination on secondary school enrolment in SSA?	What is the effect of high school enrolment rate on crime rate in SSA?
Dependent variable(s) or Outcome	1) Presence of fee-free policy 2) Absence of fee-free policy	1) Upper secondary school enrolment	Crime rate
Independent variable(s) or conditions	1) Regime type 2) Electoral competition 3) Ideological lineage 4) Economic conditions 5) Social context	1) Cost elimination policy 2) Poverty	1) Upper secondary school enrolment
Design/Method	Case study/Qualitative Comparative Analysis (QCA)	Large-N/Panel data analysis of SSA countries from 2003-2018	Large-N/Panel data analysis of SSA countries from 2003-2018
Original Article Access information	Asante, G. (2023). The politics of social policy in Sub-Saharan Africa: A Configurational Approach to Fee-Free Policies at the High School level. *SAGE Open*, https://doi.org/10.1177/21582440231184970	Asante, G. (2022). The effects of cost elimination on secondary school enrolment in Sub-Saharan Africa. *Educational Review*, 1–25. https://doi.org/10.1080/00131911.2022.2028732	Asante, G., & Bartha, A. (2022). The positive externality of education on crime: Insights from Sub-Saharan Africa. *Cogent Social Sciences, 8*(1), 1–24. https://doi.org/10.1080/23311886.2022.2038850

Source: Author's construction

CHAPTER 2: THE POLITICS OF SOCIAL POLICY IN SUB-SAHARAN AFRICA: A CONFIGURATIONAL APPROACH TO FEE-FREE POLICIES AT THE HIGH SCHOOL LEVEL

Abstract

Governments in Sub-Saharan Africa (SSA) are expanding access to high school education, which is a perpetuation of the previous focus on basic education. This study applies qualitative comparative analysis (QCA) using data from seven countries from 2010 to 2020 to examine the potential conditions of fee-free policies at the high school level. Five potential conditions are analysed. They include the regime type, electoral competition, ideological lineage, economic conditions, and social context. The findings indicate the significant influence of electoral competition and a high level of lower secondary school enrolment for the adoption of fee-free policies. The absence of electoral competition leads to a lack of fee-free policy. The paper explains how elections, one indicator of representative democracy, motivate political leaders to initiate social policies. Additionally, the study challenges the relevance of two important explanations for expansionary social policy in the literature – the partisan theory of policy outcomes, and the economy.

Keywords: *Social Policy, Fee-free education, Secondary Education, Electoral Competition, QCA, Sub-Saharan Africa*

2.1 Introduction

The global vision of primary and secondary education for all is set to be achieved in 2030 according to the Sustainable Development Goals (SDGs) (United Nations, 2000). Currently, data from the United Nations Educational Social and Cultural Organisation (UNESCO) Institute of Statistics (UIS) shows that an average of 60% of youth of high school age are in school on a global basis (UNESCO Institute for Statistics [UIS], 2021). High school (formally called upper secondary education) refers to the level three of educational gradation (ISCED: 3); the stage just before tertiary education associated with a theoretical entry age of 14 to 16 and completion age of 17 to 19 (UIS, 2012) (UNESCO Institute for Statistics, 2012). There are great disparities among the individual regions of the world in terms of high school

enrolment. For example, in 2018 Arab States reported an average of 61%; Central and Eastern Europe, 105%; South and West Asia, 60%; and Sub-Sharan Africa (SSA), 34%. SSA has the lowest proportion of youth taking part in high school education. This is a social problem. Primary education, and in some countries lower secondary education (basic school), is free and compulsory in many SSA countries, while high school/upper secondary education is not. Consequently, some countries – for example, South Africa, Kenya, Ghana, Namibia, Sierra Leone, Malawi, and Uganda – are implementing specific policies termed cost-elimination policy (popularly called fee-free education policies) at the high school level to increase enrolment to achieve SDG 4.

The provision of fee-free education can be considered a pragmatic social policy approach that responds to the lower rate of school enrolment (Marshall, 1967). This is because it involves direct government spending rather than leaving matters to the market. Although the study of social policies is a growing area of research (Adésínà, 2007; Altman & Castiglioni, 2020; Grebe, 2015; Gumede, 2018; Haggard & Kaufman, 2008; Hunter & Sugiyama, 2009; Mkandawire, 2004), the recent expansion of fee-free policies to the high school level in SSA has not been explored in the field of political science. This paper adds to the body of literature from this perspective. In the social policy literature, several theoretical arguments that attempt to explain the conditions favourable to the adoption of expansionary social policies are explored. The regime type (Dornbusch & Edwards, 1991), electoral competition (Ward et al., 2015), the partisan theory of policy outcome (Huber et al., 2008), size of economy and economic growth (Islam & Clarke, 2002; Sen, 1976) and societal factors are some factors scholars have explored. In the context of SSA, the present paper explores, in relation to the adoption and implementation of fee-free policies at the high school level, what condition(s) prevail in the respective countries and why. In addition, it explores under what condition(s) fee-free policy is not adopted and implemented.

I aim to unravel this complexity and answer these kinds of research questions that are outside the scope of the conventional variable-oriented approach. I employ fuzzy-set Qualitative Comparative Analysis (fsQCA) (Ragin, 2008) that allows for an investigation of the potential conditions (or combination of conditions) that lead to fee-free policies, or otherwise. Therefore, the two outcomes of interest are the presence of a fee-free policy and the absence of a fee-free policy. The paper makes three major contributions. One, through QCA it develops a novel way to account for the adoption

or otherwise of fee-free policies in SSA. Two, it explains the potential causal conditions of the popular recent fee-free policies we have witnessed in some SSA countries. Three, it challenges the relevance of two important explanations of the literature on expansionary social policy – the left turn described in the traditional partisan theory of policy outcomes, and economic growth. I argue that electoral competition (one of the narrower concepts associated with representative democratic regime/politics) in social policy politics drives fee-free education in SSA. This factor is complemented by the social context of high lower secondary school enrolment rate. The paper proceeds as follows. In Section 2, I discuss the wider literature on social policy and explore the basic arguments and conditions deemed favourable (unfavourable) to expansionary social policies. In Section 3, I present the methods, operationalise the conditions and outcomes of interest, and discuss the calibration process. I present findings in Section 4. I use Section 5 to reflect on the analysis, test the robustness of the results regarding specific cases that are discussed, and offer some conclusions.

2.2 Theoretical considerations for social policy expansion

2.2.1 Regime type

Regime type is arguably one of the key factors that shapes the access to and exercise of power. This is because, as some scholars argue, regime type affects the constraints politicians face in the distribution of resources (Dornbusch & Edwards, 1991). While we may perceive that the exercise of power is accountable and responsive to the needs of citizens – for example, the provision of education under democratic regimes – this is not so under authoritarian regimes. This suggests that a high level of democracy provides room for popular demands and is more liable to lead to the implementation of social policies such as fee-free education than in an authoritarian regime where resource allocation is constrained by economic forces (Brown & Hunter, 1999). This is because access to power is more competitive and broader in democratic regimes than in authoritarian ones. Across Africa, the emergence of new democracies implies that voters are often following elections more closely (Payne, 2008) and citizens are increasingly viewing social policies as an integral part of their livelihood, with a direct link to democracy (Adésínà, 2007). From this perspective, we expect countries with

stronger democracies to be more likely to have fee-free policies than those with weaker democracy indices.

Notwithstanding this general argument and expectations, some scholars argue that the simple distinction between democracy and authoritarian regimes does not capture the important features that influence political behaviour in resource allocation (Przeworski & Limongi, 1993). Peiffer (2012) argued that African democracy does not produce social policies because other non-democratic countries in the region provide equal social support. Rather, it is because of the exogenous factors that compel SSA countries to engage in political liberalisation. Hence, having democracy in SSA does not guarantee the provision of social services. According to the study, this is because of the weak electoral incentives for such policies. The mixed evidence concerning the link between regime type and social policy output necessitates better defined political science concepts for exploring the ideal-type democracy-authoritarian dichotomy that can explain social policy outcomes. Hence, I consider the role of electoral competition.

2.2.2 Electoral competition

There is a need to specifically consider the role of political parties who may have the incentive to propose and provide social policy when seeking political power and when in government because of the concept of electoral competition. The need to appraise the impact of electoral competition from the perspective of the composite concept of regime-type impact on social policy stems from the complexity of the latter (Hunter & Sugiyama, 2009; Nelson, 2007). Political parties are important for policies, especially in SSA's new democracies, where representative democracy is emphasised (Lindberg, 2004). During electoral campaigns, political parties politicise issues, both economic and non-economic, put them on the agenda, and quickly draw the attention of everyone to them as a means of obtaining a political advantage over their competitors (Dragu & Fan, 2016; Grebe, 2015; Ward et al., 2015).

From the political economy perspective, offering free education to all students is a popular initiative and attracts votes (Correa, Lu, Parro, & Villena, 2020; Fernandez & Rogerson, 1995) – the phenomenon thus has the potential to generate an electoral incentive and motivate politicians to spend more on significant areas such as education (Ha, 2015). In this way, policy actors may be motivated to propose and respond to

policies that expand access to education not only as a service to the public but as a means of obtaining a self-interest-based political advantage over their competitors, especially during competitive elections (Keefer & Khemani, 2005; Pierskalla & Sacks, 2020). This is a particularly important factor considering the increasing democratic quality of SSA's democracies (which are developing from weakly institutionalised democracies), where electoral competition has become a key feature in elections (Lindberg, 2004) and individuals in public institutions – either elected or appointed – are central actors and influence processes that are on the political spectrum and the administration of public affairs (Young, Wiley, & Searing, 2020). Although the citizen preferences articulated by political actors due to electoral competition are not always translated into government action (Lindberg, 2004), a large-scale study suggests that parties that enter governments are highly likely to fulfil their policy pledges (Thomson et al., 2017). Political parties in SSA countries, through their manifestos and political campaigns, set national policy agendas through proposing numerous policy alternatives to electorates during elections (Ayee, 2016). From this perspective, it is important to assume that parties proposing fee-free education to electorates during the electoral campaign may be necessary for a country to have fee-free education.

2.2.3 Ideological leanings

According to the traditional partisan theory of policy outcomes, leftist governments are inclined to reduce social inequality and expand social citizenship rights, such as the right to access to education, and to favour the redistribution of national wealth, hence pursuing a more universal social policy program. The argument is that left-wing governments expand social policies and spend more on education in less developed countries because their orientation makes them sensitive to the demand of the population (Ha, 2015). In Latin America, where social policy regimes were earlier established in the 1970s to cover most citizens, Huber et al. (2008) claim that while right-wing parties may reduce education and health spending – inhibiting the provision of services such as fee-free education –, the left impact them positively.

However, a recent study by Altman and Castiglioni (2020) in Latin America made a strong case, using panel data analysis, that social policies are not the exclusive domain of the left, since right-wing parties engage in expansionary social policies. In post-communist Europe, Tavits and Letki (2009) argued that right-wing parties are more inclined to pursue social policies and tend to increase government expenditure

in sectors such as education, health, and pensions than left-wing parties, while leftist parties are more fiscally stringent. Although employing an ideological continuum or coding of leftist-rightist political orientation is highly controversial and criticised empirically (Benoit & Laver, 2006), it is still the most widely used form of related classification in the literature, including that which concerns SSA (Dreher, Minasyan, & Nunnenkamp, 2015; Facchini & Melki, 2014; Tawiah & Karungi, 2020). Political parties in SSA identify with international and sub-regional groupings based on ideological leanings, such as the International Democratic Union (right), the Democratic Union of Africa (right), and the Socialist International (left). Notwithstanding this, it is important to recognise that contemporary global development goals – for example, secondary education for all, as promulgated in line with the Sustainable Development Goals (Goal 4) – may hinder such ideological leanings from playing a major part in local-level policy adoption, especially in developing economies such as SSA. Political parties in government, thus operating from a less ideological orientation, are expected to fulfil global visions that are becoming increasingly profound in an era of neoliberalism and where international organisations have important interests in local political economies and policy formulation (Simmons & Elkins, 2004). Therefore, policies such as fee-free education may not be adopted based on the ideological orientation of parties or governments but in response to global visions about development. Despite the foregoing, it is still important to consider the ideological lineage of decision-makers due to the long tradition of the former of influencing expansionary social policies.

2.2.4 Economic conditions

Economic conditions, such as the wealth of a country, may influence the provision of social policy within the political economy. This view has been long held by development economists and other scholars due to the implicit reasoning that an increase in national wealth spurs a nation's welfare development (Islam & Clarke, 2002; Sen, 1976). For example, Huber et al. (2008) argued that a high GDP per capita, indicating national affluence, creates the opportunity to devote a greater share of national resources to education and health. It is also important to consider not only the aggregate wealth of a country per se, but also the growth in this wealth. Przeworski et al. (2000) correctly claim that individual (national) well-being is much better expressed in terms of growth of income and consumption rather than aggregate wealth.

As a result, one might expect that in cases where a country is well-to-do economically or has a higher growth it may lead to the adoption of fee-free education. A small economy or slowly growing one is more liable to cause the absence of fee-free policies.

2.2.5 The social context

Social policies change based on economic factors as well as demographic factors or social structures. Social factors may serve as the basis for the provision of social policy. For example, an ageing society may call on the government to pay more attention to social policies such as pension and health (Estes, 2001). The increase in enrolment at the primary and lower secondary levels after the beginning of the early and mid-2020s means that many youths will need high school education – the next level of the educational ladder. As many youths are enrolling and completing the lower levels of the educational ladder, psychological factors such as family and individual aspirations for further education at a high level subsequently increase demand (Plank, 2004). This means that the very success of a state's efforts to increase access and provide opportunities for schooling make new demands on the education system at different levels (World Bank, 2009). It is therefore expected that in cases when countries experience a higher rate of schooling at the lower secondary level, fee-free policies will be introduced at the high school level to deal with the increased demand than in periods associated with a low rate of schooling at the lower secondary level.

2.3 Methodology

I use the fuzzy set Qualitative Comparative Analysis (fsQCA) approach. QCA is a case-oriented research method that is based on a configurational approach and examines set relations between cases, rather than correlation between variables (Ragin, 2008). Compared to standard statistical procedures such as regression, QCA considers each case holistically and permits in-depth insight into different cases as configurations of attributes. In this way, QCA helps with understanding complex relationships between each set in each case rather than merely establishing the relationship between variables with the assumption that different conditions can lead to the same outcomes (Porta, 2008). This means that there may be different explanations for an outcome than for its non-occurrence. This is known as asymmetric causation (Oana, Schneider, & Thomann, 2021). To examine how different

configurations of attributes contribute to an outcome of interest, QCA uses Boolean algebra – a notational system that permits the algebraic manipulation of logical statements and treats cases as having either full membership in sets, full exclusion from a set, or being more in or out of a set (maximum ambiguity). Through systematic logical case comparisons based on the rules of Boolean algebra, QCA identifies similarities and commonalities among these configurations, thus reducing the complexity of the typology in a 'truth table' matrix. A truth table is a data matrix that is created through the QCA data collection and analysis process that includes potential configurations of conditions and their associated empirical outcomes presented in rows (Fiss, 2010).

2.3.1 Selection of cases and data

Cost elimination or fee-free education refers to access-oriented policies and legal frameworks designed to offer free education to children and youth at different levels of education (World Bank, 2009, p. 1). In this study, fee-free policy at the high school level is defined as a policy initiative by a government – other than a legal framework – that eliminates or partially reduces the direct cost of attending senior high education. Countries that have adopted a fee-free policy at the high school level in SSA were selected for the sample. The timeframe for analysis is defined as from 2010 to 2020, during which time cases could be identified for each country to serve as the units of analysis. The focus is on the years(s) of the occurrence or non-occurrence of the outcome, thus time (2010-2020) is only used as a means of "build[ing] narratives of process" (Porta, 2008, p. 207), not for panel data structuring. I selected this timeframe (to derive the cases) for three practical reasons. First, since the Education For All (EFA) initiative in 2000, which was supposed to be achieved in 2015 according to Millennium Development Goals (MDGs), enrolment at the primary and lower secondary level improved significantly (Little & Lewin, 2011). Practically, the externality of this effect is that the many youths who are seeking a high school education have increased government attention to this level of education. Second, the conditions selected for the analysis are associated with recent data (until 2020). Third, the issue of fee-free education at the high school level was highly contentious in the political space during this period. I identified seven countries with a fee-free policy as defined in this study. The countries are Ghana, Kenya, Malawi, Namibia, Sierra

Leone, South Africa, and Uganda. Based on the selected timeframe (2010 to 2020, involving 11 time periods), 11 cases were identified for each country leading to 77 cases in total. Although this is a large sample for QCA, it supports diversity in the analysis (Stevens, 2016).

The two outcomes that are considered are the presence of a fee-free policy and the absence of a fee-free policy. The presence of a fee-free policy is observed in 48 cases, while 29 cases are identified with the absence of a fee-free policy. The presence of a fee-free policy in a country can be holistic or partial. A holistic fee-free policy means that the government, through its policy, absorbs all forms of direct fees at the high school level throughout the country for all students. A partial fee-free policy is defined as when some direct fees – for example, tuition fees and registration fees – are absorbed, or fees for some students within a defined geographical area or of a certain economic status are absorbed. This may be done through several means, such as the 'big bang' approach, the phasing in approach, targeting, or means-testing (Morgan et al., 2014).

On theoretical grounds, five conditions are presented and included in the study. I used the measure of regime type from the Economic Intelligence Unit (EIU) Democracy Index. The EIU Democracy Index measures the level of democracy in 167 countries, including all selected countries in this study. The EIU Democracy Index is selected over other measures of regime type (such as the Freedom House or Polity IV score) because the Democracy Index aggregates all the 60 indicators used to measure the level of democracy and assigns a numerical score ranging from 0 to 10 to each country to provide a broader outlook on the level of democracy in each country. Countries with an index of 8.01-10 are considered "full democracies"; countries scoring 6.01-8 are considered "flawed democracies"; countries with an index of 4.01-6 are classified as "hybrid" regimes, and countries with an index of 0-4 are considered "authoritarian" regimes.

Data on electoral competition is taken from national sources and political parties' documents. Electoral competition is operationalised as political campaign promises by a political party to offer fee-free education at the high school level. These electoral campaign promises are proposed to the electorates by the political parties contesting the national elections. From the cases selected as the units of analysis, I identified if the political party in government promised to adopt a fee-free policy at the high school level when voted into power. This is perceived as part of electoral competition because

political parties wish to obtain votes and therefore need to promise free education to gain a political advantage over their political competitors. Data on the ideological lineage of the political party in power is taken from political party documents and their websites as well as knowledge about international ideological groupings, including the International Democrat Union, Democratic Union of Africa, and Socialist International. Information on the data concerning the countries, political parties, the political campaign for fee-free education, the year(s) the party has been in government, and political ideology are provided in Table 2A1 in the Appendix.

Data on economic conditions used World Bank Development Indicators, including both Gross Domestic Product (GDP) Per Capita in current US Dollars, and Gross Domestic Product (GDP) Per Capita growth (World Bank, 2021). The two matrixes measure national income as well as growth in income, respectively, denoting the wealth of a country. I use data for the proportion of lower secondary school enrolment as a measure of the social context. People attending lower secondary education are the intake for high schools. This means if a country has a large number of people attending lower secondary it is more probable that government will need to consider fee-free education at the high school level. This data is taken from the United Nations Educational Scientific and Cultural Organisation (UNESCO) Institute of Statistics (UIS) (UNESCO Institute for Statistics, 2021). I did not use lower secondary school completion rates because this data is not available for some countries. For enrolment, some values are missing for some of the observed years for some countries. As a result, the missing data was input using the linear interpolation method before any other form of calibration. The distribution of the raw dataset is displayed in Table 2.1.

Table 2.1: Description of raw data for conditions and outcome

	n	Minimum	Median	Maximum
Fee-free policy	77	0.00	1.00	2.00
Electoral competition	77	0.00	1.00	1.00
Ideological lineage	77	0.00	1.00	1.00
Democracy	77	4.51	5.66	7.90
GDP Per Capita	77	315.8	1315.8	8007.5
GDP Per capital growth	77	-22.31	1.89	18.05
Lower secondary school enrolment	77	21.52	85.06	114.03

Source: Author's construction

2.3.2 Data calibration

Calibration of the data was carried out using the "QCA" package version 4.1.0 in the R statistical software environment (Dusa, 2019). Calibration enables cases to be assigned fuzzy-set scores. This means that we consider the conditions within each case, and determine if they are qualitatively high or low (Ragin, 2008). For example, if Namibia has a raw democracy index value (based on the EIU measurement) of 0.64 in 2010, should we consider that case (N10 = Namibia in 2010) as a strong democracy or weak democracy? Here, there is a need to specify three thresholds. Full membership of the set may be specified (with a score of "1"), full exclusion from the set (with a score of "0"), and the crossover point of maximum ambiguity (with a score of "0.5") – this approach helps specify if a case is classified as inside or outside of the set of cases with that condition.

For the outcomes of interest, I used the indirect calibration method. Holistic fee-free education (with a raw value of "2") was assigned a fuzzy set score of "1" (i.e., fully within the set for fee-free policy). Partial fee-free education (with a raw value of "1") was assigned a fuzzy set score of 0.75 (i.e., more within the set of fee-free policy than outside). Calibrating the fuzzy set score of a partial fee-free policy of above 0.5 (i.e., maximum ambiguity) is considered appropriate since partial fee-free policies, even when they do not cover everyone in the country or do not cover all cost items, are considered to be significant factors in increasing the rate of enrolment (Asante, 2022; Bray, 2007). The absence of a fee-free policy was assigned a fuzzy set score of "0".

Electoral Competition (ELC) was defined in the following qualitative way. Either the political party in power promised fee-free high school education and was considered as 'fully in the set' with a score of "1" or did not and was thus "fully out of the set" with a score of "0". Parties with a left-wing political ideology (LEFT) were considered as 'fully in the set' with a score of "1", while right-wing parties were 'fully out of the set' with a score of '0'. There is no degree of membership for these two conditions.

The three thresholds for the other four conditions were determined by knowledge of the qualitative difference about the condition. The calibration of a High Level of Democracy (DEM) using the EIU Democracy Index data was guided by the project threshold for classifying countries. The full inclusion threshold was taken from the democracy index which classifies countries with an index of 10 as being "full democracies". Countries classified as not being democracies ("authoritarian regimes") were calibrated as being fully outside the set of a high level of democracy. The crossover point for maximum ambiguity was set at 6.01, thus the beginning of the index for "flawed democracy" status. Countries with "flawed democracies" are considered more "in" than "out" because, according to the EIU democracy index, they have free and fair elections and basic civil liberties are respected. Again, since countries in SSA hardly qualify as being "full democracies", including 'flawed democracy' scores limits the problem of skewness in the calibrated data.

The calibration of Lower Secondary School Enrolment (LSE), gross domestic product per capita (GDP), and gross domestic product per capita growth (GDG) relied on the everyday meaning of "high" or "low" in the context of SSA. Therefore, the procedure for the calibration of fuzzy set scores for these conditions was determined by inspecting the distribution of the data. A breakpoint in the distribution (a value with no observation) that was near the median was chosen as the point of maximum ambiguity. The threshold for full set inclusion and exclusion was set at breakpoints near the maximum and minimum values at each end of the distribution, respectively. For GDG, the exclusion score was set at "0," which represents no growth for the observed year. In the analysis, Economic Condition (ECO) is denoted by GDP per capita OR GDP per capita growth (that is, the union of the two sets). The chosen calibration thresholds for all conditions are displayed in Table 2.2. The presumed asymmetrical relations between the conditions and the outcomes of interest are illustrated in Figure 2.1.

Table 2.2: Fuzzy set calibration of conditions

Condition set	Indicators	Calibrated Threshold		
		Fully out	Maximum ambiguity	Fully in
Electoral competition (ELC)	Party in government promised fee-free education	0	-	1
Ideological lineage (LEFT)	Party in government is Leftist	0	-	1
High Democracy (DEM)	Democracy Index score from EIU	0.00	6.01	10.00
High GDP Per Capita (GDP)	The total gross domestic product of the year of a country per capita	300	1300	8000
High GDP per capita growth (GPG)	The gross domestic product growth in a year	0	1.8	5
High economy (ECO)	Union of GDP OR GDG			
High Lower secondary school enrolment (LSE)	The rate of enrolment at the lower secondary level in a year	10	80	100

Source: Author's construction

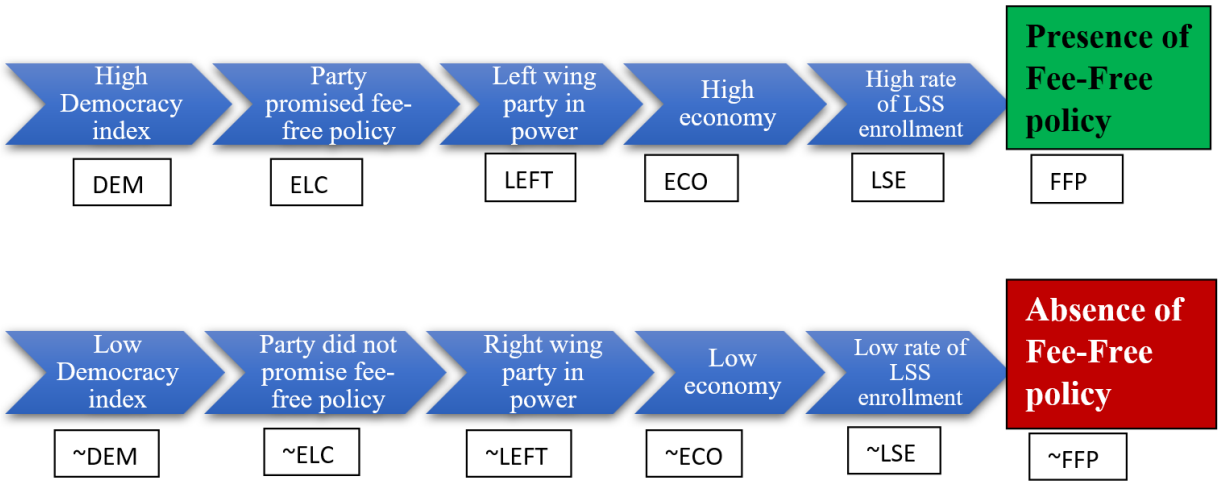

Figure 2.1: Concept map illustrating conditions and outcomes of interest

Source: Author's construction

2.4 Results

2.4.1 Necessity Analysis

I present the necessary conditions for the two outcomes in Table 2.3. Theoretically, all conditions are negated using the traditional negation tilde symbol (~) that precedes the condition in the analysis for the outcome "Absence of fee-free policy" (~FFP). Since a consistency threshold of at least 0.90 is required for necessary conditions (C. Q. Schneider & Wagemann, 2012), Table 2.3 shows that electoral competition (ELC), as represented by a political party in power that promised fee-free policy, is the only set that is a necessary condition for the outcome "Presence of fee-free policy" (FFP). With coverage of 0.71 and relevance of 0.61, the condition may be trivial in producing the outcome. This means it may only be sufficient to produce the outcome in combination with other condition(s). With this insight, we expect to see this condition in solution(s) sufficient for enabling fee-free policies. The negation of electoral competition (~ELC) has a consistency score of 0.61 but high coverage and a relevance score of "1", showing that the condition is less trivial in relation to causing the absence of fee-free policy. In summary, the analysis of the necessary conditions indicates the importance of electoral competition in fee-fee policies.

Table 2.3: Analysis of necessary conditions for the two outcomes "presence of fee-free policy" (FFP) and "absence of fee-free policy" (~FFP)

Conditions	Outcome			Conditions	Outcome		
	FFP				~FFP		
	Consistency	Coverage	Relevance		Consistency	Coverage	Relevance
DEM	0.65	0.65	0.74	~DEM	0.65	0.66	0.74
ELC	1	0.71	0.61	~ELC	0.61	1	1
LEFT	0.81	0.44	0.17	~LEFT	0.02	0.12	0.90
ECO	0.78	0.56	0.51	~ECO	0.41	0.66	0.86
LSE	0.73	0.63	0.67	~LSE	0.59	0.69	0.81

Notes: DEM=High Democracy, ELC=Political party in power promised fee-free education, LEFT=Political party in power is leftist, ECO=High economy, LSE=High lower secondary school enrolment rate ~DEM=Low Democracy, ~ELC=Political party in power did not promise fee-free education, ~LEFT=Political party in power is rightist, ~ECO=Low economy, ~LSE=Low lower secondary school enrolment rate

Source: Author's construction

2.4.2 Sufficiency Analysis

Regarding the analysis of sufficient conditions, I began by generating the truth table. In creating the truth table, a threshold for the value of consistency scores is defined for the conditions to be examined. In this study, I choose a consistency threshold of sufficiency of 0.76. There are two main methodological and practical reasons for selecting this inclusive score as the parameter of fit. One, following Schneider and Wagemann (2012, p. 127), values below 0.75 (the lower bound of the acceptable consistency level) are problematic as they have consequences for the subsequent analysis. Two, with the simultaneous subset relations (PRI) set at the acceptable level of 0.51, this sufficiency inclusive score ensures that all truth table rows with a case or cases belong to one outcome of interest. To obtain the solution term, the software minimises the truth table using Boolean algebra and identifies the combinations of conditions that are sufficient to produce one of the two outcomes of interest.

The creation of the truth table allows for an examination of the distribution of the data concerning the potential theoretical configurations across cases vis-à-vis the outcomes in question (Ragin, 2014). Cases identified to have the same profile of causal conditions are grouped for assessment in relation to whether they agree on the outcome. Conditions identified to have a limited empirical impact on the outcome are eliminated to reduce the combination of properties. With five conditions, there are 32 logically possible configurations. Thirteen (13) of the configurations are present in the cases in the sample for the outcomes (eight configurations meet the threshold for the parameters of fit for the presence of fee-free policy, while five configurations meet the threshold for the parameters of fit for the absence of fee-free policy). This means nineteen (19) configurations are associated with no empirical observations (i.e., logical reminders). Following Stevens's (2016) approach, rows that meet the parameters of fit for each of the two outcomes are presented and numbered in Table 2.4 for ease of reference.

Table 2.4: Truth table for the analysis of sufficient conditions for the outcomes "Presence of Fee-free policy" (FFP) and the "absence of fee-free policy" (~FFP)

Row	Configuration of fuzzy set membership					Consistency for FFP	Cases in each configuration
	DEM	ELC	LEFT	ECO	LSE		
1	0	1	0	0	0	**1.00**	M20, S18
2	0	1	0	0	1	**1.00**	S20
3	0	1	0	1	1	**1.00**	S19
4	1	1	0	1	1	**1.00**	G17, G18, G19, G20
5	0	1	1	1	1	**0.90**	K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20
6	0	1	1	0	0	**0.90**	M18, U12, U13, U14, U15, U16, U17, U20
7	1	1	1	1	1	**0.89**	G13, G14, G15, G16, N15, N16, N17, N18, N19, N20, SA10, SA11, SA12, SA13, SA14, SA15, SA16, SA17, SA18, SA19, SA20
8	0	1	1	1	0	**0.76**	M19, U10, U11, U18, U19
	Configuration of fuzzy set membership					Consistency for ~FFP	Cases in each configuration
	~DEM	~ELC	~LEFT	~ECO	~LSE		
9	0	1	0	0	0	*1.00*	N10, N11, N12, N13, N14
10	0	1	0	0	1	*1.00*	G10, G11, G12
11	0	1	0	1	1	*1.00*	M12
12	1	1	0	0	1	*1.00*	M10, M11, M13, M14, S10, S11, S12, S13, S14, S16, S17
13	1	1	0	1	1	*1.00*	M15, M16, M17, S15

Notes: DEM=High Democracy, ELC=Political party in power promised fee-free education, LEFT=Political party in power is leftist, ECO=High economy, LSE=High lower secondary school enrolment rate. Conditions with tilde (~) notation are the negation of the condition. M=Malawi, S=Sierra Leone, G=Ghana, K=Kenya, M=Malawi, N=Namibia, SA=South Africa. The numbers attached to the letters are the observed year. 0=Condition is absent, 1=Condition is present.

From the truth table (Table 2.4) we can observe the presence of electoral competition in all rows assessed as sufficient to generate fee-free policy (see rows 1-8 in Table 2.4) and several rows indicate a high lower secondary school enrolment rate (see rows 2-5 and 7 in Table 2.4). We can find the absence of electoral competition in all rows that are consistent with the absence of a fee-free policy (see rows 9-14 in Table 2.4). In addition, a low secondary school enrolment rate is present in several consistency rows that are associated with the absence of fee-free policies (see rows 10-14 in Table 2.4). In Row 1, the presence of electoral competition alone is adequate to generate fee-free policy, while its absence may cause the absence of fee-free policy in Row 9. The truth table results are consistent with the analysis of the necessary conditions.

To overcome the problem of limited diversity in minimising the truth table in the analysis of sufficient conditions (i.e., the presence of logical remainders), I use the 'standard analysis procedure' strategy suggested by Ragin (2008). This strategy involves producing the complex solution (without assumptions about logical remainders), the intermediate solution (only easy counterfactuals), and the most parsimonious solution (all simplifying assumptions). The "complex solution" uses all configurations that are present in the sampled cases of the two outcomes. It only eliminates redundant conditions. In the 'intermediate solution', logical remainder configurations are treated as if they affect the outcomes, as we would expect them to be based on theoretical expectations (thus enabling the use of previously generated knowledge in the analysis). The incorporation of the "logical reminders" configuration in the Boolean minimisation produces the "parsimonious solution" (Ragin, 2008).

In interpreting fsQCA, the intermediate solutions are those most likely to provide valid information about the potential causes of the outcome (Ragin, 2008). In this study, I include all conditions in the theoretical directional expectations of the solution for the analysis of the presence of fee-free policy (FFP). The negation of all conditions is included in the expectation of the absence of fee-free policy (~FFP). The intermediate solutions for the two outcomes are displayed in Table 2.5. In line with the suggestion of Schneider and Wagemann (2012), the full formulas for the complex solutions and the parsimonious solution are provided in Table 2B1 in the Appendix. Besides the score for consistency, the coverage of the solutions is also provided. The coverage measure provides information regarding the relative importance of each path; that is, the proportion of the outcome covered by the solution (Ragin, 2008).

Table 2.5: Intermediate Solution of sufficient conditions for the outcomes 'Presence of fee-free policy' (FFP) and 'Absence of fee-free policy' (~FFP)

a. Presence of fee-free policy (FFP)

Configuration	Consistency	Raw Coverage	Unique Coverage	Cases
ELC*~ECO	0.90	0.39	0.16	M20, S18, S20, M18, U12, U13, U14, U15, U16, U17, U20
+				
ELC*LSE	0.81	0.73	0.49	S20, S19, K10, K11, K12, K13, K14, K15, K16, K17, K18, K19, K20; G17, G18, G19, G20; **G13, G14,** G15, G16, **N15,** N16, N17, N18, N19, N20, SA10, SA11, SA12, SA13, SA14, SA15, SA16, SA17, SA18, SA19, SA20
Solution Consistency	0.82			
Solution Coverage	0.89			

b. Absence of fee-free policy (~FFP)

Configuration	Consistency	Coverage	Cases
~ELC	1.00	0.61	N10, N11, N12, N13, N14; G10, G11, G12, M12, M10, S10, S11, S12, S13, S14, S16, M11, M15, M16, M17, S15, S17; M13, M14

Notes: * means logical AND, + means logical OR. Conditions with tilde (~) notation indicate the negation of the condition (<0.5). Cases in bold fonts are deviant cases.

The intermediate solution in Table 2.5 suggests that the adoption of a fee-free policy at the high school level is indeed configurational. The configurations uncover some surprises concerning theoretical expectations. The presence of electoral competition (i.e., the political party in power promised fee-free policy during the electoral campaign) (ELC) *AND* Low level of economy (~ECO) *OR* the Presence of electoral competition (ELC) *AND* High level of lower secondary school enrolment rate (LSE) are sufficient to cause fee-free policy at the high school level. The two

configurations – each containing the presence of electoral competition – with total coverage of 89% and a consistency score of 82% are usually sufficient to cause fee-free policy. The unique coverage measure provides information regarding the relative importance exclusive to each path – that is, the proportion of the outcome covered exclusively by the path (Ragin, 2008). Of the total solution coverage of 89%, 16% is due solely to the first path (ELC*~ECO) while the second path (ELC*LSE) uniquely covers 49%. This means that although all the two paths are important for causing fee-free policy, the second path is more important than the first. Turning to the absence of fee-free policies, the absence of electoral competition (~ELC) is sufficient to cause the absence of fee-free policy with total coverage of 61%.

2.5 Robustness Checks and Discussions

When QCA is applied to a handful of cases, it is always advisable to apply a systematic robustness check in the analysis (Oana et al., 2021). In this study, I used two of the main ways of testing how robust the initial solutions that were obtained are, and their effects on my conclusions. First, I conducted qualitative discussions of the solution terms and applied different cases in this discussion to reveal whether the observed configurations indeed represent the potential causal relationships (Emmenegger, Kvist, & Skaaning, 2013). Second, since QCA is a case-based method (i.e., is case sensitive), I conducted a sensitivity test by considering measurement error and changes in the parameter of fit; that is, the consistency inclusion score.

2.5.1 Application of fsQCA findings to cases

The analysis helps to explain differences in the presence or absence of fee-free policies between cases in countries in SSA. In Ghana, the idea of a fee-free policy at the high school level was put on the national agenda in the 2008 general elections by the then-presidential candidate of the ruling right party, the New Patriotic Party (NPP), Mr Akuffo-Addo (Ayee, 2016). After the party lost the elections to the then-opposition party, National Democratic Congress (NDC), which is a left-wing party, the idea of fee-free policy at the high school level did not materialise in the country during their administration (2009-2012). NDC did not promise any form of fee-free policy in the 2008 elections. In 2011 the country recorded high GDP per capita growth of 11% and Real GDP growth of 14.0% because of the discovery and mass production of oil (Fosu, 2017), but a fee-free policy was not implemented in 2012 either, although there was

economic growth of 6.7%. The country's democracy index in these periods was "quite satisfactory" at 6.02 (flawed democracy). A plausible explanation for the absence of a fee-free policy in these years may be the lack of promotion of a fee-free policy by the political party in power (albeit left-wing) during the 2008 electoral campaign period.

In the 2012 general elections, both political parties (NDC and NPP) promised fee-free policies at the high school level. NDC, led by Mr John Dramani Mahama, won the elections. During their administration in 2013 (associated with GDP per capita of US$2,361 and growth of 4.8%), a fee-free policy was not implemented, or in 2014. These two cases and the case of Namibia in 2015 are deviant cases (G13, G14, and N15 in Table 2.5) because a fee-free policy was promised *and* there was a high level of lower secondary school enrolment, yet the outcome did not materialise. The outcome, however, was observed in subsequent years. In Ghana, the government adopted a partial fee-free policy in 2015 when the country's economy grew by -0.17%, with a GDP per capita of US$1,706. Electoral competition and the social context may explain the adoption of the partial fee-free policy in 2015, which is reflected in the configurational paths. The campaign promise made in the 2012 general elections needed to be fulfiled since the next general election in 2016 was approaching and fee-free education was high on the national agenda because NPP had maintained their fee-free policy campaign message. As argued by Dragu and Fan (2016), when a party (NDC) envisages that an opponent (NPP) is gaining support for a popular issue during an election, they are incentivised to advertise the same issue. Since the increase in enrolment at the lower secondary school level was increasing the demand for high school education, the ruling party (NDC) needed to act on their promise to show their commitment to fee-free education to build political capital, hence they introduced a partial fee-free policy. According to critics, the outcome of this is reflected in poor pre-policy planning, inadequate stakeholder consultation, and the lack of the timely release of funds for the operationalisation of the policy (Ansah, 2019; Opoku & Adogla-Besaa, 2017). These results do not conflict with what has been presented so far in the literature about fee-free policies at the primary level in SSA. In Malawi, Kenya, and Uganda, "the adoption of universal free primary education was triggered by political demand rather than by rational planning processes" (Avenstrup et al., 2004, p. 9).

NPP won the 2016 elections. In 2017, GDP per capita in Ghana (US$2,021) was less than in 2013 (US$2,361). However, after the party assumed power in January

2017, the government immediately introduced a holistic fee-free policy in September 2017, in contrast to the assumptions of the traditional partisan theory of policy outcome and economy. Cases from Sierra Leone further challenge traditional partisan theory concerning policy outcomes. In 2017, Mr Maada Bio, the then-presidential candidate for Sierra Leone Peoples Party (SLPP), a right-wing party, promised to adopt a fee-free policy if voted into power. After winning power in 2018, the government adopted a partial fee-free policy. As argued by Tavits and Letki (2009), right-wing parties often want to appeal to the general populace, broaden their support base, and avoid the claim that they belong to the elite class, hence tend to expand social policies. Left-wing parties, due to their committed support base, may be reluctant to adopt expansionary social policies.

Cases from Uganda are also interesting. The country has a relatively low level of democracy, weak economy, and low level of lower secondary school enrolment, yet there has been a partial fee-free policy at the high school level since 2012. Uganda is one of the pioneers of fee-free primary education in SSA. Since 2001, President Yoweri Mossuveni's National Resistance Movement has promised fee-free education at all elections (BBC, 2001). Although this policy is not producing the expected higher level of enrolment at the lower secondary school level, the policy was extended to the upper secondary school level in 2012. Apart from the influence of electoral competition in producing fee-free policies, the rationale for extending fee-free policy to the upper secondary level in Uganda requires case-specific explanation. Complicating the explanation is the fact that political opponents have little opportunity to obtain positions of political power as elections are mostly neither free nor fair, and opposition political parties are tyrannically repressed (Economist Intelligence Unit, 2021).

Based on the above analysis, the claim that the presence of high-level democracies is associated with fee-free policies in SSA may be misleading. Fee-free policies were introduced in Kenya, Malawi, and Sierra Leone when the democracy index was assessed at less than 6. A case in Malawi (M12) with the outcome "Absence of fee-free policy" was associated with a democracy index of above 6.01. In addition, six cases from Namibia (N10-N15) with the outcome "Absence of fee-free policy" were associated with an index of above 6.01. Cases from South Africa with the highest democracy index of all cases (average of 7.5) are associated with only a partial fee-free policy. However, since electoral competition is necessary to deliver fee-free

policies, strengthening core aspects of democracy such as free and fair elections, which demand accountability from political leaders, can be an important way of increasing the prevalence of fee-free policies in the region to increase enrolment. Promising fee-free policies during elections and getting them implemented incentivises politicians during electoral campaigns as it assists them to obtain political power.

2.5.2 Measurement error and sensitivity test

Measurement errors are an inevitable part of such analyses. For example, in Kenya, the identification of political parties with ideologies is problematic. Political parties form coalitions to contest national elections. These coalitions are not based on party ideology and political parties are not identified with international ideological groupings. For example, The National Alliance (on which ticket the current president Uhuru Kenyatta won political power in 2013) was merged into the Jubilee Party, on which ticket the same president won power in 2017. The mélange of party ideologies means it is analytically unreasonable to associate a ruling party with the Left or Right. All cases from Kenya have either partial fee-free policy or holistic fee-free policy as the outcome. Although the results presented in the initial analysis define all political parties in Kenya as left-wing parties, the presence of a left party is not necessary and not present in any solution term to cause the presence of fee-free policy. Further analyses which assigned all cases in Kenya to the Right were conducted. The solutions obtained for the presence of a fee-free policy are the same as those presented in the initial solutions. For the absence of fee-free policy, the presence of electoral competition (ELC) *OR* Low level of democracy (~DEM) *AND* High level of economy (ECO) *AND* Low level of lower secondary school enrolment (~LSE) are sufficient to cause the outcome. This further shows the importance of elections and lower secondary school in fee-free policy.

For the sensitivity test, I selected the high consistency inclusive score of 0.9, as recommended by Thiem and Duşa, (2013). This meant that I disregarded the idea of making all truth table rows with a case or cases belong to one of the outcomes of interest. I present the intermediate solution for this analysis in Table 2.6.

Table 2.6: Intermediate solution of sufficient conditions for the outcome "Presence of fee-free policy" (FFP) and "Absence of see-free policy" (~FFP) at a consistency score of 0.9

a. Presence of fee-free policy (FFP)

Configuration	Consistency	Coverage	Cases
ELC*~LEFT	0.87	0.18	M20, S18; S20; S19; G17, G18, G19, G20

b. Absence of fee-free policy (~FFP)

Configuration	Consistency	Coverage	Cases
~ELC	1.00	0.61	N10, N11, N12, N13, N14; G10, G11, G12; M12; M10, S10, S11, S12, S13, S14, S16; M11, M15, M16, M17, S15, S17; M13, M14

Notes: * means logical AND, Conditions with tilde (~) notation indicate the negation of the condition (<0.5).

The solutions of the robustness analysis associated with a high inclusive score show that the presence of electoral competition (ELC) AND non-left party (~LEFT) are sufficient for fee-free education. This means that when a rightist party promises to adopt a fee-free policy, they are more likely to deliver this when in power than a left-wing party. The cases in this configuration are consistent since all parties that adopted fee-free policies in their countries in these years are right-wing. Again, a high democracy index and a strong economy do not appear in any solution path. As expected, the absence of electoral competition (~ELC) is enough to cause the absence of a fee-free policy.

2.6 Conclusions

Overall, four main conclusions can be drawn from the analysis.

One, adopting a fee-free policy may increase political capital, thus creating the incentive for political parties to promise this during electoral campaigns. The latter are mindful of the need to implement such a policy immediately or later after winning political power. This is more liable to happen in a social context where many youths

want access to high school education. The World Bank (in a report from 2009 on abolishing school fees in SSA) recommended that "to maintain the present growth momentum, it is necessary to have determined political leadership, resulting in targeted assistance to address both demand and supply factors hampering access and school retention for these children" (World Bank & UNICEF, 2009, p. 9). Electoral dynamics and electoral competition have always played a significant role in social policies in SSA and in less well-developed countries (Grebe, 2015; Ha, 2015; Keefer & Khemani, 2005). In relation to fee-free education, politics and political leadership are key. This is not surprising, because personalities, including elected officials, have always played a significant role in the interaction between politics and administration concerning which policies should be implemented and when in the public domain (Young et al., 2020). The effect of politics on the administration of (social) policies cannot be overemphasised.

The presence of a high rate of lower secondary school enrolment *and* electoral competition as a significant potential cause of fee-free policy at the high school level is not surprising. This is because as the number of people enrolling in lower levels of education increase, the demand for high school education also rises. This increases the political capital associated with promising to adopt fee-free policies. From this conclusion, the next critical question for studies to address is how well are fee-free policies at the high school level delivered when they are implemented? This assessment must be conducted through investigating policy implementation frameworks to identify the quality and the relevance of education that is delivered. This is also an important objective since we can observe the adoption of fee-free policies in configurations involving a declining economy.

Two, in contrast to the suppositions of the traditional partisan theory of policy outcome, expansionary social policy is not necessarily the preserve of leftist parties in SSA. In the observed cases, few identifiable right-wing parties have governed their respective countries. Notwithstanding this, these right-wing parties have either delivered holistic fee-free policy or partial fee-free policy, while some left-wing parties have not. Even in Kenya, where ideologies are less important for political parties and in national elections, we observe the presence of partial and holistic fee-free policy. Although the left-wing governments in developing countries may expand education (Ha, 2015), so may right-wing ones. Although these conclusions suggest that ideological leaning has only a minor role in expansionary social policy (Altman

& Castiglioni, 2020), it is also important to consider the role of neoliberalism in SSA countries from the 1990s to the 2000s (during which period there was a transition from dictatorial regimes and state-controlled enterprises to market economies characterised by fiscal austerity and the privatisation of public sector services) (Hujo & Bangura, 2020). During this period in SSA, the majority of the ruling political parties were left-wing (see (Narsiah, 2002; Pitcher, 2020)).

Neoliberal adjustment and institutionalisation have impacts on party systems organised around left-wing cleavages (A. Schneider, 2020). Neoliberal stabilisation and structural adjustment policies may curtail left-wing parties – right from their inception – from adopting policies such as fee-free education, although this objective may have already been integrated into the contemporary programs of political parties in power. During the former period of dramatically contracting fiscal space, adopting policies such as fee-free education was not possible. Neoliberal conditions and tendencies may not have permitted political parties to pursue programs that were in line with their ideological orientation. This was also the case in post-communist European countries – as argued by Tavits and Letki (2009). Mass support for left-wing parties afforded them the opportunity to tighten budgets and avoid spending on social policies, whereas right-wing parties had the incentive and were compelled to spend more to alleviate economic hardship during the transition to market economy to garner popular support.

Three, since electoral competition is an important condition of the adoption and implementation of fee-free policies (its absence is sufficient to cause the absence of fee-free policy), there is a need to support and sustain representative democracy to promote access to high school education (to achieve SDG 4.1). Although (competitive) elections are not the only sufficient condition nor an exclusive domain of democracy, they are nevertheless a necessary condition and an intrinsic democratic component of representative democracy (Lindberg, 2004; Mackie, 2009). The quality of democracy can be viewed through the quality of competitive elections, and in SSA it is believed that the quality of democracy tends to improve with continuous (competitive) multiparty elections (Lindberg, 2004, p. 86). Electoral competition may be hampered in an environment where democracy is stifled.

Finally, rather than focusing on thick concepts such as regime type or the ideology of a regime to identify which is associated with a broader range of social policy, there is a need to dissect these broader concepts and focus on narrower ones

such as pressure politics, elections, representation, civil society, and population growth to explain social policy delivery.

2.6.1 Limitations of the study

Although fsQCA is appropriate for analysing a relatively large number of cases and has the benefit of enabling the evaluation of specific cases within a set of selected cases, it has its limitations. Some of these are common to the mainstream regression approaches used in this field, such as sensitivity to omitted condition/variable bias, and ambiguity about causation. The power of any study is limited if it omits any condition that could change its outcome. In fsQCA it is advised to keep conditions to a minimum. If other concepts that explain social policy are included, such as the strength of civil society, the level of pressure politics, or forms of representation – i.e. narrower democratic concepts, for example – this would strengthen the analysis of whether such factors aside from electoral competition may combine to produce fee-free policies. Other studies may investigate this limitation. In addition, the possibility of the spurious conflation of configurations and outcomes remains. While QCA analysis shows which configurations are empirically consistent with being necessary and sufficient to cause outcomes, it does not prove that the latter are the causes of such outcomes. This and the cross-national nature of the analysis are reasons why the present article cannot claim that it definitively identifies the causes of fee-free policies.

CHAPTER 3: THE EFFECTS OF COST ELIMINATION ON SECONDARY SCHOOL ENROLMENT IN SUB-SAHARAN AFRICA

Abstract

Following the widespread adoption and implementation of Education for All (EFA) at the World Education Forum held at Dakar as part of the Millennium Development Goals in 2000, school enrolment at the basic level of education has increased in Sub-Saharan Africa. With the region having the lowest rate of youth enrolled in upper secondary schools in the world, countries are paying considerable attention to upper secondary education, which is argued to be a significant component of human capital formation and for meeting Sustainable Development Goal 4. However, unlike for basic level education, academic research on the factors that determine upper secondary school enrolment in the region is limited. Against this backdrop, the study investigates the effects of cost elimination on upper secondary school enrolment in Sub-Saharan Africa using macro-level panel data analysis of countries from 2003 to 2018. The results show that cost elimination, as a demand-side intervention, has a significant positive effect on upper secondary school enrolment. However, amid a high level of poverty rate, the magnitude of the positive effects of cost elimination tends to reduce. This shows that along with demand-side interventions that reduce direct costs to schooling, policies must focus on reducing the level of poverty for cost elimination to become effective in increasing school enrolment.

Keywords: *Secondary education; enrolment rate; fee-free education; cost elimination; poverty; Sub-Saharan Africa*

3.1 Introduction

Sub-Saharan Africa (SSA) has the lowest rate of upper secondary education enrolment across the world.[5] This hinders these countries' achievement of the Sustainable Development Goal (SDG) 4.1 of providing primary and secondary education for all by the year 2030. Despite less than 10 years left for the deadline, on average, only 34% of the youth of upper secondary schooling age in the region attend school. Upper

[5] Upper secondary education has often been referred to as "senior secondary school," "senior high school" or "high school." I will use these terms interchangeably throughout the study. The theoretical entrance age and number of years in school used to represent this level of education remain unique to each country. See supplementary material for details on this for each country in SSA.

secondary education is a key determinant of human capital formation (Becker, 1993). Therefore, in contemporary SSA, there has been a widespread endorsement of the international protocols for Education for All (EFA) adopted at the World Education Forum at Dakar in 2000. Consequently, access to basic education, that is, primary and lower secondary education, has improved (Little & Lewin, 2011). However, transition into the upper secondary level is still low. The International Standard Classification of Education (ISCED) classifies upper secondary education as level three in the educational gradation (ISCED: 3); with a theoretical entry age of 14 to 16 and completion age of 17 to 19 (UNESCO Institute for Statistics, 2012). Notwithstanding the low enrolment rates in high schools in the region generally, there are also enormous disparities between the countries. For example, in 2018, Malawi had an enrolment rate of 23% and Burkina Faso had 18%, while for the same year Cape Verde, Ghana, and Mauritius had 71%, 56%, and 82%, respectively (UNESCO Institute for Statistics [UIS], 2021). These disparities make it difficult to identify conditions that apply uniformly in determining school enrolment or participation in the region at the upper secondary level.

Nevertheless, research suggests that school enrolment, that is access to schooling, is dependent on government policies or interventions (Connelly & Zheng, 2003) and other factors theorised under demand and supply frameworks (Hunt, 2008). Government policies may be in the form of compulsory school leaving age, minimum dropout age, and funding through provisions such as subsidised education. Studies have analysed the effects of government policies, especially cost elimination policies, (funding) popularly called fee-free education, on individuals' decisions to enrol in school. While some argue that eliminating fees increases school enrolment (Al-Samarrai & Zaman, 2007; Blimpo et al., 2019; Duflo et al., 2017; Garlick, 2013; Godda, 2018; Morgan et al., 2014; Psacharopoulos & Arriagada, 1987), others argue that such policies have no significant positive effect on enrolment (Branson & Lam, 2017; Ponce & Loayza, 2012). Regarding the demand and supply obstacles, studies argue that although several factors such as unemployment, poverty levels, income, availability of school, and school quality affect access, poverty (as a demand-side obstacle) is the major factor causing low enrolment rate in SSA, as poverty causes parents to not be able to afford the cost of education (Bray, 2007; World Bank, 2018).

This study aims to investigate and extend our understanding of the effects of cost elimination on upper secondary school enrolment in SSA using macro-level data of

countries. Recently, many countries in SSA have been implementing cost elimination policies at the upper secondary school level, as an extension of their focus on basic education. This presents an opportunity to observe the effects of cost elimination policies at the upper secondary level on enrolment rates. Additionally, the paper studies the rate of poverty and examines its moderating role on the cost elimination-enrolment nexus at the upper secondary level. I argue that cost elimination as a demand-side intervention by governments increases upper secondary school enrolment, but that cost elimination has a minimal positive effect on enrolment due to a high rate of poverty by using a large-N research design panel data analysis of SSA countries from 2003 to 2018[6], and synthesising the results of previous studies. The rest of the paper is structured as follows. The next section reviews the existing literature to expose the gap that the present research seeks to fill. The "Data and methods" section discusses the research methods, chosen variables and data. Following on from that is the "Results" section, while the "Discussion and conclusions" section is devoted to discussions and implications for policy and further research avenues.

3.2 Literature

3.2.1 School enrolment – theoretical arguments

An empirical analysis of the reasons for school enrolment needs to be adequately examined and linked to theories which view expenditure on education as an investment rather than as consumption expenditure. The investment may be in the form of individual expenditure or, more importantly, government funding through policies. Additionally, the analysis must take into account the demand and supply obstacles of school participation to frame the barriers to school enrolment. This study situates the theoretical discussions on the need to invest in education and policies such as cost elimination in the human capital theory.

3.2.2 Human capital and school enrolment

At the individual and national levels, Becker (1993) suggests that the social and economic returns on high school education encourage people to enrol and countries to invest. The central proposition of the human capital theory, with regards to education,

[6] This paper is part of a broader PhD thesis to be defended later. This timeframe has been chosen to conform to the timeframe used for the analysis by other papers in this project.

is that people with a higher level of education are more productive due to their increase in knowledge and skills. Becker (1993) argues that, in the US, "the growth in high-school education….mostly due to compulsory school laws is more directly related to anticipated private and social real rates of returns" and that people without at least a high school education are "obsolete" to national economies (Becker, 1993, pp. 218–219). Although access to education is only one of the facets of schooling (Stromquist, 2012), it is nevertheless a prerequisite, since other aspects such as quality, relevance, and schooling experience depend on enrolment. Empirical studies in SSA suggest that human capital formation through the increase in government expenditure in education is a key variable in achieving SDGs (Babasanya, 2018). While studying the determinants that sustain human capital, including institutional quality and infrastructure development in 33 Africa countries, Shuaibu and Oladayo (2016) demonstrated that investment in education is a key variable. Despite their findings, the aforementioned studies lack a clear plan on how these investments in education should be made, especially in high school education.

The slow growth of developing countries is often attributed to low expenditure in education and Africa has consistently recorded weak education indicators compared to other regions (Schultz, 1999; UNESCO Institute for Statistics [UIS], 2021). Despite a lack of access to education stifling human capital formation and long-term improvements in productivity; in almost all countries in SSA, access to education has been stifled by the existence of fees "particularly for the poorest and most vulnerable children, thus leading to a stagnating or even declining enrolment rate" (World Bank & UNICEF, 2009, p. xi). Therefore, from the mid-1990s the attention of governments has shifted to championing the abolition of fees in primary education, and in some countries lower secondary education, which has led to an increase in enrolment rates (Little & Lewin, 2011). The importance of education to human capital formation justifies government policies to invest in education such as through absorption of the direct cost of schooling.

3.2.3 Cost elimination and school enrolment

Policymakers pursue a range of interventions to increase access to education. In formal schooling, the setting of minimum dropout age, compulsory school leaving age, and funding are common policies (Connelly & Zheng, 2003). Other specific strategies

include supply-side interventions such as school construction or upgradation, class size reduction, teacher incentives, and changes in education technology to improve the adequacy of school services (Fiszbein & Schady, 2009; Handa, 2002). School fees elimination or reduction, conditional cash transfers, and merit scholarships are implemented as demand-side interventions to increase participation through funding (Fiszbein & Schady, 2009; Garlick, 2013). This study focuses on funding through cost elimination.[7]

Cost elimination includes access-oriented policies designed to offer free education to children and youth at different levels of education (World Bank, 2009, p. 1). From a development economics perspective, school fees (direct cost) is one of the demand-side obstacles to schooling (Lincove, 2015). This is because "imposing or increasing fees for schooling would, all other things being equal, reduce demand" (Birdsall & Orivel, 1996, p. 293). Hence, subsidising or providing fee-free education to reduce the price elasticity of education to enable high demand or access constitutes a demand-side intervention (Garlick, 2013; World Bank, 2018, p. 117). Cost elimination policies in education have been a contentious subject in developing economies. One leg of the argument is that the acute resource constraints of developing countries make it restrictive to provide free or subsidised education (World Bank, 2009). Additionally, it is argued that cost elimination would lead to poorer quality in education, as governments will be unable to provide adequate funds to sustain the policies (Bhalotra et al., 2014; Meki Kombe & Herman, 2017), thereby making the "concept of 'free education' unviable" (Nhundu, 1989, p. 254). The other side of the argument is the "right-based" argument that emphasises the positive externalities of education to society and encourages the elimination of user fees (Collin & Ferrare, 2015; Morgan et al., 2014). They argue that schooling provides substantial long-term gains; and that with political will and international support to relax resource constraints, it is possible to eliminate the direct cost of education.

Nevertheless, recent studies have concluded that policy interventions that reduce or eliminate direct cost at the basic level of education increase enrolment significantly in developing economies (Bhalotra et al., 2014; Bray, 2007; Deininger, 2003). Bray (2007, p. 32) summarised it as follows:

[7] In other literature the term "School fee abolition initiative," "Free education," "Fee- free education" may be used to represent the term cost elimination. These terms have the same interpretations.

> The fee-abolition schemes in Africa and elsewhere have shown that the existence of fees commonly has a much greater impact on household decision-making than the other demands of schooling, such as books, school meals and opportunity costs, even though in absolute terms these demands may be greater than the fees.

Furthermore, Hermida (2014) argues that cost elimination has a higher positive and significant impact on male enrolment than female enrolment. According to Blimpo et al. (2019), cost elimination policies targeted at females in The Gambia had the spillover benefit of increasing male enrolment. In summary, based on studies conducted in other countries, researchers generally agree that cost elimination has some positive effects on school enrolment. It is, therefore, plausible to assume that when the financial burden is reduced or eliminated through access-oriented policies at the upper secondary level, the rate of enrolment should increase in SSA.

3.2.4 Demand and supply frameworks of school enrolment - poverty

It is theorised that certain factors under demand and supply frameworks cause low school enrolment (Hunt, 2008). Demand-driven factors affect enrolment as students lack the means to afford schooling. In this framework, factors related to poverty, unemployment, level of family support, pregnancy, health-related issues, low-income neighbourhood, and inequality among families contribute to low educational consumption (Akyeampong et al., 2007; Ananga, 2011b; Deininger, 2003; Freudenberg & Ruglis, 2007; Krishnaratne, White, & Carpenter, 2013; World Bank & UNICEF, 2009). The supply-driven factors affect enrolment when the consumption power for schooling is available, but other factors in or around school pull or push children out of school (Hunt, 2008). These may include low educational quality, lack of school supply or space to accommodate students, low socio-economic status of the school population, academic tracking and racial or ethnic segregation (Akyeampong et al., 2007; Ananga, 2011b; Lincove, 2015).

Although all the factors highlighted above affect school enrolment, several empirical studies argue that the demand-driven factor – poverty – is most significant in reducing school enrolment at the basic level in SSA (Akyeampong et al., 2007; Deininger, 2003; Krishnaratne et al., 2013; Lucas & Mbiti, 2012; World Bank, 2018). Although direct costs such as registration fees and tuition fees are covered by several

governments in SSA during basic education, indirect costs such as transportation, feeding and opportunity cost of schooling continue to affect enrolment due to poverty. At the upper secondary level, however, many countries continue to charge direct costs including registration fees and tuition fees. This combined with indirect costs, causes many youths to drop out of school during the transition from lower secondary to upper secondary, leading to a low rate of enrolment at the upper secondary level (World Bank, 2018, pp. 113–119). Therefore, the paper investigates the effects of cost elimination on upper secondary school enrolment while focusing on the rate of poverty.

3.2.5 Research gap

A review of the existing literature suggests that there is indeed a relationship between cost elimination, poverty, and school enrolment. However, there are significant gaps. In the context of SSA, many of these studies are limited to primary and lower secondary school levels (Al-Samarrai & Zaman, 2007; Deininger, 2003; Godda, 2018; Little & Lewin, 2011). This is because in recent years, the attention of policymakers has been on improving basic education in developing countries due to the idea that investment in higher education would yield lower social returns than that in lower levels (Heyneman, 2003). This was reasonable for economic growth and social justice where a majority of the citizens needed access to basic education rather than higher education (Archer, Hutchings, & Ross, 2002). A few studies that focus on upper secondary education can be identified. Duflo et al. (2017) through an experimental study (not a government policy) in Ghana showed that paying the initial fees of students who could not enrol due to cost barriers could increase enrolment by 51% relative to those who may not have that facility. However, Branson and Lam (2017) and Garlick's (2013) studies on No-Fee Policy in South Africa indicated that the programme had no positive effect and a small effect on enrolment, respectively. This is attributed to other direct costs such as transportation, school uniform and textbooks, or other indirect costs such as the opportunity cost of attending school, which people from poor backgrounds could not afford. The shortcoming of many of these studies is the focus on one country for empirical analysis. Previous studies have not attempted to use data from all countries in SSA to examine the effect of cost elimination on upper secondary enrolment. Additionally, the effect of rate of poverty at the national level

on the cost elimination-enrolment nexus has also not been sufficiently investigated. These gaps limit our understanding of the relationship between fee-free policies and enrolment, particularly regarding upper secondary education in SSA.

3.2.6 Research question and hypotheses

The study seeks to answer the research question: What is the effect of cost elimination on upper secondary school enrolment in SSA? The main research ambition is to identify a common variable to increase the average enrolment rate, that may apply to all countries in the region. Drawing from the theoretical and empirical arguments set forth and using macro-level data, I specify the following hypotheses:

> ***H1:*** *Cost elimination has a significant positive relationship with upper secondary school enrolment rate in Sub-Saharan Africa.*

> ***H2:*** *The level of increase in upper secondary school enrolment through cost elimination reduces as the rate of poverty increases.*

3.3 Data and methods

3.3.1 Data

To approximate the effects of cost elimination on high school enrolment in SSA and the moderating effect of poverty, I used an econometric approach under *large N* design using countries in SSA to construct a panel data analysis from 2003 to 2018. First, descriptive statistics and pooled ordinary least squares (pooled OLS) estimates were calculated to show the possible associations between the main variables of interest, and then a series of panel data analyses were conducted. The SSA countries were selected based on the classification formulated by the United Nations Development Programme (UNDP), which lists 46 out of the 54 African countries (UNDP, n.d.). However, due to the limitation of availability of data for one or more variables of the key indicators, 39 countries (n = 39) are included in the analysis with 415 observations (N = 415).[8] Panel data analysis was selected due to its effectiveness in controlling for unobserved country-fixed effects (for example culture) and other unobserved time-fixed effects (for example changes in the educational system and national politics) which are not easily quantifiable (Wooldridge, 2016). Panel analysis allows for the inclusion of several time-varying factors due to the high number of degrees of freedom. Some data was missing in the datasets sourced, including poverty rate, as it is not measured every year. The missing values are missing completely at random (MCAR). This means that the missing data is not a function of the outcome variables (enrolment rate). Hence, explanatory variables that have missing values are imputed by time and entity using the linear interpolation method in STATA.[9]

3.3.2 Variables

3.3.2.1 Dependent variables

The main dependent variable of interest is the upper secondary school enrolment rate. However, as a form of robustness to check the consistency of the results and with the interest to check the effect of cost elimination along gender dimensions, the male and female enrolment were included in separate models. Official figures of the gross enrolment ratio of upper secondary school were used to measure upper secondary school enrolment. As defined by the UNESCO Institute of Statistics (2009), it is the

[8] See online supplementary material for list and number of observations of countries.
[9] All analyses in the study are implemented using STATA 16.0 Statistical/Data Analysis software.

measure of the number of students enrolled in upper secondary education, regardless of age, as a percentage of the official total population of the corresponding age group in a country. Male and female enrolment is measured as gross male or female enrolment ratio of upper secondary school regardless of age as a percentage of the official total population of the corresponding age group of males or females.

3.3.2.2 Independent variables

The two main independent variables of interest were cost elimination and poverty rate. Following the classification proposed by the Results for Development Institute (2015)[10], cost elimination (Cost Elimination) is measured as a national policy or legal framework that eliminates registration fees and tuition fees at the upper secondary school level in a country. This is the most conservative form of defining school fees (Branson & Lam, 2017), however, it is adopted in this study because the two cost items are identified to be the major cost barriers to enrolment in developing economies (Bray, 2007; Deininger, 2003). Additionally, it is deemed appropriate because there is no formal consensus and interpretation on what constitutes "Free education" (Inoue & Oketch, 2008).

Thus, in this study, a country is said to have cost elimination, only if students at the upper secondary school level do not pay for registration fees and tuition fees before they are enrolled in school because there is a specific government policy or legal framework that absorbs these cost items, regardless of the presence of any other form of subsidy or cost-sharing. I use official national sources to identify the presence of cost elimination as operationalised in this study, rather than using the UIS dataset. This is because while legally there may be fee-free education, the students may be required to pay for registration fees before they are enrolled. This caution is also highlighted by Branson and Lam (2017).[11] Table 3.1 provides details of countries, name of the intervention and the year(s) of the presence of cost elimination as defined in this study. A dummy variable of one (1) is entered for the presence of cost elimination and zero (0) when it is absent. Poverty rate (Poverty Rate) is measured as the national poverty headcount ratio of the percentage of the population living below the extreme poverty

[10] School fees encompass registration fees, tuition fees, examination fees, teachers' salary fees, parents-teachers association dues, other enrolment fees, etc.

[11] Data provided by World Policy Analysis Centre under the category "Beginning secondary education-free?" are for beginning lower secondary education. Caution must, therefore, be exercised when relying on this information for upper secondary education.

line of $1.90 per day at constant 2011 purchasing power parity (PPP). A value of 0 means no poverty, whereas a value of 100 means extreme poverty.

3.3.2.3 Control variables

Demographic and cultural factors (apart from cost and poverty) that affect demand and supply frameworks can also serve as obstacles to school participation. Although all the factors highlighted in the "Literature" section may affect school enrolment, six factors were selected and controlled for, based on the context and approach of the study.[12] Therefore, I control for unemployment rate (Akyeampong et al., 2007), income levels, income disparities (Kabubo-Mariara & Mwabu, 2007; Shapiro & Tambashe, 2000), the ability to supply schools (Barro, 1991; Rumberger & Lamb, 2003), population growth (Oseni, Akinbode, Babalola, & Adegboyega, 2020; Ta, 1972; Watson, 1988, p. 164), and conflict (Bertoni et al., 2019).

[12] My approach is geared towards examining national characteristics measured in aggregate terms that may have an effect on individuals' lives or the nature of school provision.

Table 3.1: Countries with cost elimination at Upper secondary level and the year(s) of implementation with a dummy of 1.

No.	Country	Name of Intervention	Year(s)	Sources
1	South Africa	No-Fee Policy	2007-2018	Government Gazette (2006)
2	Uganda	Universal Secondary Education	2012-2018	Ministry of Education and Sports (2013)
3	Kenya	Free Day Secondary School	2008-2018	Republic of Kenya (2019)
4	Botswana	Legal Framework	2003-2006	Botswana Federation of Trade Unions (2007)
5	Ghana	Free Senior High School	2017-2018	Republic of Ghana (2017)
6	Sierra Leone	Free Quality School Education	2018	Republic of Sierra Leone (2018)
7	Malawi	Free Secondary School Education	2018	Government of Malawi (2016)
8	Namibia	Fee-Free Secondary Education	2016-2018	Republic of Namibia (2015)
9	Mauritius	Legal Framework	2003-2018	Ministry of Education, Culture and Human Resources (2008)
10	Seychelles	Legal Framework	2003-2018	Republic of Seychelles (2016)

Sources: Author's compilation from national official sources

Notes: To prevent bias in the estimates towards gender due to the inclusion of gender dimension, policies that target a specific gender (for example Girls' Scholarship Programme in The Gambia) are not considered in this study.

Unemployment (Unemployment Rate) is measured as the percentage of the national workforce who are unemployed and are looking for work. Income level is measured as the gross national income (GNI) per capita (GNI Per Capita) based on purchasing power parity (PPP), in US dollars. Per capita and the purchasing power parity measurements are considered to control for population and inflation. According to the Gini index based on World Bank estimates, income disparities are measured as a degree of national income inequality (Inequality Rate). The ability to supply schools is estimated from the level of economic activities in a country. A country with a higher level of economic activities is assumed to be able to support a higher number of schools than an economy with a low level of economic activities (Barro, 1991; Rumberger & Lamb, 2003). Therefore, the annual gross domestic product per capita growth (GDP Per Capita Growth) based on constant 2010 U.S. dollars at purchaser's price is used to measure the ability to supply schools. Population growth is measured

as the annual population growth rate of a country (Population Growth). Finally, to measure conflict (Conflict), a "dummy" variable with a value of 1 is created for years where there was an internal conflict of type 2, 3, or 4, with a high fatality estimate of more than 500 deaths. Table 3.2 summarises the variables and the sources for the data used in the analysis.

The independent variables were checked for multicollinearity. The highest variance inflation factor (VIF) variable is gross national income with a value of 4.21 and a mean VIF of 2.05. Since they are all below the critical value of 5 (VIF<5) it indicates relative normality in the explanatory variables. Government spending on education was not included in the analysis for several reasons: 1) the complete data relates to education spending at all levels; 2) for government spending on upper secondary school, the data is not available for many countries and so inputting through linear interpolation is not possible; and 3) government spending on education is unlikely to be independent of cost elimination since it is an input in education.

Table 3.2: Summary of variables, operationalisation, and data sources.

Variable	**Operationalisation**	**Sources**
Dependent Variables		
Upper Secondary School Enrolment Rate	Gross enrolment ratio of upper secondary school.	UNESCO Institute for Statistics (UIS) (2021)
Male and Female Enrolment rate	Gross male or female enrolment ratio of upper secondary school.	
Independent Variable		
Cost Elimination	National policy intervention(s) or legal framework that eliminates registration fees and tuition fees.	National official sources
Poverty Rate	Poverty headcount ratio of $1.90 per day.	World Bank (2021)
Control Variables		
Unemployment	The percentage of the national workforce who are unemployed and are looking for work.	
GNI Per Capita	Gross national income per capita.	
Inequality Rate (GINI)	Gini index.	
GDP Per capita Growth	The annual percentage growth rate of GDP.	
Population Growth	The annual population growth rate of a country.	
Conflict	A dummy of 1 where there was an internal conflict of type 2, 3, or 4 with a fatality of over 500 deaths.	Oslo (PRIO) (2021)

Source: Author's compilation

3.3.3 Data analysis

3.4.3.1 Pooled ordinary least square (Pooled OLS) estimates

The relationship between the main variables was analysed by pooling the data. In this way, a simple reduced-form relationship was observed between cost elimination, poverty, and high school enrolment rate in SSA, conditional on other observed national characteristics in the equation:

$$Enrolment^{j}_{i} = \beta_0 + \beta_1 CostElimination_i + \beta_2\, Poverty_i + \gamma X_i + \sigma d_t 03 + \ldots + \sigma d_t 18 + \mathcal{E}_i \quad \textbf{(3.1)}$$

where *Enrolment* is the dependent variable (DV) with *j* as *Enrolment rate, Male enrolment,* or *Female enrolment*. β_0 captures the intercept, and B_1 and B_2 are the vectors of coefficient for cost elimination and poverty rate, respectively - the main independent variables (IV). *X* represents a vector of one control variable as IV with its associated vector of coefficient (γ), *i* is the unit of observation (country*year), d_t is a dummy variable for each period (2003-2018) which is optional and $\mathcal{E}$ is the error variance which is assumed to be identical (homoscedastic) and uncorrelated across units and over time.

3.3.3.2 Fixed effect (FE) estimates

The effects of cost elimination and poverty on upper secondary school enrolment in SSA were analysed using Fixed Effects (FE) panel data analysis.[13] This measures the variations in enrolment rate within countries with cost elimination. The FE estimator of panel data is assumed to yield unbiased and consistent parameter estimates in the presence of correlated and heteroskedastic error terms across panels (Wooldridge, 2016, p. 106). With clustered standard errors at the country level, the following equation was estimated:

$$Enrolment^{j}_{it} = \beta_0 + \beta_1 CostElimination_{it} + \beta_2\, Poverty_{it} + \gamma X_{it} + \sigma d_t 03 + \ldots + \sigma d_t 18 + v_{it} \quad \textbf{(3.2)}$$

[13] In choosing between fixed effect (FE) and random effect (RE) estimators for panel data analysis, the Hausman test was implemented under the assumption that the difference in the coefficients for FE and RE estimators is not systematic (in that case RE estimator is preferred). This assumption was rejected at the 1 percent significance level for most of the basic models. For the sake of parsimony, the FE estimate is used throughout the analysis. Nevertheless, results from RE estimator which is not very different from the results presented in the main discussions are presented in the supplementary material.

where the subscripts *i* and *t* represent entity (country) (i = 1, 2, 3,…n) and time (year) (t= 2003, 2004, 2005,….2018), respectively. d_t is a dummy variable for each period (2003-2018) that does not change across entities (i), hence, no entity subscript was used. The error component (v) is the composite error term assumed to have the usual noise properties. It is the purely random part of the error term and includes both entities and time effect components that are correlated across entities for any time. It can be decomposed into two:

$\boldsymbol{v_{it} = u_i + e_{it},}$ where u_i is the individual heterogeneity (unobserved country fixed effect) and e_{it} is the idiosyncratic shock. Other interpretations are identical to Equation (3.1).

A potential problem with this model is omitted variable bias. There may be unobserved factors affecting school enrolment, not measured in the models. I have tried to control for this, in part, by controlling for time (year) effects in all models.

Detrending the data. An important methodological issue needs to be confronted in dealing with the data. Empirical evidence suggests that cost elimination may not have any significant effect on enrolment in countries that may have already had a high rate of enrolment (Branson & Lam, 2017). Countries performing well on the rate of enrolment initially would have less room for improvement and, therefore, changes in enrolment rate may not be affected by cost elimination. Thus, the level of enrolment in a year may be influenced by its past values, introducing dynamics in the data. The magnitude of the coefficients and the statistical significance may therefore be misleading. Due to these methodological considerations, I "stationarised" or detrended the data to introduce history into the analysis. To detrend the data, I control for the initial level of the dependent variable using a one-year lag differencing of enrolment rate as part of the regressors. To implement this, I estimate the following equation:

$$\boldsymbol{Enrolment^{j}_{it}=\beta_0+\Delta\beta_1 Enrolment^{j}_{it-1}+\beta_2 CostElimination_{it}+\beta_3 Poverty_{it}+\gamma X_{it}+\sigma d_t 03+\ldots+\sigma d_t 18+u_i+e_{it}} \qquad \boldsymbol{(3.3)}$$

where $\boldsymbol{\beta_1}$ captures the coefficient of one-year lag difference of enrolment rate as a regressor, and B_2 and B_3 are the vectors of coefficient for cost elimination and poverty, respectively. All other interpretations are identical to Equations (3.1 and 3.2). The lag

differencing generates the difference between current and previous values to eliminate the non-stationarity of the data in the following equation:

$$\nabla Enrolment^{j}_{(it)} = Enrolment^{j}_{(it)} - Enrolment^{j}_{(it-1)} \quad \textbf{(3.4)}$$

3.3.3.3 The joint effect of cost elimination and poverty on enrolment – Long-run and Short-run effects

In this study, I am interested in how the rate of poverty, identified to cause low enrolment rate in developing economies, moderates the cost elimination - enrolment nexus in SSA. The joint effects of poverty and cost elimination on enrolment need to be investigated to achieve this. I interacted the presence and absence of cost elimination with different levels of poverty rate (from the minimum 0% to the maximum 100%) and used predictive margins to predict their joint effect on enrolment both in the long and short run. To implement this assumption in the long run, I estimate the following equation:

$$Enrolment^{j}_{it} = \beta_0 + \beta_1 CostElimination_{it} + \beta_2 Poverty_{it} + \beta_3 CostElimination_{it} \times Poverty_{it} + \gamma X_{it} + \sigma d_t 03 + \ldots + \sigma d_t 18 + u_i + e_{it} \quad \textbf{(3.5)}$$

where β_3 captures the partial effect of cost elimination and poverty on enrolment depending on the values of each regressor. All other interpretations are identical to Equations (3.1 and 3.2).

To consider the dynamics in the panel which has a short time series *(T=16)* and wide cross-section *(N=34),* I estimate the first differencing of the dependent variable and analyses the growth rate of enrolment which provides a short-run effect of the variables on enrolment in the following equation:

$$\Delta Enrolment^{j}_{it-1} = \beta_0 + \beta_1 CostElimination_{it} + \beta_2 Poverty_{it} + \beta_3 CostElimination_{it} \times Poverty_{it} + \gamma X_{it} + \sigma d_t 03 + \ldots + \sigma d_t 18 + u_i + e_{it} \quad (3.6)$$

where $\Delta Enrolment$ is the dependent variable in the following equation:

$$\Delta Enrolment^{j}_{i} = Enrolment^{j}_{it} - Enrolment^{j}_{it-1} \quad (3.7)$$

All other interpretations are identical to Equation (3.5).

3.4 Results

3.4.1 Descriptive statistics

I first present descriptive statistics from the data.[14] Figure 3.1 shows the trend of upper secondary school enrolment in countries. From the plots, it can be observed that there is no uniformity in the rate of enrolment among countries. While some countries such as Mauritius, Cape Verde and South Africa have relatively high rates of enrolment, others such as Angola, Burkina Faso, Tanzania, and Niger have relatively low rates. In addition, while some countries such as Burundi, Eswatini, Ghana, and Sao Tome and Principe, started at a very low rate and progressed steadily, others such as Nigeria retrogressed after some time. This shows the enormous disparities between countries concerning high school enrolment.

Figure 3.2 (a, b, and c) presents the event study graph for cost elimination and general enrolment, as well as male, and female enrolments, respectively. It can be observed from the diagrams that the trends in enrolment rate increase relative to event time -1, that is one year before introducing cost elimination. While there may be retrogression in enrolment after some time, it never falls to the level of the reference point or to the levels in the years before the introduction of cost elimination. Therefore,

[14] Detailed descriptive statistics for all variables can be found in the online supplementary materials and the results of the random effects estimator.

it can be surmised in general that there are positive gains for enrolment with the introduction of cost elimination.

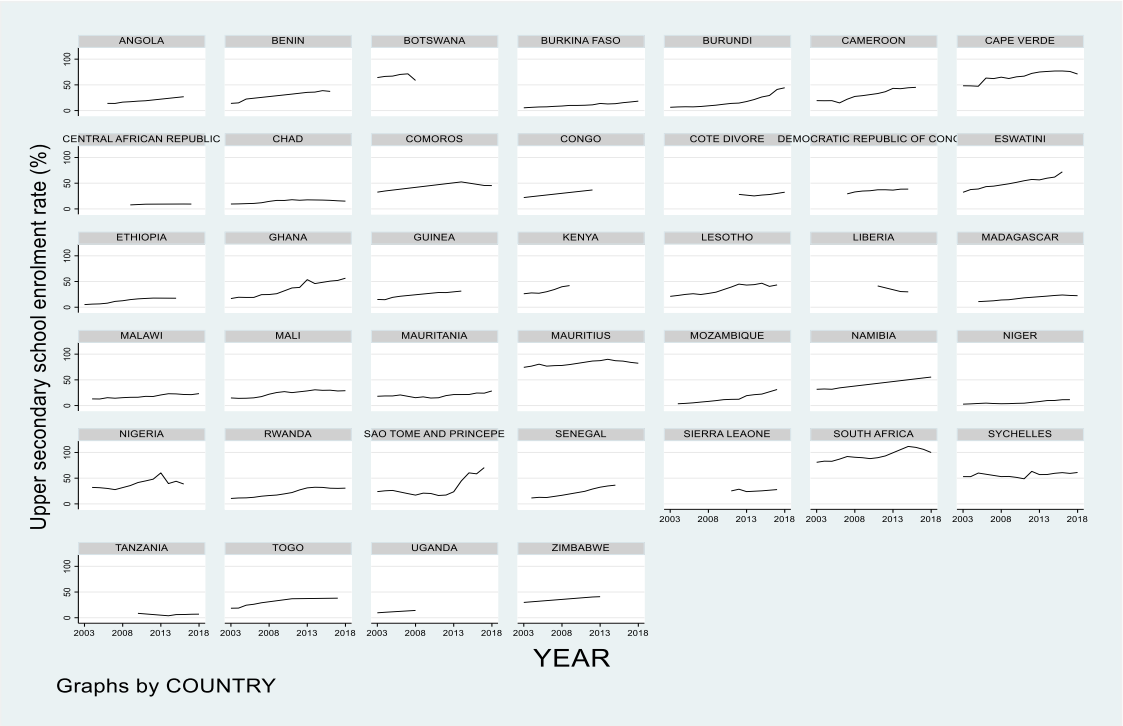

Figure 3.1: Trends in upper secondary school enrolment in SSA by countries - from 2003-2018

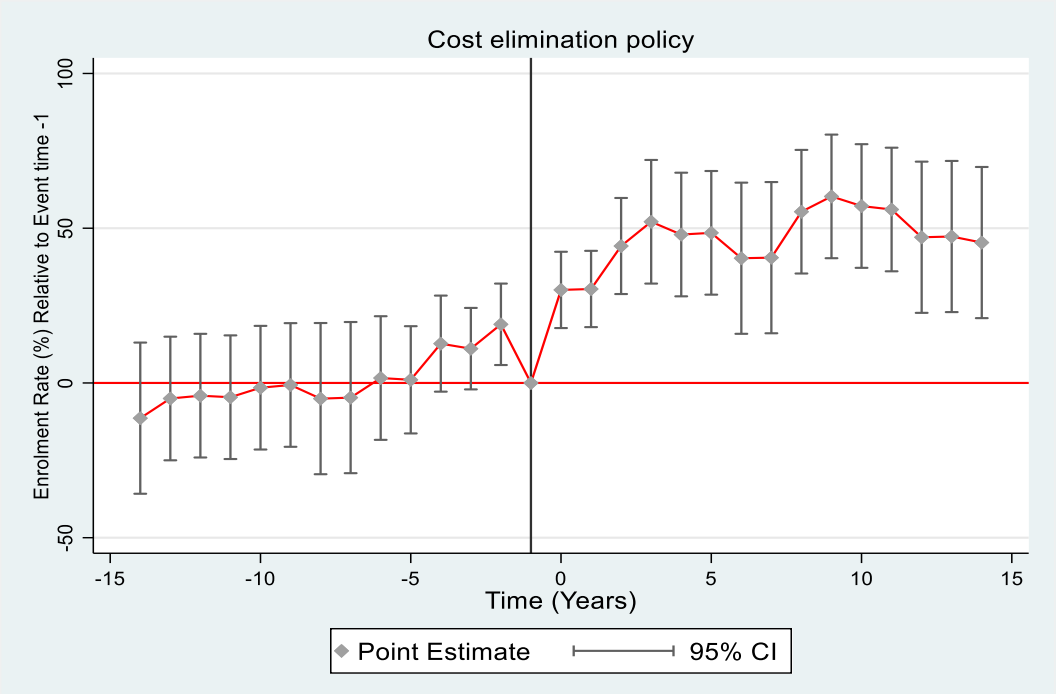

Figure 3.2a: Event study graph of enrolment rate relative to event time -1 of the introduction of cost elimination.

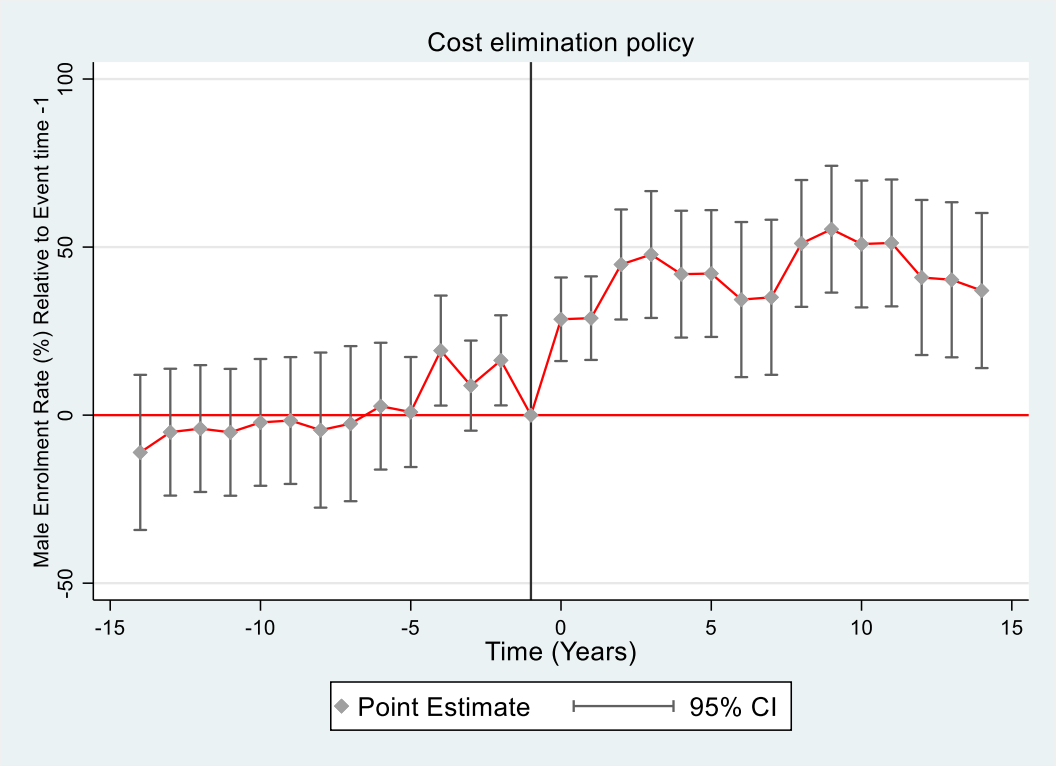

Figure 3.2b: Event graph of Male enrolment relative to event time -1 of the introduction of cost elimination.

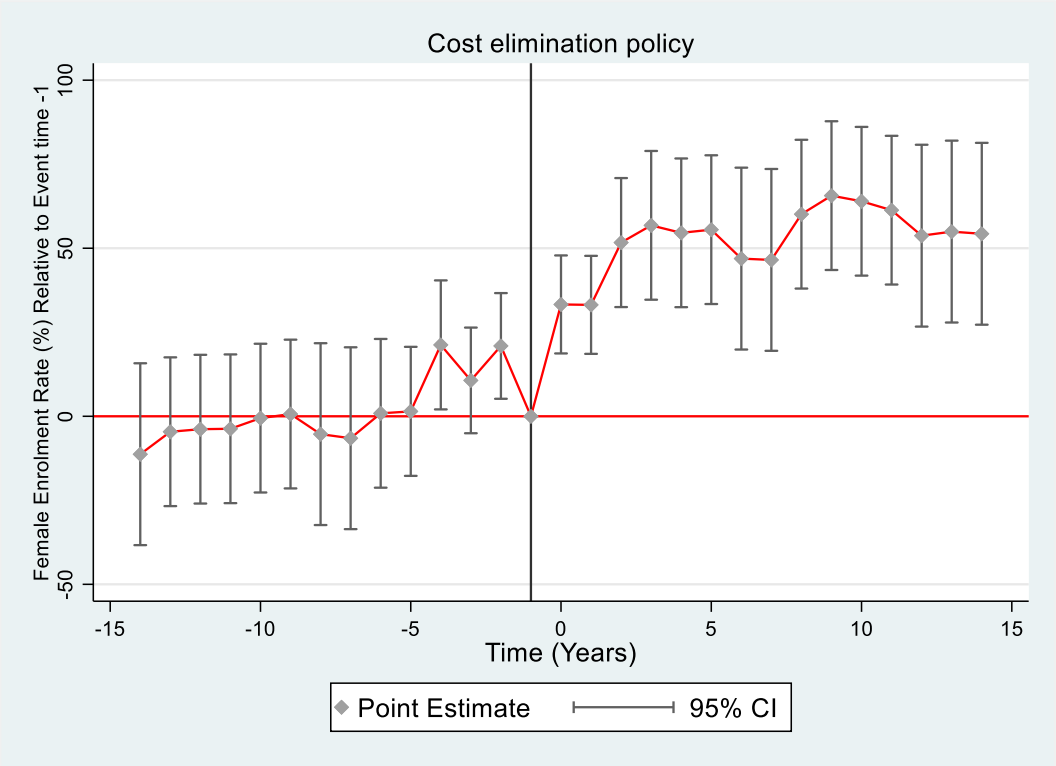

Figure 3.2c: Event graph of Female enrolment relative to event time -1 of the introduction of cost elimination.

3.4.2 Pooled ordinary least square (Pooled OLS) estimates

Table 3.3 reports the results of the pooled OLS estimates. The focus on the results from the pooled OLS estimates is to observe the relationship between the main variables with no fixed effects. From the results, it can be observed that irrespective of the control of time, cost elimination and poverty have significant effects on enrolment rate in the positive and negative directions, respectively. The results from the pooled OLS show that cost elimination may be highly related in the positive direction with enrolment rate, while poverty rate may be related in the negative direction. Although the models of the OLS estimator yield high R-squared (minimum of 79% total variation of the dependent variables), it is still important to investigate the assumptions using the FE estimator for two reasons: One, further investigations reveal the violation of the basic assumptions of the pooled OLS with this data[15]; two, the possibility of the existence of several unobserved variables in the cost elimination-enrolment relationship.

[15] Since the data I use in the study span a period of 16 years, the possibility of autocorrelation is to be expected. Using a Wooldridge test for autocorrelation in the panel data, the null is rejected, indicating the presence of spatial and serial correlation in the panel. Additionally, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity with a null hypothesis of constant variance in the error term is rejected, showing the presence of heteroskedasticity.

Table 3.3: Pooled OLS of the effects of cost elimination on upper secondary school enrolment rate in Sub-Saharan Africa.

Explanatory Variables	Dependent variables (%)					
↓	Enrolment Rate		Male Enrolment		Female Enrolment	
	(3.1)	*(3.2)*	*(3.3)*	*(3.4)*	*(3.5)*	*(3.6)*
Cost Elimination	12.839***	15.847***	14.439***	17.838***	14.128***	17.489***
	(3.46)	(3.77)	(3.47)	(3.61)	(3.60)	(3.76)
Poverty Rate	-0.223***	-0.205***	-0.203***	-0.186***	-0.272***	-0.254***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Unemployment	0.573***	0.641***	0.577***	0.662***	0.684***	0.776***
Rate	(0.13)	(0.13)	(0.13)	(0.12)	(0.14)	(0.14)
GNI Per Capita	0.001***	0.001**	0.001***	0.001**	0.001***	0.001***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Inequality Level	0.312***	0.308***	0.317***	0.321***	0.373***	0.378***
(Gini)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)
GDP Per Capita	-0.249*	-0.149	-0.325**	-0.226*	-0.243	-0.118
	(0.14)	(0.13)	(0.14)	(0.13)	(0.16)	(0.14)
Population Growth	-2.838**	-3.213**	-1.126	-1.313	-3.643**	-3.977**
	(1.33)	(1.32)	(1.27)	(1.24)	(1.42)	(1.37)
Conflict	5.941**	5.312*	6.526*	5.696*	4.009	3.251
	(2.98)	(2.89)	(3.37)	(3.34)	(2.75)	(2.71)
Constant	22.969***	15.819**	20.233***	12.646**	21.414***	12.818**
	(5.81)	(5.85)	(5.72)	(5.74)	(6.22)	(5.99)
No. of Observations	415	415	405	405	405	405
R-square	.83	.84	.79	.80	.86	.86
Year Effects	NO	YES	NO	YES	NO	YES

Notes: The standard errors provided in the parentheses are heteroskedastic consistent (robust). Asterisks denote significance on the coefficient at the following levels: ***p < .001, *p < .05, **p < .1.
GNI = Gross National Income, GDP = Gross Domestic Product

3.4.3 Fixed effect (FE) estimates

Table 3.4 presents the results from the FE panel analysis. From the results in column (4.1), it can be observed that, with all other things being equal, a unit presence of cost elimination causes a 6.7% increase, on average, in upper secondary school enrolment rate. This relationship is significant at the 1% level. Column (4.2) controls for the initial level of school enrolment by lag differencing to "stationarise" the data. From the results, it can be observed that the lag differenced enrolment rate as an explanatory variable is highly significant with a positive coefficient. This shows that the presence of inertia in the dependent variable influences the analysis and proves the assumption that the current enrolment rate is affected by the past year's enrolment rate. The positive magnitude effect of cost elimination on enrolment decreases to 6% from 6.7%. This may be explained by the fact that students spend three years on average in upper secondary school, in SSA. This means that a considerable number of the same students already enrolled are present in the school in subsequent years. In essence, factoring this out by controlling for enrolment rate causes the magnitude of the positive effect of cost elimination to reduce.

Additionally, the results show that cost elimination has a greater positive impact on male enrolment compared to overall as well as female enrolment. The second column of each dependent variable shows that a unit presence of cost elimination led to an increase of 7.5% and 6.5% for male and female enrolment, respectively, significant at conventional levels. In summary, Hypothesis 1 that, all other things being equal, the presence of cost elimination leads to an increase in upper secondary school enrolment in SSA can be accepted. Upon analysing the individual effect of poverty on upper secondary school enrolment, the results show that the poverty rate has a negative relationship with enrolment. However, these differences are not statistically significant on conventional levels, when all other variables are constant and controlling for time fixed effects. Since the focus of poverty in this study was not on its individual effects on enrolment but on how it influences the effects of cost elimination on enrolment, the interaction between cost elimination and poverty must be analysed to estimate their joint effects.

Table 3.4: The effects of cost elimination on upper secondary school enrolment rate in Sub-Saharan Africa.

Explanatory Variables	Dependent variable (%)					
	Enrolment Rate		Male Enrolment		Female Enrolment	
↓	*(3.1)*	*(3.2)*	*(3.3)*	*(3.4)*	*(3.5)*	*(3.6)*
$\Delta Enrolment_{t-1}$		0.670***		0.604***		0.721***
		(0.07)		(0.05)		(0.10)
Cost Elimination	6.683***	5.964**	7.526***	7.457***	6.807***	6.355**
	(1.73)	(1.96)	(1.77)	(2.11)	(2.03)	(2.39)
Poverty Rate	-0.142	-0.142	-0.117	-0.132	-0.172	-0.195
	(0.12)	(0.13)	(0.11)	(0.12)	(0.14)	(0.16)
Unemployment Rate	0.339	0.501	0.404	0.658**	0.371	0.530
	(0.31)	(0.36)	(0.28)	(0.33)	(0.36)	(0.40)
GNI Per Capita	0.000	0.000	-0.000	0.000	0.001	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Inequality (Gini)	0.341**	0.316**	0.313**	0.295**	0.361**	0.337**
	(0.11)	(0.12)	(0.10)	(0.12)	(0.14)	(0.14)
GDP Per Capita	0.137*	0.148	0.130*	0.167**	0.122	0.099
	(0.08)	(0.10)	(0.07)	(0.07)	(0.10)	(0.14)
Population Growth	-1.012	-0.554	-0.668	-0.327	-1.335	-0.972
	(1.01)	(0.92)	(0.87)	(0.82)	(1.29)	(1.23)
Conflict	2.064	1.849	2.427	2.182	1.790	1.841
	(1.85)	(2.09)	(1.99)	(2.32)	(1.81)	(2.21)
Constant	10.750	9.041	12.916*	10.881	8.290	7.650
	(6.66)	(8.59)	(6.80)	(8.78)	(7.52)	(9.75)
No. of Countries	39	39	39	39	39	39
No. of Observations	415	340	405	331	405	331
R-square	.65	.71	.63	.70	.61	.66

Notes: Models (4.2), (4.4), (4.6) are estimated with Equations (3), others are estimated with equation (2). All standard errors are corrected for heteroskedastic consistency (robust) and is clustered on country level in parentheses. Each row is a separate regression. All rows control for year effect in dummies of 16 years (2003-2018). Asterisks denote significance on the coefficient at the following levels: ***p < .001, **p < .05, *p < .1. GNI = Gross National Income, GDP = Gross Domestic Product

3.4.4 The joint effect of cost elimination and poverty on enrolment rate

I present graphical output for easy interpretation of the interactions.[12] Figures 3.3–3.5 predict the joint effect of cost elimination and poverty on general enrolment, male enrolment, and female enrolment at different levels of poverty rate, respectively. Each figure is categorised into (a) and (b) with Figure (a) predicting long-run effects and (b) predicting the short-run effects.

From Figure 3.3a, it can be observed that when the rate of poverty is at 0%, a unit presence and absence of cost elimination has an average effect of 38% and 32%, respectively, on enrolment rate in the long run. However, as the rate of poverty increases, the enrolment rate decreases both in the presence and absence of cost elimination. Nevertheless, the average rate of reduction in enrolment, in the presence of cost elimination is higher compared to that in the absence of cost elimination. For example, at a 100% rate of poverty, the data predicts a reduction in enrolment from 38%to 35% in the presence of cost elimination, a difference of almost 4%. On the other hand, in the absence of cost elimination, there is an average reduction in enrolment from 32% to 31%. This shows that as the rate of poverty increases, the implementation of cost elimination has a less positive impact on enrolment. Figure 3.3b - which provides short-run interpretation – shows that a high rate of poverty causes the positive effect of cost elimination on enrolment to retrogress to the negative in both the presence and absence of cost elimination. However, in the absence of any intervention, the rate of retrogression is higher. This may explain why some countries experience a decline in enrolment from one year to another. In the presence of a high rate of poverty, the growth in gross enrolment ratio also declines.

Turning to the gender dimension, the results are statistically not different from the general enrolment. From Figure 3.4a, it can be observed that, as the poverty rate increases, the presence of cost elimination makes only a minimal impact on male enrolment. At the maximum 100% rate of poverty, there is no difference in the positive effect of cost elimination on male or female enrolment, irrespective of the presence of cost elimination. Additionally, in the short run, with an increasing rate of poverty, the presence or absence of cost elimination has a retrogressive effect on male enrolment.

The plausible explanation for these results is that when people can afford to pay for the direct cost and other indirect costs of schooling, probably because there is relatively less poverty, cost elimination has some positive impact. However, when poverty is high, people cannot afford the direct cost of schooling, and the condition

deteriorates without government intervention, thereby causing no significant increase in the long run and retrogression in the short run. A closer look at the gender dimension shows that males seem to benefit more than females from the implementation of cost elimination in the long run at an average poverty rate of 40% (average poverty rate in SSA). Therefore, we cannot reject Hypothesis 2: The presence of high poverty rate causes cost elimination to have a minimal positive effect on upper secondary school enrolment in SSA. However, it can also be argued that cost elimination causes poverty to not have an extremely negative effect on enrolment.

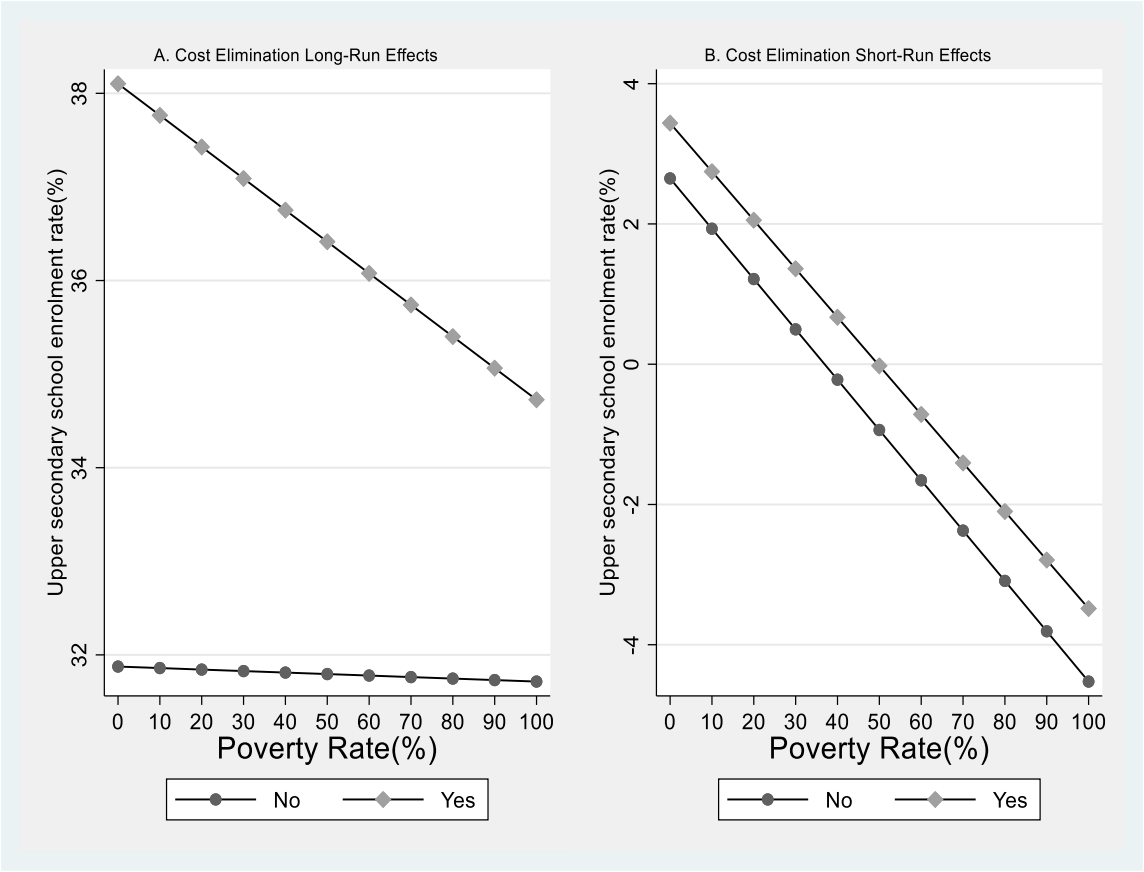

Figure 3.3: Predictive Margins of Cost elimination on enrolment rate at a different rate of poverty

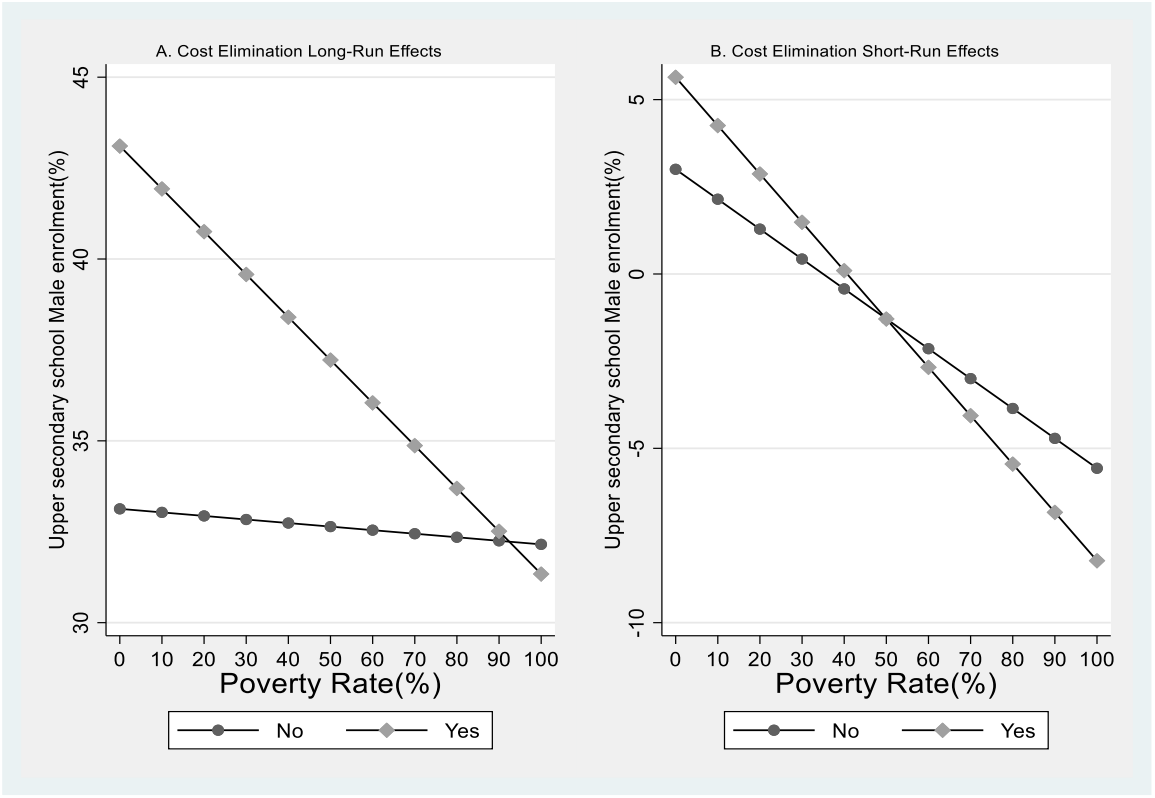

Figure 3.4: Predictive Margins of Cost elimination on Male enrolment at a different rate of poverty

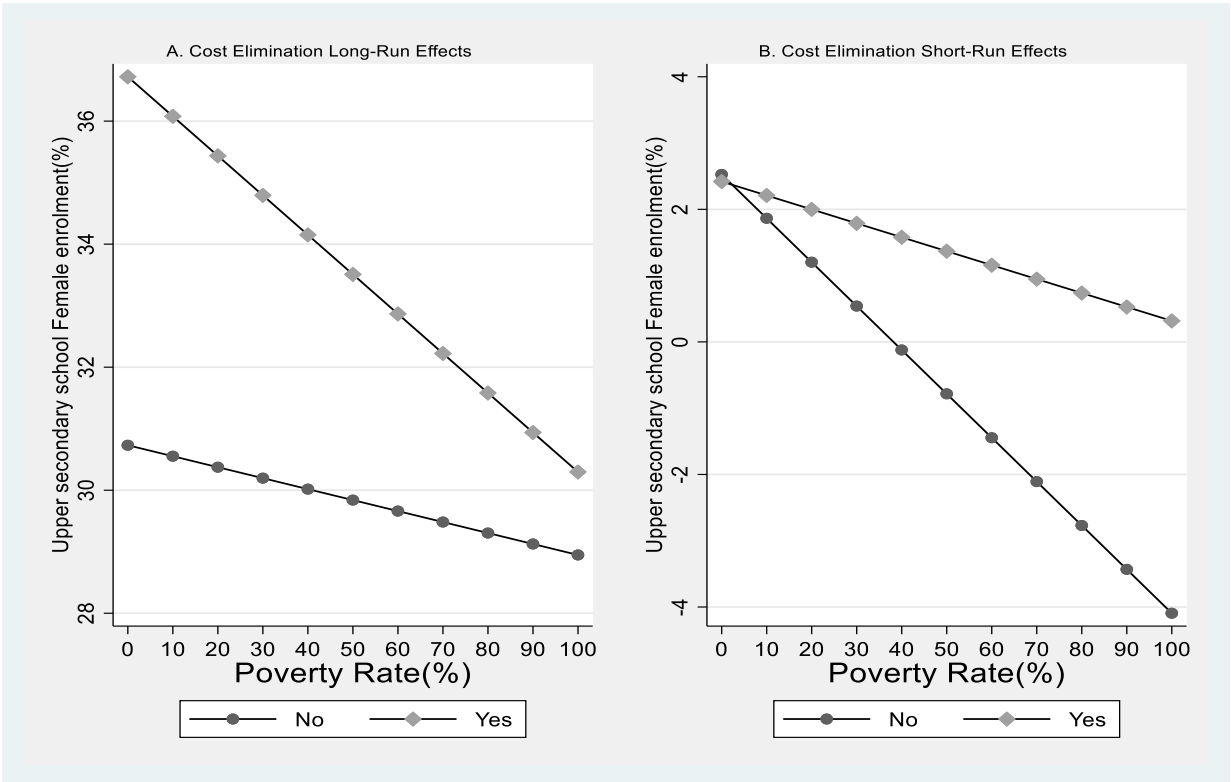

Figure 3.5: Predictive Margins of Cost elimination on Female enrolment at a different rate of poverty

3.5 Discussion and conclusions

The central empirical ambition of the article is to examine the effects of cost elimination on upper secondary school enrolment in Sub-Saharan Africa (SSA) and the moderating role of poverty in this relationship. This research ambition is particularly crucial in the context of the world vision of 2030 under the Sustainable Development Goals (SDGs). Goal 4.1 sets a target of achieving primary and secondary education for all in the next decade. The region that will find it most difficult to meet this target is SSA, as the region records an average enrolment rate of only 34% in the upper secondary school level, with enormous disparities existing among the constituent countries. Several empirical studies conducted in one or a few selected countries, focusing on basic education and relying on individual-level data, have concluded that poverty causes a low rate of enrolment, while demand-side interventions from the government, such as cost elimination increase school enrolment in developing countries (World Bank & UNICEF, 2009).

I re-examined and extended this general understanding at the basic education level to upper secondary level using macro or national-level data. I operationalised cost elimination as a government policy or legal framework that eliminates registration and tuition fees at the upper secondary level. I conducted panel data analysis on SSA countries from 2003 to 2018, by employing descriptive statistics, pooled OLS, and fixed effect estimation techniques. The empirical patterns revealed strong evidence in favour of cost elimination accounting for an increase in the rate of high school enrolment in SSA, when all systematic measurement errors are controlled. In general, with all other things being equal, a unit presence of cost elimination leads to an average increase of 6% in upper secondary school enrolment. This supports earlier studies and the study hypothesis that cost elimination increases school enrolment (see (Akyeampong et al., 2007; Huisman & Smits, 2015; Hunt, 2008; Kabubo-Mariara & Mwabu, 2007; Sabates et al., 2010).

Furthermore, I interacted the presence or absence of cost elimination with the rate of poverty to predict their joint effect on school enrolment at different levels of poverty in the long and short run. In the long run, the presence of cost elimination has about 6% more positive effect on enrolment than the absence of cost elimination when the rate of poverty is low. However, as the rate of poverty increases, the impact of cost elimination on the enrolment rate decreases. Garlick (2013) emphasised that

eliminating school fees amid a high rate of poverty leads to only a marginal increase in enrolment. This study confirms those findings using the national poverty rate. This may be because the direct costs of registration and tuition fees, while prerequisites for obtaining an education, are not the end of the cost incurred in schooling. Other indirect costs for school supplies and ancillary services such as transportation, feeding, school uniforms, and books may be significant barriers in a country with a high rate of poverty. These results support the literature that argues that although policy interventions as a means to increase enrolment are effective, poverty alleviation is an important dimension in achieving this aim, as a high poverty rate constrains the ability to afford the indirect costs of education (Branson & Lam, 2017; Kabubo-Mariara & Mwabu, 2007; World Bank & UNICEF, 2009, p. 11).

Investigating the gender dimension, we find that cost elimination has a greater positive impact on male enrolment compared to female enrolment. This is not surprising since gender disparity and inequality in school enrolment have always been unfavourable to females in SSA (Fentiman, Hall, & Bundy, 1999; Gajigo, 2016; Warrington, 2013). As demonstrated by other studies, raising incomes or reducing poverty will not ameliorate the differences caused by cultural factors that perpetuate gender disparities in schooling (Colclough, Rose, & Tembon, 2000). Therefore, in addition to the general policies or legal frameworks, there is the need to encourage targeted policies such as the Girls' Scholarship Programme in Gambia, to address gender disparities in enrolment (Gajigo, 2016).

Consequently, from the several statistical analyses and predictions, it can be surmised that demand-side interventions – in the form of the absorption of the direct cost of schooling by governments - is highly significant in increasing enrolment not only at the basic level of education but also at the high school level in SSA. I conclude that governments' and policymakers' quest to increase high school enrolment in SSA must be geared towards more demand-driven interventions, most importantly through the absorption of the direct cost of schooling. This is identified to be a necessary uniform variable to increase enrolment in SSA. Governments need to adopt the "rights-based argument" and demonstrate the political will to absorb the direct cost of schooling to achieve the Sustainable Development Goal 4.1 of secondary education for all by the year 2030. Additionally, while focusing on cost elimination, continuous efforts are needed to reduce poverty, to ensure that the positive impact of cost

elimination on enrolment is realised. High poverty rates negate the effects of cost elimination (so-called fee-free education) on increasing school enrolment.

3.5.1 Limitations and implications for further research

The elimination of fees is bound to increase the demand for schooling. Therefore, as enrolment increases in response to the demand-side intervention, the supply of infrastructure, materials, and teachers to meet the increased demand may be unavailable because the supply-side intervention budget may be limited. These were witnessed during the Free Primary Education (FPE) programmes in Kenya (Oketch, Mutisya, Ngware, & Ezeh, 2010) and Ghana (Akaguri, 2011; Nsiah-Peprah, 2004). This suggests that after eliminating fees, there could be other obstacles to achieving school enrolment (apart from the national rate of poverty), and the quality of education could possibly be affected by the policy. Additionally, these obstacles may be particular to individual countries. This study could not delve into these issues.

Future studies in the public policy research field should conduct in-depth studies of one or some selected countries during their implementation of cost elimination policies. Relevant questions that may be raised include: What drives cost elimination policies at the upper secondary level in SSA? After eliminating fees at the high school level, what other factors in schools affect access? How is the quality of education improved or not compromised under fee-free policies? Theoretical and empirical knowledge on these factors will deepen our understanding of the concept as the cost elimination-enrolment nexus has so far only been marginally studied at the upper secondary level. Additionally, there may be other important direct costs in schooling at the high school level, apart from registration fees and tuition fees, which may limit the operationalisation of cost elimination.

CHAPTER 4: THE POSITIVE EXTERNALITY OF EDUCATION ON CRIME: INSIGHTS FROM SUB-SAHARAN AFRICA

Abstract

Although researchers have investigated the association between education and crime, few studies have studied Sub-Saharan Africa, which has the lowest rate of youth enrolled in high school. Notwithstanding, some countries are paying attention to high school education, whereby specific policies often termed "cost elimination" are designed to facilitate free education. At the micro-to-micro level, it is argued that enrolling and completing high school reduces the rate of criminal engagement. Against this backdrop, we investigate the effect of high school enrolment on the crime rate using macro-to-macro-level panel data about Sub-Saharan Africa countries from 2003 to 2018. Using theft and homicide rates as proxies for property and violent crime, respectively, our results show that an increase in enrolment has a significant negative effect on property crime. We find no evidence of a significant effect on violent crime. When addressing endogeneity bias using cost elimination as an instrument for enrolment, we find that the magnitude of the negative effect on the rate of theft is significantly greater and robust than the baseline estimates. These findings support the assumption that interventions that support access to education improve social structures and have the additional benefit of reducing the rate of theft, giving credence to social support theory. In a region where a majority of theft is committed by youth without a high school education, policymakers need to make concerted efforts to raise participation in high school as one of the means of reducing rime, rather than focusing exclusively on crime control.

Keywords: *Upper secondary education; Property crime; Violent crime; Social support; Cost elimination; Sub-Saharan Africa*

4.1 Introduction

Crime creates a sense of insecurity and discomfort in all societies. Crime is a wrongful act or offence, the enforcement of which is typically entrusted to the state (Hermalin, 2005). Criminal activities impose a huge economic cost on societies and generate psychological costs for individuals (Wickramasekera et al., 2015). Studies show that

crime undermines development by eroding human and social capital and impeding business and investment in Sub-Saharan Africa (SSA) (Kingdon & Knight, 2007; United Nations Office on Drugs and Crime [UNODC], 2005). For this reason, the means of reducing criminal activity has received considerable attention from researchers and policymakers (see, (Welsh & Farrington, 2012). Research on crime reduction focuses on different levels of analysis. This may involve the micro-to-micro (individual) level, the micro-to-macro or macro-to-micro (cross) level, and macro-to-macro (group) level analysis (Matsueda, 2017). Criminologists have mainly focused on micro-level analysis. This is not surprising because the longheld view is that individuals' experiences are liked to individual outcomes, and it is easier to measure and assess individuals and create preventive measures (Pratt & Cullen, 2005)(Pratt & Cullen, 2005). The crosslevel effect operates using the assumption that causality works at the individual level and macro outcomes are merely the aggregation of individual outcomes (Matsueda, 2017). The macro-to-macro- level assumption is that aggregate phenomena are collaboratively created by individuals yet are not reducible to individual action. The environment, social structures, and social support affect behaviour and are susceptible to producing social outcomes. Hence, making inferences from aggregate crime is no different from making inferences from individual-level analysis (Durlauf, Navarro, & Rivers, 2010).

In this study, we focus on crime prevention at the macro-to-macro level of analysis. In recent literature, several micro and cross-level studies mostly conducted in advanced economies have argued that education at the upper secondary level[16] can reduce crime and can be part of crime prevention strategies (Ades & Mishra, 2021; Becker, 1968; Bell et al., 2016; Bennett, 2018; Hjalmarsson, Holmlund, & Lindquist, 2015; Hjalmarsson & Lochner, 2012; Jonck, Goujon, Testa, & Kandala, 2015; Lochner, 2004; Lochner & Moretti, 2004). The argument is that policies that encourage enrolling and completing upper secondary (high school) education have some unobserved positive externalities, including reducing engagement in criminal activity. This is because evidence suggests that (on average) younger persons,

[16] Upper secondary education is often referred to as "senior secondary school", "senior high school", or "high school." We use these terms interchangeably throughout the study. According to the International Standard Classification of Education (UNESCO Institute for Statistics, 2012), this relates to level three of the educational ladder (ISCED 3). Pupils usually enter this level at the age of 14 to 16 and complete it at age 17 to 19, which thus constitutes the theoretical official school-going age of students enrolled in this level of education (UNESCO Institute for Statistics, 2012).

especially uneducated males, commit more crimes than other groups in society (Åslund et al., 2018; Elonheimo et al., 2014; Hjalmarsson et al., 2015; Hövermann & Messner, 2021, p. 18; Lochner & Moretti, 2004). We contribute to this body of literature with the main objective of studying the potential causal link between education and crime by examining the effect of high school enrolment rate on the crime rate in SSA. Through analysing the macro-to-macro level, we seek understanding of how a macro-level structure—that is, the rate of school enrolment—can affect the macro-level crime rate.

Sub-Saharan Africa was selected because the region has the smallest proportion of youth enrolled in high school in the world. According to the United Nations Education, Scientific and Cultural Organisation (UNESCO) Institute of Statistics (UIS), in 2018 barely 34% of the population of official school-going age (upper secondary school) were attending school (UNESCO Institute for Statistics [UIS], 2021). Notwithstanding this, some countries in the region are implementing policies generally termed "cost elimination", or popularly called "fee-free" education as social support programmes to increase the level of school enrolment. This presents an opportunity to study how enrolment—that is, the rate of "being in school" as a macro-level educational indicator (rather than attainment)—affects the crime rate. The immediate aim of these policies is not to reduce crime; however, as argued in several micro and/or cross-level studies, these national policies may have some indirect or positive externalities at the macro-level on crime, as suggested by social support theory (Cullen, 1994). The study uses countries in SSA to construct a macro-to-macrolevel panel data analysis that spans the years 2003 to 2018 with country years as the units of analysis.

The rest of the paper is structured as follow. In Section 2 we discuss crime and theories commonly advanced in the crime prevention literature and describe the nature of crime in SSA. Section 3 specifies the research question and hypotheses. Section 4 provides details about our statistical model. The analytical results are presented in Section 5, and Section 6 is devoted to a discussion and suggests policy implications and avenues for further research.

4.2 Theoretical considerations

4.2.1 Typologies and sources of crime

A complex typology of crime has been developed over the years and several sources of crime are identified in the literature. Hagan (2009) classified crime according to the categories of violent crime, property crime, white-collar crime, political crime and terrorism, organised crime, public order crime, and computer-related crime. The National Incident-Based Reporting System (NIBRS) of the United States (US Department of Justice, 2012) classifies all crimes into one of four broad categories—namely, crimes against persons, crimes against property, crimes against society, and any other form of crime. Others view white-collar crime as a category of property crime. Indeed, there are overlaps in the typologies of crime since criminal activities are linked to each other. Consequently, in studying crime it is useful to point to the specificities of the criminal act rather than combine multiple crimes into a single category (Brame, Mulvey, & Piquero, 2001).

Turning to sources of crime, some of the most commonly advanced classical theories include strain theories. Among the latter is Agnew's (1985) general strain theory which views the source of crime as the strain experienced by individuals. This may develop into negative emotions, including anger, depression, or anxiety, and leads to various types of delinquent adaptations. Runciman's (1972) relative deprivation theory refers broadly to people's perceptions of their well-being relative to others. For example, inequality leads to a feeling of envy or injustice, engendering social comparison, deviant patterns, and involvement in criminal activity (Fajnzylber, Lederman, & Loayza, 2002). Others refer to cultural deviance theories, such as Sutherland and Cressey's (1966) differential association theory which holds that criminal behaviour is learned through association (people commit crimes because this is consistent with their values or norms). Merton's (1968) anomie theory involves a discussion of how culture and social structure (for example, lack of access to education, or inadequate legitimate economic opportunities) can lead to criminal behaviour. For example, Rocque et al. (2019) and Rosenfeld and Fornango (2007) studied the effect of the economy on different indicators of property and violent crime in US states and found an association between these variables.

Hirschi (1969) posited social control theory, arguing that crime and delinquency are outcomes of asocial human nature. Thus, understanding crime is not problematic,

according to the previous theories. What remains to be explained is why most people conform to the laws most of the time. Social control theory suggests that crime and delinquency are more likely to occur in circumstances of weak social bonds and are affected by a low level of social integration. According to the four principles of the theory—attachment, commitment, involvement, and belief—youth who are attached to parents, teachers, peers, and others are less likely to engage in delinquent behaviour. Commitment to achieving educational goals and success prevents youth from crime. Involvement is related to the incapacitation effect of education (Jacob & Lefgren, 2003), which means that time engaged in social activities such as learning limits simultaneous engagement in crime. Social bonds may also create a strong belief in the moral validity of the law, which creates an abhorrence of criminal acts.

Furthermore, Lochner (2004) interprets human capital theory to argue that schooling at the upper secondary level can reduce the rate of criminal engagement. According to Bell et al. (2018), this assumption is valid because education, especially at the high-school level, alters the age-crime profile, discouraging criminal engagement at the typical peak crime-related age. Therefore, policies for increasing the proportion of those in school at the high-school level have the further benefit of reducing crime; an effect which has been termed education-policy-induced crime reduction. However, Elonheimo et al. (2014), Hjalmarsson et al. (2015), Hövermann and Messner (2021), and Moffitt et al. (2006) argue that (on average) the effect is stronger for males than females. This is because male adolescents are more likely to offend than females therefore, educating males at their late adolescence have a significant reduction in their criminal engagement compared to females. For example, Hjalmarsson et al. (2015) found that an additional year of high school due to school reforms is associated with an average of 2.2 and 0.4 percentage points reduction in committing a crime for males and females, respectively with strong statistical significance for males. In addition, Bennett (2018) demonstrates that the probability of conviction for males reduces significantly by 9.5, 8 and 2.5 percentage points for any crime, property crime and violent crime, respectively due to having high school education with inconsistent statistical significance across crimes for females. Again, several empirical studies emphasise that the negative effect of education (upper secondary level) on crime is concentrated in relation to property crimes such as theft rather than on violent crimes such as homicide because of the economic motivation

for property crime (Ades & Mishra, 2021; Åslund et al., 2018; Lochner, 2004; Machin, Marie, & Vujić, 2011).

Although Hirschi's (1969) social control theory and Lochner's (2004) interpretation of human capital provide enough reasons to assume that schooling can reduce crime, they are limited in their explanation of macro-level crime rates.

4.2.2 Social support and the macro-level analysis of education and crime

Cullen (1994) proposes social support theory and argues that the level of instrumental or expressive support provided by families, interpersonal relations, or states through social programmes can reduce aggregated crime. He further argues that social support makes social control more effective because social control structures (for example, schools) operate in a social context. This means that an ecological setting that provides material benefits to people through social support programmes (for example, paying tuition fees for individuals to help them complete college) makes the social-control-crime-reducing effect at the individual level an effective influence on the national (aggregate) crime rate (Pratt & Cullen, 2005). Intuitively, prosocial influences increase while anti-social influences decrease as a result of social support, while community integration may also be fostered, helping to diminish the effects of the root causes of crime. Some macro-to-macro-level studies of education and crime can be identified. Buonanno and Montolio (2008) examined the issue in relation to the Spanish Provinces from 1993 to 1999 through a panel dataset, finding an association between education and property crime rates, and one Italian study that looked at crime on a regional basis concluded that more than seventy-five per cent of convicted Italians had no high-school education (Buonanno & Leonida, 2006). Killias and Aebi (2000) compared crime trends in Europe and the US and concluded that a lack of educational opportunities for migrant youth in the EU and Eastern Europe may at least partly account for an increase in the crime rate.

4.2.3 The education-crime nexus in Sub-Saharan Africa

In SSA, Austin and Kim (1999) used multiple regression to study education (with educational attainment and literacy as proxies) and homicide and found that there is a positive significant relationship between the latter. In Kenya, Muchwanju et al. (2015) analysed variables affecting the crime rate using panel datasets for provinces in that country. Austin and Kim's (1999) and Muchwanju et al.'s (2015) studies, however, conflate educational attainment with school enrolment, as they do not specify the level of education used in the study. This is an important limitation in the analysis of the education-crime relationship because the level of education tends to determine the direction and significance of the relationship with certain categories of crime. For example, Hjalmarsson and Lochner (2012) find that white-collar crimes (embezzlement, tax evasion, confidence tricks, forgery, and check fraud) as categories of property crime increase with education. It is vital to distinguish between the two measures of education (that is, enrolment versus attainment associated with a defined level of education) when estimating the education-crime relationship either at the micro-level or macro-level.

Furthermore, it is important to dichotomise or study different categories of crimes separately, rather than to estimate the overall number of crimes due to differences in patterns of crime related to their predictors (Brame et al., 2001; Elonheimo et al., 2014). For example, to focus on property crime and violent crime using specific indicators such as theft and homicide, respectively—which is the focus of this study. Another potential limitation of education-crime studies in SSA is the reverse causation problem, and the many potentially unobserved variables that are included in education-crime-related studies which lead to estimation bias. These limitations have been overlooked in previous studies.

Although there may not be clearly defined properties of the macro-social benefits of education on crime or a direct relationship, there are several reasons to assume that the social structure or characteristics (for example, schooling) of youth at their peak-crime age may impact the aggregate crime rate in SSA. For example, a study in Nigeria by Ajaja (2012) noted that 85% of criminal activities such as stealing and robbery are reportedly committed by youth who do not have a secondary school education, and the latter constitute the largest proportion of individuals in prison. A study by Jonck et al. (2015) found that the majority of people who committed crimes in South Africa had only completed primary education. Shavisa et al.'s (2015) study in Kenya showed

that engagement in crime is statistically associated with juveniles who are not enrolled in school.

Furthermore, other descriptive statistics from national and international institutions provide evidence that many criminal activities in SSA involve male uneducated youth. A World Bank (2012) report on youth violence in South Africa indicated that youth are often the perpetrators of violence. According to a 2013 report by the Ghana Prisons Service, 45% of all those convicted are between the ages of 18 and 25. Among them, 79.7% have an education that is below the high school level and a large proportion are male (Ghana Prisons Service, 2013). Last, almost 60% of Sub-Saharan Africa's population are youth under the age of 25, while 20% of the population are youth aged between 15 and 24 years (United Nations Department of Economic and Social Affairs, 2019; United Nations Population Fund [UNFPA], 2014), indicating that this cohort is strongly represented in terms of day-to-day activity.

4.3 Research question and hypotheses

Based on the applicability of a macro-level perspective on crime, we examine the relationship between a macro-social indicator (the enrolment rate) and macro-level crime rate in SSA by asking the following research question (RQ):

RQ: What is the effect of the rate of high school enrolment on the crime rate in Sub-Saharan
Africa?

In answering this research question, we specify the following hypotheses:

H1: *An increase in the high-school enrolment rate is negatively and significantly related to the rate of property crime/theft.*
H2: *An increase in the high-school enrolment rate is negatively and significantly related to the rate of violent crime/homicide.*

4.4 Data and methods

4.4.1 Data

To analyse the effect of education (upper secondary school enrolment) on crime (property crime and violent crime) we use an econometric approach that includes Sub-Saharan African (SSA) countries to build panel data from 2003 to 2018. This timeframe was chosen because the crime related data for many countries in SSA compiled by the United Nations Office on Drugs and Crime (UNODC)—the main source of crime data for this study—start from 2003, and recent values are for 2018. We conduct a fixed-effect (FE) regression analysis of panel data coupled with instrumental variable (IV) estimates. However, we start off by pooling the data using ordinary least squares (OLS) estimates. Levitt (2001) recommends the use of panel data to study crime due to its effectiveness for several reasons. Based on the goal of the research, the researcher can remove and control for unobserved entity-fixed effects (for example, civil war, the strength of security-related institutions, or the quality of education) and unobserved time-fixed effects (for example, changes in a country's laws or national politics) that are not easily quantifiable. Panel analysis also allows for the inclusion of other time-varying factors due to the high number of degrees of freedom, permitting the control of factors that might be plausible explanations for crime. What tempers these advantages is the incidence of missing data found in many panel datasets, which will be discussed subsequently. Nevertheless, utilising internationally (macro) comparable data through panel data analysis is one of the best strategies for studying crime (Levitt, 2001, p. 381).

In terms of SSA countries, we use the classification of the United Nations Development Programme (n.d.), which lists 46 countries out of 54 African countries. However, the unavailability of data and many instances of missing data for countries led us to omit some countries from the analysis. In the analysis of property crime represented by the rate of theft, 15 countries ($n = 15$) have data that can be used with 240 observations $(N = 240)$, while 19 countries ($n = 19$) have data for violent crime represented by the homicide rate with 304 observations $(N = 304)$.[17]

There are some issues related to the data which need to be clarified. First, there is the issue of relying on reported crime data, especially in the context of the study. Soares (2004) observed that the underreporting of crime is a common characteristic of

[17] See Online Supplement A for the list of countries for the analysis.

developing countries, mostly due to low quality policing and judicial systems, and a poorly educated population. Low-value property crimes such as petty theft may not be reported. In addition to this, the measurement process may involve different entities. We try to minimise these limitations by using, in most cases, a single source for the crime-related data which has been comparably compiled by the UNODC. Second, crime data reported to the police (the source of the compilation by UNODC) do not contain information on the characteristics of those committing the crimes, such as their educational background. Since UNODC is the only up-to-date and comparable crime data with a relatively wide scope in terms of time for SSA countries, we collected the nationally aggregated crime data of interest and matched them to the main independent variable, which is also aggregated educational data for each entity and year. This helps to reduce, if not overcome, this challenge.

Finally, there is the issue of missing data. Missing data affect the dependent variables and the main independent variable, as well as other control variables. All missing values are "missing completely at random" (MCAR). This means that their lack is not a function of nor is statistically independent of the explanatory variables and outcome variables. As stated earlier, we eliminated countries with a lot of missing data from the analysis. We relied on countries that have enough data that permitted the tracking of specific trends over time and used the linear interpolation method in the STATA Statistical Software[18] to input the missing data for the remaining years. Little and Rubin (2020, p. 178) argue that "given estimates of the simple correlation for two different values . . . one can estimate the simple correlation for any other value . . . using linear interpolation".

4.4.2 Variables

4.4.2.1 Dependent variables

The dependent variables throughout the study are the rate of theft, which is used as a proxy for property crime (*Theft Rate*) and the homicide rate (*Homicide Rate*) that is used as a proxy for violent crime. These variables are measured as theft or homicide rates per 100,000 people in a country within one year. Following previous studies, and to reduce the influence of high crime rates and facilitate interpretation of the

[18] All analyses in the study were implemented using STATA 16.0 Statistical/Data Analysis software.

coefficients as elasticities, we used the natural log to transform the crime rates for all the estimates.[19]

The use of the rate of theft as a specific proxy for property crime is justified in several ways: 1) it is the metric that is readily available and easily comparable as a category of property crime that has been collected by UNODC for SSA; 2) theft is the leading criminal offence recorded by the police in almost all SSA countries. The homicide rate was selected because: 1) unlike other violent crimes such as rape or serious assault, homicide is the crime least affected by underreporting; 2) the homicide rate is the most available piece of crime-related data for SSA countries that is collected by UNODC; 3) the approach is consistent with prior literature that attempted to explain crime, since many of these studies used the homicide rate as a proxy for violent crime (see, (Fajnzylber et al., 2002; Rocque et al., 2019).

4.4.2.2 Independent variables

The main independent variable of interest is the gross upper secondary school enrolment rate (*Enrolment Rate*). We use this measure of the level of upper secondary school participation to capture the level of the "being-in-school" effect on crime at the macro-level. The latter is a measure of the number of students enrolled in upper secondary education, regardless of age, as a proportion (percentage) of the total official population of the corresponding age group (UNESCO Institute for Statistics, 2009). However, we include the male enrolment rate (*Male enrolment)* as another indicator of education in separate models as a form of robustness check. As argued earlier, theoretical and empirical evidence indicate that young uneducated males commit more crimes than females (Elonheimo et al., 2014; Hjalmarsson et al., 2015; Hövermann & Messner, 2021; Moffitt et al., 2006). Therefore, if school enrolment generally has any negative effect on crime, as hypothesised, this must be true of male enrolment.

4.4.2.3 Control variables

We selected and controlled for several economic, demographic, and deterrence effects that have been demonstrated to affect the crime rate to minimise potential confounding effects. Regarding economic factors, we control for the level of youth unemployment (Levitt, 2001), the level of inequality (Fajnzylber et al., 2002), and economic growth

[19] We choose to log the dependent variable in line with other studies on crime, such as Levitt (2001) and Fajnzylber et al. (2002). To deal with observations with zero values in the dataset, a constant value of one (1) was added to all values in the log transformation.

(Rosenfeld & Fornango, 2007). Unemployment is the proportion of youth unemployed (*Youth Unemployment)* measured as the share of the labour force aged 15–24 without work but available for and seeking employment. The inequality rate (*Inequality Level (GINI)*) is measured as the Gini index, whereby an index of "0" represents perfect equality, while an index of "100" implies perfect inequality. Economic growth is measured as the annual percentage growth rate of gross domestic product (GDP) per capita (*GDP Per Capita Growth*). The GDP values are aggregates based on constant 2010 U.S. dollars at purchase prices to control for inflation and population variation.

Concerning demographic factors, we control for peak crime traits (Witte, 1997), population density (Nolan, 2004), and upper secondary school attainment. Peak crime trait is measured as the number of males aged 15–24 (*Male Age [15–24])* as a proportion (%) of the total population. Population density (*Population Density*) is measured as the midyear population of a country divided by the country's land area in square kilometres. Since several other studies have used educational attainment as a measure of education in education-crime-related studies, we control for upper secondary school attainment in separate models to check our assumption of a "being-in-school" effect on crime. Attainment (*Attainment*) is measured as the number of persons of upper-secondary school age who have completed the last grade of upper secondary education as a proportion (%) of the total population of upper secondary school age. For deterrence, we control for the existence of the death penalty (*Death Penalty)* and the effectiveness of the rule of law (*Effective Rule of Law*) in a country. The death penalty is measured as a dummy variable, whereby countries that retain the death penalty for ordinary crimes in the observed year are assigned a dummy of "1". Countries that are abolitionist in practice are not considered as having the death penalty. The rule of law is used as a proxy to measure the effectiveness of the criminal justice system. It measures the perception of the extent people have confidence in the police, courts, property rights, as well as the likelihood of crime and violence, and ranges from approximately −2.5 to 2.5.

We investigated multicollinearity, thus the correlation between the independent variables, using variance inflation factor (VIF). The highest and the mean VIF is 4.75 and 2.12, respectively, for the theft rate sample. For the homicide rate sample, the highest VIF is 4.17, with a mean of 2.10. Since these values are all below the critical value of 5, this indicates normality in the explanatory variables. Table 4.1 summarises all the variables and the sources of data.

Table 4.1: Variables, operationalisation, and data sources

Variable	Operationalisation of variable	Source
Dependent Variables		
1. Theft rate 2. Homicide rate	Log of number of crimes (theft or homicide) per 100,000 population.	United Nations Office on Drugs and Crime (2018) and Official National Sources[20]
Independent Variables		
Upper Secondary School Enrolment Rate	Gross enrolment rate in upper secondary school, regardless of age, as a proportion (%) of the official total population of upper secondary school age.	UNESCO Institute for Statistics (UIS) (2021)
Male Enrolment	Gross male enrolment rate of males in upper secondary school, regardless of age, as a proportion (%) of the official total population of the corresponding age group.	
Control Variables		
Youth Unemployment	Labour force aged 15-24 without work but available for and seeking employment.	World Bank (2021)
Inequality Rate	Gini index with index '0' representing perfect equality and index 100 perfect inequality.	
GDP Per capita Growth	Annual percentage growth rate of gross domestic product (GDP)	
Population Density	Mid-year population of a country divided by the country's land area in square kilometres.	
Upper Secondary Attainment rate	Persons of upper secondary school age who have completed the last grade of upper secondary education as a proportion (%) of the total population of upper secondary school age.	UNESCO Institute for Statistics (UIS) (2021)
Male Age (15-24)	The number of males aged 15–24 as a proportion (%) of the total population.	World Bank (2021)
Death Penalty	Dummy variable of '1' for countries that retain the death penalty for ordinary crimes.	Amnesty International (2018)
Effective rule of law	Perception of people's confidence in the police and courts as well as the likelihood of crime.	World Governance Indicators (2019)
Cost Elimination	National policy intervention or legal framework that eliminates registration fees and tuition fees.	National official sources

Source: Authors' compilation

[20] Theft data for South Africa and Ghana are from official national sources. The data for South Africa is from the South African Police Service (2018) under the offence category "Theft". Data for the Ghana Police Service (2017) are from the annual crime report under the offence category "Stealing".

4.4.3 Data analysis

4.4.3.1 Pooled ordinary least square (pooled OLS) estimates

As stated earlier, we begin analysing the relationship between upper secondary school enrolment and the rate of crime by pooling the data with no fixed effect. In this way, we could observe a simple reduced-form relationship between the rate of crime, log($Crime^j_i$) *(j= log of theft or homicide rates)* and educational enrolment *($Enrolment_i$)* in Sub-Saharan Africa, conditional on other observed national characteristics (X_i) in the equation:

$$\log(Crime^j_i) = \beta_0+\beta_1 Enrolment_i+\gamma X_i+\mathcal{E}_i \quad (4.1)$$

where β_0 is the constant term, β_1 captures the coefficient of the net effect of educational enrolment on the rate of crime in SSA, $\mathcal{E}$ is the error term that is assumed to have the usual noise properties, and subscript *i* is the unit of observation (country*year). The pooled OLS regression estimation assumes that the error variance ($\mathcal{E}_i$) is identical (homoscedastic) and uncorrelated across units and over time.

4.4.3.2 Fixed-effect (FE) estimates

Since panel data usually barely meet the assumption of identical and correlated error variance across units, we utilise a fixed-effect (FE) estimator of panel data analysis, where the unobserved entity-specific effects are modelled as part of a basic panel equation, as follows:

$$\log(crime^j_{it}) = \beta_0 +\beta_1 Education_{it}+\gamma X_{it}+\sigma d_t 03 +\ldots..+\sigma d_t 18+v_{it} \quad (4.2)$$

where log*(crime)* is the dependent variable (DV) with *j* as either *Theft Rate* or *Homicide Rate.* The subscripts *i* and *t* represent entity (country) (*i* = 1, 2, 3,….n) and time (year) (*t*= 2003, 2004, 2005,….2018), respectively. β_0 is the constant term, B_1 is the vector of coefficient for Education*;* the main independent variable (IV) entered as *Enrolment Rate* (and *Male Enrolment* as a form of robustness check) for each entity and time. *X* represents a vector of one control variable as IV with its associated vector of coefficient (γ) to be estimated. d_t is a dummy variable for each period (2003-2018) that does not change across entities (*i*), which is why it has no *i* subscript. The error

component (*v)* is the composite error term, assumed to have the usual noise properties. It is the purely random part of the error term. It can be decomposed into two parts as:

$v_{it} = u_i + e_{it,}$ where u_i is the individual heterogeneity (unobserved country-fixed effect) and e_{it} is the idiosyncratic shock.

4.4.3.3 Instrumental variable (IV) two-stage least squares (2SLS) Estimates

The instrumental variable (IV) estimator is implemented because we assume that school enrolment in school is not strictly exogenous to the dependent variables. The crime level may be correlated with the level of educational participation. This is because crime has an economic benefit (Becker, 1968) that may encourage habitual offenders who are not caught and punished not to participate in school but rather engage in crime. Thus, high participation in crime may imply low attachment to school. The methodological issue presented here is thus the problem of endogeneity or reverse causation. Another methodological problem is the possibility of omitted variables in the FE estimates. An instrumental variable estimator can handle errors from reverse causation or joint endogeneity, where the covariance of two or more variables in estimation can be corrected. It is also efficient at dealing with omitted variable bias. From the above, we analyse the relationship between enrolment and the rate of crime using a two-stage least-squares estimate that takes the form of the following basic equation:

$$\log(crime^{j}_{it}) = \beta_0 + \beta_1 Enrolment_{it} + \gamma X_{it} + \sigma d_t 03 + \ldots\ldots + \sigma d_t 18 + u_i + e_{it} = Z_{it}\,\sigma + u_i + e_{it} \qquad 4.3)$$

where *Enrolment (*and *Male enrolment* as robustness checks) is treated as an endogenous regressor, and *Z* is the instrument for the endogenous regressor. The other interpretations in the equation are the same as explained under Equation (42). Moreover, with the IV estimator, the random error component ($u_i + e_{it}$) can also correlate with the instrument, therefore, this error part is repeated.

Studies in advanced economies have mainly used compulsory school-leaving age or minimum dropout-age policies to address reverse causation or omitted-variable-related methodological issues (Anderson, 2014; Lochner & Moretti, 2004; Machin et al., 2011). In this study, we use cost elimination as an instrument (*Z*) for the enrolment rate. Cost elimination refers to access-oriented policies designed to offer free

education to children and youth at different levels of education (World Bank, 2009, p. 1). Many researchers have concluded that financial constraints (mostly registration fees and tuition fees) are the most important barriers to accessing basic education in developing countries (Al-Samarrai & Zaman, 2007; Bray, 1987; Petrosino, Morgan, Fronius, Tanner-Smith, & Boruch, 2012). A recent study by Naape et al. (2020) demonstrated that increasing education-related spending by eliminating or reducing the direct cost of schooling increases enrolment. Based on this empirical knowledge, we use fee-free policies, which have been implemented in some countries at the high school level, as an instrument for enrolment.

Following the Results for Development Institute's (R4D; 2015)[21] categorisation of types of educational cost, cost elimination *(Cost Elimination)* is measured as a national policy or legal framework that eliminates registration fees and tuition fees at the upper secondary school level in a country. This is the most conservative form of defining school fees (Branson & Lam, 2017). This means, apart from any other form of subsidy or cost-sharing that may be in existence, students at the upper secondary school level do not pay registration fees or tuition fees before they are enrolled in school because there is a specific government policy or legal framework that absorbs these cost items. I use national official sources to identify the presence of cost elimination policies as operationalised in this study rather than using the UIS dataset. This is because fee-free education may formally be reported, but in reality, it may not exist since students may be required to pay registration fees before they are enrolled. This caution is also highlighted by Branson and Lam (2017).[22] A dummy variable of "1" is created for each observation with the presence of cost elimination. Table 4.2 illustrates those countries with cost elimination and year(s) of implementation.

[21] See Results for Development Institute (2015) for the categorisation of various cost components in school. It is important to emphasise that disparity exists among countries in terms of the number of cost components absorbed by the implementation of cost elimination. By using tuition fees and registration fees, we can capture those countries that had these policies or legal frameworks implemented during the study timeframe.

[22] Data provided by the World Policy Analysis Centre under the category "Beginning secondary education-free?" are for starting lower secondary education. Caution must therefore be exercised when relying on this information for upper secondary education.

Table 4.2: Countries with cost elimination (Fee-free education) at upper secondary level and year(s) of implementation with a dummy of '1'

No.	Country	Name of intervention	Year(s)	Sources
1	South Africa	No-Fee Policy	2007-2018	Government Gazette (2006)
2	Kenya	Free Day Secondary School	2008-2018	Republic of Kenya (2019)
3	Ghana	Free Senior High School	2017-2018	Republic of Ghana (2017)
4	Sierra Leone	Free Quality School Education	2018	Republic of Sierra Leone (2018)
5	Malawi	Free Secondary School Education	2018	Government of Malawi (2016)
6	Namibia	Fee-Free Secondary Education	2016-2018	Republic of Namibia (2015)
7	Mauritius	Legal Framework	2003-2018	Ministry of Education, Culture and Human Resources (2008)
8	Seychelles	Legal Framework	2003-2018	Republic of Seychelles (2016)

Notes: Some other countries such as Uganda may have cost elimination but are excluded from this table and the analysis since there is not enough data on other variables for use in this study.
Source: Authors' compilation from national official sources.

The relevance and validity of the instrument: In IV estimation, a critical issue is investigating and identifying an instrument that satisfies two basic assumptions: 1) the instrument should be relevant in that it should be strongly correlated with the endogenous regressor *(Enrolment);* the stronger the correlation, the better, and; 2) it should be uncorrelated with the idiosyncratic part of the random error term (e_{it}) and can only affect the dependent variable through the endogenous regressor. In estimating 2SLS, Staiger and Stock (1997) and Stock and Yogo (2005) proposed a rule of thumb for the first stage regression. According to the latter, at the first stage in a single endogenous regressor, the proposed instrumental variable for the endogenous regressor (in addition to all other exogenous regressors) should have a joint F statistic greater than 10 ($F > 10$). An F statistic greater than 10 demonstrates that we do not have to worry about having a weak instrument (Wooldridge, 2016, p. 478).

Furthermore, before we can accept the results from the IV estimation at the second stage, it is important to investigate if the implementation of the policy used as an instrument affects any unobserved variable(s) that affect the outcome of interest – for example, an increase in the resources of security agencies dedicated to fighting crime, or an increase in the income of households. Theoretically, the police are the

most important component of the internal security capacity to reduce crime through prevention strategies (Abdelmottlep, 2016). However, tracking the trends in the resources allocated to the police and criminal justice system is more difficult due to the unavailability of data related to police personnel and police expenditure in the context of this study. Accordingly, we rely on government expenditure on the military as a percentage of general government expenditure to measure the variation in security expenditure. Relying on military expenditure, although not a perfect measure of internal security, can still give a sense of how much governments in SSA have generally been committed to security over the years. In terms of an increase in the income of households, which may affect crime, to the best of our knowledge cost elimination generally absorbs the cost of schooling and does not involve providing direct material support to households, thus we do not expect the implementation of such policies to increase household income. All other pieces of information are presented in the results section.

4.4.3.4 Robustness checks

To check the consistency and the reliability of the results, however, we introduce homogeneity into the dataset for robustness checks. We use only countries with data for the two dependent variables (theft and homicide) in the analysis. Furthermore, we use the original theft and homicide rates (thus rate per 100,000 of the population) as the dependent variables to check the power of significance and direction of our assumptions. Throughout the robustness checks, the direction of the relationship between the main variables and their significance level did not change from the results presented in the main study.[23]

[23] See the Online Supplement C for the results and discussions concerning the robustness checks.

4.5 Results

4.5.1 Descriptive statistics

We first present descriptive statistics about the data used in the analysis.[24] Figure 4.1 (a and b) plots the trend in theft and homicide, respectively, over time (2003-2018) in logs for the countries included in the study. The trends show an increase in crime over time for some countries and a decrease for others, while some have a relatively stable incidence of crime.

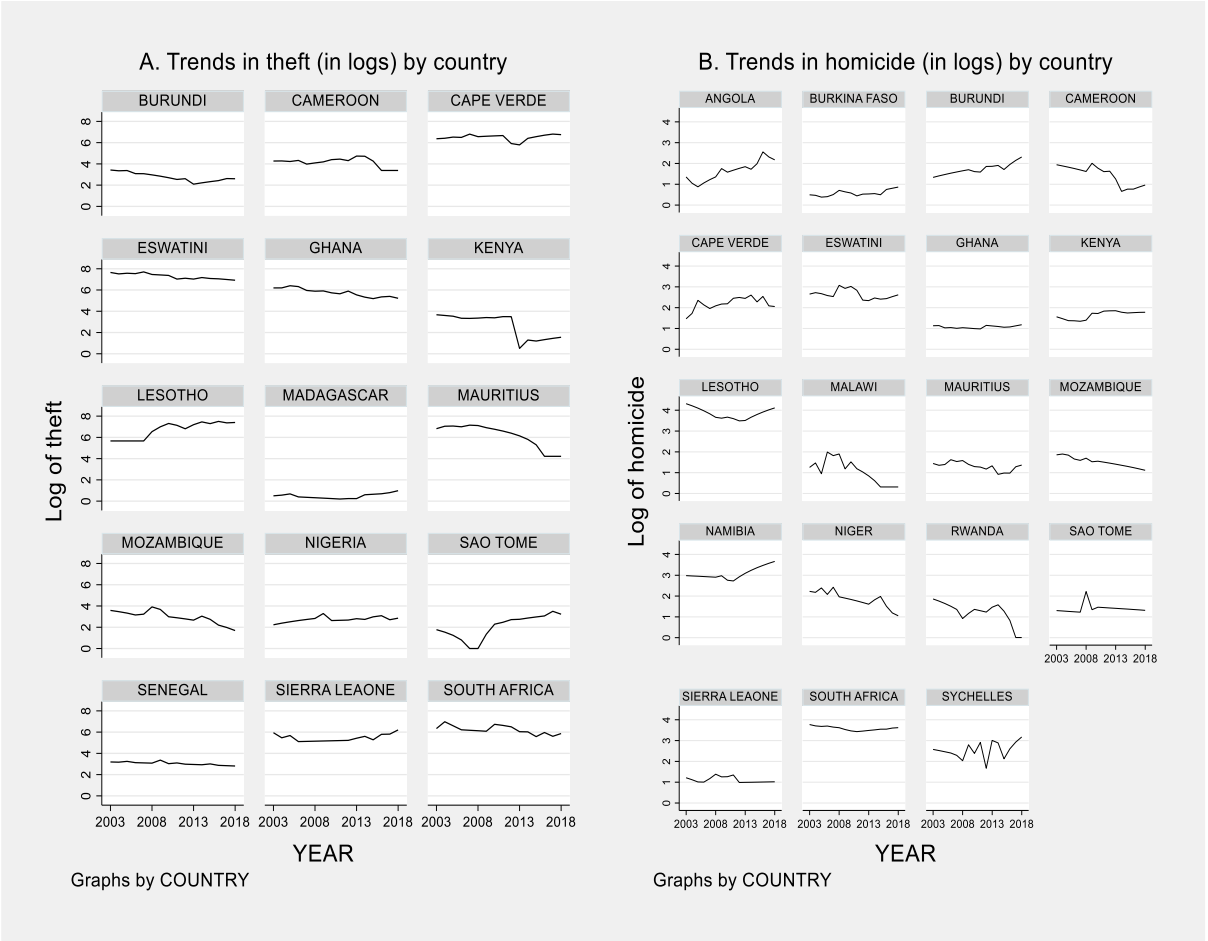

Figure 4.1: Crime trends by country

[24] Detailed descriptive statistics for all variables can be found in Online Supplement B.

Figure 4.2 shows the enrolment trend by country. From the plots, it appears that there is no uniformity in the rate of enrolment among countries. While some countries have a relatively high rate of enrolment (such as Mauritius, Cape Verde, and South Africa), others have a relatively low rate (including Angola, Burkina Faso, and Niger). In addition, some countries started at a very low rate of enrolment and have progressed steadily, such as Eswatini, Ghana, Kenya, and Sao Tome and Principe.

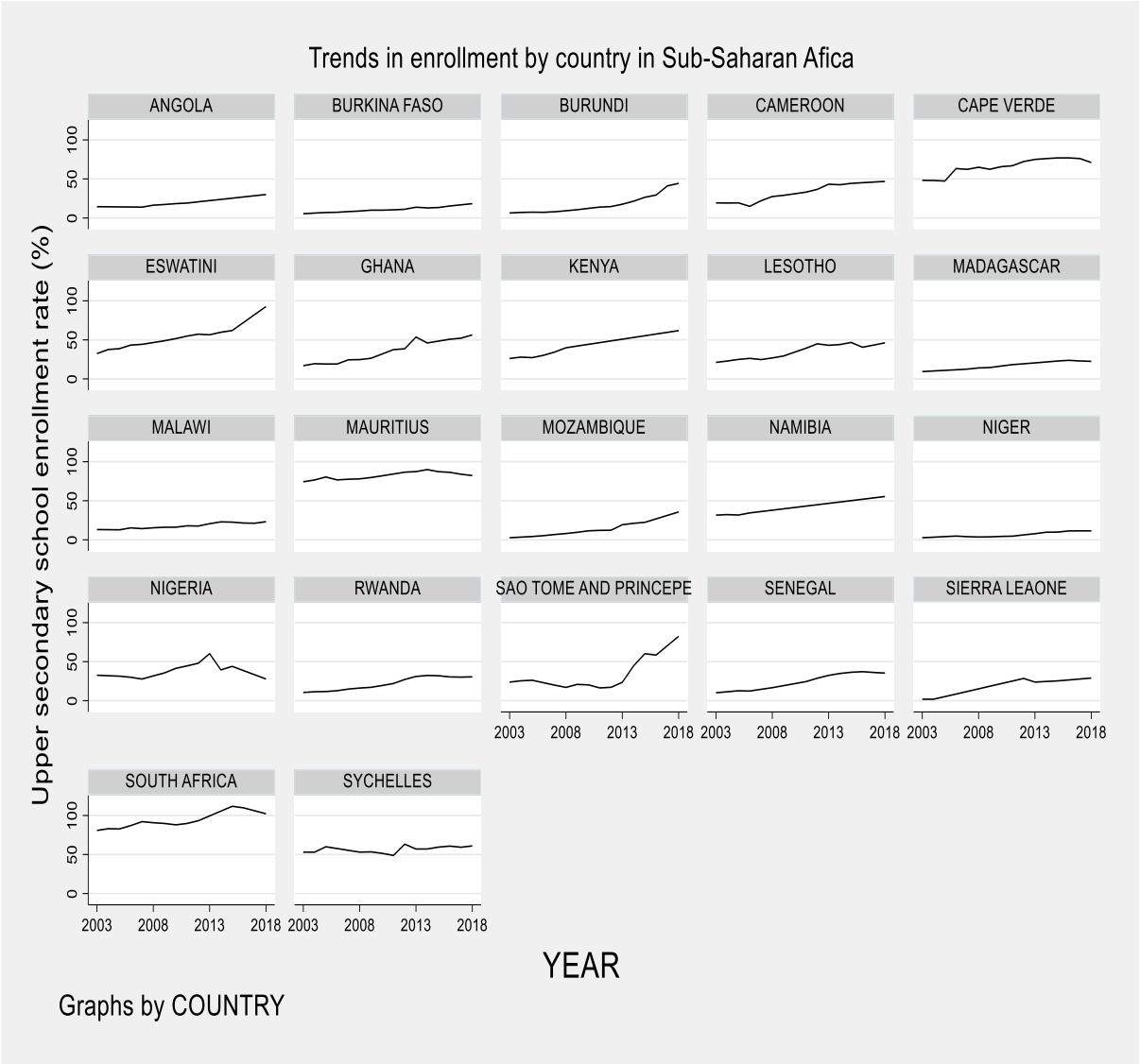

Figure 4.2: Upper secondary school enrolment trends in SSA by country

Figure 4.3 plots the potential relationship between the main variables of interest (that is, theft, homicide, and the upper secondary school enrolment rate). From the figure, the data for theft indicate a declining trend. When the enrolment rate is low, we find a high number of data points on the upper-left side of the diagram. This suggests a potentially negative association. However, homicide does not appear to have a clear pattern of association. For the enrolment figures displayed on both the left and right, we have data points above and below the fitted line.

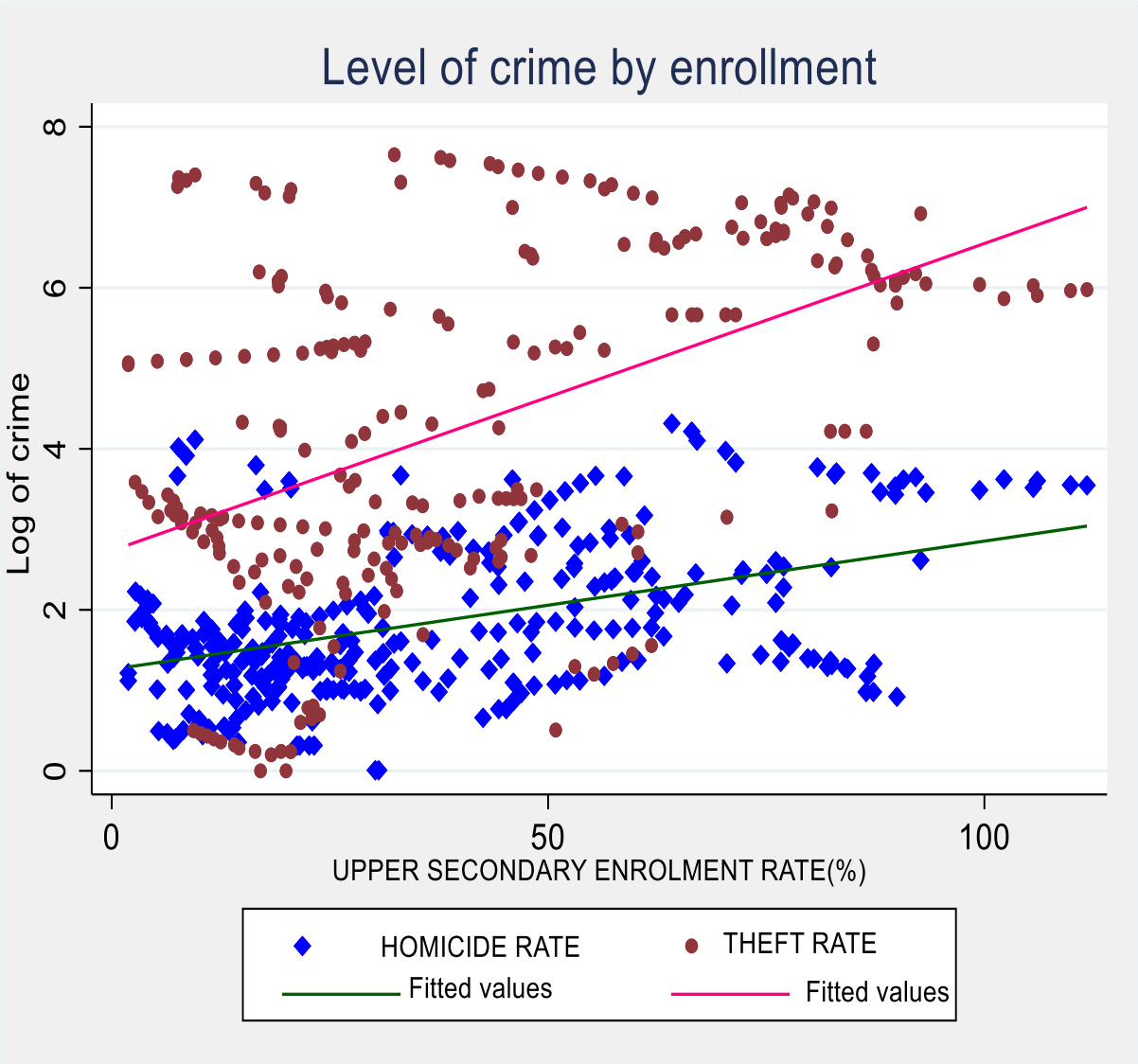

Figure 4.3: Scatterplot of the level of theft and homicide by enrolment in SSA

4.5.2 Pooled ordinary-least-square (Pooled OLS) estimates

Table 4.3 reports the results from the pooled OLS estimates. They indicate that the school enrolment rate may be strongly negatively associated with the rate of property crime in SSA with no significant relationship with the rate of violent crime. The focus on the results from the pooled OLS estimates is observing the relationship between the main variables without any fixed effects. From the results, enrolment and male enrolment rate have a significant impact on the theft rate in the negative direction with or without the control of school attainment. Youth unemployment and inequality level are consistently significant in the positive direction for all indicators of crime. These economic variables indicate that unfavourable economic conditions may have some positive relationship with the rate of crime in SSA.

Although the models of the OLS estimator yield a very high *R*-squared (minimum of 58% total variation of the dependent variables), it is still important to investigate the assumptions using the FE estimator for two reasons. One, further investigations may reveal the violation of the basic assumptions of the pooled OLS.[25] Two, the possibility of multiple unobserved variables in the potential education-crime relationship. The fixed-effect estimator of panel data is assumed to yield unbiased and consistent parameter estimates in the presence of correlated and heteroskedastic error terms across panels.

4.5.3 Fixed-effects (FE) estimates

The FE results show that many of the variables in the OLS estimates which have significant coefficients are no longer significant. However, the results (as presented in Table 4.4) show the significant relationship between enrolment rate and theft and the coefficients take a negative sign. However, the enrolment rate is insignificant without controlling for upper secondary school attainment. When attainment is controlled for, enrolment has a significant negative effect of 1.6% on the theft rate, holding all other variables constant. This shows that the "being-in-school" effect on the theft rate is stronger in SSA than the role of attainment. In addition, male enrolment has a significant negative effect of 1.5% on the theft rate, holding all other variables constant, and without controlling for attainment. These results further show that

[25] Since the data we use in the study span 16 years, the possibility of autocorrelation is not surprising. Using a Wooldridge test for autocorrelation in the panel data, the null hypothesis is rejected, indicating the presence of spatial and serial correlation in the panel. Additionally, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity with a null hypothesis of constant variance in the error term is rejected, showing the strong presence of heteroskedasticity.

having more male youths in school (regardless of the level of attainment) may have a stronger negative effect on the theft rate than the general enrolment rate. There is no statistically significant effect at the conventional level of 5% on the homicide rate.

Table 4.3: Pooled OLS estimates of the effect of education on crime in Sub-Saharan Africa

Explanatory Variables	Dependent Variables (in logs)					
	Theft			**Homicide**		
	(3.1)	***(3.2)***	***(3.3)***	***(3.4)***	***(3.5)***	***(3.6)***
Enrolment Rate	-0.023**	-0.041***		0.001	-0.003	
	(0.01)	(0.01)		(0.00)	(0.00)	
Male Enrolment			-0.020**			-0.003
			(0.01)			(0.00)
Youth Unemployment	0.071***	0.085***	0.068***	0.036***	0.038***	0.038***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Inequality Level (Gini)	0.071**	0.085***	0.067**	0.021***	0.017***	0.022***
	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)
GDP Per Capita	0.062	0.083	0.062	-0.025**	-0.031**	-0.024**
	(0.05)	(0.06)	(0.05)	(0.01)	(0.02)	(0.01)
Male Age (15-24)	-0.071**	-0.095***	-0.071**	-0.004	0.007	-0.007
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Population Density	0.002**	0.000	0.002**	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Attainment		0.012			0.011*	
		(0.01)			(0.01)	
Death Penalty	-1.187***	-1.312***	-1.217***	0.326*	0.415**	0.272
	(0.25)	(0.29)	(0.24)	(0.17)	(0.17)	(0.17)
Effective rule of law	0.959***	0.077	0.848***	-0.039	-0.202**	-0.009
	(0.19)	(0.29)	(0.18)	(0.08)	(0.10)	(0.08)
Constant	2.610**	2.141**	2.771**	0.368	0.148	0.411
	(0.89)	(0.88)	(0.90)	(0.27)	(0.28)	(0.26)
No. of Observations	240	208	240	304	241	304
R-square	.59	.58	.58	.64	.69	.64

Notes: All standard errors are corrected for heteroskedasticity (robust) in parentheses. Each row is a separate regression. Columns (3.2) and (3.5) control for school attainment; Columns (3.3) and (3.6) use Male Enrolment Rate as the main explanatory variable instead of Enrolment Rate in Columns (3.1) and (3.4). All rows control for the year effect in dummies of 16 years (2003-2018). Coefficient estimates are multiplied by 100. Asterisks denote significance for the coefficient at the following levels: ***p < .001, **p < .01, *p < .05

The differences in the results between the pooled OLS and the FE estimates may be due to the unobserved characteristics in countries such as the school system, culture, or the nature of the crime reporting system. Some observed economic conditions, including the level of unemployment or inequality, may account for the incidence of

crime in some years in individual countries irrespective of the level of educational enrolment. Notwithstanding this, from both the OLS and FE estimates educational enrolment seems to explain variation in the rate of theft without accounting for significant variation in the homicide rate. We cannot, however, make conclusions from these results due to the methodological issue of reverse causation and the possibility of omitted variable bias. We therefore further investigate the education-crime nexus using the IV estimator.

Table 4.4: Fixed-effects (FE) estimates of the effect of education on crime in Sub-Saharan Africa

Explanatory Variables	Dependent Variables (in logs)					
		Theft			**Homicide**	
	(4.1)	***(4.2)***	***(4.3)***	***(4.4)***	***(4.5)***	***(4.6)***
Enrolment Rate	-0.010	-0.016**		0.002	0.005	
	(0.01)	(0.01)		(0.00)	(0.00)	
Male Enrolment			-0.015**			0.001
			(0.01)			(0.00)
Youth Unemployment	-0.026	-0.032	-0.022	0.025	0.015	0.026
	(0.04)	(0.04)	(0.03)	(0.02)	(0.01)	(0.02)
Inequality Level (Gini)	0.045**	0.048*	0.049**	0.002	-0.007	0.002
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
GDP Per Capita	-0.009	0.003	-0.008	-0.008	-0.003	-0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Male Age (15-24)	-0.162	0.077	-0.154	-0.143**	-0.166**	-0.143**
	(0.12)	(0.10)	(0.13)	(0.05)	(0.04)	(0.05)
Population Density	-0.003	-0.001	-0.002	-0.003	-0.001	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Attainment		-0.016			0.013	
		(0.01)			(0.01)	
Death Penalty	-0.921*	-0.321	-0.924*	0.489	0.386	0.493
	(0.52)	(0.37)	(0.51)	(0.36)	(0.34)	(0.36)
Effective rule of law	0.251	-0.195	0.289	0.438	-0.063	0.445
	(0.63)	(0.54)	(0.63)	(0.36)	(0.26)	(0.35)
Constant	7.669**	1.639	7.402**	4.906**	5.497***	4.879**
	(3.42)	(2.86)	(3.33)	(1.51)	(1.29)	(1.47)
No. of Observations	240	208	240	304	241	304
No. of countries	15	13	15	19	16	19
R-Square	.29	.36	.33	.23	.33	.23

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. Each row is a separate regression. Columns (4.2) and (4.5) control for school attainment; Columns (4.3) and (4.6) use Male Enrolment Rate as the main explanatory variable instead of Enrolment Rate in Columns (4.1) and (4.4). All rows control for the year effect in dummies of 16 years (2003-2018). Coefficient estimates are multiplied by 100. Asterisks denote significance for the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

4.5.4 Instrumental variable (IV) two-stage least squares estimates

In the IV estimates, we first check if our instrument is not weak—or in other words, if the instrument is relevant and valid. We present the results in Table 4.5. In Columns 5.1 to 5.4, it can be seen that the *F*-statistic in all models is greater than 10, showing that the instrument is valid and relevant. Second, the instrument strongly predicts educational enrolment positively. This is true of individual samples based on the dependent variables. It is also true when the instrument alone is regressed on the endogenous variable, as well as when all other covariates are added. Finally, in Columns 5.5 and 5.6 we find no statistically significant evidence that indicates that the presence of cost elimination has led to an increase in the resources of the military. These pieces of information eliminate concern about the weakness of the instrument. Since the instrument satisfies all the listed assumptions, it means that the coefficient (β) of the IV estimator is consistent. Therefore, if the effect of the upper secondary school enrolment rate varies across countries, and if there are gains for enrolment from cost elimination, the IV estimator in the second stage should be interpreted as the effect of enrolment on crime owing to the margin of higher enrolment due to cost elimination.

Table 4.5: First-stage regressions and the effect of cost elimination on military expenditure

Explanatory variable	***Enrolment Rate***				***Military Expenditure***	
	Theft rate sample		Homicide rate sample			
	(5.1)	***(5.2)***	***(5.3)***	***(5.4)***	***(5.5)***	***(5.6)***
Cost Elimination	17.26***	22.29***	14.02***	19.87***	-0.28	-0.64
	(2.86)	(3.64)	(2.26)	(2.85)	(0.47)	(0.48)
No. of Observations	240	240	304	304	336	336
No. of countries	15	15	19	19	21	21
F-statistic	12.07	37.41	15.29	48.60		
R-square	.58	.14	.57	.15	.24	.01
Covariates included	Yes	No	Yes	No	Yes	No

Notes: Columns (5.1) and (5.3) control for all the variables included in the analysis. Columns (5.2) and (5.4) do not have any controls. All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. Asterisks denote significance for the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

The second-stage regression from the IV estimates is presented in Table 6. The estimate for property crime suggests a significantly negative effect of enrolment on the theft rate with or without controlling for attainment. Male enrolment as a

robustness check variable is also significant and robust compared to the fixed effect estimates. Since we capture here solely the "being-in-school" effect on crime, we use the estimate in Column 6.2, which controls for attainment, in the discussions. Results show that a 1% increase in the enrolment rate is associated with an average 3.3% decrease in the theft rate, holding all other variables constant. Turning our attention to violent crime, the estimate is statistically insignificant. This means that, similarly to the previous results, we cannot associate an increase or decrease in the homicide rate with school enrolment. In summary, we can accept Hypothesis 1 but reject Hypothesis 2.

Table 4.6: 2SLS IV estimates of the effect of education on crime in SSA

Explanatory Variables	Dependent Variables (in logs)					
		Theft			**Homicide**	
	(6.1)	***(6.2)***	***(6.3)***	***(6.4)***	***(6.5)***	***(6.6)***
Enrolment Rate	-0.039***	-0.033***		0.009	0.013	
	(0.01)	(0.01)		(0.01)	(0.01)	
Male Enrolment			-0.036***			0.009
			(0.01)			(0.01)
Youth Unemployment	0.015	-0.015	0.002	0.019	0.005	0.020
	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
Inequality Level (Gini)	0.072*	0.064*	0.066***	-0.004	-0.016	-0.004
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
GDP Per Capita	0.001	0.011	-0.001	-0.010	-0.005	-0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Male Age (15-24)	-0.068	0.162	-0.099	-0.155*	-0.190*	-0.153*
	(0.17)	(0.16)	(0.15)	(0.05)	(0.07)	(0.05)
Population Density	-0.001	0.000	-0.001	-0.004	-0.002	-0.004
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Attainment		-0.015			0.011	
		(0.02)			(0.01)	
Death Penalty	-0.726	-0.151*	-0.837**	0.457	0.367	0.471
	(0.55)	(0.38)	(0.53)	(0.36)	(0.34)	(0.36)
Effective rule of law	*0.565*	*-0.093*	*0.491*	*0.308*	*-0.199*	*0.329*
	(0.69)	*(0.52)*	*(0.68)*	*(0.42)*	*(0.32)*	*(0.41)*
Constant	4.404	-1.017	5.486*	5.352**	6.432**	5.275**
	(4.87)	(4.78)	(4.25)	(1.75)	(2.45)	(1.70)
No. of Observations	240	208	240	304	241	304
No. of countries	15	13	15	19	16	19
R-square	.17	.27	.21	.19	.28	.19

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. Each row is a separate regression. Columns (6.2) and (6.5) control for school attainment; Columns (6.3) and (6.6) use Male Enrolment Rate as the main explanatory variable instead of Enrolment Rate in Columns (6.1) and (6.4). All rows control for the year effect in dummies of 16 years (2003-2018). Coefficient estimates are multiplied by 100. Asterisks denote significance for the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

It seems that the statistical significance of the results on the main independent variable and theft rate is consistent in all the estimation strategies. Comparing the magnitude of the effect in the FE estimate in Table 4.4 to the IV estimate in Table 4.6, there is a significant difference in the decrease in the theft rate due to educational enrolment. Figure 4.4 compares the average marginal effects of the coefficient estimates from the two estimators. It may be observed that whereas a 1% increase in high school enrolment reduces the rate of theft on average by 1.6%, the reduction is 3.3% when enrolment is estimated as a function of cost elimination. This means that, in general, cost elimination further induces a lower theft rate. From these results, it is plausible to think that when cost elimination is implemented, this affects educational enrolment positively, with a stronger significant negative effect on the theft rate.

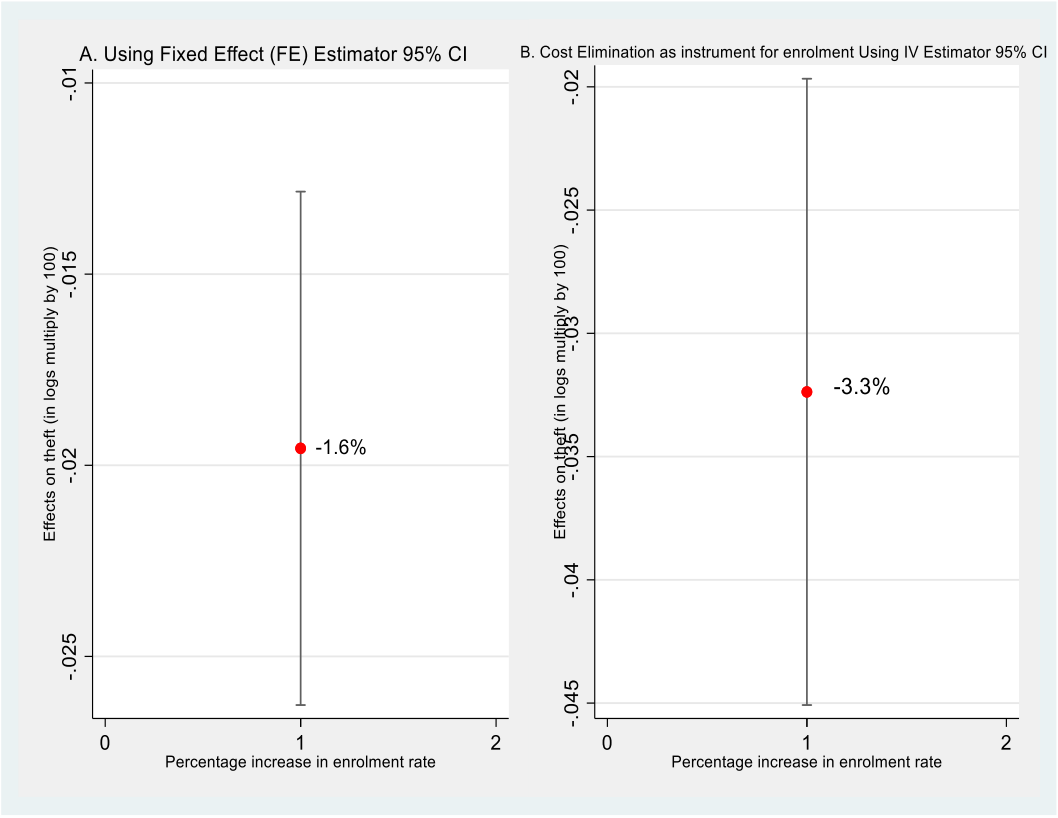

Figure 3 4.4: Comparison of FE and IV estimations of the average marginal effects of enrolment on the rate of theft.

4.6 Discussion, limitations and conclusions

In this paper, we estimate the effect of high school enrolment rate on the crime rate in Sub- Saharan Africa (SSA). We use macro-to-macro level indicators and utilise government policies in the form of "fee-free" education as an instrument for school enrolment. This adds to the body of literature that describes the positive externality of education on crime (Bennett, 2018; Hjalmarsson et al., 2015; Hjalmarsson & Lochner, 2012; Lochner, 2004; Lochner & Moretti, 2004). In using macro-level enrolment, we learn about how a social structure (that is, the national rate of schooling or "being-in-school effect") affects the national crime rate. After controlling for several other macro-level factors, the estimates from the pooled OLS and fixed-effects panel data analysis indicate that the effect of a high school enrolment rate is significantly negative for property crime proxied by the rate of theft. Male enrolment used as another indicator of education led to similar results.

However, in the fixed-effect estimates which consider unobserved country-fixed effects, enrolment is only significant (with a magnitude of −1.6%) in relation to the rate of theft when high school attainment is controlled. This may be because educational attainment may increase expectations of achieving high-status jobs that the economies of developing countries in SSA cannot provide. An increase in educational access does not automatically translate into better job creation (Teal, 2021). Therefore, a high proportion of high-school graduates without the economic growth required to create employment, coupled with a high rate of income inequality, may lead to a strong incentive to steal, as individuals have lower absolute or relative salaries. These speculations are supported by Kingdon and Knight's (Kingdon & Knight, 2007, p. 842) study in South Africa, which argued that the rise in unemployment and income inequality may lead people to engage in illegal acts such as "crime and theft".

In dealing with the problem of omitted variable bias and/or reverse causation in the education-crime relationship, we used cost-elimination so-called "fee-free education" as an instrument for the enrolment rate, which was treated as an endogenous regressor in two-stage instrumental variable estimations. These estimates reflect the causal effect of education on crime and Bell et al.'s (2018) idea of education policy-induced crime reduction. We find that the relationship between enrolment and the rate of theft is robust and significantly negative with or without controlling for school attainment. In addition, the negative effect of 3.3% on average is higher than

the fixed effect estimates of −1.6% on average. These results show that the immediate and rapid increase in enrolment through specific policies of cost elimination in the form of social support programmes have the further positive benefit of reducing the rate of theft in society. From our estimates, it is plausible to believe that policies aimed at increasing upper secondary school enrolment in SSA have a negative effect on the rate of theft, lending credence to Cullen's (1994) social support theory.

The study confirms a recommendation by Jonck et al. (2015, p. 150) who suggested examining "the potential effect of formal education in reducing crime" and recommended widening "the spectrum of interventions aimed at increasing school retention up to completing [high school] grade 12" in South Africa. In this study, we provide causal evidence about the positive externality of education on crime through utilising government policies to increase high school enrolment. In the international literature, Hjalmarsson and Lochner (2012, p. 54) argue that "policies designed to encourage schooling among more crime-prone groups are likely to produce the greatest benefit from crime reduction". In terms of violent crime, proxied by the homicide rate, however, there is no statistically significant relationship. What may explain this is that property crime in general and theft, in particular, is a common criminal offence among uneducated youth in SSA, unlike homicide (Jonck et al., 2015). Again, as commonly argued in the crime literature, socioeconomic factors such as the rate of educational enrolment are more likely to affect property crimes, while crimes against the person, typically homicide, may depend on more complicated predictors difficult to account for using aggregated data (Pratt & Cullen, 2005). A distinct mechanism between education and violent crime may require further investigation, a suggestion put forward by Ades and Mishra (2021).

Furthermore, these results are consistent with Killias and Aebi's (2000) speculation that improving educational opportunities in Europe may reduce crime rates. They also support Buonanno and Montolio's (2008) study in the Spanish Provinces that concluded that education is negatively related to property crime. Nevertheless, the results disprove Austin and Kim's (1999) conclusion about the positive significant relationship between education and homicide in SSA. Due to the inability to clearly operationalise education and the overlooked omitted variable or reverse-causation methodological issues in their study, we reject their results. The conclusions of Muchwanju et al.'s (2015) study are largely in line with the findings presented in this study about the education-theft relationship. This is because in the

fixed-effect estimates we find a negative and insignificant relationship. The study of the former, however, ignored the possibility of omitted variable bias (for example, educational attainment and reverse causation, which are taken care of in this study, causing enrolment to have a significant effect). This suggests that when using enrolment as a measure of education to estimate the effect on crime which captures the being-in-school effect, it is necessary to control for the level of educational attainment and to consider the potential effect of any other omitted variables.

4.6.1 Limitations and directions for further research

The study is limited in several ways. One is the inability to obtain crime data disaggregated by age. This would provide insight into how the criminal behaviour of the cohort of interest, conditional on the level of social support received through cost elimination, affects the macro-level crime rate. Future studies may consider this limitation and study it in detail, especially at the individual level and across levels. Two, the source of crime data that was used lacks data for many countries, leading to the exclusion of some countries from the analysis. Nevertheless, from the macro-level analysis, this study opens up the possibility of investigating the economic and the social rate of return of education on crime in SSA. This is necessary, especially due to the recent introduction of policies aimed at increasing high school education in countries such as Kenya, Ghana, Gambia, and Sierra Leone. Further studies may focus on individual countries with enough data to analyse the high school enrolment-crime nexus and the possible cost savings that can be made through this crime prevention strategy. Finally, there are several other macro-level factors besides cost elimination that may affect the rate of enrolment, either in a negative or positive direction. Since this study did not investigate beyond this assumption, but only identified cost elimination as a valid and relevant instrument for enrolment, one avenue of research would be examining the significance of cost elimination policies on high school enrolment among other variables, such as the level of poverty, which may affect upper secondary school enrolment.

4.6.2 Conclusions

To conclude, our results are potentially useful in relation to two main policy objectives in SSA. First, since the region performs poorly in terms of the rate of upper secondary school enrolment, the benefits of public expenditure on increasing the proportion of youths in upper secondary education should not be evaluated only in terms of achieving the Sustainable Development Goal 4.1 of ensuring secondary education for all by the year 2030. Rather, it also should be evaluated in terms of how it "promot[es] peaceful and inclusive societies for sustainable development" (United Nations, 2020, p. 56). Two, in a region where the majority of property crimes are committed by youth without a high school education, policy actors tasked with crime reduction should consider the use of indirect mechanisms, including supporting policies, to increase high school enrolment rather than focusing exclusively on crime control mechanisms that involve the police, courts or prison.

CHAPTER 5: CONCLUSIONS

5.1 Overview

Education as social policy is the broad focus of enquiry of the dissertation. The narrower research area is cost-elimination policies (popularly called fee-free education) in Sub-Saharan Africa (SSA) at the upper-secondary level. The dissertation's underlying ambition was to understand the conditions necessary and sufficient for the adoption of fee-free policies, and subsequently to examine the effects of fee-free policies on key social indicators, particularly school enrolment rates and crime rates. While there are abundant studies in Western literature about how educational policies for improving school access and attainment affect crime and criminal behaviour, this is not so in other developing economies, including SSA. Moreover, due to governments' previous focus on how to improve access to primary and lower secondary education (basic education) in SSA, studies on the effects of fee-free policies on enrolment are dominated by a focus on this level of education (see (Al-Samarrai & Zaman, 2007; Deininger, 2003; Hermida, 2014; İşcan, Rosenblum, & Tinker, 2015; Orodho, 2014; World Bank & UNICEF, 2009). It appears that upper-secondary education is less well studied; even when it is, the design is dominated by one or a few selected country studies (see Branson & Lam, 2017; Duflo et al., 2017). Furthermore, to my knowledge, the conditions that facilitate the recent attention to the adoption of fee-free policies at the upper-secondary level have not been studied in the academic literature. The few studies that have done something close to this have also failed to open the "black box" by revealing the actual mechanisms, or were unable to generalise about the SSA region (see Adarkwah, 2022; Mohammed, 2020).

To respond to the above-highlighted limitations in the literature and achieve the objectives of the dissertation, three research questions were posed. Each research question was answered in a distinctive, independent research paper published in an academic peer-reviewed journal within the framework of an article-based dissertation. Each article relied on a specific theoretical assumption but was theoretically connected to the idea of fee-free education as a form of social policy. Below, I present the key arguments of the thesis drawn from all three analytical papers that make up the article-based dissertation.

5.2 Summary of the analytical chapters

The importance of education has caused countries to pay critical attention to this sector. Recently, due to the global vision of ensuring secondary education for all according to the Sustainable Development Goals (Goal 4), countries in the global South, notably SSA, are paying critical attention to this level of education, a perpetuation of the previous focus on the basic level of education (primary and lower secondary). A key policy tool many of these countries are using to increase access is the adoption of cost-elimination policies – popularly called fee-free education. What conditions propel countries to adopt these policies? In other words, how do these policies evolve? Furthermore, does these policies have any effect on improving school participation and more importantly, do they have an impact on the general social structure or variables such as the reduction of crime? The subsequent sub-section provides an overview of how each individual analytical chapter or article contributes to addressing these research questions raised.

5.2.1 Article on conditions necessary and sufficient for fee-free policies

The first research ambition focused on addressing the conditions necessary and sufficient for expansionary social policies, specifically fee-free educational policies within the general framework of the research ambitions. The study was situated within the social policy literature and identified potential condition(s) within the socio-political environment that are favourable (or unfavourable) to the adoption of fee-free policies at the high-school level in SSA, using fuzzy-set qualitative comparative analysis (fsQCA). The results show the strong influence of electoral competition in both outcomes. In the analysis of the outcome "presence of fee-free policy" the path analysis showed that the presence of electoral competition (i.e., the political party in power promised fee-free policy during their electoral campaign) *and* low level of economic performance *or* the presence of electoral competition *and* high level of lower-secondary-school enrolment rate (i.e., a relative higher number of people attending junior high school) are sufficient to drive fee-free policy at the high-school level. Regarding the outcome "absence of fee-free policy", the absence of electoral competition is sufficient to cause the absence of fee-free policy.

Indeed, the results from Study 1 in Chapter 2 support the broader theoretical positions and contributes to our understanding of expansionary social policies within

developing democracies such as SSA. The results from the study identify electoral competition and dynamics as having a significant role in the development of social policies (Grebe, 2015; Keefer & Khemani, 2005; Stasavage, 2005). In addition, they support earlier empirical studies, mainly in relation to the basic level of education in SSA, which argue that political demands trigger the adoption of universal free primary education due to electoral competition (Avenstrup et al., 2004). The implication drawn from this study vis-à-vis the dissertation's general theoretical proposition is that elections strongly influence agenda-setting, policy formulation, and the adoption of social policies in SSA. The combination of a high level of lower-secondary school enrolment with electoral competition further provides strong evidence of the expectations. This is believed to exist due to the increase in political capital required to adopt fee-free policies when many young people are ready and progressing to the high-school level. The younger people are enrolling in lower levels of education and are expected to progress to the upper secondary level, the higher the incentive to adopt these policies because these cohort provide a base for maximizing political power.

Weak economic performance combined with electoral competition in the production of fee-free policy may, however, be counter-intuitive but is not surprising. For example, among all the cases that were analysed, cases from South Africa were associated with the strongest economic performance. Notwithstanding this, only a partial fee-free policy has been adopted in relation to the relatively weak economy of Ghana in 2017, but adopted a holistic fee-free policy. Moreover, in Ghana the government adopted a partial fee-free policy in 2015 when the economy grew by -0.17%, with a GDP per capita of US$1,706. Ironically, in 2013 GDP per capita was US$2,361 with growth of 4.8%, but a fee-free policy was not implemented either in 2014 although the problem of the low rate of transition from lower secondary to upper secondary school persists. The reason attributed to this by other scholars is political actors' desire to fulfil a campaign promise made in the 2012 general elections, in view of the next general election in 2016, despite the declining economy (Adarkwah, 2022; Mohammed & Kuyini, 2021). Moreover, the agenda associated with free education at the high-school level attracted national attention going into the election. This is partly due to the consistency of the main opposition party in highlighting free education, which compelled the incumbent government to display their commitment, hence leading to the introduction of a fee-free policy in 2015. Also, when economic

conditions are not favourable for citizens, governments may attempt to deliver some social interventions to alleviate extreme hardship.

Furthermore, the study did not reveal any influence of political parties' ideologies in the adoption of fee-free policies. This result calls for a rethink of the left turn of the partisan theory of policy outcomes which argues that left-wing parties pursue expansionary social policies more than right-wing parties. In this dissertation, fee-free education in SSA is not the preserve of left-wing parties. In fact, right-wing parties were identified to engage in rigour fee-free policies compared to left-wing parties, which supports the findings of Tavits and Letki (2009) in post-Communist Europe.

The result of this study improves our understanding of the evolution of expansionary social policies in developing democracies by clarifying the prominent contradictory theories in the literature. We are able to identify electoral competition emanating from domestic electoral politics as the most necessary condition for governments in SSA to expand fee-free educational policies from the basic level of education to the upper secondary level. Again, the study highlights the insignificance of certain theoretical explanations of the evolution of fee-free educational policies (as a component of expansionary social policies) in SSA. For example, the left turn of policy outcomes and the economy.

5.2.2 Article on fee-free policies and school enrolment

Do fee-free policies have any effect at all? In Study 2, presented in Chapter 3, I was interested in investigating the effect of fee-free policies on school enrolment and the moderating effects of the poverty rate. The result of the study was that fee-free policies significantly positively affect the rate of high-school enrolment in SSA. All other things being equal, an implementation of cost-elimination policy in one year leads to an average increase of 6% in the upper-secondary-school enrolment rate. As expected, offering fee-free education improves school participation, thereby improving the country's human capital formation.

The results support Hypothesis 1 and earlier studies at the basic level of education that posited that fee-free educational policies increase enrolment (Akyeampong et al., 2007; Kabubo-Mariara & Mwabu, 2007; Sabates et al., 2010). However, a higher rate of poverty moderates the cost-elimination-enrolment nexus, reducing the effect of cost elimination on enrolment. This means that an increase in the enrolment rate may still not be achieved despite the implementation of fee-free policies if national poverty

levels are high. This also supports Hypothesis 2 and earlier studies that argue that eliminating fees amid a high level of poverty will only have a minimal positive impact on enrolment (Branson & Lam, 2017, 2017; Garlick, 2013; World Bank & UNICEF, 2009). Conversely, offering fee-free education means that poverty does not have an extremely negative effect on enrolment. The implication of this study within the broader dissertation is that social policy – and in this case, the provision of fee-free education – at the high-school level promote school participation and social inclusion for endogenous growth. However, high rate of national poverty work against the positive effects expected to be derived from expansionary social policies such as fee-free educational policies.

The general outlook of developing economies and, in this case, SSA indicates a high poverty level. For example, SSA has a national average poverty rate of about 40% (World Bank, 2021). Despite the efforts of national governments to reduce the poverty rate, it is a continuous process that demands time. The implication here is that relinquishing access to education to the capabilities of individuals will continue to have an adverse negative effect on school participation. Therefore, from the results of this study, social policies such as fee-free education offered by national governments should be encouraged to mitigate the low level of school participation within the region. Notwithstanding, the continued government agenda to reduce the national poverty rate is key for the long-term sustainability of the evolution of social policies, such as the positive effect of fee-free policies on school participation to promote human capital development.

The results from this analytical chapter contribute to our understanding about the effects of fee-free policies on enrolment. We are able to understand that there is, indeed, a positive relationship between fee-free policies and educational enrolment at the upper-secondary level to improve human capital formation from a broader perspective (using data from all countries in the SSA region). Again, as pertains at the individual level in one or a few selected country studies that economic poverty is the main cause of people's inability to enrol in school, this study provides further evidence and argues that not only at the individual level or one or a few selected countries do high poverty levels affect enrolment negatively, but at the macro level across SSA region as well. Even in the presence of fee-free policies, high level of poverty rate can still affect enrolment negatively.

5.2.3 Article on education and crime

Apart from whether fee-free policies have a significant positive outcome on the rate of school enrolment, is there any impact from these policies on society? To address this question, I utilised crime as a subject of investigation. I had the ambition of uncovering the effect of the macro-level rate of school enrolment on the crime rate and further utilising fee-free policies as an instrument of enrolment to estimate the causal effect of the education-crime nexus. The results support the first proposition that an increase in enrolment negatively affects property crime. A 1% increase in the enrolment rate leads to a 1.6% reduction in the theft rate, all other things being equal. There is no evidence of a significant effect on violent crime. Furthermore, when school enrolment was estimated as a function of fee-free policies using the two-stage least square estimates, the negative effect on the rate of theft was more significant and robust than the baseline estimates. With a 1% increase in enrolment, there is a 3.3% reduction in theft rate, all other things being equal. What may explain the relatively more substantial effect may be the gains for enrolment due to fee-free policies. Meanwhile, the rejection of Hypothesis 2 is suggested by the belief that while socioeconomic factors (such as the level of school enrolment) may affect social phenomena such as theft, crimes against the person, typically homicide, may depend on more complicated predictors that are difficult to account for using aggregated data.

The results of this study support Cullen's (1994) normative social support theory with regard to property crime and other empirical studies and speculation about the effect of educational levels and crime rate (Buonanno & Montolio, 2008; Jonck et al., 2015; Killias & Aebi, 2000). The implication of the research described in the paper within the broader theoretical framework of the dissertation is that fee-free education as a social policy for supporting access to education improves social structures and has the additional benefit of reducing the rate of theft, lending credence to social support theory.

The result from this study further contributes to accomplishing the general ambition of the dissertation and improves our knowledge of the literature. The evolution of social policies, specifically fee-free educational policies, does not only have an immediate effect of improving school participation but has additional societal benefits that transcend beyond the immediate beneficiaries of these programmes and policies. The social benefits of fee-free educational policies in reducing aggregated theft rates further improve our knowledge about the extensive studies in the Western

literature using micro-to-micro level data about the negative relationship between education and crime. In developing democracies such as SSA region, improving social support structures impact aggregated crime, especially theft rate, which is the dominant criminal offence of many offenders or prisoners. Furthermore, it reinforces the need to investigate the sources of the evolutions of these policies in developing democracies (as undertaken in analytical Study 1) to better understand and, if need be, improve these social structures within the broader expansionary social policy literature.

5.3 Advancing a common theoretical understanding

The findings from the dissertation have wide-reaching implications for both theory and empirical political science and sociological literature. To understand how fee-free policies at the upper-secondary-school level get on the agenda and subsequently get adopted in SSA, one needs to understand the electoral politics triumphed in the domestic political environment. In brief, one needs to be aware of the dynamics of electoral competition and political agents' interests. In contrast to the evidence that external influence and foreign pressure may persuade many countries to succumb to some key political ideals, such as democracy in the post-Cold-War era in Africa and elsewhere (Huntington, 1991; Peiffer, 2012), or coalitions or networks, the adoption of fee-free policies at the high-school level is due to domestic political influence involving the strive for political power or an attempt to maximise political capital/power. This is not surprising. Partisan power politics has been the driving force in facilitating educational reforms for a long time; they are dynamic political processes dependent on the outcome of various political struggles during critical junctures in historical development (Busemeyer, 2015; Busemeyer & Trampusch, 2012). Educational issues attract national attention, and direct intervention in education, especially such as the introduction of fee-free education, is warmly welcomed by the public. Moreover, citizens view political actors as having the direct control to implement such policies. This general understanding is so more pervasive under weak or developing democracies where the maximisation of political power or political opportunism by political actors is a crucial component of the democratic system.

Furthermore, in democratic politics, decision-makers associated with public policies are identified to be affected by the process of electoral politics (opposed to the notion of the exclusive maximisation of social welfare) (Downs, 1957).

Notwithstanding this, the empirical findings advanced in this study affirm that the mere existence of democratic practices is a weak driver of the provision of fee-free education. Given the above, this work contributes to the research on the influence of competitive elections and not democratic credentials per se in the provision of social policies. Nelson expressed it this way: "democratic politics generate weak or negative incentives for politicians to promote reforms. When they do so, it is rarely because of electoral pressures" (Nelson, 2007, p. 79). These empirical findings and theoretical positions are re-echoed in this dissertation. The consequences of elections influence political executives' attitudes, frequently in domestic politics, and the allocation of resources is, in some cases, due to political opportunism or maximising political power (Aravacik, 2018, 2018; Downs, 1957; Kovács & Hajnal, 2013; Kpessa, 2011; Mares & Carnes, 2009).

However, these distributive politics in fee-free education as a form of social policy differ from the direct or targeted benefits of the exchange of goods and services known as *quid pro quo* tendencies, as argued by Stokes (2013). The provision of fee-free policies is associated with the hope and uncertainty of delivering political advantage in electoral competition due to the popularity of the latter among electorates. Electorates view the elimination of school fees as a dimension that political agents have direct control over, thus proposing them during electoral campaigns directly impacts electoral outcomes. Indeed, some empirical evidence suggests that fee-free policies deliver electoral victory (Correa et al., 2020; Frempong, 2020; Harding & Stasavage, 2014).

Furthermore, like in Latin America, Grindle (2004) succinctly demonstrated using twelve different cases that presidents and other high-level public officials legally control when and how education reforms occur. Cases from SSA bring to the fore the fact that electoral campaigns are the first viable place to raise the issue of fee-free education to attract public attention. In this regard, electoral cycles are critical, and together with the personalities involved, policy changes that involve providing fee-free education can occur swiftly due to its political consequences. However, in weaker democratic states like SSA countries with weak institutional structures (Alhassan & Kilishi, 2019; Lewis, 1992), the dominance of electoral politics as the overarching causal mechanism in adopting fee-free policies is a cause for concern. Could the empirical and theoretical evidence expounded in this dissertation contribute to explaining the prevalence of policy discontinuity in the region and many developing

democracies (Gonzalez, 2002; Kaye-Essien, 2019; Vordzorgbe, 2005)? Given this, the application of the theoretical exposition of this thesis should focus on developing democracies such as those in SSA countries.

Notwithstanding the dominance of electoral competition in the evolution of fee-free policies, the outcome and the impact of these policies on society are positive. The provision of universal upper-secondary education makes a critical contribution to the human capital formation of the sub-region. This vision, according to the results of this study, can be partly achieved through fee-free education. This leapfrog strategy for improving human capital will level the playing field, promote endogenous growth akin to the high school revolution in the US fostered by the high school movement (Putnam & Garrett, 2020), and lead to a massive regional-level improvement in productivity and economic growth. What is more important is the other impact of fee-free policies, especially reducing the aggregated rates of crime (theft). These pieces of evidence also bring to the fore the idea that scholars should view the application of Cullen's (1994) social support theory as an organising concept for crime, beyond its borders of origin. The intergenerational support in education offered to people by states can help reduce the crime rate not only in developed economies but also in developing economies such as SSA countries. This finding adds to the body of literature that education has a profoundly positive impact on individuals who complete it, as well as on general society.

The logical theoretical conclusion of the findings of the entire dissertation combining all three analytical chapters is summarised in Figure 5.1.

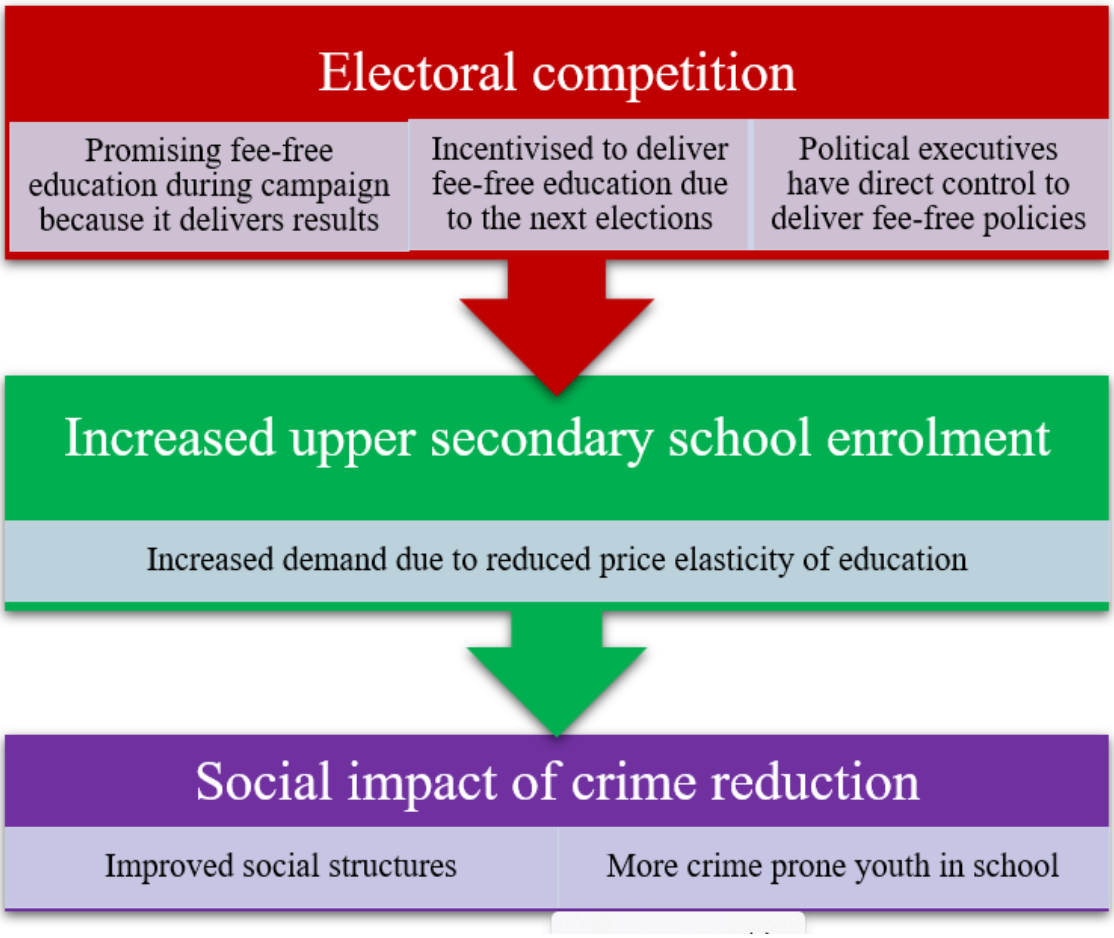

Figure 5.1: Summary of results: The mechanisms of the conditions and the social benefits of fee-free policies

5.4 Policy implications of the dissertation

The findings from the dissertation have wide-reaching implications for policy. First, I think that expenditure on education by countries in SSA should be viewed as investment expenditure for endogenous growth drive for human capital formation and intergenerational development, not as consumption expenditure. This practical conclusion stems from the idea that a high human capital index of a country is a generally positive phenomenon for a country. For example, in the US, Becker (1993) and Putnam and Garrett (2020) argued that the growth in high-school education is directly related to the socio-economic transformation of the country and that people without any form of upper secondary education are obsolete to national economies.

Developing economies, including countries in SSA, are considered to have a low level of human capital, which situation is partly blamed for the region's slow pace of development. The results of this dissertation (presented in analytical study 2) show that providing fee-free education to people at the high-school level can increase the rate of school participation, which is critical for improving human capital formation. Notwithstanding this positive outcome of providing fee-free education to people, states must not lose sight of other pressing country-level variables – for example, reducing the rate of poverty – which, if not checked, can reduce the positive effect of investment in education. Hence, attempts to improve the human capital index of countries in the developing world must be viewed as a complex and interdependent activity.

Second, it is essential to consider that striving to make societies safer from crime must not be approached only by controlling criminal activity through punishment. Critical attention should also be paid to identifying how to strengthen social policies and provide national support – for example, education - to people, at least to the upper-secondary level. Strengthening social structures impacts aggregated crime rate (Cullen, 1994). From the empirical study of this dissertation (presented in analytical study 3), providing fee-free education at the upper-secondary level strengthens school participation to reduce aggregated theft rate.

Last, to sustain the gains from policies aimed at increasing school participation, there must be conscious efforts to design fee-free policies within countries' broader national development agendas. This paradigm shift will limit the personal preferences that different governments and personalities may attach to the continuity or otherwise of social policies. The importance of this policy recommendation originates from the idea that, in the absence of national agendas for a policy within which fee-free policies can be incorporated, the desired outcome and impact of these policies cannot be sustained and achieved in the long-term. Most of the time, policies designed through competitive electoral politics may suffer from policy discontinuity (Gonzalez, 2002; Kaye-Essien, 2019).

5.5 Limitations of the dissertation and guidelines for further studies

This dissertation is not without limitations. One more obvious source of potential criticism of the theoretical explanation offered to explain the evolution of fee-free policy is the inability to analyse all other socio-political variables that could be potential drivers. This limitation is not exclusive to this study but applies to any other empirical study that needs to compromise between parsimony and comprehensive modelling. In analytical Study 1 (i.e., Chapter 2), a compromise needed to be made in applying QCA by keeping the number of conditions as small as possible. This compromise led to the inclusion of five conditions. Together with the main condition (electoral competition) identified in this study, other studies may explore the other conditions potentially necessary and sufficient for the adoption of fee-free policies or may apply other innovative methodological approaches. In addition, implementing empirical studies using a narrower brief such as single-country cases for understanding the conditions that facilitate the adoption of fee-free policies at the upper-secondary level may be useful.

Furthermore, many countries in the region were not associated with data, which led to their exclusion from the empirical analysis in Studies 2 and 3. This led to relatively fewer observations, in contrast to what is desired in statistical analysis. However, having now generated a general overview of this area, further studies may apply statistical analysis in individual countries using more data.

Last, the dominance of electoral competition approaches to the evolution of fee-free policies instead of pragmatic politics recommends that scholars in public administration closely monitor other outcomes and the medium and long-term impact of fee-free policies. Areas to focus on are the measurement of educational quality using indexes – for example, school grades and job market absorption. What is the rate of students' performance vis-à-vis global standards of education after the implementation of these policies compared to prior to them? What is the external efficiency of the fee-free education system, i.e., is the job market supplied with the requisite skilled people to fill various vacancies? What is the cost-effectiveness of fee-free policies? Such further studies will help us understand the value for money of investing in fee-free education.

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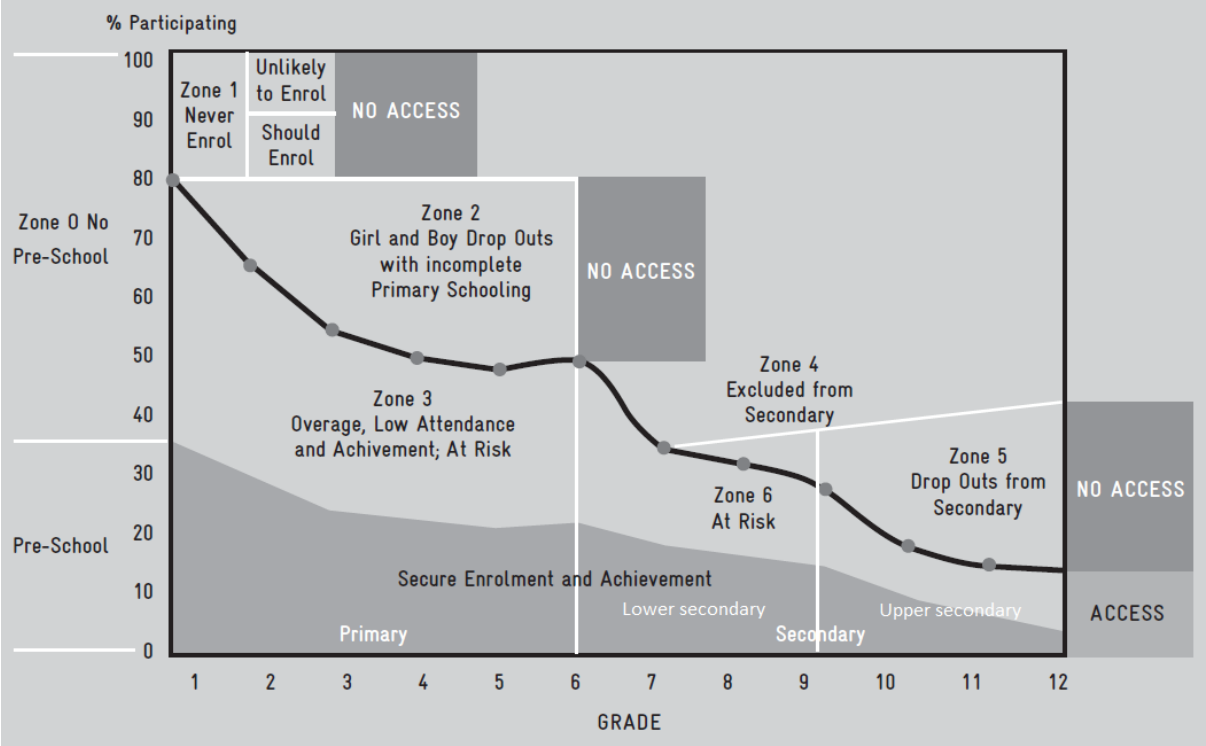
APPENDIXES

APPENDIX 1: Introductory chapter

Consortium for Research on Education Access, Transition and Equity (CREATE) identifies seven modified Zones of exclusion ranging from Zone 0 to Zone 6, i.e., from pre-school to secondary school (Lewin, 2009). Zone 0 constitutes people with no pre-school access. Zone 1 is for those children who have access but never enrol. Zone 2 is made up of dropouts from primary schooling. Zone 3 constitutes children in school who are at risk of dropping out due to low coverage, low attendance and low achievers. Zone 4 are children who are primary leavers but are excluded from secondary education because they fail to transit to secondary level (both lower secondary and upper secondary). Zone 5 is for people who enter secondary school but drop out before completing the entire cycle. Zone 6 are those who enter secondary schooling and are enrolled but are "at risk" of dropping out before completion due to irregular attendance, low achievement and silent exclusion from practical learning (Lewin, 2007, 2009). The zones of exclusion are summarised in the table below.



CREATE's Zones of exclusion by grade of participation

Source: Adapted and modified from Lewin (2007)

APPENDIX 2: Conditions for fee-free policy chapter

2A: Details on Cases

Table 2A1: Countries, Political parties and the resources used to code government ideology, presence, and the nature of fee-free policy

No	Country	Political party	Year(s) in power	Ideological lineage	Campaign promise	Name and year of Fee-free policy adoption	Nature of Fee-free policy	Sources of Information on Ideology, Campaign promise, and policy adoption
1	Ghana	National Democratic Congress (NDC)	2010-2016	Left	2012	Progressively Free Senior High School (2015-2016)	Partial	Boadu (2015), Socialist International, (2021), National Democratic Congress (2012)
		New Patriotic Party (NPP)	2017-2020	Right	2016	Free Senior High School (2017-2020)	Full	Republic of Ghana (2017), International Democrat Union (n.d.), New Patriotic Party (2008)
2	Malawi	Democratic Progressive Party	2010-2019	Left	2016	Free Secondary School Education (2018-2019)	Partial	Government of Malawi (2016)
		Malawi Congress Party	2020	Right	2019	Free Secondary School Education (2020)	Partial	Malawi Congress Party (2019), Democrat Union of Africa (n.d.)
3	Namibia	South West African People's Organisation (SWAPO)	2010-2020	Left	2014	Fee-Free Secondary Education (2016-2020)	Partial	Republic of Namibia (2015), SWAPO (2014), Socialist International, (2021)
4	Sierra Leone	All People's Congress	2010-2017	Left	-	-	-	All People's Congress (2019)
		Sierra Leone People's Party	2018-2020	Right	2017	Free Quality School Education (2018-2020)	Partial	Republic of Sierra Leone (2018), Democrat Union of Africa (n.d.)
5	South Africa	African National Congress (ANC)	2010-2020	Left	1994	No-Fee Policy (2010-2020)	Partial	Government Gazette (2006), Socialist International, (2021), African National Congress (2009)
6	Uganda	National Resistance Movement	2010-2020	Left	2001	Universal Secondary Education (2012-2020)	Partial	BBC (2001), Ministry of Education and Sports (2013)
7	Kenya	Party of National Unity	2010-2012	-	2007	Free-Day Secondary School (2010-2016)	Partial	Republic of Kenya (2019), Clarke (2007), Murunga (2010)
		The National Alliance	2013-2016	-	2002			
		Jubilee Party	2017-2020	-	2017	Full Free Secondary Education (2017-2020)	Full	African Elections Project (2017), The Presidency of Kenya (2017)

Source: Author's compilations

Table 2A1 lists all the cases in the study. Columns 1-2 list the seven countries. Column 3 specifies the political parties in power in that country with the year(s) in power listed in Column 4. The year and the countries provide the cases that are analysed. Column 5 specifies the ideological lineage of the political party in power in the observed year. This information is mainly from sub-regional and international bodies such as the International Democrat Union, Democrat Union of Africa, and Socialist International. Column 6 specifies the year in which the political party in power made a promise to adopt a fee-free policy at the high school level. The year can precede the year the party is in power and/or the policy is adopted. This information is mainly from the political parties' manifesto. Column 7 specifies the name of a fee-free policy that was adopted in the country, if any. It also specifies the year this policy was implemented according to the study timeframe. The policy may exist before the specified period in this study. For example, Free Day Secondary Education in Kenya was adopted in 2008, but in this study, I stated it as 2010. The reason is that I stick to the timeframe of this study and specifies the years within the timeframe in which the policy started. Column 8 specifies the nature of the policy, that is if the policy is a partial fee-free policy assigned a fuzzy score of 0.75 or holistic fee-free policy assigned a fuzzy set score of 1 as discussed in the Methods section. These pieces of information are mainly taken from government official sources and personal knowledge. The last column cites all the sources of this information.

APPENDIX 2B: Complex and Parsimonious solutions for the two outcomes

Table 2B1. Complex and Parsimonious Solutions for the outcomes 'Presence of fee-free policy' (FFP) and 'Absence of fee-free policy' (~FFP)

Complex Solution

a. Presence of fee-free policy (FFP)

Configuration	Consistency	Raw Coverage	Unique Coverage
ELC*ECO*LSE+~DEM*ELC*~ECO*~LSE+(~DEM*ELC*~LEFT*~ECO)	0.87	0.82	
ELC*ECO*LSE+~DEM*ELC*~ECO*~LSE+ (~DEM*ELC*~LEFT*LSE)	0.87	0.82	
Elements of Complex solution			
ELC*ECO*LSE	0.85	0.67	0.60
~DEM*ELC*~ECO*~LSE	0.91	0.26	0.11
~DEM*ELC*~LEFT*~ECO	1.00	0.07	0.01
~DEM*ELC*~LEFT*LSE	1.00	0.08	0.01

b. Absence of fee-free policy (~FFP)

Configuration	Consistency	Raw Coverage	Unique Coverage
~ELC*LEFT*~LSE	1.00	0.37	0.19
+			
DEM*~ELC*LEFT*ECO	1.00	0.23	0.05
Solution Consistency	1.00		
Solution Coverage	0.42		

Parsimonious Solution

a. Presence of fee-free policy (FFP)

Configuration	Consistency	Raw Coverage	Unique Coverage
ELC*~ECO	0.90	0.39	0.16
+			
ELC*LSE	0.81	0.73	0.49
Solution Consistency	0.83		
Solution Coverage	0.89		

b. Absence of fee-free policy (~FFP)

Configuration	Consistency	Raw Coverage
~ELC	1.00	0.61

Notes: * means logical AND, + means logical OR. Conditions with tilde (~) notation indicate the negation of the condition

APPENDIX 2C: SUPPLEMENTARY MATERIAL: Data
Table 2C1. Calibrated fuzzy Set scores

Cases	Outcome		Potential Conditions for Presence of fee-free Policy						
	Present(FFP)	Absent (~FFP)	DEM	ELC	LEFT	GDG	GDP	ECO	LSE
G10	0.00	1.00	0.502	0.000	1.000	0.960	0.500	0.960	0.471
G11	0.00	1.00	0.502	0.000	1.000	1.000	0527	1.000	0.477
G12	0.00	1.00	0.502	0.000	1.000	0.989	0.532	0.989	0.484
G13	0.00	1.00	0.559	1.000	1.000	0.943	0.615	0.943	0.539
G14	0.00	1.00	0.559	1.000	1.000	0.111	0.566	0.566	0.542
G15	0.75	0.25	0.652	1.000	1.000	0.038	0.544	0.544	0.722
G16	0.75	0.25	0.633	1.000	1.000	0.235	0.567	0.567	0.712
G17	1.00	0.00	0.623	1.000	0.000	0.974	0.579	0.974	0.678
G18	1.00	0.00	0.612	1.000	0.000	0.873	0.597	0.873	0.690
G19	1.00	0.00	0.612	1.000	0.000	0.903	0.599	0.903	0.690
G20	1.00	0.00	0.589	1.000	0.000	0.003	0.611	0.611	0.690
K10	0.75	0.25	0.346	1.000	1.000	0.968	0.264	0.968	0.646
K11	0.75	0.25	0.346	1.000	1.000	0.797	0.276	0.797	0.683
K12	0.75	0.25	0.346	1.000	1.000	0.504	0.382	0.504	0.718
K13	0.75	0.25	0.394	1.000	1.000	0.775	0.434	0.775	0.768
K14	0.75	0.25	0.394	1.000	1.000	0.695	0.502	0.695	0.811
K15	0.75	0.25	0.417	1.000	1.000	0.771	0.504	0.771	0.835
K16	0.75	0.25	0.417	1.000	1.000	0.806	0.512	0.806	0.865
K17	1.00	0.00	0.392	1.000	1.000	0.627	0.530	0.627	0.890
K18	1.00	0.00	0.392	1.000	1.000	0.873	0.545	0.873	0.910
K19	1.00	0.00	0.400	1.000	1.000	0.751	0.557	0.751	0.928
K20	1.00	0.00	0.385	1.000	1.000	0.001	0.559	0.559	0.942
M10	0.00	1.00	0.479	0.000	1.000	0.868	0.082	0.868	0.169
M11	0.00	1.00	0.479	0.000	1.000	0.521	0.095	0.521	0.173
M12	0.00	1.00	0.513	0.000	1.000	0.010	0.064	0.064	0.176
M13	0.00	1.00	0.499	0.000	1.000	0.603	0.057	0.603	0.196
M14	0.00	1.00	0.457	0.000	1.000	0.711	0.061	0.711	0.207
M15	0.00	1.00	0.444	0.000	1.000	0.050	0.063	0.063	0.214
M16	0.00	1.00	0.444	0.000	1.000	0.033	0.052	0.052	0.201
M17	0.00	1.00	0.437	0.000	1.000	0.294	0.086	0.294	0.209
M18	0.75	0.25	0.437	1.000	1.000	0.458	0.095	0.458	0.207
M19	0.75	0.25	0.438	1.000	1.000	0.745	0.108	0.745	0.184
M20	0.75	0.25	0.467	1.000	0.000	0.003	0.121	0.121	0.163
N10	0.00	1.00	0.540	0.000	1.000	0.896	0.858	0.896	0.771
N11	0.00	1.00	0.542	0.000	1.000	0.791	0.879	0.879	0.839
N12	0.00	1.00	0.542	0.000	1.000	0.790	0.885	0.885	0.890
N13	0.00	1.00	0.542	0.000	1.000	0.861	0.858	0.861	0.923
N14	0.00	1.00	0.542	0.000	1.000	0.903	0.862	0.903	0.945
N15	0.00	1.00	0.555	1.000	1.000	0.634	0.829	0.829	0.961
N16	0.75	0.25	0.555	1.000	1.000	0.003	0.806	0.806	0.973

Cases	Outcome		Potential Conditions for Presence of fee-free Policy						
	Present(FFP)	Absent (~FFP)	DEM	ELC	LEFT	GDG	GDP	ECO	LSE
N17	0.75	0.25	0.555	1.000	1.000	0.000	0.857	0.857	0.981
N18	0.75	0.25	0.544	1.000	1.000	0.015	0.868	0.868	0.986
N19	0.75	0.25	0.577	1.000	1.000	0.001	0.838	0.838	0.991
N20	0.75	0.25	0.593	1.000	1.000	0.000	0.782	0.782	0.993
S10	0.00	1.00	0.324	0.000	1.000	0.751	0.066	0.751	0.221
S11	0.00	1.00	0.324	0.000	1.000	0.876	0.075	0.876	0.241
S12	0.00	1.00	0.346	0.000	1.000	1.000	0.103	1.000	0.287
S13	0.00	1.00	0.338	0.000	1.000	1.000	0.152	1.000	0.277
S14	0.00	1.00	0.330	0.000	1.000	0.607	0.151	0.607	0.270
S15	0.00	1.00	0.328	0.000	1.000	0.000	0.110	0.110	0.263
S16	0.00	1.00	0.328	0.000	1.000	0.861	0.087	0.861	0.295
S17	0.00	1.00	0.340	0.000	1.000	0.544	0.086	0.544	0.290
S18	0.75	0.25	0.340	1.000	0.000	0.292	0.095	0.292	0.282
S19	0.75	0.25	0.363	1.000	0.000	0.813	0.093	0.813	0.531
S20	0.75	0.25	0.363	1.000	0.000	0.000	0.083	0.083	0.971
SA10	0.75	0.25	0.788	1.000	1.000	0.400	0.934	0.934	0.965
SA11	0.75	0.25	0.788	1.000	1.000	0.468	0.950	0.950	0.979
SA12	0.75	0.25	0.788	1.000	1.000	0.125	0.939	0.939	0.983
SA13	0.75	0.25	0.801	1.000	1.000	0.175	0.919	0.919	0.981
SA14	0.75	0.25	0.792	1.000	1.000	0.073	0.905	0.905	0.980
SA15	0.75	0.25	0.758	1.000	1.000	0.029	0.875	0.875	0.979
SA16	0.75	0.25	0.738	1.000	1.000	0.009	0.851	0.851	0.968
SA17	0.75	0.25	0.713	1.000	1.000	0.049	0.893	0.893	0.966
SA18	0.75	0.25	0.713	1.000	1.000	0.020	0.903	0.903	0.959
SA19	0.75	0.25	0.713	1.000	1.000	0.008	0.888	0.888	0.950
SA20	0.75	0.25	0.683	1.000	1.000	0.000	0.841	0.841	0.940
U10	0.00	1.00	0.385	1.000	1.000	0.618	0.195	0.618	0.079
U11	0.00	1.00	0.394	1.000	1.000	0.979	0.200	0.979	0.084
U12	0.75	0.25	0.397	1.000	1.000	0.121	0.181	0.181	0.088
U13	0.75	0.25	0.404	1.000	1.000	0.078	0.190	0.190	0.088
U14	0.75	0.25	0.404	1.000	1.000	0.435	0.225	0.435	0.089
U15	0.75	0.25	0.404	1.000	1.000	0.408	0.207	0.408	0.089
U16	0.75	0.25	0.409	1.000	1.000	0.218	0.159	0.218	0.090
U17	0.75	0.25	0.389	1.000	1.000	0.049	0.164	0.164	0.090
U18	0.75	0.25	0.402	1.000	1.000	0.609	0.174	0.609	0.091
U19	0.75	0.25	0.381	1.000	1.000	0.766	0.184	0.766	0.091
U20	0.75	0.25	0.372	1.000	1.000	0.025	0.194	0.194	0.092

Notes: FFP=Presence of fee-free policy, ~FFP=Absence of fee-free policy, DEM=High Democracy, ELC=Political party in power promised fee-free education, LEFT=Political party in power is leftist, ECO=High economy, LSE=High lower secondary school enrolment rate. 1 minus the value of a condition in a case is used in the analysis of the absence of the outcome.

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APPENDIX 3: **Cost-elimination and enrolment chapter**

3A: COUNTRIES

Table 3A1: Countries (with data) included in the analysis and the Theoretical Age and Number of years of Upper Secondary Education

No.	Country	Theoretical Entrance Age	Theoretical Duration	No.	Country	Theoretical Entrance Age	Theoretical Duration
1	Angola	15	3	**21**	Madagascar	15	3
2	Benin	16	3	**22**	Malawi	16	2
3	Botswana	16	2	**23**	Mali	16	3
4	Burkina Faso	16	3	**24**	Mauritania	16	3
5	Burundi	16	3	**25**	Mauritius	14	4
6	Cameroon	16	3	**26**	Mozambique	16	2
7	Cape Verde	15	3	**27**	Namibia	17	2
8	Central Africa Republic	16	3	**28**	Niger	17	3
9	Chad	16	3	**29**	Nigeria	15	3
10	Comoros	16	3	**30**	Rwanda	16	3
11	Democratic Republic of Congo	14	4	**31**	Sao Tome and Principe (STP)	15	3
12	Cote d'Ivoire	16	3	**32**	Senegal	16	3
13	Congo	16	3	**33**	Sierra Leone	15	4
14	Eswatini	16	2	**34**	South Africa	16	3
15	Ethiopia	17	2	**35**	Seychelles	15	4
16	Ghana	15	3	**36**	Tanzania	18	2
17	Guinea	17	3	**37**	Togo	16	3
18	Kenya	14	4	**38**	Uganda	17	2
19	Lesotho	16	2	**39**	Zimbabwe	17	2
20	Liberia	15	3				

Source: UNESCO Institute for Statistics, 2021

3B: SUMMARY STATISTICS

Table 3B1: Descriptive statistics of the variables

Variables		Mean	Std. Dev.	Min	Max	Observations
Upper Secondary School Enrolment	overall	32.47	22.87	2.73	111.76	N = 415
	between		19.88	6.10	93.23	n = 39
	within		8.01	13.80	71.21	T = 10.64
Male Enrolment	overall	33.75	21.21	3.75	113.25	N = 405
	between		18.31	7.38	89.28	n = 39
	within		7.70	14.63	65.60	T = 10.38
Female Enrolment	overall	30.60	25.44	1.80	116.20	N = 405
	between		21.97	4.81	97.24	n = 39
	within		8.37	7.10	76.36	T = 10.38
Cost Elimination	overall	0.13	0.33	0.00	1.00	N = 624
	between		0.29	0.00	1.00	n = 39
	within		0.17	-0.63	1.06	T = 16
Poverty Rate	overall	40.58	22.14	0.14	96.29	N = 624
	between		21.10	0.37	79.88	n = 39
	within		7.46	6.64	69.33	T = 16
Unemployment	overall	7.32	7.23	0.32	32.77	N = 624
	between		7.20	1.02	27.04	n = 39
	within		1.31	3.03	13.43	T = 16
GNI Per Capita	overall	3832.02	4500.88	80.00	27310.00	N = 624
	between		4394.34	678.13	19551.25	n = 39
	within		1188.55	-2789.23	11980.77	T = 16
Inequality Rate (GINI)	overall	43.71	9.00	5.30	81.40	N = 624
	between		7.87	30.05	63.58	n = 39
	within		4.53	16.39	71.03	T = 16
GDP Per capita Growth	overall	2.19	4.36	-36.56	28.68	N = 624
	between		1.42	-0.58	6.66	n = 39
	within		4.12	-34.09	27.66	T = 16
Population Growth	overall	2.38	0.94	-2.63	4.63	N = 624
	between		0.88	0.24	3.81	n = 39
	within		0.35	-1.15	4.31	T = 16
Conflict	overall	0.07	0.25	0.00	1.00	N = 624
	between		0.13	0.00	0.44	n = 39
	within		0.21	-0.37	1.00	T = 16

Notes: N= Number of observations for the variable, n= Number of countries (panels) with data on the variable, T = average number of years of the variable, GNI = Gross National Income, GDP = Gross Domestic Product.

Table 3B2: Summary statistics of enrolment rate (dependent variable) of individual countries.

No.	Country	N	Mean	Std. Dev.	Minimum	Maximum	No.	Country	N	Mean	Std. Dev.	Minimum	Maximum
1	Angola	7	18.02	4.42	13.90	26.96	**21**	Madagascar	12	17.94	4.91	10.94	23.81
2	Benin	8	28.88	10.19	14.00	38.81	**22**	Malawi	15	18.04	3.70	12.76	23.19
3	Botswana	6	66.38	4.61	58.71	71.51	**23**	Mali	15	23.41	6.48	14.04	30.63
4	Burkina Faso	16	10.97	3.84	5.37	18.37	**24**	Mauritania	15	19.91	3.82	14.64	28.40
5	Burundi	15	17.87	12.36	6.41	44.35	**25**	Mauritius	16	82.12	4.67	74.37	89.98
6	Cameroon	13	30.50	11.04	14.96	45.20	**26**	Mozambique	13	12.86	8.32	3.45	31.23
7	Cape Verde	16	65.87	10.37	47.34	76.99	**27**	Namibia	5	33.23	2.00	31.63	36.18
8	CAR	5	9.04	0.70	7.81	9.56	**28**	Niger	15	6.10	3.09	2.73	11.42
9	Chad	15	14.45	3.09	9.51	17.84	**29**	Nigeria	13	38.87	9.01	27.75	60.29
10	Comoros	6	43.61	8.18	32.60	52.49	**30**	Rwanda	16	21.90	8.47	10.56	32.34
11	Congo	3	27.56	8.08	22.07	36.84	**31**	STP	14	31.76	18.50	16.36	70.49
12	Cote d'Ivoire	6	28.50	2.50	25.28	32.47	**32**	Senegal	12	26.59	10.49	11.46	37.16
13	DRC	9	35.59	2.97	29.27	38.55	**33**	Sierra Leone	6	26.24	1.74	23.89	28.53
14	Eswatini	13	50.72	11.22	32.38	72.18	**34**	South Africa	14	93.23	9.96	80.86	111.76
15	Ethiopia	11	12.11	4.98	5.12	17.82	**35**	Seychelles	15	56.42	4.18	48.83	63.25
16	Ghana	15	35.57	14.72	16.90	56.44	**36**	Tanzania	6	6.48	1.54	3.87	8.61
17	Guinea	8	22.89	6.36	14.65	31.41	**37**	Togo	7	27.49	7.87	18.57	38.10
18	Kenya	7	32.56	6.39	26.19	42.09	**38**	Uganda	3	12.52	2.40	9.67	14.24
19	Lesotho	15	34.16	9.29	21.16	46.66	**39**	Zimbabwe	3	37.09	6.27	29.85	41.00
20	Liberia	3	33.96	6.50	29.95	41.47							

Notes: N = Number of observations for the country.

APPENDIX 3C: RANDOM EFFECTS ESTIMATES

Table 3C1: Random Effects estimates of the effect cost elimination on upper secondary school enrolment in Sub-Saharan Africa

Explanatory Variables	Dependent variable (%)					
	Enrolment Rate		Male Enrolment		Female Enrolment	
↓	*(3.1)*	*(3.2)*	*(3.3)*	*(3.4)*	*(3.5)*	*(3.6)*
$\Delta Enrolment_{t-1}$		0.662***		0.607***		0.690***
		(0.06)		(0.04)		(0.09)
Cost Elimination	5.242**	4.184**	5.969**	4.834**	4.346**	3.126
	(1.51)	(1.60)	(1.76)	(1.91)	(1.95)	(2.17)
Poverty Rate	-0.067	-0.132	-0.044	-0.131	-0.093	-0.170
	(0.12)	(0.14)	(0.12)	(0.13)	(0.14)	(0.16)
Unemployment Rate	-0.392	-0.322	-0.124	0.027	-0.617	-0.687
	(0.33)	(0.42)	(0.31)	(0.43)	(0.46)	(0.56)
GNI Per Capita	-0.001	-0.001	-0.001*	-0.001*	-0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Inequality (Gini)	0.269**	0.240**	0.265**	0.237**	0.278**	0.251**
	(0.08)	(0.08)	(0.09)	(0.09)	(0.11)	(0.10)
GDP Per Capita	0.087	0.113	0.102	0.156**	0.065	0.050
	(0.07)	(0.08)	(0.07)	(0.07)	(0.09)	(0.10)
Population Growth	-0.146	0.306	-0.103	0.407	-0.269	0.090
	(0.95)	(0.76)	(0.86)	(0.62)	(1.24)	(1.10)
Conflict	1.924	1.430	2.237	1.729	1.522	1.235
	(1.57)	(1.67)	(1.79)	(1.95)	(1.46)	(1.57)
Constant	12.009**	9.568	13.122**	8.873	10.172*	8.933
	(4.76)	(5.80)	(5.44)	(5.84)	(5.65)	(7.17)
No. of Countries	39	39	39	39	39	39
No. of Observations	415	340	405	331	405	331
R-square	.65	.71	.63	.70	.61	.66

Notes: All standard errors are corrected for heteroskedastic consistency (robust) and is clustered on country level in parentheses. Each row is a separate regression. All rows control for year effect in dummies of 16 years (2003-2018). Asterisks denote significance on the coefficient at the following levels: ***p < .001, **p < .05, *p < .1.

GNI = Gross National Income, GDP = Gross Domestic Product

APPENDIX 4: Education and crime chapter

APPENDIX 4A: COUNTRIES

Table 4A1. Countries with data included in the study

No.	Theft Rate	Homicide Rate
1	Burundi	Angola
2	Cameroon	Burkina Faso
3	Cape Verde	Burundi
4	Eswatini (formerly Swaziland)	Cameroon
5	Ghana	Cape Verde
6	Kenya	Eswatini (formerly Swaziland)
7	Lesotho	Ghana
8	Madagascar	Kenya
9	Mauritius	Lesotho
10	Mozambique	Malawi
11	Nigeria	Mauritius
12	Sao Tome and Principe	Mozambique
13	Senegal	Namibia
14	Sierra Leone	Niger
15	South Africa	Rwanda
16		Sao Tome and Principe
17		Sierra Leone
18		South Africa
19		Seychelles

APPENDIX 4B: SUMMARY STATISTICS OF VARIABLES

Table 4B1. Descriptive statistics of all variables

Variable		Mean	Std.Dev.	Min	Max	Observations
Log of Theft	overall	4.28	2.11	0.00	7.65	N = 240
	between		2.09	0.45	7.33	n = 15
	within		0.57	2.17	5.51	T = 16
Log of Homicide	overall	1.85	0.93	0.01	4.32	N = 304
	between		0.90	0.57	3.84	n = 19
	within		0.32	0.66	2.78	T = 16
Enrolment Rate	overall	35.70	25.23	1.89	111.76	N = 352
	between		23.16	6.43	94.54	n = 22
	within		11.11	6.64	83.83	T = 16
Male Enrolment	overall	36.30	23.32	2.77	113.25	N = 352
	between		21.07	7.81	90.72	n = 22
	within		10.90	11.48	75.34	T = 16
Youth Unemployment	overall	16.99	15.67	0.47	61.04	N = 352
	between		15.79	1.60	52.43	n = 22
	within		2.67	5.36	28.61	T = 16
Inequality Level	overall	44.36	8.64	5.30	66.00	N = 352
	between		7.50	32.62	63.58	n = 22
	within		4.57	17.04	71.68	T = 16
GDP Per Capita	overall	2.46	3.32	-22.31	18.05	N = 352
	between		1.17	-0.58	4.94	n = 22
	within		3.11	-22.44	17.92	T = 16
Male Age (15-24) years	overall	21.00	3.84	13.48	37.70	N = 352
	between		3.81	16.10	36.37	n = 22
	within		0.95	17.05	23.99	T = 16
Population Density	overall	133.46	147.65	2.28	623.30	N = 352
	between		149.81	2.61	614.60	n = 22
Attainment	overall	18.21	15.05	0.61	59.29	N = 289
	between		13.91	1.46	48.82	n = 19
	within		5.74	1.69	37.25	T= 15.21
	within		17.77	56.15	222.28	T = 16
Death Penalty	overall	0.18	0.39	0.00	1.00	N = 352
	between		0.36	0.00	1.00	n = 22
	within		0.15	-0.76	1.12	T = 16
Effective Rule of Law	overall	-0.41	0.57	-1.54	1.08	N = 352
	between		0.56	-1.26	0.91	n = 22
	within		0.16	-0.99	0.05	T = 16
Cost Elimination Policy	overall	0.18	0.39	0.00	1.00	N = 352
	between		0.34	0.00	1.00	n = 22
	within		0.21	-0.57	1.12	T = 16
Military Expenditure	overall	5.61	3.61	0.61	26.46	N = 336
	between		3.19	0.68	13.86	n = 21
	within		1.81	-0.58	18.21	T = 16

Notes: N= Number of observations for the variable, n= Number of countries (panels), T = average number of years.

Table 4B2. Summary statistics of log of Theft rate by individual country

No.	Country	N	Mean	Std.Dev.	Minimum	Maximum
1	Burundi	16	2.743771	.4257391	2.09401	3.428209
2	Cameroon	16	4.150444	.4274507	3.382031	4.739371
3	Cape Verde	16	6.591458	.1133686	6.368542	6.753438
4	Eswatini	16	7.328206	.2299249	6.921418	7.652585
5	Ghana	16	5.670961	.3568121	5.190738	6.196104
6	Kenya	16	2.622889	1.143293	.5068176	3.673903
7	Lesotho	16	6.710173	.7547809	5.664532	7.40242
8	Madagascar	16	.4471823	.1947779	.1995064	.7814327
9	Mauritius	16	6.173957	1.095715	4.217442	7.152596
10	Mozambique	16	2.822372	.5430066	1.691477	3.583958
11	Nigeria	16	2.705932	.2293161	2.234328	3.292387
12	Sao Tome	16	2.007612	1.083357	0	3.229384
13	Senegal	16	3.012934	.1207424	2.810955	3.192342
14	Sierra Leone	16	5.19313	.0894844	5.045774	5.328103
15	South Africa	16	6.08723	.1377491	5.864937	6.33577

Table 4B3. Summary statistics of log of Homicide rate by individual country

No.	Country	N	Mean	Std.Dev.	Minimum	Maximum
1	Angola	16	1.508279	.5476357	.3544547	2.174172
2	Burkina Faso	16	.5734198	.1433737	.3848541	.8670584
3	Burundi	16	1.727084	.2657783	1.332736	2.311416
4	Cameroon	16	1.438728	.4751808	.6599523	2.00859
5	Cape Verde	16	2.190463	.3046444	1.466468	2.605767
6	Eswatini	16	2.637108	.228404	2.340363	3.075823
7	Ghana	16	1.074592	.0617815	.9806542	1.180162
8	Kenya	16	1.647725	.1904681	1.347086	1.853528
9	Lesotho	16	3.843429	.2580135	3.490782	4.315466
10	Malawi	16	1.064804	.5813592	.315759	1.99173
11	Mauritius	16	1.308293	.2085289	.9207209	1.623617
12	Mozambique	16	1.512327	.2395343	1.115797	1.898429
13	Namibia	16	3.092184	.2848298	2.726617	3.665138
14	Niger	16	1.744676	.3642606	1.052358	2.227204
15	Rwanda	16	1.204587	.5403639	.0083649	1.862575
16	Sao Tome	16	1.400858	.2291252	1.225333	2.217169
17	Sierra Leone	16	1.113115	.1399515	.9870847	1.386269
18	South Africa	16	3.583745	.1009398	3.43106	3.771201
19	Seychelles	16	2.549042	.3999969	1.671342	3.172761

APPENDIX 4C: ROBUSTNESS CHECKS

4CA: Using homogenous dataset with the same countries with data for the dependent variables.

Table 4CA1. Fixed effects (FE) estimates

Explanatory variables	Dependent variables (in logs)					
	Theft Rate			**Homicide rate**		
	(1.1)	***(1.2)***	***(1.3)***	***(1.4)***	***(1.5)***	***(1.6)***
Enrolment Rate	-0.010 (0.01)	-0.018* (0.01)		0.001 (0.00)	0.002 (0.00)	
Male Enrolment			-0.017 (0.01)			0.001 (0.00)
Attainment		-0.022 (0.02)			0.015** (0.00)	
Constant	11.378* (4.96)	2.240 (5.79)	10.965* (4.65)	3.650** (0.96)	6.415*** (1.10)	3.561** (0.96)
No. of Observations	192	160	192	192	160	192
No. of Countries	12	10	12	12	10	12
R-square	.35	.42	.40	.43	.55	.43

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. All other control variables used in the main manuscript are included in each model but are excluded from the table to save space. All rows control for year effect in dummies of 16 years (2003-2018). Coefficient estimates are multiplied by 100. Asterisks denote significance of the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

Table 4CA1 indicates that the results are not statistically different from the FE estimates in the main manuscript. From Column (1.1), the enrolment rate, which is the main explanatory variable of interest, is statistically insignificant for the theft rate. However, in Column (1.2), which controls for educational attainment to capture only the being-in-school effect on crime, we find that enrolment is significant in a negative direction on the theft rate. Rounding the figure up, we have a magnitude of a -2% effect on theft, which is the same as the results in the main study. Coefficients for enrolment are statistically insignificant for the homicide rate, identical to the results presented in the main study findings.

Table 4CA2. 2SLS Instrumental Variable (IV) estimates

Explanatory variables	Dependent variables (in logs)					
	Theft Rate			**Homicide rate**		
	(2.1)	***(2.2)***	***(2.3)***	***(2.4)***	***(2.5)***	***(2.6)***
Enrolment Rate	-0.039**	-0.030***		0.007	0.006	
	(0.01)	(0.01)		(0.01)	(0.00)	
Male Enrolment			-0.034***			0.006
			(0.01)			(0.01)
Attainment		-0.024			0.016	
		(0.02)			(0.01)	
Constant	7.224	-0.336	8.927	4.513*	7.246***	4.206**
	(5.85)	(6.03)	(4.79)	(1.86)	(1.95)	(1.60)
No. of Observations	192	160	192	192	160	192
No. of Countries	12	10	12	12	10	12
R-square	.19	.38	.32	.38	.52	.38

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. All other control variables used in the main manuscript are included in each model but are excluded from the table to save space. All rows control for year effect in dummies of 16 years (2003-2018). Coefficient estimates are multiplied by 100. Asterisks denote significance of the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

Results in Columns (2.1) and (2.2) of Table 4CA2 are consistent with the results in the main study. The coefficient for enrolment in both columns is significant (negative) for theft rate. In addition, the coefficient in Column (2.2), which controls for attainment, is smaller in magnitude than the coefficient for theft in the model that does not control for attainment. In addition, the magnitude of the negative effect is greater (-3.0) than the magnitude in the FE estimate (-1.8). This shows that cost elimination policies induce a higher degree of crime reduction through enrolment. The homicide rate is positively associated with enrolment, but once again, the relationship is statistically insignificant. This is also the same in the main study findings. Therefore, we cannot reject our findings in the main study. These checks further prove Hypothesis 1 that upper secondary school enrolment is negatively and significantly related to property crime/theft rate, while we reject Hypothesis 2 because we do not find any statistically significant relationship between enrolment and the violent crime/homicide rate.

4CB: Using Theft and homicide rate per 100,000 people as the dependent variables

Table 4CB1. Pooled OLS estimates

Explanatory Variables	Dependent Variables (per 100,000 people)					
	Theft Rate			**Homicide Rate**		
	(1.1)	***(1.2)***	***(1.3)***	***(1.4)***	***(1.5)***	***(1.6)***
Enrolment Rate	-3.727** (1.60)	-9.158*** (1.95)		0.028 (0.04)	0.048 (0.09)	
Male Enrolment			-2.466* (1.54)			0.006 (0.04)
Attainment		3.579** (1.28)			0.087 (0.10)	
Constant	37.952 (151.79)	-52.857* (122.45)	54.977 (157.58)	-9.273** (3.42)	-7.202* (4.10)	-9.110** (3.46)
No. of Observations	240	208	240	304	241	304
R-*square*	.57	.69	.57	.66	.69	.66

Notes: All standard errors are corrected for heteroskedasticity (robust) in parentheses. All other control variables used in the main manuscript are included in each model but are excluded from the table to save space. Coefficient estimates are per 100,000 people. Each row is a separate regression. All rows control for the year effect in dummies of 16 years (2003-2018). Asterisks denote significance for the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

The results in Table 4CB1 indicates that the results are not statistically different from those according to the pooled OLS estimates in the main manuscript. From Columns (1.1) to (1.3), the enrolment rate, which is the main explanatory variable of interest, is statistically significant for the theft rate. The coefficient of enrolment in Column (1.2) is greater than the coefficient in Column (1.1). From Column (1.2), a percentage increase in high school enrolment reduces the rate of theft by 9 per 100,000 people. Coefficients for enrolment are statistically insignificant at the conventional level for the homicide rate, identical to the results presented in the main study findings.

Table 4CB2. Fixed effects (FE) estimates

Explanatory variables	Dependent variables (per 100,000 people)					
	Theft Rate			**Homicide rate**		
	(1.1)	***(1.2)***	***(1.3)***	***(1.4)***	***(1.5)***	***(1.6)***
Enrolment Rate	-1.231 (2.02)	-2.999** (1.22)		0.075 (0.05)	0.064 (0.03)	
Male Enrolment			-1.289 (2.00)			0.083 (0.06)
Attainment		-1.551 (3.14)			0.190 (0.15)	
Constant	1361.421 (1239.85)	-134.820* (297.87)	1379.402* (1219.79)	31.029* (17.44)	20.494 (17.82)	31.025* (17.46)
No. of Observations	240	208	240	304	241	304
No. of Countries	15	13	15	19	16	19
R-square	.31	.47	.31	.18	.30	.19

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. All other control variables used in the main manuscript are included in each model but are excluded from the table to save space. Coefficient estimates are per 100,000 people. Each row is a separate regression. All rows control for the year effect in dummies of 16 years (2003-2018). Asterisks denote significance of the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

Table 4CB2 indicates that the results are not statistically different from those according to the FE estimates in the main manuscript. From Column (1.1), the enrolment rate, which is the main explanatory variable of interest, is statistically insignificant for the theft rate. However, in Column (1.2), which controls for educational attainment to capture only the being-in-school effect on crime, we find that enrolment is significant in a negative direction on the theft rate. The results also exhibit differences in the level of significance and the magnitude of effects between the OLS estimator and FE estimator. These inferences are true when the logarithm of the theft rate is used in the results presented in the main manuscript. Coefficients for enrolment are statistically insignificant at the conventional level for the homicide rate, identical to the results presented in the main study findings.

Table 4CB3. 2SLS Instrumental Variable (IV) estimates

Explanatory variables	Dependent variables (per 100,000 people)					
	Theft Rate			**Homicide rate**		
	(1.1)	***(1.2)***	***(1.3)***	***(1.4)***	***(1.5)***	***(1.6)***
Enrolment Rate	-3.653**	-2.599**		0.287	0.295	
	(1.81)	(1.90)		(0.22)	(0.18)	
Male Enrolment			-3.441**			0.288
			(1.63)			(0.22)
Attainment		-2.852			-0.124	
		(2.66)			(0.18)	
Constant	237.339	-172.198	258.415	27.656	35.659	27.963
	(520.49)	(298.51)	(527.04)	(28.54)	(60.26)	(28.58)
No. of Observations	240	208	240	304	241	304
No. of Countries	15	13	15	19	16	19
R-square	.16	.44	.15	.24	.40	.22

Notes: All standard errors are corrected for heteroskedasticity (robust) clustered on the country level in parentheses. All other control variables used in the main manuscript are included in each model but are excluded from the table to save space. Coefficient estimates are per 100,000 people. Asterisks denote significance of the coefficient at the following levels: ***p < .001, **p < .01, *p < .05.

Results in Columns (2.1) and (2.2) in Table 4CB3 are statistically consistent with the results in the main study. The coefficient for enrolment in both columns is significant (negative direction) at conventional levels for theft rate. In addition, the coefficient in Column (2.2), which controls for attainment, is smaller in magnitude than the coefficient for theft in the model that does not control for attainment (Colum 3.1). The homicide rate is positively associated with enrolment, but once again, the relationship is statistically insignificant. This is the same in the main study findings. Therefore, we cannot reject our findings in the main study. These checks further prove Hypothesis 1 that upper secondary school enrolment is negatively and significantly related to property crime/theft rate, while we reject Hypothesis 2 because we do not find any statistically significant relationship between enrolment and the violent crime/homicide rate.

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