

**EFFECT OF ABOLITION OF PRIMARY EDUCATION SCHOOL FEES  
ON PUPIL PARTICIPATION AND PERFORMANCE**

**BY**

**MELAP SITATI**

**X50/64164/2011**

**A Research Project Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Masters of Arts in Economics, in the School of Economics, University of Nairobi.**

**November, 2014**

## **DECLARATION**

This Research Project is my original work and has not been presented for a degree in any other University.

**Melap Sitati**

**Reg No: X50/64614/2011**

Signed \_\_\_\_\_

Date \_\_\_\_\_

This Research Project has been submitted for examination with our approval as university supervisors:

**Prof. Jane Kabubo-Mariara**

Signed \_\_\_\_\_

Date \_\_\_\_\_

**Dr. Thomas Ongoro**

Signed \_\_\_\_\_

Date \_\_\_\_\_

## **DEDICATION**

With great gratitude and profound humility, I dedicate this work to my family (Philip, Sandra and Angela) for bearing with my absence, encouragement, support and for believing in me. Indeed you all inspired me to have a reason to study.

## **ACKNOWLEDGEMENT**

First and foremost, thanks giving to Almighty God who gives me strength to live through all circumstances. Secondly, I would like to profoundly thank my supervisors Prof. Jane Kabubo-Mariara and Dr. Thomas Ongoro for their tireless support and comments. I salute you for your insightful scholarly input which was the driving force to the completion of this study.

I am deeply indebted to my parents who sacrificed to ensure I get good education. I would not be where I am without your financial support. I am also indebted to my dear husband for proof-reading part of the work and believing in me. Sandra and Angela, thanks for coping with my absence from home.

Last but not least, my thanks go to Jessica, Rachael, Josephine Munyasa and all those other people who have contributed to this work directly or indirectly. To all of you I am deeply grateful and honored.

## **ABSTRACT**

Since the inception of Free Primary Education (FPE), the Government has made significant investment in providing access to basic education through provision of capitation grants, infrastructure development, teacher employment and training and provision of instructional material. The FPE programme has seen increased pupil participation since its implementation. Despite the effort made by the government to achieve goals of education for all and the millennium development goal on universal primary education, a number of challenges still exist. Among the challenges include congested classrooms, very high pupil teacher ratio in some regions and poor learning facilities.

The paper examines the effect of abolition of primary education fees on school participation and performance in Kenya. The study provides comparison of pupil participation and performance in the period preceding the introduction of FPE in 2003 and after the introduction of FPE to the year 2013. Participation is measured by the gross enrollment in primary schools while performance is measured by the KCPE test scores over these two periods. The study uses panel data for the period 1998-2013 from all counties in Kenya. The study uses fixed effects model to assess the effect of abolition of fees on pupil participation and performance in KCPE examination.

The study found that since the inception of FPE, pupil participation has increased tremendously on one hand and national performance is still below average mark of 250. The study also found regional disparities in terms of performance and pupil participation.

To ensure pupil participation in primary education, the study recommends removing all costs relating to schooling so that education is completely free. To ensure equality in access to education, the government should implement affirmative policies to bring the disadvantaged regions at par with the rest of the country. This may include; setting up mobile schools, provision of low cost boarding school, enhancing school feeding programmes and setting up an equalization fund for education.

The study also recommends that the government should improve existing infrastructure by increasing number of classrooms, textbooks and teachers to ensure improved performance.

## TABLE OF CONTENTS

DECLARATION .....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT .....	v
TABLE OF CONTENTS .....	vi
List of Tables.....	vii
List of Figures.....	viii
List of Acronyms .....	ix
1. CHAPTER ONE: INTRODUCTION .....	1
1.1 Background.....	1
1.2 Statement of the Problem.....	6
1.3 Research Objectives.....	8
1.4 Justification of the Study .....	9
1.5 Organization of the Study .....	9
2. CHAPTER TWO: LITERATURE REVIEW .....	10
2.1 Theoretical Literature .....	10
2.2 Empirical Literature .....	12
2.3 Overview of Literature.....	19
3. CHAPTER THREE: METHODOLOGY .....	20
3.1 Theoretical Framework.....	20
3.2 Model Specification.....	22
3.3 Definition and Measurement of Variables.....	23
3.4 Sources of Data used in the Study .....	25
4. CHAPTER FOUR: RESULTS AND DISCUSSION .....	26
4.1 Descriptive Statistics.....	26
4.2 Hausman Test Results .....	26
4.3 Correlation Analysis .....	27
4.3 Results of the Fixed Effects Model.....	30
5. CHAPTER FIVE: CONCLUSION AND POLICY RECOMMENDATIONS.....	38
5.1 Summary and Conclusion.....	38
5.2 Policy Implications .....	39
5.3 Limitations and Areas for Further Research .....	40
REFERENCES .....	41

## List of Tables

Table 1.1: National Mean Scores by Candidature in KCPE, 2003-2013 .....	3
Table 3.1: Variable Definition and Hypothesized Relationships.....	23
Table 4.1: Descriptive Statistics.....	26
Table 4.2: Hausman Test Results.....	27
Table 4.3: Correlation Matrix.....	27
Table 4.4: Mean Comparison Test .....	28
Table 4.5: Fixed Effects Results for Pupil Participation: Dependent Variable is Number of Pupils.....	30
Table 4.6: Fixed Effects Results for Performance: Dependent variable is County Mean Score .....	34
Table A. 1: Budget Expenditure on Education and Per Capita Spending (KES) in Primary Schools .....	46
Table A.2: Enrolment Trends in Kenyan Primary Schools.....	47
Table A.3: County results on pupil participation .....	48
Table A.4: Regression Results of Pupil Participation.....	49
Table A.5: County Results on Performance.....	50
Table A.6: Regression Results of Performance using OLS .....	51
Table A.7: County Order of Merit in KCPE.....	55

## List of Figures

Figure 1.1: Trend in pupil teacher ratio between 2002 and 2013 .....	5
Figure 4.1: Scatter Diagram on Correlation.....	28
Figure 4.2: Scatter Diagram on change in enrolment and KCPE mean score (2003-2013).....	29
Figure 4.3: Trend in Pupil Class Ratio between 2003-2013 .....	31
Figure 4.4: Variations in pupil teacher ratio across counties .....	32
Figure A.1: Trend in County Mean Scores .....	52
Figure A.2: Performance in ASAL Areas .....	53
Figure A.3: County Performance in KCPE in Quintiles .....	54



## List of Acronyms

ASAL	Arid and Semi-Arid Land
EFA	Education for All
EPF	Education Production Function
FPE	Free Primary Education
FE	Fixed Effects
FY	Financial Year
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GoK	Government of Kenya
KCPE	Kenya Certificate of Primary Education
KES	Kenya Shillings
KIHBS	Kenya Integrated Household Budget Survey
KNEC	Kenya National Examination Council
MDGs	Millennium Development Goals
MoEST	Ministry of Education, Science and Technology
NER	Net Enrolment Rate
OLS	Ordinary Least Square
PTA	Parents Teacher Association
PTR	Pupil Teacher Ratio
PBR	Pupil Book Ratio
TIMSS	Third International Mathematics and Science Study
TSC	Teacher Service Commission
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPE	Universal Primary Education
WMS	Welfare Monitoring Survey

# 1. CHAPTER ONE: INTRODUCTION

## 1.1 Background

The World Conference on Education for All (EFA) (1990) held in Jomtien agreed to universalize primary education and massively reduce illiteracy by end of 2000. From this conference, which was later supported by the World Education Forum held on 26<sup>th</sup> to 28<sup>th</sup> April 2000, in Dakar, countries reaffirmed the commitment to provide EFA. The United Nations Millennium Development Goal (MDG) number two aims to provide Universal Primary Education (UPE) by 2015. All these forums stressed that education is a fundamental human right and pushed countries to strengthen their efforts to improve education in order to ensure the basic learning needs for all were met (UNESCO, 2000)<sup>1</sup>. The Government of Kenya was a signatory to the commitments of these two international conferences and considers attainment of UPE as a critical component of the National Development Strategy.

As part of international effort to achieve UPE by 2015, many African countries have followed suit in implementing the fee abolition policy. For instance, Uganda introduced Free Primary Education (FPE) in 1997, Tanzania in 2002, Malawi in 1994, and Kenya in 2003 among others. This is because they value the importance of education as an engine to spur development. Thus governments and households are investing immensely to ensure that education becomes accessible to all and also for them to reap the benefits of human capital in economic growth. It is evident that education is absolutely beneficial to society and needs to be reinforced to each person throughout life (World Bank 2011<sup>2</sup>).

The Dakar Framework for Action did not establish financing targets for education. As a result, there is a wide difference in governments spending on education. For instance, the financing and provision of education in Kenya is a partnership between the government, households and communities, donors and private investors. Private education is entirely financed by the households and the private sector. There are no clear standards of sharing the education costs

---

<sup>1</sup><http://unesdoc.unesco.org/images/0012/001211/121147e.pdf> accessed on 17<sup>th</sup> March, 2014.

<sup>2</sup> <http://go.worldbank.org/F5K8Y429G0> accessed on 17<sup>th</sup> March, 2014.

across the stakeholders, resulting into high education cost burden on all the stakeholders, especially households and the government (GOK, 2008).

The Constitution of Kenya 2010 provides that every Kenyan child has the right of access to basic education. In 2003, Kenya introduced FPE in all public primary schools. Among the objectives of FPE is to increase enrolment, transition and completion rates; to reduce expenditures by households on primary education (GOK, 2012a). The FPE programme is meant to reduce the cost of education previously borne by households which hindered children especially from poor backgrounds to access education. In this regard the effort put in provision of free primary education by the government is noticeable in the budgetary allocations to the education sector.

The Government has made significant investment in providing access to basic education through provision of capitation grants, infrastructure development, teacher employment and training, instructional material development, among others. It spends about 6.5% of its GDP on education and these budgetary resources have been growing in real terms maintaining an average of 20 percent share of the budget (GOK, 2012b).

The total expenditure in education grew from around Kenya Shillings (KES) 65 billion in the Financial Year (FY) 2002/03 to roughly KES 253 billion in the FY 2013/14, with primary education receiving around KES 22.8 billion to approximately KES 99 billion in the same financial years respectively (See Appendix Table A1).

At inception of FPE, the government started paying one thousand and twenty shillings (KES. 1,020) for each child per annum as capitation grant. The average annual unit cost of primary education is estimated at KES 11,000 per child. Households pay various costs such as boarding and tuition fees for up to KES 13 billion and spends KES 24 billion for the purchase of uniforms, school supplies, transport services or extra-tuition. The net expenditure of households amounts to KES 109.5 billions, totaling 33.6% of total government expenditure (GOK 2013).

As the government continues to commit more resources to the education sector, it is imperative that expected outcomes and outputs are achieved, i.e. pupil participation and performance. Households being the main financial partner of government, have to take care of Parents' Teachers Association (PTA) charges, cost of uniforms, medication, development fees, examination fees, sports fees, boarding fee, lunch, transportation and other school fees/levies. All

these expenditures constitute a cost burden of schooling on households despite the free schooling intervention which is aimed at reducing the household cost burden of financing education. These indirect costs pose a negative effect on school participation.

The direct outcome of FPE was increased school participation. Prior to free fee policy, school enrolments were very low. A study by Bedi et al. (2002) and Kimalu et al. (2001) showed that Gross Enrolment Rate (GER) dropped from 98 percent in 1989 to 89 percent in 2002 (GoK 2001). According to the World Bank, (2004) free fee policy in African countries led to a surge in enrolment, pushing the gross enrolment rate to just over 100%. Enrolment increased from 6 million pupils in the year 2000 to almost 11 million pupils in 2013 (See Appendix Table A2).

Despite increase in enrolment, a common concern is that performance in KCPE examinations over the years of FPE is nearly flat in the mean score. It is also puzzling that the mean score is below the average pass mark of 250. In 2002, the national mean score for performance was 247.9 which dropped further to 245.9 in 2013. From Table 1.1 it can be observed that public primary school performance in national exams is below the average pass mark between 2003 - 2013, the period when FPE was effected. In the year 2003 and 2004 the average mean score in KCPE was averagely 248 marks which dropped by one point to 247 in 2005, thereafter for five years it remained at an average mark of 245 and dropped further by 4 points in 2011. Indeed the scores show that pupil performance is still poor.

**Table 1.1: National Mean Scores by Candidature in KCPE, 2003-2013**

<b>Year</b>	<b>Males</b>	<b>Females</b>	<b>All Candidates</b>	<b>National Mean Score</b>
2003	303,907	284,054	587,961	247.8
2004	342,979	314,768	657,747	247.9
2005	352,826	318,724	671,550	247.4
2006	352,782	313,669	666,451	245.2
2007	372,265	332,653	704,918	244.9
2008	367,125	328,652	695,777	245.4
2009	381,600	345,454	727,054	245.3
2010	388,221	357,859	746,080	245.2
2011	400,814	375,400	776,214	241.5
2012	415,620	396,310	811,930	248.7
2013	426,369	413,396	839,765	245.9

*Source: Kenya National Examination Council (data various years), Ministry of Education, Statistical booklet on education management system (2003-2008)*

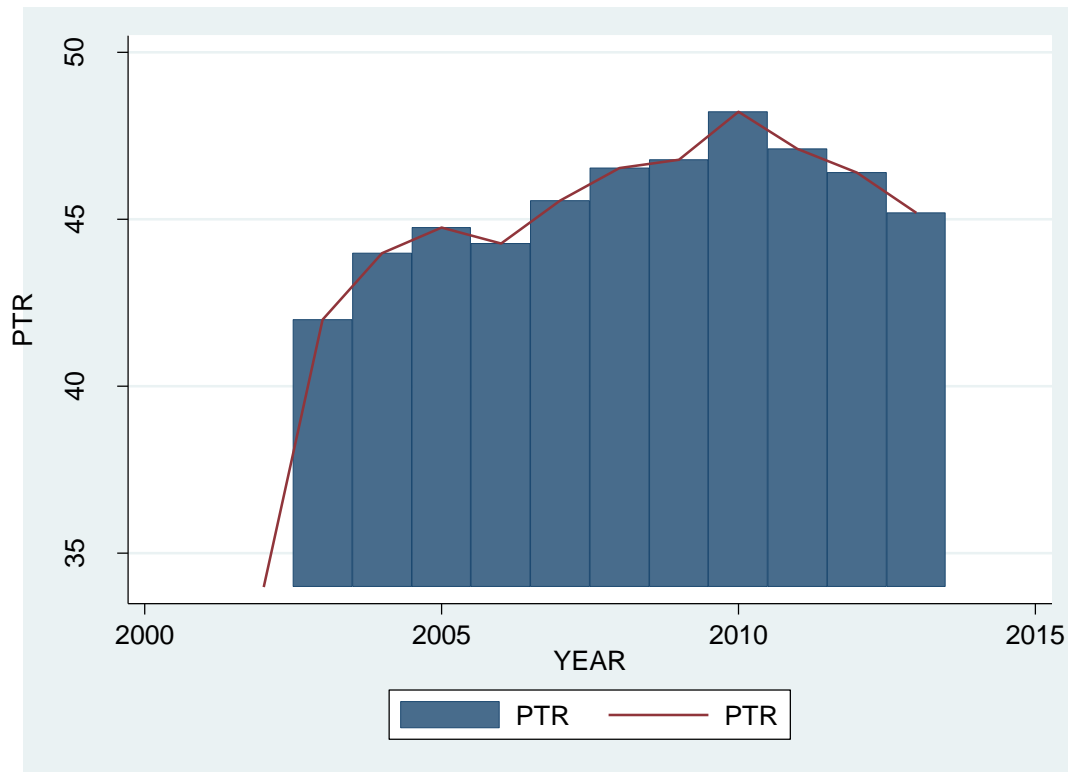
Even though, abolition of school fees has led to a positive increase in enrolment, other important barriers to school participation and pupil performance remain. In particular, while enrolment is now high on average, there are still regions where enrolment remains an issue especially in arid and semi-arid regions and over 1 million children are still out of school. Additionally, irregular attendance amongst those who are enrolled is a major problem across the country. From the Uwezo report Kenya (2013), it is noted that some learner's ability to read and write in primary schools is still below average. This is a pointer to the low quality education offered in schools thus there is need to examine the causes of poor performance.

### **Challenges of free primary education**

Increased participation due to school fees abolition, has not been matched by expansion in infrastructure. There are still overcrowded classrooms, high pupil to textbook ratio and limited physical facilities. Pupil -Teacher Ratio (PTR) increased from 1:34 in 2002 to 1:42 in 2003 and further to 1:44.8 in 2005. In 2008 the PTR was 1:45 and 1: 45.2 in 2013. The situation is grimmer for schools in the ASAL areas, as well as those in the slums of urban areas. Regions such as North-Eastern experienced very high PTR of 1:62 which was far beyond the recommended maximum rate of 1:40 as per the Kenya's standard (GOK, 2009). The pupil class ratio increased from 40 to 60 in 2003 while in some regions classes busted up with more pupils rising to 80 forcing some schools to teach pupils under trees. Shortage of learning facilities and PTRs are worse in arid and semi-arid areas.

Moreover, PTR in 2003 was 1:53 in North Eastern, for example, 1:48 in Nairobi, 1:35 in Eastern regions (Mwaniki and Bwire 2003). All these cause strain to infrastructure which has not been expanded to accommodate additional pupils (UNESCO 2005). Although the government employed more teachers due to the increase in the number of pupils, this did not match with the enrolments rates raising the national PTRs above the recommended 1:40. Figure 1.1 shows the trend in PTR between 2002 and 2013.

Figure 1.1: Trend in pupil teacher ratio between 2002 and 2013



Another challenge FPE has faced is understaffing and lack of teacher motivation. Increased enrollment at the primary school level has created serious understaffing in a majority of schools. Some schools in some areas are forced to employ untrained teachers whose qualification and competency are questionable. This has adverse implications on the morale of teachers and quality of education due to capacity constraints. Given a large number of pupils per teacher, it becomes difficult for teachers to give adequate assignments to the pupils, as teaching workload and marking become overwhelming (UNESCO, 2005). World Bank Report (1986) acknowledges that teacher satisfaction is largely related to achievement. Contented teachers would concentrate therefore enhancing academic performance of their pupils.

Absenteeism by both teachers and pupils is also a challenge. High teachers' rate of absenteeism yields poor academic results for pupils. When teachers absent themselves from school frequently, pupils go unattended and do not do well in examinations. Absenteeism by teachers reduces the amount of instructional time and this result in the syllabi not being completed. This in return results to lower output of work by the pupils (Ubogu, 2004). On a given day, more than

10 out of 100 teachers and children are not in school (Uwezo report, 2012). For pupils, absenteeism also affects performance negatively. The effect of absenteeism and irregular school attendance is that materials taught is difficult to understand when studied on one's own. Continued loss of classes results to loss of content and knowledge. Assignments and exercises would not be properly and correctly done leading to poor performance.

Quite a number of pupils absent themselves from school due to various reasons, among them are: distance from the school, child labor, lack of basic needs, regional conflicts and health issues. Insecurity, nomadic lifestyle and food shortage has affected school attendance and pupil participation in ASAL areas. Therefore these regions have not fully reaped the benefits of FPE (Ogola, 2010).

Kenya Integrated Household Budget Survey (KIHBS) 2006 reported that 19.8 per cent of the pupils from households interviewed lacked money for school expenses despite the abolition of school fees. 29.1% of households reported that their parents did not let them go to school, 22.4 per cent households reported that pupils had to help at home. About 9.9 per cent of school age children had never attended school due to ill health, involving the child or a member of the family. This is a major challenge because it affects pupil participation and performance. Child labor is a hinderance for pupils to access education. According to a Child Labor Analytical Report, conducted by Kenya National Bureau of Statistics in 2008, in the FY 2005/06 about one million children were reported to be working which constitute 52.2% of children aged 5 to 14 years. These was more severe in marginalised regions where poverty levels are high.

Accountability is another challenge facing implementation of FPE (Ogola 2010). The weak accountability system is also accentuated by the weak financial and education management information systems and reporting of government and non-government spending. This makes it difficult to determine actual spending on education by various government and non-government agencies; and households at both national and sub-national levels.

## **1.2 Statement of the Problem**

To ensure every Kenyan child get access to education, the government implemented the FPE programme in 2003. With implementation of FPE programme, there was consensus that the programme increased education opportunities for Kenyan children as it opened the doors for

pupils from poor households who would have missed a chance to receive education (Ogola 2010). This is backed by evidence on increased pupil participation in public primary schools from around 6.1 million in 2002 to 6.9 million in 2003 suggesting that the costs of schooling constituted a significant obstacle to more widespread primary school attendance by the poor households (GoK 2012a).

However, while FPE has increased participation, it has at the same time created several problems. A sudden increase in pupil population is likely to have far-reaching implications in terms of existing physical facilities and human resources. This does not augur well for the government objective to provide quality education. As a result of the high increase in the number of pupils, classrooms are congested and hence the problem of strain on teaching and learning facilities. All these factors affect performance of pupils which is an outcome of schooling. The Uwezo report Kenya, (2012), indicates that around a million children in primary schools could neither read nor write. This reflects poor performance experienced across the country. In addition there still exists a wide regional disparity in terms of school participation and performance across the country (GOK 2008a).

By 2008 it was noted that over 1.5 million eligible children were reported to be still out of school (GOK 2008a). The most pronounced disparities exist in ASAL regions. The factors differ in different regions because of such parameters as different socio-economic status of different regions, leadership trends of the region and the geographical location (Sifuna 2005b). The 2013/14 Education For All (EFA) Global Monitoring Report demonstrates that MDG goal 2 on UPE will not be fully achieved globally by 2015, since millions of children are not accessing education and also the performance is poor.

There seems to be a gap between the intents of the FPE in Kenya and the observed achievement so far since some children are out of school and the performance is still below average. In Kenya, there is a dearth in research on the topic at national level. Most empirical studies in Kenya have focused mainly on a sub-sample population datasets for particular regions. For instance, Kimenyi et al. (2010) who examined impact of FPE on enrolment trends and accountability focused only on school participation in Nairobi region. Ogola (2010) investigated the challenges in implementing FPE with a focus only on performance. Kabubo-Mariara and



Mwabu (2007) focused on determinants of school enrolment and education attainment. Olwande et al. (2010) evaluated the impact of FPE program. Tooley, et al. (2008) investigated the impact of FPE in Kibera slums.

Although Ngware et al. (2007) focused on both school participation and performance, they give a limited scope in terms of geographical coverage. Kanina (2012) also investigated technical efficiency in Kenya public primary schools for sampled districts. All these studies used sub-sample data from particular regions, thus the conclusions drawn from these studies may not be valid to guide in policy interventions at national level. This study addresses these gaps and investigates the effect of abolition of primary school fees on pupil participation and performance in Kenyan public schools at national level.

This study addresses the following research questions:

- (i) Does abolition of school fees result to deterioration of pupil participation in primary education?
- (ii) Does abolition of school fees result to deterioration of performance in public primary education?
- (iii) What policy options would improve participation and performance in public primary education?

### **1.3 Research Objectives**

The main objective of the study is to examine the effect of abolition of school fees on primary pupil participation and performance in public primary schools in Kenya.

The specific objectives of the study are to:

1. Investigate the effects of abolition of school fees on pupil participation in public primary schools.
2. Examine the effects of abolition of school fees on performance in public primary schools; and
3. Suggest policy implications for improving pupil participation and performance in public primary schools.

## **1.4 Justification of the Study**

Knowledge of school participation and performance as well as the possible causes of poor performance in the education sector at national level can assist in formulation of government policies that will guide in achieving better results. The study could help policy makers, scholars, stakeholders, teachers, parents and students to identify the problems and give recommendations on improving outputs in the education sector in tandem with increased government expenditure.

The study could also add to data and literature on effects of FPE in Kenya. The study also forms a basis for further research for scholars interested in the subject.

## **1.5 Organization of the Study**

Following this introduction, the rest of the project is structured as follows: chapter two presents a review of theoretical and empirical literature pertinent to the study as well as an overview of the same. Chapter three is methodology which outlines the theoretical framework, model specification, definition and measurement of variables and sources of data used in the study. Chapter four presents results and discussions while five provides summary, conclusion and policy interventions.

## **2. CHAPTER TWO: LITERATURE REVIEW**

This chapter gives a review of theoretical and empirical literature on the effects of abolition of primary education school fees and other factors on pupil participation and performance. It also gives a summary of the literature review highlighting the key issues in the literature and indicates potential contribution of this study to the existing literature in Kenya.

### **2.1 Theoretical Literature**

The human capital theory suggests that schooling is considered as one of the most important means of raising worker productivity (Becker, 1962). According to Schultz (1961), human capital is the capacity to adapt with the changing environment and thus education leads to an improvement in the quality and level of production which is associated with higher average level of human capital formation and lower wage inequality. Mincer, (1976) shows that one way of investing in human capital is through education, because education links life cycle earnings to the human capital.

Therefore, individuals make choices of investing in human capital based on rational benefits and costs that include a return on investment. Human capital is seen through schooling which raises a person's income after netting out indirect and direct costs of schooling. The benefits of schooling have to be comparable with these foregone earnings, thus should lead to a proportional increase in earnings in the future (Gertler and Glewwe, 1990).

As a result of benefits from education, people are investing in education to maximize earnings (Becker, 1962). For instance knowledge and technical skills, for example, lead to greater productivity, higher incomes and generation of valuable ideas which are beneficial and vital to a nation's growth. Returns to schooling are a useful measure of productivity of education and incentive for individuals to invest in their own human capital. Thus public policy needs to heed this evidence in the design of policies and crafting incentives that both promote investment and ensure that low income families make those investments (Psacharopoulos and Patrinos, (2004).

In addition to private benefits derived from education, investing in education also derives high social returns (World Bank, 1995; Psacharopoulos, 1994). Public education not only rewards the

educated individuals, but education it as well creates a range of benefits that are shared by society at large. There is strong emphasis on primary education, because it is proved to be the most socially profitable of the three levels of education in developing countries (Mingat 1995; Becker, 1975). The social rates of return include crime reduction, better health, increased citizen participation on the growth and productivity of the overall economy (Behrman and Knowles 1999).

The social return to education is very important for assessing the efficiency of public investment in education. Becker (1975) shows that public agencies spend in education to attain the social returns benefits. This is evident as governments are heavily involved in the financing and delivery of education and training because of high social rates of return (Mincer, 1976; Becker, 1962; Schultz, 1961; Behrman and Knowles, 1999; Psacharopoulos and Patrinos, 2004). In this regard, Governments have implemented free fee policies or subsidized education in many countries (Becker, 1962). These subsidies cater for direct costs of schooling and are based on various inputs in the education process.

According to Hanushek (1971, 1979); Summers and Wolfe (1977) and Hamilton (1983), education financing should be considered as a fixed input in the production process. Other inputs include number of teachers, number of classes, quality of teachers, learning and teaching facilities. These inputs are converted to produce a range of outputs through the education process. Education outputs can be categorized as literacy, numeracy and test scores among others. Different scholars will use diverse outputs. Mincer (1970) and Psacharopoulos and Patrinos (2004) use school attainment as an output measure of individual skill.

Borrowing from the equilibrium model on demand and supply and using the model in the education context, high prices on school fees lowers pupil participation on the demand side, whereas on the supply side, subsidized education systems and high income for households increases enrollment (Becker, 1962). By eliminating school fees FPE is expected to increase enrolment.

From the theoretical review, education is seen to have both private benefits and high social returns. The governments' objective in subsidizing education is to ensure that every child, of school going age accesses quality education. However, many children do not have equal

opportunities to learn and are not likely to attend school full time since the government only subsidizes direct operating costs of primary educational institutions. Thus households are left to care for the indirect costs which have a significant hindrance to pupil participation in education (Olwande et al. 2010).

Moreover, as long as acquisition of education requires households to spend on indirect costs, children from poor families would be barred from participating in schooling since these costs are a significant determinant of pupil participation in schools. These indirect costs are a burden that is often greatest for the poorest families which in turn defeats the aim of FPE. These issues raise critical questions on whether the FPE programme will achieve universal and equitable access to primary education for all.

## **2.2 Empirical Literature**

### **Participation**

There exist a number of studies on the effects of subsidized fees in public primary schools on enrolment and performance. However these studies produce mixed results. Some studies showed significant relationship between cost of schooling and school participation. An analysis by World Bank strategies in education, tuition fees and education levies have been censured for reduced enrolments (World Bank, 1995). The government is the principal, if not the sole, provider of education in most developing economies.

Thus many governments offer educational opportunities at subsidized costs or at no cost, in order to promote enrollment. Gupta et al. (1999) study on the effects of higher spending on education and health care used ordinary least square (OLS) regression on a cross sectional data from 50 developing economies. The findings point out that greater public spending on primary education has a positive impact on gross enrolment. The results also showed that enrollment is affected by factors such as household income, urbanization, adult illiteracy, access to safe sanitation and water, and health thus cost of schooling alone cannot be the single-most important factor.

Using panel data for four African countries (South Africa, Algeria, Nigeria and Egypt) from 1990 to 2002, Anyanwu and Erhijakpor (2007) investigated the relationship between government expenditure on education and enrolment at the primary and secondary school levels. Results

provided support for the positive relationship between government expenditure on education and education attainment.

Huijsman, et al. (1986) empirical analysis of college enrolment in the Netherlands, found that enrolment rates of first-year students over the period from 1950 until 1982 were positively affected by financial aid but no significant influence was found for tuition fees. This result is supported by Canton and de Jong (2005) who studied enrolment of students as a percentage of the number of qualified secondary school graduates between the period of 1950 to 1999. While financial support for students is shown to have a positive impact on enrollment rates, no significant influence was found for tuition fees.

In Uganda, Deininger (2003) found that the introduction of free primary education was associated with a significant increase of school participation in primary education by the poor and that the school fees decreased significantly. He also found that school attendance increased dramatically for girls aged 6 to 8 years and that the household expenditure on primary schooling decreased by about 60 percent between 1992 and 1999. Although there was empirical evidence indicating a significant increase in enrollments just after the adoption of universal primary education, it was too early to evaluate the impacts of the UPE on the overall educational attainments.

Kabubo-Mariara and Mwabu (2007) focused on determinants of school enrolment and education attainment in Kenya and used probit and ordered probit methods to model enrolment and attainment respectively. Their study found out that cost of schooling is one of the factors of schooling which hinder students from accessing and completing education. The study also found that besides cost of schooling, other factors that affect demand for education in Kenya include; education level of a parent, distance to school, cognitive ability and child characteristics.

Olwande et al. (2010) evaluated the impact of FPE program using panel data from about 1500 rural Kenya households from 2000 to 2007, to analyze enrolment trends, grade progression and transition rates. The study found that increase in enrolment was attributed to the FPE programme implementation and the primary education sensitization programme. They also found that grade progression could indicate declining quality of primary education as a result of overcrowding, high pupil teacher ratio and inadequate primary school infrastructure which was not matched by

increased enrolment. Ogola (2010) looked at ways of overcoming the obstacles that face FPE in the Kenyan public primary schools. Using Ordinary Least Squares (OLS) method he found that enrolment increased tremendously especially at the inception of FPE since pupils who had dropped out of school due to school fees challenges and those who had never accessed school were the primary entrants thus an increased gross enrollment rate.

Despite the government's spending on education to ensure every child accesses education, the funding is not adequate to meet all the schooling costs. This possibility has led to households to supplement the remaining cost of schooling which is not easy for poor households since they consider provision of free primary education as a goal in itself. Even under the FPE policies, the remaining private costs of education are still impediments for enrolment. The FPE policy only subsidizes direct schooling costs, leaving other costs to be borne by households and families. Klees, (1984); Cornea, Jolly and Stewart, (1987), argues that raising fees will reduce educational attainment among the poor and thus aggravate inequality.

There is a positive relationship between household income and schooling (Glick and Sahn, 2000, Reche et al. 2012). This is because it may be hard for poor households to afford the direct and indirect costs of schooling and also such households may be constrained in their ability to borrow to cover the costs. Normally, a household would not send its children to school if it falls into poverty. In fact due to low level of incomes many parents pull children out of schools. Child labor prevents children from benefiting fully from school by increasing the opportunity cost of education and reducing child schooling (Ray, 2000).

From the literature reviewed it is evident that an increase in enrolment is associated with subsidized schooling cost. Kanina (2012) investigated the technical efficiency and the changes in total factor productivity of public primary schools Kenya and found that FPE significantly increased pupil participation although enrolment levels should be addressed by increasing the number of classes as well as the number of teachers. However there are also a number of studies that find negative influence of direct costs on enrolment. For instance, in analyzing impact of Free Primary Education in Kenya: Bold et al. (2011) examined enrolment trends and accountability. The study found that while inequality in education access declined with

implementation of FPE, there has been massive transfer of pupils from public schools to private which has been attributed to decline in education quality in public schools.

Tooley, et al. (2008) in the Impact of free primary education in Kibera slums of Nairobi in Kenya corroborates Bold et al. (2011) findings by reporting that children from the slum were not reaping the expected benefits of FPE. Instead, parents are opting to enroll their children in private schools where they are required to pay tuition fees. The argument is that public schools started performing poorly after the introduction of FPE in 2003.

The evidence that subsidized education affects enrolment either positively or negatively is however not as clear-cut as one might think in light of literature reviewed so far. Some studies found negative significant enrolment (Bold et al. 2011; Tooley, et al. 2008) whereas other studies positive significant enrolment (Olwande, et al. 2010; Ogola, 2010; Deininger, 2003; Kabubo-Mariara and Mwabu 2007).

Different methods and techniques have been applied in the empirical studies above. These techniques have their strengths and weaknesses. Some studies have used only descriptive statistics in analysis, (Bold et al. 2011; Reche, et al. 2012). Nonetheless descriptive statistics show association and does not show the causal relationship between FPE and variables. The descriptive statistics may however form the basis of the initial description of the data as part of a more extensive statistical analysis which may provide insight to policy makers and scholars in order to improve the weak areas. Other studies combined descriptive statistics and OLS regression analysis, (Deininger, 2003; Huijsman, et al. 1986; Gupta, et al. 1999; and Canton and de Jong, 2005). Kabubo-Mariara and Mwabu (2007) used descriptive statistics and probit ordered probit method. Olwande, et al. (2010) used descriptive statistics and propensity score matching in their analysis.

Most of the studies on subsidized education have used secondary data. This is because secondary data enables researchers to analyze information over extended time periods. This kind of information is not readily available in primary data sources. For instance Bold et al. (2011) used survey data by KIHBS 2005/06 for analysis of education expenditure and enrolment and test-score data from the Kenya Certificate of Primary Education (KCPE) exam. On the other hand primary data addresses specific research issues. Primary data enables the researcher to have a



higher level of control over how the information is collected. Olwande et al. (2010) used primary data of the school going age children from about 1500 rural households to analyze the effect of FPE while Ngware et al. (2007) used primary data on various variables including availability and use of textbooks, teacher in-service training, teacher pre-service training, class size from a total of 448 primary schools in Kenya.

For a better understanding on the effects of FPE on the education outcomes, some researchers chose to use data from several surveys. For instance Kabubo-Mariara and Mwabu (2007) used Welfare Monitoring Survey (WMS III) data collected from a sample of 50,713 individuals from 10,873 households. Reche et al. (2012) used a sample survey in a sample of 6 head teachers, 51 teachers and 146 standard eight pupils in public day primary schools in Mwimbi Division, Tharaka Nithi county from 2005 to 2013. Tooley, et al. (2008) used survey data from Nairobi, Kibera slums. Other studies used cross country data (Anyanwu and Erhijakpor, 2007; Gupta et al. 1999).

From the literature reviewed, there is a gap in the studies on the effects of abolishing school fees on school participation and performance in public primary schools. Because the studies carried out in Kenya either sampled a particular region or used a different methodologies and also produced mixed results. Thus this study will examine the effects of abolishing school fees in public primary schools on participation and performance in all counties in Kenya to give a national perspective.

## **Performance**

From the literature review, there are various factors that contribute to pupil performance; among them; learning materials and facilities, health, safety, cognitive ability, teacher characteristics, parental involvement and behavioral characteristics of individuals which are pre-conditions that can hamper or improve performance (Hanushek, 1986; Hattie's, 2003; Woolley and Grogan-Taylor 2005; Wossmann, 2000, 2012; Boissiere, 2004 and Bowen et al. 2008).

Parental involvement in public schools has been documented as academically beneficial on early children's literacy and participation (Quiocho and Daoud, 2006; Bowen et al 2008; Brannon, 2008:57; Avvisati et al. 2010). When parents understand the importance of education, they will

work in consultation with the teachers in order to understand their children better. This relationship between parents, teachers and pupils will realize good performance and higher school participation. Most studies have found that in subsidized education systems, parents participation in school management and accountability goes down (Epstein et al. 2001 and Kimu, 2012). Since FPE was implemented, parental involvement in public schools education has gone down especially in management and accountability (Kimu, 2012).

Kimu (2012) shows that before FPE, parents catered for all education costs; hence they were fully involved in the education system in terms of management and accountability. With FPE in Kenya, parents and communities feel that they have no stake in school governance now that the government is responsible for everything. Under such an environment, parents become passive in decision making and school activities which might lead to low performance and high levels of pupil dropout.

Poor performance is also associated with limited learning materials and facilities (Riddell and Nyagura 1991). Riddell and Nyagura (1991) study focused on the causes of poor achievement in Zimbabwe. They show that adequate learning materials and facilities such as availability of sufficient textbooks and well trained and experienced instructors will improve pupil performance. Hanushek, (1986); Wossmann, (2000) and Boissiere, (2004) found that teachers and class size appears to be the most important ingredient that affect performance. These results suggest that larger class sizes are associated with better achievement.

Using a combination of inputs among them developed curriculum, sufficient materials for instructing students, ample time for teaching and learning will improve performance (Levin and Lockheed 1991). Monk (1994) supports the importance of teachers in subject preparation and argues that teachers who have taken course work in pedagogy will have a positive impact on pupils' performance.

In Kenya, Ngware et al. (2007) applied an educational production function using KCPE mean score as the output while inputs included pupil teacher ratio, pupil toilet ratio, class size, textbook pupil ratio, utilization of textbooks, existence of school feeding programme, number of permanent classrooms, teacher qualification and student characteristics to analyze factors determining performance of primary schools in Kenya. Using OLS regression, results indicated

that textbooks utilization, teacher characteristics, school facilities and existence of school feeding programmes had a major effect on students' performance in the KCPE. Pupil teacher ratio had a negative effect on performance. For pupils from poor areas, the existence of school feeding programme was positively related to improve KCPE scores.

Glewwe, et al. (2002) study on textbooks and test scores in Kenya found that the provision of textbooks to Kenyan schools increased test scores by about 0.2 standard deviations with a greater impact among students who had access to textbooks comparing to those students who did not have access to textbooks. They also mention that Kenyan textbooks are written in English and reflect a curriculum designed for elite families in Nairobi, which may be more difficult for rural children to understand.

A study by Chuck, (2009), investigated how FPE impacts academic performance in Nairobi Public Schools. The data used in this study covered from 2001 to 2009. Using OLS, the study shows that FPE has benefited schools but has exacerbated disparities in education offered at various public primary schools. Schools located in middle-income areas with the potential to offer quality education, saw an increase in performance. Different areas have different factors that affect performance. For instance in ASAL areas, pupils might not attend classes because of various factors besides FPE. Among these factors are: distance to school, lack of transport, lack of food etc. which affects performance negatively (Chuck, 2009). Thus it is important to understand the dynamism of these areas and study each on its own.

Reche, et al. (2012) on the factors contributing to poor performance in Kenya primary education found that understaffing, inadequate monitoring by head teachers, inadequate learning resources, high teacher turnover rate, inadequate prior preparation, lack of motivation for teachers, huge workload, nonattendance by both pupils and teachers, pupils lateness, lack of support from parents all contribute to poor performance in primary national examination.

Some studies found a negative relationship between abolishing school fees and performance (Noss, 1991; Mingat& Tan, 1992). Lee and Barro (1997) study on schooling quality in a cross section of countries, showed that pupil-teacher ratio has a negative and significant impact on achievement. Resources alone are no guarantee for higher outputs of education (Todd and Wolfing, 2003; Alton-Lee, 2002; and Bowen, 2008).

## **2.3 Overview of Literature**

Different studies have been conducted investigating the relationship between abolishing school fees and education outcomes (participation and performance). In Kenya, researchers have based their studies using different methodologies on a particular population (Kimenyi et al. 2010; Ngware et al. 2007; Reche et al. 2012; Kabubo-Mariara and Mwabu 2007; Sifuna 2005b; Ogola, 2010; and Olwande et al. 2010) to investigate the effects of FPE. However, these studies produce mixed results in their empirical findings. This makes it difficult to generalize the results to the entire country. There is need for national level empirical studies to examine the effect of abolishing school fees on primary education and its implications on the overall performance using test scores and school participation in Kenya. This study will address this gap and gives insight for policy formulation at national level.

### 3. CHAPTER THREE: METHODOLOGY

This chapter presents the methodology and data that are used in the study. It provides theoretical and empirical framework of the model and how the data obtained is presented and analyzed.

#### 3.1 Theoretical Framework

Two of the first basic models on the production of human capital are found in Becker (1962) and Mincer (1958), which link the life-cycle of earnings to the investment in human capital. Parents plan for the total investment in a child's education based on assumptions about future costs and benefits. A model of the demand for schooling is applied by specifying the utility obtained from each schooling option (Gertler and Glewwe 1990). Every household is assumed to have a utility function that depends on the human capital of its children and the consumption of goods and services. The expected utility conditional on sending a child to school is given by:

$$U_1 = f(X_1, C_1) + \varepsilon_1 \dots\dots\dots (1)$$

Where  $U_1$  is the utility conditional on sending a child to school,  $X_1$  is the increment to a child's human capital from another year of education;  $C_1$  is the consumption possible after incurring both the direct and indirect costs of sending a child to school and  $\varepsilon_1$  is the error term. The decision to send a child to school depends on the quality of education received and expected future financial returns (Gertler and Glewwe, 1990).

Borrowing from Kabubo-Mariara and Mwabu (2007), if parents decide not to send their child to school, the household utility can be expressed as:

$$U_0 = f(C_0) + \varepsilon_0 = F(0, C_0) + \varepsilon_0 \dots\dots\dots (2)$$

Where  $U_0$  is the utility conditional on not sending a child to school  $C_0$  is the consumption possible for not sending a child to school and  $\varepsilon_0$  is the error term.

Households maximize utility function in equation (1) subject to the budget constraint associated with the household given by equation (3):

$$Y = C_1 + P = C_0 \dots\dots\dots (3)$$

Where P includes both direct and indirect costs of sending the child to school, and Y is the household disposable income.

The unconditional utility maximization problem can be derived by combining (1) and (2), given the constraints defined in (3), to obtain:

$$U^* = \max U_0 U_1 \dots\dots\dots (4)$$

Where U\* is maximum utility, and  $U_0$ , and  $U_1$  are the conditional utility functions specified in (2) and (3).

To achieve desired utility from education, Schultz (1961) and Becker (1962) showed that it is important to include the production process in schooling. A production function states the quantity of output that a firm can produce is a function of the quantity of inputs to production which a firm employs. In education context, the common inputs used include parental characteristics and early home environment, teacher characteristics, socioeconomic factors and pupil characteristics. Thus the production function can be expressed in linear form as:

$$Q = F I_1, I_2, \dots I_N \dots\dots\dots (5)$$

Where Q represents education outcomes

$I_1, I_2, \dots I_N$  represents the education inputs (i.e. cost, socio economic characteristics among others).

This modification yields a theoretical economic model of the behavior of schools that gives observations related to school organization, management and governance, which are important to the delivery of quality education services. Following Todd and Wolpin (2003), this framework specifies a level of achievement measured by students' test scores, as the typical output, and characteristics of the teaching and learning environment as typical inputs.

### 3.2 Model Specification

This study examines the effects of abolition of school fees on participation and performance of pupils in public primary schools in Kenya.

We first start by identifying the primary schooling performance indicators and compare their effects on pupil performance in public primary schools. We also analyze the impact of FPE on pupil participation.

To examine the relationship of primary schooling outcome and cost of schooling, the study adopts a modified model applied by Ngware et al. (2007) in examining the effects of FPE in Kenya.

The performance model 1 can be represented in a mathematical expression as:

$$Z_{it} = \alpha + \beta_1 PTR_{it} + \beta_2 PBR_{it} + \beta_3 NS_{it} + \beta_4 GH_{it} + \lambda D_{it} FPE + \mu_{it} \dots \dots \dots (6)$$

Where: i denotes county level (i=1....., n) and t denotes time period.

Z is county i KCPE mean score, analogous to Q in equation (5)

PTR represents pupil teacher ratio for county i

PBR represents pupil book ratio for county i

NS represents number of schools in county i

GH represents class size for county i

$D_i FPE$  is a dummy variable for FPE where D=1 from 2003-2013, otherwise =0 from 1998 -2002

$\mu$  is an error term

Since this study uses panel data, the cross- section units consist of all counties hence the use of fixed effects model. Fixed effects regression helps us control for omitted variables that differ between cases but are constant over time. It allows us to use the changes in the variables over time to estimate the effects of the independent variables on our dependent variable. As a result, the estimated coefficients cannot be biased because of omitted time invariant characteristics. We

run Hausman test to investigate whether the error terms are correlated and that those time-invariant characteristics are unique to the individual counties and should not be correlated with other individual characteristics.

Since our dependent variables are two (performance and pupil participation), we run another model for pupil participation.

Our model 2 is represented as:

$$W_{it} = \alpha + \beta_1 PTR_{it} + \beta_2 PBR_{it} + \beta_3 NS_{it} + \beta_4 GH_{it} + \lambda D_{it} FPE + \mu_{it} \dots \dots \dots (7)$$

Where:

W represents pupil participation in county i at time t, analogous to Q in equation (5), all the other variables are as earlier defined.

### 3.3 Definition and Measurement of Variables

This subsection presents the definition of variables used in the analysis, measurement and the expected signs.

#### Dependent Variable

The study focuses on effects of abolishing school fees in public primary schools on pupil participation and performance. In this study, the dependent variables are performance which is measured by KCPE mean scores and pupil participation which is measured by number of pupils.

#### Independent Variables

Selected explanatory factors included in this study are: pupil teacher ratio, pupil textbook ratio, class size and number of schools. Other factors that are known to affect school participation and performance such as household characteristics are not included in this study because data was not available at the county level.

Variable definitions and expected signs are presented in table 3.1.

Table 3.1: Variable Definition and Hypothesized Relationships.



<b>Variable</b>	<b>Measurement</b>	<b>Expected sign and literature source</b>
Pupil-teacher ratio	Proxy for teacher quality.	This is the average number of pupils per teacher. It's computed by dividing the total number of pupils in a county by the number of teachers in the county. A lower pupil teacher ratio has a positive correlation with pupil performance. It is expected that quality and adequate number of teachers will improve performance (Todd and Wolfing 2003; Ngware et al. 2007; Olwande et al. 2010; Reche et al. 2012 )
Pupil-textbook ratio	Proxy for quality of education	This is the average number of books per pupils in a county. It is expected that if there are more books, then performance would improve (Gupta, et al. 1999; Glewwe, et al. 2002; Ngware, et al. 2007; Chuck, 2009)
Class size	Proxy for quality of education	This is the number of pupils per classroom in a county in a school. It's computed by dividing the total number of pupils in the county by the number of classrooms in the county and it is often expressed as a ratio of pupils to classes. Classes refer to the streams in place with an average enrolment of 40 pupils. It is expected that a class with 40 or less pupils will have better performance than bigger classes, since the teacher will attend to each pupil (Hanushek, 1986; Wossmann, 2000; Boissiere, 2004; Ngware et al. 2007; Kanina, 2012).
Primary schools	Number of schools	This refers to the total number of schools in a county
County size	Number of pupils enrolled in primary schools	This refers to the total number of pupils in a county

*Source: Author's construction*

### **3.4 Sources of Data used in the Study**

The study uses secondary data from three different sources. Data on county enrolment, number of public primary schools, number of textbooks and class size for the period 1998 to 2013 was obtained from the Ministry of Education, Science and Technology. Data on pupil performance in KCPE for the period 1998-2013 was provided by the Kenya National Examination Council (KNEC) and data on teachers from the Teachers Service Commission (TSC).

## 4. CHAPTER FOUR: RESULTS AND DISCUSSION

This chapter discusses and presents the results of the study. First, summary descriptive statistics of the data are presented. Next, Hausman results of primary schooling outcomes (pupil performance and participation) followed by the regression results using the fixed effects model analysis are presented and discussed.

### 4.1 Descriptive Statistics

Overview of the summary statistics of the variables used in the analysis is presented in table 4.1.

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
County mean score	131.8	110.9	109.6	287.1
No of pupils	154979.0	106732.3	10428.0	623485.0
No of teachers	3806.0	2448.3	189.0	24362.0
No of schools	393.0	247.1	49.0	2463.0
No of classes	4194.0	2606.8	540.0	11016.0
Pupil teacher ratio	43.5	39.9	10.9	1074.4
Textbook pupil ratio	1.5	6.5	1.2	1.10

The study was based on 47 counties over a period of 16 (Years) (752 observations). It is observed that the county KCPE mean score was estimated at 131.8 where the lowest county KCPE mean score was 109.6 and the maximum was 287.1. Before 2003, average KCPE mean scores was 350 marks out of 700 marks. Thus this study has weighted the KCPE mean score to reflect the average of 250 marks out of 500 marks. This suggests a wide variability in performance of pupils across counties in Kenya. The average number of pupils per county is 154,979 with 10,428 and 623,485 as the least and maximum number of pupils in a county respectively. These statistics probably reflect the differences in population densities across Kenya. The average number of teachers per county is 3, 806 with 189 and 24,362 as the least and maximum number of teachers in a county respectively. This illustrates a wide disparity that exists in pupil teacher ratio across the counties in Kenya.

### 4.2 Hausman Test Results

We run Hausman test to investigate whether the error terms are correlated and that those time-invariant characteristics are unique to the individual counties and should not be correlated with

other individual characteristics. The null hypothesis is that the preferred model is fixed effects vs. the alternative, the random effects. It basically tests whether the unique errors  $\mu_i$  are correlated with the regressors, the null hypothesis is that they are. We run a fixed effects model and save the estimates, then run a random model and save the estimates, then perform the test. The results were obtained using xtreg command in Stata as tabulated in table 4.2.

Table 4.2: Hausman Test Results

	Coefficients			
	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag (V_b-V_B))S.E.
No of schools	-.0344	-.0332	-.0012	.0577
No of pupils	.0003	.0002	.0001	.0001
No of classes	.0351	-.0067	.0418	.0081
No of teachers	.0066	.0048	.0018	.0008

b = consistent under Ho and Ha;  
 B = inconsistent under Ha, efficient under Ho;  
 Test: Ho: difference in coefficients not systematic  
 chi2(4) = 38.15  
 Prob>chi2 = 0.0000

Since Prob>chi2 = 0.0000 is less than 0.05 (i.e. significant) then we use fixed effects model to test for (heterogeneity) unobserved variables that do not change over time.

### 4.3 Correlation Analysis

Table 4.3: Correlation Matrix

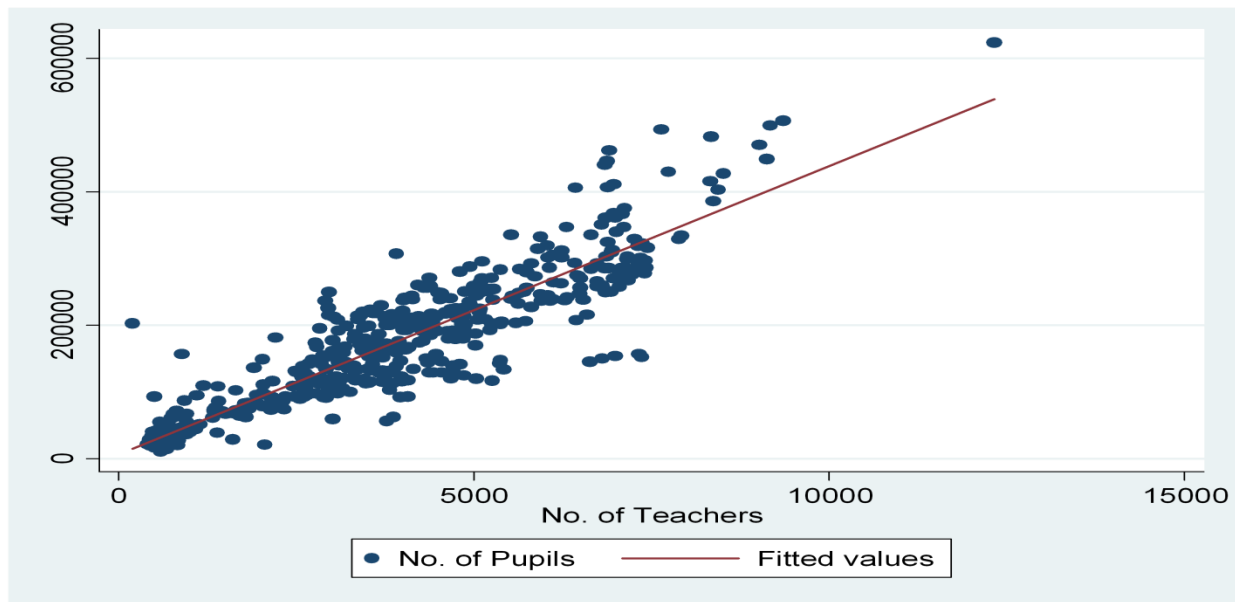
	Performance	No of pupils	PTR	Pupil class ratio	No of schools	FPE
Performance	1.0000					
Number of pupils	-0.0194	1.0000				
Pupil teacher ratio	0.0574*	0.0643*	1.0000			
Pupil class ratio	0.0626*	0.1070*	0.1711*	1.0000		
No of schools	0.0659*	0.8306**	-0.0512	-0.0653	1.0000	
FPE	0.3348*	0.1231*	0.01072	0.1902	0.0484	1.0000

\*and \*\* represents low and high levels of correlation between number of pupils which is a measure of pupil participation and independent variables respectively. Results show that all independent variables are positively correlated to the number of pupils (dependent variable). The correlation between number of schools and the dependent variable is very high thus we expect

that number of schools has a high level of significance on pupil participation and performance. FPE also has a positive impact on number of pupils. We expect any interventions put in place to enhance FPE will have a significant impact on pupil participation.

Figure 4.1 indicates a positive and strong correlation between number of pupils and number of teachers. There is a positive strong linear relationship as shown by the scatter diagram as the scatter dots are clustered around the line of fit. We expect that as the independent variable increases the dependent variable increases too.

Figure 4.1: Scatter Diagram on Correlation



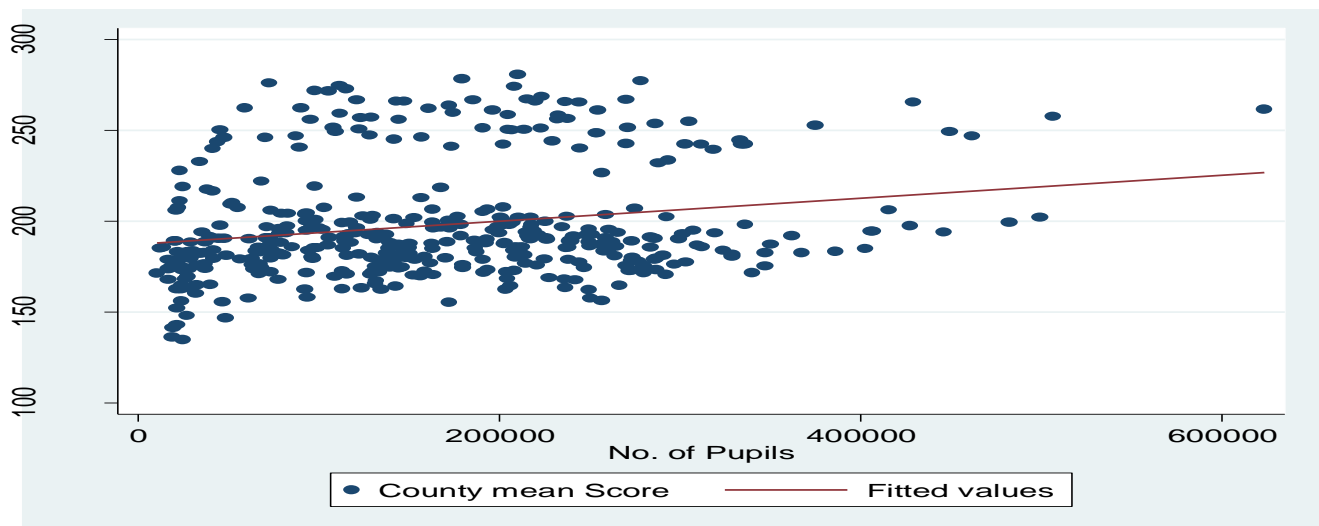
From the correlation above, it is expected that any positive intervention in the independent variables will increase pupil participation and performance respectively.

Table 4.4: Mean Comparison Test

Group	Observations	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]
Before FPE	282	127777.3	4980.4	83634.8	117973.7 137580.9
During FPE	470	168725.3	4913.7	106527.5	159069.6 178381.0
Combined	752	153369.8	3664.4	100487.0	146176.1 160563.4
Diff		-40948.0	7425.1		-55524.4 -26371.5
diff = mean(0) - mean(1)				t = -5.5	
Ho: diff = 0				degrees of freedom = 750	
Ha: diff < 0		Ha: diff = 0		Ha: diff > 0	
Pr(T < t) = 0.0000		Pr( T  >  t ) = 0.0000		Pr(T > t) = 1.0000	

It is useful to compare the two distinct periods of before and after FPE was implemented to see the effect of FPE on pupil participation. From table 4.4, we conclude that there is a difference between enrolment before FPE and during implementation of FPE programme. We also note that enrolment increased more during the period of FPE implementation. The results show that the difference between pre and post FPE in enrolment is statistically significant. The number of pupils enrolled increased between 2003 and 2013 by average 168,725 pupils, or an average growth of 26% controlling for other observable factors. The increase in the number of pupils in absolute terms between 1995 and 2002 has a mean of 127,777 which is equivalent to 3.8%. Change in pupil participation and KCPE performance can be illustrated in figure 4.2.

Figure 4.2: Scatter Diagram on change in enrolment and KCPE mean score (2003-2013)



The lower part of the scatter diagram is clustered by counties in arid and semi-arid (ASAL) areas. They include: Mandera, Turkana, Wajir, West Pokot, Samburu Marsabit and Garissa. Results show an increase in enrolment although with fewer pupils in schools compared to other counties no ASAL areas. Some associated contributors of low access in these counties can be harsh weather conditions, nomadic lifestyle, and higher poverty levels compared to the rest of the country. This demonstrates the evident inequalities in the educational opportunities in the country. Performance in these regions has been below the mean mark of 250 but with an improvement over time. In the year, 2013 for instance, even though Mandera county was the last with a mean score of 185.83, it showed an improvement of 0.61 from a mean score of 188.82 in

2012, a further improvement of 54.09 from a mean score of 134.79 in 2003. We can explain that these counties started with a lower base mean score.

The middle part of figure 4.6 shows where most of the counties' cluster. It appears clearly that many recorded most improvement in the number of pupils taking KCPE examination and the performance in the KCPE. From our model, the results suggest that FPE led to poor performance in public primary schools in Kenya.

### 4.3 Results of the Fixed Effects Model

#### Pupil participation

Table 4.5 presents the fixed effect regression results (including county fixed effects) for the pupil participation based on equation (7). The variables included give a picture of some of the important factors in determining pupil participation at the primary school level. The main factors that affect pupil participation in primary schools are pupil teacher ratio, pupil textbooks ratio, class size and number of schools.

Table 4.5: Fixed Effects Results for Pupil Participation: Dependent Variable is Number of Pupils

Pupil Participation	Coefficient	Std. Err.	P> t
No. of schools	0.72***	0.002	0.000
Pupil class ratio	0.01***	0.003	0.001
Pupil teacher ratio	0.18***	0.005	0.016
Pupil book ratio	0.25***	0.009	0.014
Free Primary Education	0.23***	0.037	0.000
constant	10.91	0.091	0.000
sigma_u	0.77		
sigma_e	0.18		
rho	0.95		
R-square: Within	0.56		
R-square: Between	0.82		
R-square: Overall	0.63		
Number of observations	752		

\*\*\* represents 1% level of significance

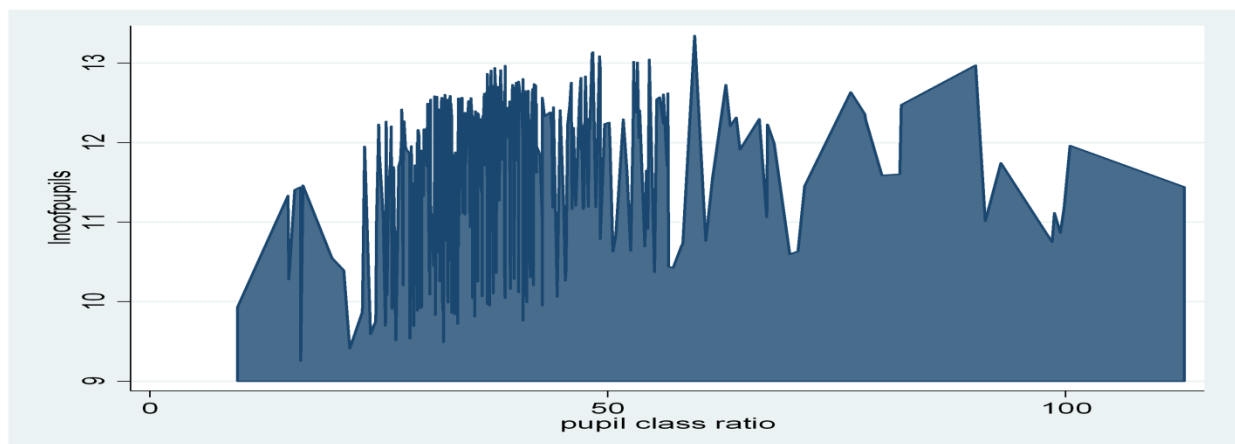
Chi2=17710.50

The R-squared statistics show that 63% of the overall variation in pupil participation is explained by the exogenous variables in our model. The R statistics results show that the independent variables are a perfect predictor of the dependent variable.

When all of the other variables equal zero, the predicted value for pupil participation is 10.91. The introduction of FPE in 2003 to 2013, has led to increase in number of pupils at one percent level of significance. From the results, there is a positive relationship between FPE and number of pupils. The coefficient of FPE is 0.23, so for every unit increase in FPE, we expect a 0.23 increase in number of pupils holding other variables. From the literature review, it is expected that FPE programme will increase pupil participation. Thus these results are in line with findings of Boissiere, (2004); Ngware et al. (2007); Ogola, (2010); Olwande, et al. (2010): and Kanina, (2012). We find that with introduction of FPE, pupil participation increased.

The coefficient for pupil class ratio which is a measure of class size is 0.01. This implies there is a positive relationship between class size and pupil participation. Consequently, for every unit increase in classes, we expect an increase of 0.01 in number of pupils holding other variables constant. We find that class sizes have a significant impact on enrollment at one percent (1%) level of significance. Adequate number of classrooms will attract more pupils. These results are corresponding to findings of Hanushek, (1986); Wossmann, (2000); Boissiere, (2004); Ngware et al. 2007; Kanina, (2012) that class size has a positive impact on pupil participation. Figure 4.3 shows variations in pupil class ratio across the counties in Kenya. Some counties have high pupil class ratio compared to the rest.

Figure 4.3: Trend in Pupil Class Ratio between 2003-2013



The coefficient on pupil teacher ratio (PTR) is 0.18 implying that for every unit increase in PTR; we expect an approximately 0.18 increase in number of pupils, holding all other variables constant. It is expected that more pupils will attract adequate number of teachers. The Pupil



Teacher Ratio (PTR) has improved steadily since the introduction of FPE. It is possible that more teachers were recruited due to high pupil enrollment. With a high PTR, it is difficult for teachers to give personalized attention to all the pupils. The results also show that the pupil teacher ratio have significant impact on enrollment at five percent (5%) level of significance.

Figure 4.4: Variations in pupil teacher ratio across counties

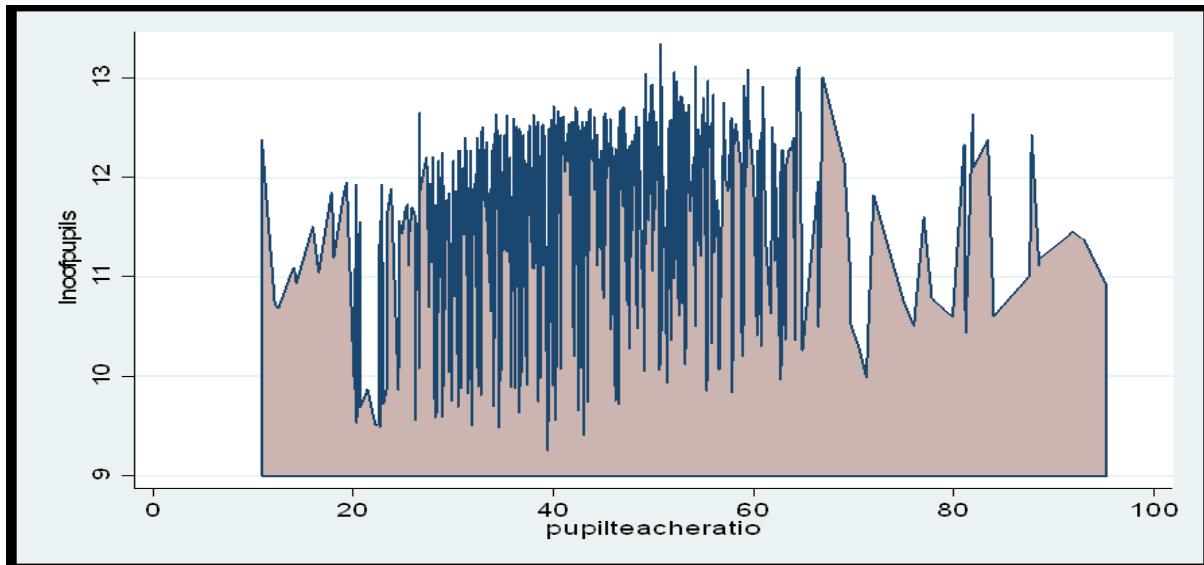


Figure 4.4 shows variations in pupil teacher ratio across the counties in Kenya. Still, there are regional variations where PTRs are higher than the national levels in some counties. For instance, results show that counties in North-Eastern regions experienced very high PTR of 1:62 which was far beyond the recommended maximum rate of 1:40 as per the Kenya standards. This translates to the heavy work load a teacher is to handle in terms of many lessons and many pupils.

Results show that the PTR increased in all counties in 2003, but they differed in ratios. For example in 2003, Wajir county had a PTR of 58.1 compared to a PTR of 40.2 in 1998. Results also show a higher PTR in 2013 of 88.3 in Mandera, 66.4 in Wajir, 77 in Turkana and 60.6 in Marsabit counties respectively. PTR in Nyeri county in 2003 was 31.2, Murang'a county 33.9 and Nairobi county 43.9 and in 2013 PTR in the same counties was 35.9, 40.4 and 55.5 respectively. This shows skewed staff patterns in favor of non-hardship areas.

The results support the findings by Kabubo-Mariara and Mwabu, (2007); Ogola, (2010); Ngware et al. (2007); Chuck, (2009) that teachers play an important role in pupil participation. With

implementation of FPE programme, the number of teachers increased but they were not able to balance out the increase in enrolment.

The coefficient for Pupil Book Ratio (PBR) is 0.25. The results show that the PBR is significant at one percent (1%). The results show there is a positive and significant relationship between PBR and pupil participation. So, for every unit increase in textbooks, we expect a 0.25 increase in number of pupils holding other variables constant. It is expected that with FPE programme the government should increase the number of textbooks to match the increased pupil participation.

The government policy on textbooks is to achieve a PBR of 1:2 for lower primary and 1:1 for upper primary across all counties. The results show that this has not been fully met but there is an improvement in the ratios. This is because before FPE, parents paid for textbooks which were a disadvantage to pupils whose parents were most likely unable to buy textbooks especially pupils from poor households as their parents. With FPE in place, most pupils can access textbooks although there is still a challenge of loss and tear which is different across schools. This result is in agreement with results in the literature (Gupta, et al.1999; Glewwe, et al. 2002; Ngware, et al. 2007; Kabubo-Mariara and Mwabu 2007).

There is a positive relationship between number of schools and number of pupils at one percent (1%) level of significance. Number of schools has a positive impact on pupil participation across counties. Hence, for every unit increase in number of schools, we expect a 151.50 increase in number of pupils holding other variables constant. This probably implies that the schools provide space to accommodate pupils who are accessing education.

Generally FPE has seen increased pupil participation in the country. However, primary school enrolment varies across counties. Appendix Table A.3 gives an overview of pupil participation across counties using xtreg command in Stata. From the results, pupils in Nyandarua, Nyeri and Uasin Gishu counties are more likely to participate in school than pupils in Kakamega, Bungoma and Nairobi counties, other factors held constant. In the year 2013, Kakamega county registered a higher enrolment of 7.2% of the national enrolment figure followed by Bungoma and Nairobi with a percentage of 5.2 and 4.9 % respectively. The results also show that Lamu county and Isiolo county have the least enrolment of 0.2% each whereas Tana River, Marsabit and Garissa registered an enrolment of 0.4% each.

In Baringo, Bomet, Bungoma, Kakamega and Nairobi counties, the findings of this study show that after the introduction of the FPE, there was a massive influx of children to primary schools that overwhelmed the existing classrooms in some schools in the mentioned counties. For example after FPE, the pupil’s class ratio in Kakamega county worsened from 36.9 in 2003 to 117.8 in 2013 and in Nairobi county, class ratio worsened from 48.1 in 2003 to 103.9 in 2013.

In deed FPE has seen a great impact on pupil participation in public primary schools. The FPE programme is a major breakthrough in the country’s education system as it has opened the doors for every school going child to get a chance to access education and improve their lives in future. Results using ordinary least square method (See Appendix Table A.4) give a similar trend as the county fixed effects results. The coefficient for FPE in the OLS results is 0.10. This implies there is a positive relationship between FPE and pupil participation at one percent level of significance. The results show that with introduction of FPE pupil participation increased across counties.

## Performance

Table 4.6 presents the fixed effects results for performance (including county fixed effects) which is measured by KCPE mean scores for each county in Kenya. Performance is the most emphasized education outcome as discussed in the literature, mostly because it is a measure of human capital (Behrman and Knowles, 1999; Glick and Sahn, 2000). As shown in Table 4.6 the main factors that affect performance in primary schools are number of pupils, pupil teacher ratio, pupil textbooks ratio, class size and number of schools.

Table 4.6: Fixed Effects Results for Performance: Dependent variable is County Mean Score

County Mean Score	Coefficient	Std. Err.	P> t
Log No. of pupils	-14.390*	12.655	0.100
No. of schools	0.074***	0.029	0.014
Pupil class ratio	-0.516**	0.261	0.054
Pupil teacher ratio	-0.025***	0.010	0.012
Pupil book ratio	12.453***	3.950	0.010
Free Primary Education	-10.360***	2.641	0.000
constant	330.860***	137.649	0.020
sigma_u	15.300		
sigma_e	30.735		
rho	0.199		
R-square: Within	0.55		
R-square: Between	0.76		
R-square: Overall	0.53		
Number of observations	470		

(\* , \*\* , \*\*\*) represents 10%, 5%, 1% levels of significance respectively)

chi2 = 125.02

Prob> chi2 = 0.0000

When all of the other variables equal zero, the predicted value of performance is 330.860. From the results, the R-squared statistics show that fifty three percent (53%) of the proportion of overall variations in performance are explained by the exogenous variables.

The coefficient of FPE is -10.360. This implies that FPE has a negative impact on performance. Moreover, pupils who sat for KCPE examinations during FPE period are likely to score -10.360 marks less compared to the pupils in the pre FPE period holding other variables constant. The results also show FPE has a significant impact on performance at one percent level of significance. These results are similar to findings by Olwande et al. (2010), Kanina (2012) and Ngware, et al. (2007) which found that FPE worsen performance.

The relationship between performance and number of schools is positive at one percent (1%) level of significant. The coefficient of number of schools is 0.074. Thus, for every unit increase in number of schools, we expect a 0.074 increase in performance holding other variables.

The fixed effects result for pupil class ratio which is a measure of class size shows a negative relationship between class size and performance at five percent level of significance. The coefficient for class size is -0.516. Thus, for every unit increase in class size, we expect a -0.516 decrease in performance holding other variables constant. This is not surprising given that the average class size in some counties is very high and exceeds the optimal size of between 40 and 45 pupils (GoK, 2005b). It is expected that smaller classes are relatively more manageable; with teacher-pupil contact being high hence improves pupil performance in KCPE examination results whereas larger class size will lead to a decline in mean score. The results are in line with the findings by Ngware et al. (2007).

One of the main inputs in any education system is availability of teachers. From the literature, it is argued that presence of high pupil teacher ratio lowers performance (Olwande, et al. 2010; Ngware, et al. 2007). From our fixed effects results, the coefficient for pupil teacher ratio (PTR) is negative 0.025. This implies PTR reduces performance by -0.025 holding other factors constant. It is expected that a higher pupil teacher ratio reduces performance and a lower PTR

improves performance since PTR is related to teacher contact with pupils during in teaching and learning. With the introduction of FPE, teachers were employed across the counties but the number did not match the pupil participation increase. This has seen deterioration in performance at primary school level. The results support findings in the literature (Olwande, et al. (2010) and Ngware et al. (2007)).

The coefficient of pupil book ratio is 12.453. So, an increase in PBR by 1 percent improves performance by 12.453 holding other factors constant. It is expected that lower pupil book ratio impacts positively on KCPE performance indicating that the extent to which textbooks are available and utilized by pupils improves performance. Results show that the effect of pupil book ratio on KCPE mean score is positive and statistically significant at one percent. The FPE programme has a component of provision of textbooks that is aimed at increasing pupils' access to a textbook. Thus, greater availability of textbooks provided to schools for pupils to access, has seen improved performance. The positive impact of textbooks on performance supports findings in the literature that lower pupil book ratio can improve performance (Gupta, et al. (1999), Glewwe, et al. (2002), Ngware, et al. (2007) and Kabubo-Mariara and Mwabu (2007)).

The results show that number of pupils has a negative effect on performance at ten percent level of significance. The coefficient of number of pupils is -14.390, meaning that for every unit increase in pupils, performance decreased by -14.390 holding other variables constant. With inception of FPE, there was a massive increase in number of pupils which was not matched by expansion in the teaching and learning environment. This causes a strain to teaching and learning facilities which has seen a decrease in performance.

Generally the results show that FPE has had a negative effect on performance (See Appendix Table A.5). Results show that even for those counties that registered improved performance, the performance is not significantly different from zero. This could be explained by factors like insufficient learning and teaching material, teacher characteristics and parental involvement that have been presented in the literature review. The results also show that pupils in Busia, Vihiga and Mombasa counties are more likely to perform better in KCPE than pupils in Nairobi and Kirinyaga counties other factors held constant. The results also show variability in performance

across the counties in Kenya (see appendix figure A.1). The performance is still below the average mark of 250 in most counties.

ASAL areas recorded the lowest performance compared to other counties. Performance in these counties is below the mean mark of 250 (see appendix figure A.2). This suggests that infrastructure development, poverty, insecurity and socio economic environment have a great impact on performance. Just like the ASAL areas, coastal region counties (Kwale, Mombasa, Taita Taveta, Tana River, Kilifi and Lamu) also show low performance. Kilifi County recorded the highest decrease in its mean score in 2013. Some associated contributors of poor performance in these counties can be their higher poverty levels compared to the rest of the country. Figure A.3 in the appendix shows performance in KCPE in quintiles.

Results show that Nairobi County attained a mean score of 280.9 and 265.6 in KCPE in 2012 and 2013 respectively. These scores are above the mean mark of 250. This could be because Nairobi County has better infrastructure, quality teachers and the economic status of parents is better compared to other areas. Kirinyaga county also had KCPE mean score of 272.1 in 2012 and 274.58 in 2013 which is also above the average national mean score. This can be explained by good learning and teaching facilities in the county.

Results using ordinary least square method (See Appendix Table A.6) are consistent with the county fixed effect results. The coefficient for FPE is -10.360 and significant at ten percent. This implies there is a negative relationship between FPE and performance. The results show that with introduction of FPE, performance declined in most counties, but there was a positive effect of FPE on performance in some counties such as Busia, Vihiga, Nairobi and Kirinyaga counties.

## **5. CHAPTER FIVE: CONCLUSION AND POLICY RECOMMENDATIONS**

### **5.1 Summary and Conclusion**

Implementation of FPE programme in Kenya is a big milestone towards the achievement of MDG goal two on provision of universal primary education by 2015. FPE in Kenya has proved EFA goals can succeed, now and in years to come. According to the human capital theory, education is a key instrument for the Country's social-economic development. It's therefore necessary that investment in this sector attains maximum possible benefits. Despite the effort made by the government to achieve national and international goal on universal primary education, a number of challenges exist which are a threat to FPE success. Among the challenges include congested classrooms, very high pupil teacher ratio in some regions and poor learning facilities.

There are also concerns regarding the overall impact of FPE on enrolment and performance of education in public primary schools. This study examines the effect of abolition of primary education fees on school participation and performance in Kenya, using panel data for the period 1990-2013. The data was sourced from the Ministry of Education, Science and Technology, Kenya National Examination Council and Teachers Service Commission (TSC). Fixed effects models for participation and performance are estimated. The study investigates whether pupil textbook ratio, pupil teacher ratio, class size and number of schools have an effect on pupil participation and performance in KCPE examination. The results show that since FPE implementation, pupil participation has increased tremendously but performance at national level is still below the average mark of 250.

The study findings show that the increase in primary school enrolment rates can largely be attributed to the FPE program. The study also shows availability of textbooks for pupils, lower pupil teacher ratio, lower class-size, and enough primary schools, positively increase pupil participation. The study also shows regional disparities in terms of pupil participation. These results are consistent with the findings by Huijsman, et al. (1986); Deininger, (2003); Gupta, et al. (1999); Glewwe, et al. (2002); Ngware, et al. (2007); Kabubo-Mariara and Mwabu (2007); and Olwande, et al. (2010) that subsidizing primary education is associated with a significant increase in pupil participation.

Another key finding of this study is that performance in KCPE is still low. This may be caused by high pupil book ratio, high pupil teacher ratio and large class size. Therefore, in order to improve KCPE performance in primary schools, the government needs to ensure that the increase in number of pupils is matched by infrastructure, teaching and learning materials. The results support findings in the literature (Hattie's, 2003; Woolley and Grogan-Taylor 2005; Boissiere, 2004; Bowen et al. 2008; Ogola, 2010; Olwande et al. 2010; Ngware et al. 2007; Kanina, 2012; and Kabubo-Mariara and Mwabu 2007).

The results also show variations in pupil participation and performance across the counties in Kenya. Despite increase in pupil participation across counties, there are still skewed patterns. For instance pupil participation in Baringo, Bungoma, Kakamega and Nairobi Counties increased significantly with implementation of FPE whereas pupil participation and performance in ASAL areas is still below the national average gross enrolment figure. This may be caused by other costs related to schooling, harsh weather conditions, regional conflicts, insecurity, nomadic lifestyle and food shortage.

Performance is also seen to vary across counties. Counties with better infrastructure, adequate teachers and better access to textbooks are seen to achieve a mean mark above 250 in KCPE examinations. For example Nairobi and Kirinyaga counties whereas counties in marginalized regions have recorded a lower mean mark in KCPE which is below the average of 250 marks. These disparities could be because of levels of poverty, inadequate teaching and learning materials, child labor, lack of basic needs and health issues.

## **5.2 Policy Implications**

FPE was a milestone to achieve the overall goal of universal pupil participation in primary education. Despite FPE implementation, there are still education related direct and indirect costs that may hinder pupil participation. Thus the study recommends removing all costs related to primary education so that primary education is completely free.

Pupil participation varies across counties in Kenya. To ensure equality in access to education, the government should implement affirmative policies to bring the disadvantaged regions at par with the rest of the country. This may include; setting up mobile schools especially for pastoralists,



provision of low cost boarding school in marginalized areas and setting up an equalization fund for education. In addition addressing insecurity and poverty in these regions will greatly help to enhance pupil participation in education in these regions.

Since inception of FPE, there was pressure on teaching and learning facilities since increase in pupil participation did not match the existing infrastructure. This has seen a negative effect on performance. The study recommends improving infrastructure by increasing the number of classes and schools to enhance pupil participation. Increasing number of schools will not only give enough room for pupils but also this will shorten the distance from the school especially in marginalized areas.

To ensure improved performance in KCPE results, the study recommends availing enough textbooks for pupils and increasing the number of quality teachers to help take care of the ever-increasing demand of free primary education.

In addition, the study recommends policies that will ensure efficient utilization of existing facilities and resources without incurring extra costs. This may include addressing teacher absenteeism, adoption of ICT in delivery of curriculum among others.

Lastly this study recommends teacher motivation as an important policy in achieving improved performance in KCPE examinations. Teacher motivation may be done through better terms of employment, awards and recognition.

### **5.3 Limitations and Areas for Further Research**

The major limitation of the study is the availability of county level data to analyze other possible determinants of education outcomes. This study could therefore not analyze the effect of socio economic variables as well as environmental variables on performance and pupil participation.

This study focused on effect of FPE on public primary schools. The areas for further research in this field include comparing private and public schools to determine whether there are differences in performance and what other factors besides FPE affect performance. This is an important factor for policy formulation.

## REFERENCES

- Adrienne, C. (2009). Disparities in the system: The effects of Free Primary Education on the quality of education in Nairobi Public Primary Schools: SIT Kenya: Development, health and society. [http://digitalcollections.sit.edu/cgi/viewcontent.cgi?article=1715&context=isp\\_collection](http://digitalcollections.sit.edu/cgi/viewcontent.cgi?article=1715&context=isp_collection) Accessed 17<sup>th</sup> March 2014.
- Anand, S., & Ravallion, M. (1993). Human Development in Poor Countries: On the Role of Public Services. *Journal of Economics Perspectives*, 7(1), 135-50.
- Anyanwu, J. C., & Erhijakpor, A. E. O. (2007). Education Expenditures and School enrolment in Africa: illustrations from Nigeria and the other SAWE Countries. Paper presented at the 50<sup>th</sup> Anniversary and Annual Conference of the Nigerian Economic Society, Abuja, Nigeria.
- Avvisati, F. G., and Maurin, G. (2010). Getting Parents Involved: a Field Experiment in Deprived Schools. *Mimeo J-PAL Europe, CEPR Discussion Paper 8020, 2010*.
- Becker, G. S. (1975). Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education. Second Edition: Chicago: University of Chicago Press.
- Becker, G.S, (1962). Investment in Human Capital: A Theoretical Analysis. *The Journal of Political Economy*. 70(5): 9-49.
- Behrman, J. R. and J. C. Knowles (1999). Household Income and Child Schooling in Vietnam. *World Bank Economic Review* 13(2): 211-56
- Boissiere, M. (2004). Determinants of Primary Education Outcomes in Developing Countries. Background Paper for the Evaluation of the World Bank's Support to Primary Education.
- Bold, T., Kimenyi, M., Mwabu, G. and Sandefur, J. (2011). Why did abolishing fees not increase public school enrollment in Kenya? Working Paper 271: Center for Global Development Working Paper Series.
- Brannon, D. (2008) "Transforming teacher education through parent involvement in high-need schools." *Journal on Innovations and Educational Leadership*. Retrieved from <http://www.acifund.org/aci-center/journal/article/transforming-teacher-education-through-parent-involvement-high-need-schools>. Accessed 19<sup>th</sup> May, 2014.
- Bruns B., mingat A. & Ramahatra R. (2003). *Achieving Universal Primary Education by 2015: A Chance for Every Child- Business & Economics*.
- Bryn Mawr College & Thomas P. Vartanian (2010). *Secondary Data Analysis- Social Science*: Oxford University Press.
- Caldwell, J. C. (1978). A theory of fertility: From high plateau to destabilization. *Population and Development Review*, 4(4), 553-577.

Canton, E., and F. de Jong (2005): “The demand for higher education in The Netherlands, 1950-1999,” *Economics of Education Review*, 24, 651–663.

Center for Public Policy Priorities. (1999). *Measuring Up: The State of Texas Education*. February 26, 1999 No. 74 (<http://www.cppp.org/products/policypages>).

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, F., Mood, A. M., Weinfeld, F. D., et al. (1966). *Equality of educational opportunity* Washington. DC: U.S. Government Printing Office.

Connelly, R. (1992). *The effect of child care costs on married women's labor force participation*. *The Review of Economics and Statistics*, 74(1), 83–90.

Cooper, S.T., and Cohn, E. (1997), *Estimation of a Frontier Production Function for the South Carolina Educational Process*: *Economics of Education Review*, 16(3), 313-27.

Deininger, K. (2003). Does Cost of Schooling Affect Enrollment by the Poor? Universal Primary Education in Uganda. *Economics of Education Review*, 22, 291-305).

Education and Development (2011). Retrieved from: <http://go.worldbank.org/F5K8Y429G0>, accessed on 5<sup>th</sup> September, 2012.

Epstein, J. L., Sanders, M. G., Simon, B. S., Salinas, K. C., Jansorn, N. R., & Van Voorhis, F. (2001). *Developing and sustaining research-based programs of school, family, and community partnerships*: Summary of five years of NNPS research.

Fuller, B (1987), What School Factors Raise Achievement in the Third World? *Review of Educational Research* No. 57 p 255-292

Gertler, P. and Glewwe, P. (1990). The Willingness to Pay for Education in Developing Countries. *Journal of Public Economics* 42: 251-275.

Glewwe P., Kremer M. and Moulin S. (2002), Textbooks and Test Scores: Evidence from a Prospective Evaluation in Kenya. Working paper, Harvard University, November.

Glewwe, P. & Patrinos, H. A. (1999). The role of the private sector in education in Vietnam: Evidence from the Vietnam living standards survey. *World Development*, 27(5), 887–902.

Glick, P. and D.E. Sahn. 2000. “Schooling of girls and boys in a West African country: The effects of parental education, income and household structure”. *Economics of Education Review*, 19: 6387.

Glick, P., & Sahn, D. E. (2000). Schooling of girls and boys in a West African country: The effects of parental education, income, and household structure. *Economics of Education Review*, 19(1), 63–87.

Government of Kenya (2005). Sessional Paper No.1 of 2005 on *Education, Training and Research*. Government Printer, Nairobi, Kenya. ”5<sup>th</sup> March 2014

Government of Kenya (2012a): *Draft Report of the implementation of FPE in Kenya*: Ministry of Education, unpublished.

Government of Kenya, (2005a), *Ministerial Public Expenditure Review*, Ministry of Education, Science and Technology, unpublished.

Government of Kenya, (2008). *Economic Survey*. Kenya National Bureau of Statistics.

Government of Kenya, (2008a). *Sector Plan on Education and Training, 2008-2013*: Ministry of Education.

Government of Kenya, (2009). *Education facts and figures, 2002-2008*: Ministry of Education.

Government of Kenya, (2013). *Financing and Expenditure in Education in Kenya*: Ministry of Education, Science and Technology.

Gupta, S., Verhoeven, M., & Tiongson, E. (1999). *Does Higher Spending Buy Better Results in Education and Health Care?* (IMF Working Paper WP/99/21) Washington, D. C.: International Monetary Fund.

Hamilton, W.B. (1983). "The flypaper effect and other anomalies." *Journal on Public Economics*. 22, 347-361.

Hanushek E. A. (1986). The Economics of Schooling: Production and Efficiency in Public Schools. *Journal of Economic Literature* 24(3), 1141-1177.

Hanushek E.A., Kimko D.D., (2000). Schooling, labor-force quality, and the growth of nations. In *American Economic Review* 5: 1184–208

Hanushek, E.A. (1971). Teacher characteristics and gains in student achievement: estimation using micro data. *Am. Econ. Rev.* 61, 280-288.

Hanushek, E.A. (1979). "Conceptual and empirical issues in the estimation of education production functions." *Journal on Human Resource*. 14, 351-388.

Huijsman, R., T. Kloek, D. A. Kodde, and J. M. M. Ritzen (1986): "An Empirical Analysis of College Enrollment in the Netherlands," *De Economist*, 134(2), 181–190.

Kabubo-Mariara J. W. and Mwabu K. D. (2007). Determinants of School Enrolment and Education Attainment: Empirical evidence from Kenya. *South African Journal of Economics* Vol. 75:3 (1-22).

Kanina, J.W., ( 2012) Technical efficiency and total factors productivity of primary schools in Kenya, University of Nairobi.

Kimu M. A.,(2012); Parent involvement in public primary schools in Kenya. *Journal of Asian and African Studies* Vol. 48: 5(607-622).

Lazear, E. (2001). Educational production, Quarterly. *Journal of Economics* 113(3), 777803.

- Lee J.W., Barro R. J., (1997). *Schooling Quality in a Cross Section of Countries*. Cambridge: National Bureau of Economic Research.
- Levin, H. M. and Lockheed, M. E. (1991). *Effective Schools in Developing Countries*. Washington DC: World Bank.23.
- Lockheed, M. E. and Hanushek, E. (1988). *Improving Educational Efficiency in Developing Countries: What do we know?* Washington DC: World Bank.
- Mincer, J. (1958).Investment in Human Capital and Personal Income Distribution..*Journal of Political Economy*, Vol. 66:4 (281-302)
- Mincer, J. (1970). The distribution of labor incomes: a survey with special reference to the human capital approach. *Journal of Economic Literature* 8:1-26.
- Mincer, J. (1974). *Schooling, Experience, and Earnings*. New York: *National Bureau of Economic Research*.
- Mingat, A. (1995). Towards improving our understanding of the strategy of high-performing Asian economies in the education sector. Paper presented at the *Asian Development Bank Conference on the Financing of Human Resources in Asia*, November 17-18, 1996, Manila, Philippines.
- Mingat, A., & Tan, J. P. (1992). *Education in Asia: A Comparative Study of Cost and Financing*. Washington, D. C.: World Bank.
- Ngware, M., Onsomu, E. & Manda, D. (2007). Impact of primary school educational inputs and outputs in Kenya: *Empirical evidence*. KIPPRA Discussion Paper N0.81
- Noss, A. (1991). *Education and Adjustment: A Review of the Literature*. (PREM Working Paper WPS 701). Washington, D. C. World Bank.
- Ogola O. F. (2010). *Free Education in Kenya's Public Primary Schools: Addressing the Challenges*. Organization for Social Science Research in Eastern and Southern Africa (OSSREA).
- Olwande J., Muyanga M., Mueni E., Wambugu S. (2010). *Free Primary Education in Kenya: An Impact Evaluation Using Propensity Score Methods*. PMMA Working Paper 2010-08
- Psacharopoulos, G and Patrinos H.A (2004). Returns to Investment in Education. *Education Economics*, Vol. 12, No. 2(1-24).
- Psacharopoulos, G. (1994). Returns to investment in education: a global update. *World Development*, 22(9):1325-1343.
- Quiocho M. L. and Daoud M. A. (2006). "Dispelling Myths about Latino Parent Participation in Schools." *Journal on the education forum*, 1- 256

- Ray, R. (2000). "Child labour, child schooling and their interaction with adult labour: Empirical evidence for Peru and Pakistan". *World Bank Economic Review*, 14(2):1- 347
- Riddell, A. R. and Nyagura, L. M. (1991), What Causes Differences in Achievement in Zimbabwe's Secondary Schools? Paper Series 705, Washington DC: World Bank.
- Schultz T.P. (1995). Accounting for Public Expenditures on Education: an international panel study. Yale: Economic Growth Center, Yale University: Economic Growth Center, 1995 Jul. [63] p. (Center Discussion Paper No. 742).
- Schultz, T.W. (1975). The value of the ability to deal with disequilibria. *Journal of Economic Literature*: 13(3):827-47.
- Sifuna, D. (2005b). Increasing access and participation of pastoralist communities in primary education in Kenya. *International Review of Education Vol., 51. No. (5/6) pp. 499-516*.
- Stromquist, N. P. (1999). The impact of structural adjustment programmes in Africa and Latin America. In C. Heward & S. Bunwaree (Eds.), *Gender, education and development: Beyond access to empowerment*. London: Zed Books Ltd.
- Tooley, J., Dixon, P., & Stanfield, J. (2008): Impact of free primary education in Kenya. *Educational Management Administration & Leadership*, 36(4), 449 –469.
- UNESCO (2000). World Education Forum. Education for All: Meeting our Collective Commitments. The Dakar Framework for Action, UNESCO: Paris. Retrieved from: <http://unesdoc.unesco.org/images/0012/001211/121147e.pdf>, accessed on 17<sup>th</sup> March, 2014.
- UNESCO, (2005). Challenges of Implementing Free Primary Education in Kenya: Assessment Report. UNESCO, Nairobi Office.
- World Bank, (2011). Abolishing School Fees in Africa Lessons from Ethiopia, Ghana, Kenya, Malawi, and Mozambique: A publication of the World Bank in collaboration with the United Nations Children's Fund (UNICEF), World Bank. Washington D.C.
- World Bank.(1995). Priorities and Strategies for Education. *A World Bank Review*. Washington D.C.: The World Bank.
- Wössmann L. (2000). Schooling resources, educational institutions, and student performance: the international evidence. Kiel Working Paper 983. Kiel Institute of World Economics: Korea.

## A. APPENDIX

**Table A. 1: Budget Expenditure on Education and Per Capita Spending (KES) in Primary Schools**

FINANCIAL YEAR	Total government education expenditure (million)	Total government primary education expenditure (millions)	Per capita spending in primary
1987/98	9,133	4,440	1,652
1988/89	10,662	4,770	931
1989/90	11,286	4,960	920
1990/91	14,050	5,454	1,012
1991/92	14,444	7,039	1,290
1992/93	17,096	7,901	1,430
1993/94	1,070	11,038	2,033
2002/03	65,135	22,826	3,723
2003/04	73,941	35,404	4,945
2004/05	86,117	42,975	5,812
2005/06	92,360	52,093	6,862
2006/07	109,827	58,080	7,610
2007/08	125,284	66,004	7,923
2008/09	144,439	69,653	8,133
2009/10	159,340	73,493	8,322
2010/11	186,296	78,252	8,341
2011/12	221,113	91,008	9,232
2012/13	252,875	98,821	9,911

*Source: Government of Kenya Economic Surveys various issues. Kenya National Bureau of Statistics.*

**Table A.2: Enrolment Trends in Kenyan Primary Schools**

<b>Year</b>	<b>Total enrolment in primary schools (000)</b>
1990	5,392.3
1991	5,456.1
1992	5,530.2
1993	5,428.6
1994	5,556.8
1995	5,536.4
1996	5,597.7
1997	5,677.3
1998	5,919.6
1999	5,867.8
2000	6,078.0
2001	6,082.0
2002	6,131.0
2003	6,906.4
2004	7,394.8
2005	7,591.5
2006	7,632.1
2007	8,330.1
2008	8,563.8
2009	8,831.4
2010	9,381.2
2011	9,858.0
2012	9,971.0
2013	10,300.0

*Source: Government of Kenya Economic Surveys various years.*



Table A.3: County results on pupil participation

R-sq: within = 0.65 between = 1.00 overall = 0.96		Number of observations = 752 Number of groups = 47 Wald chi2 (50) = 17710.54	
Log No of pupils	Coefficient	County	Coefficient
Pupil teacher ratio	0.0176***	Makueni	0.2938***
Pupil class ratio	0.0002**	Mandera	0.2072*
No of schools	0.0007***	Marsabit	-1.6847***
Pupil textbook ratio	0.0501***	Machakos	-1.4079***
FPE	0.0573***	Meru	0.2491***
<b>County</b>		Migori	0.0873
Bomet	-0.0950	Mombasa	-0.6578***
Bungoma	0.4703***	Murang'a	0.3302***
Busia	0.0317	Nairobi	0.1757***
Elgeyo Marakwet	-0.1909***	Nakuru	0.4430***
Embu	-0.0653	Nandi	0.1104*
Garissa	-1.7754***	Narok	-0.2224***
Homa Bay	0.0912	Nyamira	-0.0717
Isiolo	-1.6451***	Nyandarua	0.0100
Kajiado	-0.4813***	Nyeri	0.0934
Kakamega	0.4591***	Samburu	-1.4020***
Kericho	0.2414***	Siaya	0.1445***
Kiambu	0.4915***	T.River	-0.6559***
Kilifi	0.1355**	TaitaTaveta	-1.01812***
Kirinyaga	-0.1419**	Tharaka Nithi	-0.2171***
Kisii	0.3151***	Trans Nzoia	-0.0190
Kisumu	0.1472***	Turkana	-1.0937***
Kitui	0.1649*	Uasin Gishu	0.0616
Kwale	-0.2196***	Vihiga	0.0734
Laikipia	-0.4023***	West Pokot	-1.5880***
Lamu	-1.6722***	Wajir	-0.6970***
Constant	10.7706***		
sigma_u	0		
sigma_e	0.1760		
rho	0		

(\*, \*\*, \*\*\*) represents 10%, 5%, 1% levels of significance respectively)

Table A.4: Regression Results of Pupil Participation

R- square	= 0.97	Number of observations	= 705
Adj R-squared	= 0.97	F (50, 654)	= 434.22
Root MSE	= 0.15	Prob > F	= 0.00
<b>Log No of pupils</b>	<b>Coefficient</b>	<b>County</b>	<b>Coefficient</b>
Pupil teacher ratio	0.0093***	Makueni	0.5176***
Pupil class ratio	0.0119***	Mandera	0.4557***
No of schools	0.0003***	Marsabit	-1.9647***
Pupil textbook ratio	0.0007***	Machakos	-1.6760***
FPE	0.0958***	Meru	0.2123***
<b>County</b>		Migori	0.1803***
Bomet	-0.2394***	Mombasa	-0.69197***
Bungoma	0.6127***	Murang'a	0.2973***
Busia	-0.03056	Nairobi	0.0430
Elgeyo Marakwet	-0.3051***	Nakuru	0.5501***
Embu	-0.1559**	Nandi	0.0549
Garissa	-2.0231***	Narok	-0.0140
Homa Bay	0.4342***	Nyamira	-0.2028***
Isiolo	-1.9207***	Nyandarua	-0.0779
Kajiado	-0.6549***	Nyeri	0.0266
Kakamega	0.7337***	Samburu	-1.6560***
Kericho	0.3135***	Siaya	0.2936***
Kiambu	0.4291***	T.River	-0.8156***
Kilifi	0.1281***	TaitaTaveta	-1.4320***
Kirinyaga	-0.4400***	Tharaka Nithi	-0.0363
Kisii	0.4769***	Trans Nzoia	-0.3245***
Kisumu	0.12628***	Turkana	-1.2407***
Kitui	0.5103***	Uasin Gishu	0.0123
Kwale	-0.3064***	Vihiga	0.0445
Laikipia	-0.5482***	West Pokot	-2.0335***
Lamu	-1.8984***	Wajir	-0.7761***
Constant	10.9558***		

(\* , \*\* , \*\*\*) represents 10% , 5% , 1% levels of significance respectively)

**Table A.5:** County Results on Performance

R-sq: within = 0.11 between = 1.00 overall = 0.23		Number of observations = 470 Number of groups = 47 Wald chi2 (50) = 125.02	
Log No of pupils	Coefficient	County	Coefficient
Pupil teacher ratio	-0.0252*	Makueni	-24.3171
Pupil class ratio	0.5159***	Mandera	-15.5203
No of schools	0.0741***	Marsabit	-48.9767***
Pupil textbook ratio	0.0001***	Machakos	-16.7348
Log no. of pupils	-14.3898*	Meru	-26.3429*
FPE	-10.3605**	Migori	-21.2380
<b>County</b>		Mombasa	5.8822
Bomet	-15.3076	Murang'a	-16.6608
Bungoma	-12.9940	Nairobi	8.6596
Busia	1.8278	Nakuru	-13.9437
Elgeyo Marakwet	6.9526	Nandi	-4.7501
Embu	-8.3452	Narok	-16.5409
Garissa	-42.7441*	Nyamira	-23.5330*
Homa Bay	-28.9885*	Nyandarua	-11.4413
Isiolo	-21.8108	Nyeri	-3.1734
Kajiado	-0.5511	Samburu	-14.7763
Kakamega	-21.2385	Siaya	-12.8959
Kericho	-9.0018	T.River	-17.3495
Kiambu	-15.8842	TaitaTaveta	-33.4725
Kilifi	-6.7990	Tharaka Nithi	-12.5691
Kirinyaga	13.0439	Trans Nzoia	-2.3547
Kisii	-32.4459***	Turkana	-8.5505
Kisumu	-11.8941	Uasin Gishu	7.5111
Kitui	-51.3920***	Vihiga	1.4534
Kwale	-21.9544	West Pokot	-52.9716***
Laikipia	-9.9700	Wajir	-0.9469
Lamu	-27.3081		
Constant	345.6126***		
sigma_u	0		
sigma_e	30.7346		
rho	0		

(\*, \*\*, \*\*\*) represents 10%, 5%, 1% levels of significance respectively)

Table A.6: Regression Results of Performance using OLS

R- square = 0.23		Number of observations = 470	
Adj R-squared = 0.13		F (51, 418) = 2.45	
Root MSE = 30.74		Prob > F = 0.00	
<b>Log No of pupils</b>	<b>Coefficient</b>	<b>County</b>	<b>Coefficient</b>
Pupil teacher ratio	-0.0252*	Makueni	-24.3171
Pupil class ratio	0.5159***	Mandera	-15.5203
No of schools	0.0741***	Marsabit	-48.9767***
Pupil textbook ratio	0.0001***	Machakos	-16.7348
Log no. of pupils	-14.3898*	Meru	-26.3429*
FPE	-10.3605**	Migori	-21.2380
<b>County</b>		Mombasa	5.8822
Bomet	-15.3076	Murang'a	-16.6608
Bungoma	-12.9940	Nairobi	8.6596
Busia	1.8278	Nakuru	-13.9437
Elgeyo Marakwet	6.9526	Nandi	-4.7501
Embu	-8.3452	Narok	-16.5409
Garissa	-42.7441*	Nyamira	-23.5330*
Homa Bay	-28.9885*	Nyandarua	-11.4413
Isiolo	-21.8108	Nyeri	-3.1734
Kajiado	-0.5511	Samburu	-14.7763
Kakamega	-21.2385	Siaya	-12.8959
Kericho	-9.0018	T.River	-17.3495
Kiambu	-15.8842	TaitaTaveta	-33.4725
Kilifi	-6.7990	Tharaka Nithi	-12.5691
Kirinyaga	13.0439	Trans Nzoia	-2.3547
Kisii	-32.4459***	Turkana	-8.5505
Kisumu	-11.8941	Uasin Gishu	7.5111
Kitui	-51.3920***	Vihiga	1.4534
Kwale	-21.9544	West Pokot	-52.9716***
Laikipia	-9.9700	Wajir	-0.9469
Lamu	-27.3081		
Constant	345.6126***		

(\* , \*\* , \*\*\*) represents 10% , 5% , 1% levels of significance respectively)

Figure A.1: Trend in County Mean Scores

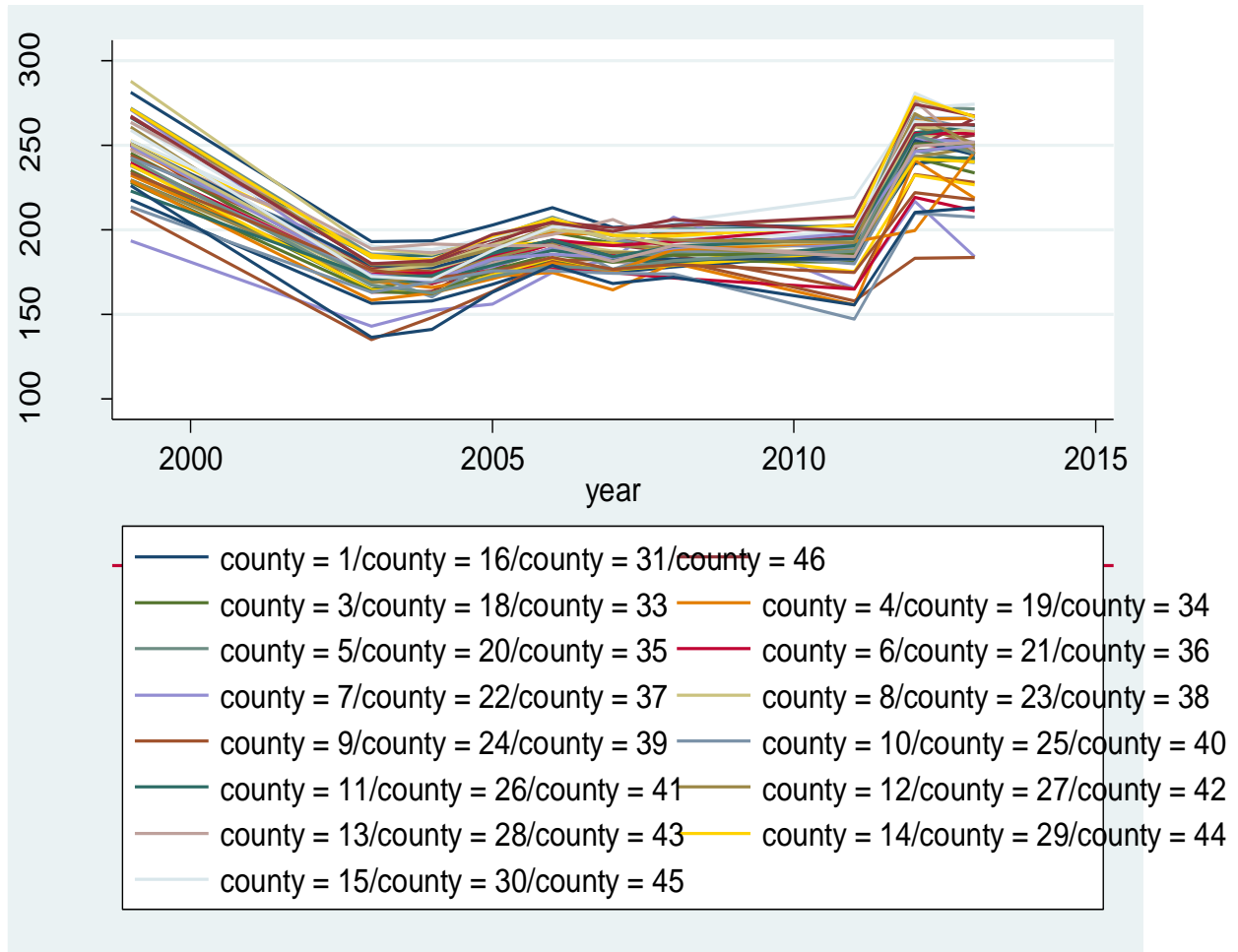


Figure A.2: Performance in ASAL Areas

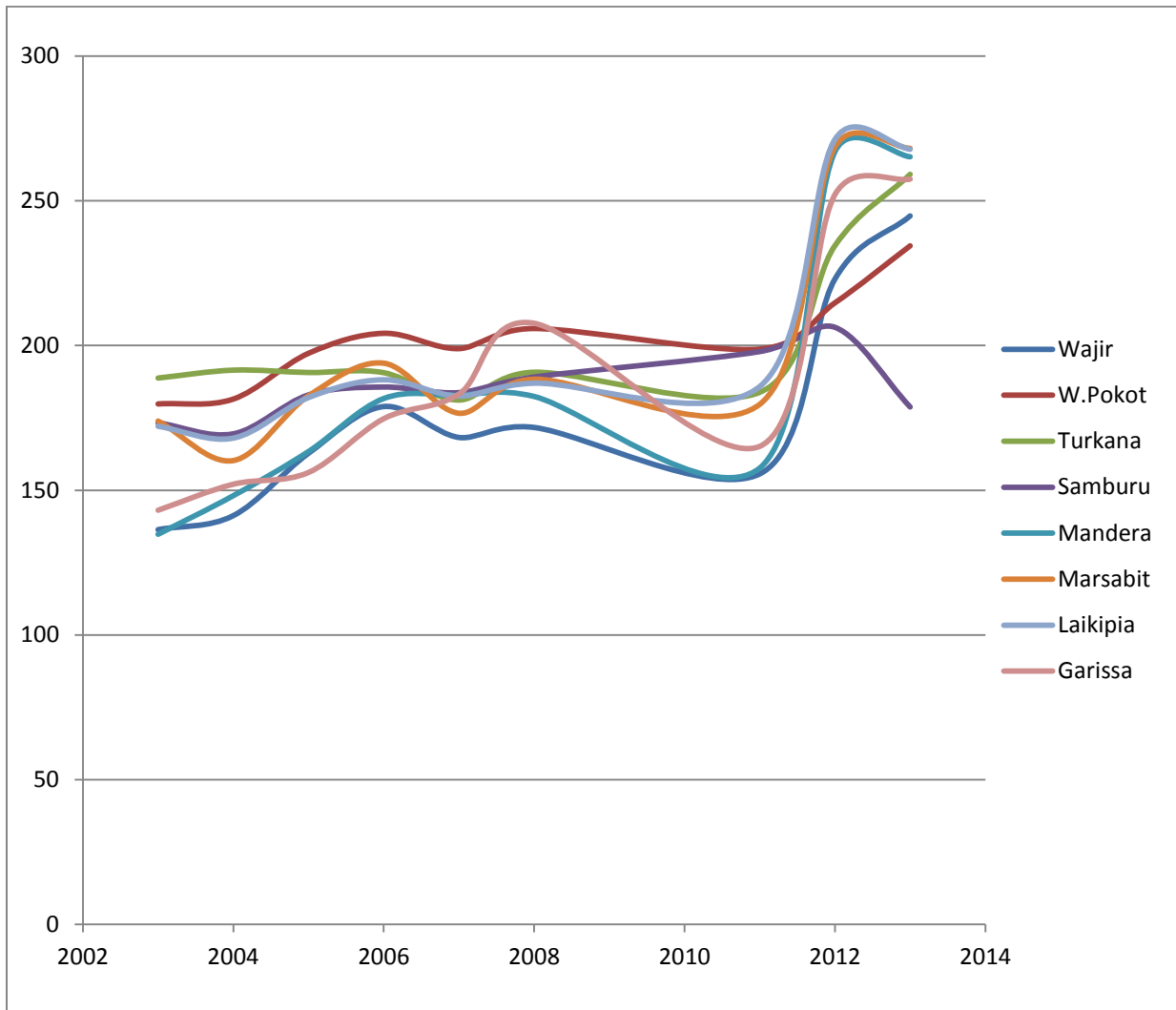


Figure A.3: County Performance in KCPE in Quintiles

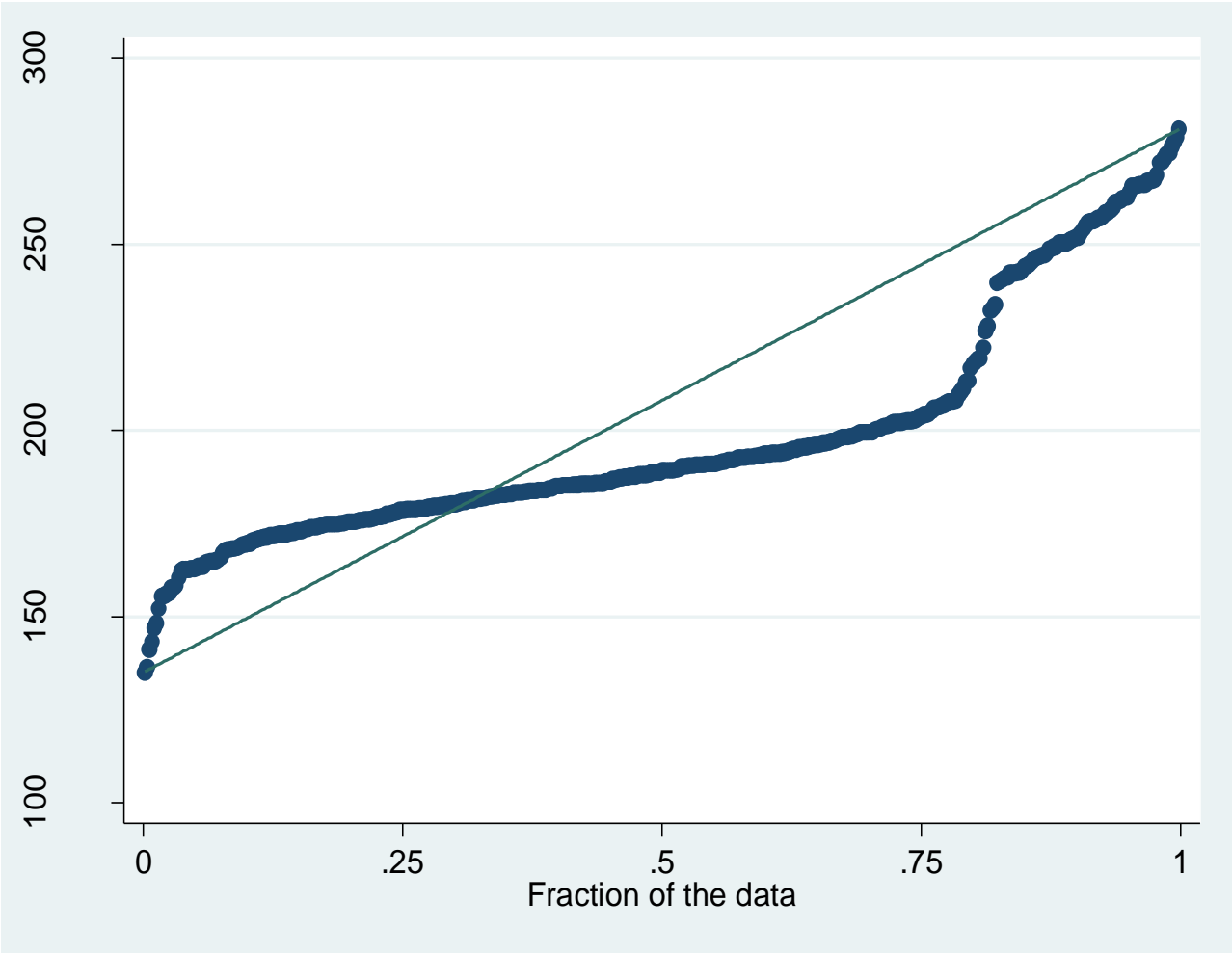


Table A.7: County Order of Merit in KCPE

S/No	Name	M/Score 2013	M/Score 2012	Variance
1	Kirinyaga	274.58	272.05	2.53
2	Elgeyo M.	271.82	273.12	(1.30)
3	Makueni	267.05	277.33	(10.28)
4	Nandi	267.27	274.22	(6.95)
5	UasinGishu	266.93	278.56	(11.63)
6	Baringo	266.06	266.06	-
7	Busia	266.15	265.63	0.52
8	Nairobi	265.56	280.91	(15.35)
9	Kisumu	265.92	248.70	17.22
10	Tharaka N	262.39	256.00	6.39
11	West Pokot	262.42	262.29	0.13
12	Kakamega	261.72	257.57	4.15
13	Kajiado	259.28	266.89	(7.61)
14	Vihiga	259.90	263.95	(4.05)
15	Homa Bay	258.60	254.99	3.61
16	Siaya	258.44	261.42	(2.98)
17	Nyeri	256.88	257.16	(0.28)
18	Bomet	256.16	250.36	5.80
19	Machakos	251.75	253.87	(2.12)
20	Turkana	251.78	249.42	2.36
21	Kericho	251.38	261.24	(9.86)
22	Samburu	250.27	246.26	4.01
23	Transzoia	250.30	268.60	(18.30)
24	Narok	250.39	251.22	(0.83)
25	Bungoma	249.29	246.97	2.32
26	Migori	248.63	242.90	5.73
27	Embu	247.28	250.76	(3.48)
28	Mombasa	246.17	276.20	(30.03)
29	Nyamira	246.53	199.42	47.11
30	Nyandarua	245.17	256.12	(10.95)
31	Kiambu	244.22	256.58	(12.36)
32	Nakuru	244.68	252.91	(8.23)
33	Meru	242.62	242.58	0.04
34	Kisii	242.35	239.51	2.84
35	Murang'a	240.28	242.25	(1.97)
36	Laikipia	240.84	246.99	(6.15)
37	Marsabit	239.85	243.87	(4.02)
38	Kitui	233.70	242.37	(8.67)
39	Isiolo	228.01	232.74	(4.73)
40	Kilifi	226.89	232.08	(5.19)
41	Kwale	218.61	241.25	(22.64)
42	T. Taveta	217.76	222.12	(4.36)
43	Wajir	212.93	210.43	2.50
44	Lamu	211.32	219.06	(7.74)
45	Tana River	207.73	209.61	(1.88)
46	Garissa	184.26	216.68	(32.42)
47	Mandera	183.83	183.22	0.61
	National Mean	245.87	248.46	(2.57)

Source: Kenya National Examination Council Results (2012 and 2013)