THE INFLUENCE OF REVENUE ALLOCATION PARAMETERS IN MODELING AN EQUITABLE REVENUE ALLOCATION FORMULA IN KENYA

JARED ABONGO ONYANGO

DOCTOR OF PHILOSOPHY

(Business Administration)

JOMO KENYATTA UNIVERSITY OF

AGRICULTURE AND TECHNOLOGY

2017

The Influence of Revenue Allocation Parameters in Modeling an Equitable Revenue Allocation Formula in Kenya

Jared Abongo Onyango

A thesis submitted in partial fulfilment for the Degree of Doctor of Philosophy in Business Administration in the Jomo Kenyatta University of Agriculture and Technology

2017

DECLARATION

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

Signature……. Date……

Jared Abongo Onyango

This thesis has been submitted for examination with our approval as the University Supervisors.

Signature…….. Date……

Dr. Geoffrey Mouni Gekara, PhD

The East African University, Kenya

Signature……. Date……

Dr. George O. Orwa, PhD

JKUAT, Kenya

DEDICATION

To my dear children, Shammah Osawa and Misha Abongo. It is my hope that this thesis will inspire you to emulate this academic journey in your life. To my loving wife Tabitha Abongo. This is a product of your inspiration. Thank you very much for your moral emotional and material support during this process. A special dedication to my parentas, the late Prescilla Osawa Onyango who ensured that I went through my basic education and undergraduate studies

ACKNOWLEDGEMENTS

To the almighty God the creator of heavens and the earth, the LORD who is infinite in being and perfection, a most pure spirit, invisible, without body, parts or passions: immutable, immense, eternal, incomprehensible, almighty, most wise, most holy, most free, most absolute: working all things according to the counsel of his own immutable and most righteous will, for his own glory: most loving, gracious, merciful, long-suffering, abundant in goodness and truth, forgiving iniquity, transgression and sin: the rewarder of them that diligently seek Him and withal, most just, and terrible in His judgements, hating all sin and Who will by no means clear the guilty: Thank you!

I recognise the invaluable contribution and support received from my supervisors: Dr Geoffrey Mouni Gekara and Dr. George Otieno Orwa for their continuous support of my Ph.D study and related research, for their patience, motivation, and immense knowledge. I could not have imagined having any better advisors and mentors for my Ph.D study. My sincere gratitude and Thanks.

I thank my fellow classmates in for the stimulating discussions, for the sleepless nights we were working together before deadlines, and for all the fun we have had in the last four years. In particular, I am grateful to Dr. Victor Nyarangi Keraro and Dr. Headmound Okari for enlightening me and being available for consultations at all times and for proofreading my thesis several times.

My dear wife and children, thank you very much for your support and for bearing with me when I had to stay late and sometimes away from you. Thank You All!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ACIR	Advisory Council on Inter-governmental Relations
AIA	Appropriation in Aid
ALC	Australian Loan Council
ANOVA	Analysis of Variances
CAP	Canadian Assistance Plan
CBK	Central Bank of Kenya
CDI	County Development Index
CGC	Commonwealth Grant Commission
CRA	Commission on Revenue Allocation
DPA	Distributable Pool Account
DSGE	Dynamic Stochastic General Equilibrium
EPF	Canada's Established Programs Financing
EU	European Union
FDC	Fairly Developed Counties
FPRO	Federal and Provincial Relations Officer
FPRO	Federal and Provincial Relations Officer
GDP	Gross Domestic Product

GMM	Generalized Method of Moments
GOK	Government of Kenya
HDI	Human Development Index
HPI	Human Poverty Index
ICPAK	Institute of Certified Public Accountants of Kenya
IDJS	International Journal of Development and Sustainability
IMF	International Monetary Fund
IPPA	Institute of Public Policy and Administration
KHRC	Kenya Human Rights Commission
KIHBS	Kenya Integrated Household Budget Survey
KNBS	Kenya National Bureau of Statistics
LATF	Local Authority Transfer Fund
LC	Loan Council
LDC	Less Developed Countries
MCMC	Markov Chain Monte Carlo
MIE	Maximum Likelihood Estimation
NARC	National Rainbow Coalition
NDR	Non Domestic Rates

OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PAS	Predictive Analysis Software
PC	Poor Counties
PCA	Principle Component Analysis
PDF	Probability Density Function
PFM	Public Finance Management
PFMA	Public Finance Management Agency
PI	Poverty Index
RJMCMC	Reversible Jump Markov Chain Monte Carlo
RLMF	Road Levy Maintenance Fund
SCG	Sub-Central Government
SGC	Statutory Grants Commission
SPSS	Statistical Package for Social Sciences
SSA	Sub Saharan Africa
TISA	The Institute for Social Accountability
UNDO	United Nations Development Organizations
USA	United States of America

VAT	Value Added Tax
VPC	Very Poor Counties
WB	World Bank

DEFINITION OF TERMS

County

In Kenya the term county is understood to refer to territorial division exercising administrative, judicial, and political functions in Kenya as per the constitution of Kenya (ROK, 2010). The Kenya constitution recognises 47 counties within its territory. This study recognizes this definition.

Decentralization

Decentralization is a process through which authority and responsibility for some functions are transferred from the central government to local governments, communities and the private sector**.** This process involves decentralized institutions, either local offices of central government or local private and civil organizations (Roberge, 2003).

Devolution differs from federalism in that the devolved powers of the subnational authority may be temporary and ultimately reside in central government, thus the state remains, *de jure* unitary. Legislation creating devolved parliaments or assemblies can be repealed or amended by central government in the same way as any statute.

Devolution

This study adopted the definition by Jones, Goodwin and Jones (2005) and Koki, Chege and Nabulumbi (2012) who refereed to definition as the transfer of power, authority and economic operations from the nation state downward to other units of government and governance. In the context of this study, the downward units of government and governance are Counties.

Federalism Federalism is a form of state structure by which power of a state is formally (constitutionally) divided among different level of government, each of which is legally supreme over its own sphere. It is the direct opposite of unitarism. It provides for an actual division of power between two or more nearly independent government each of which is against particularism and centralism authority over the same people. Federalism is a political union of different unit; a critical (Endawke, 2009). This is the definition adopted by this study.

Fiscal This study adopts the definition by Mikesell, (2006) who defines the term fiscal as "of or relating to government expenditures, revenues, and debt, a government policy for dealing with the budget (especially with taxation and borrowing) economic policy - a government policy for maintaining economic growth and tax revenues"

Government According to UNDO (2010), the term government refers to the apparatus of the state and its elected representatives. Governance is here understood as "the sum of the many ways individuals and institutions, public and private, manage their common affairs, a continuing process through which conflicting or diverse interests may be accommodated and co-operative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interests". The UNIDO generic definition of governance applies to this research.

Multi level Governance Multi-level governance has been defined as the processes of policy-making in which central and other governments are mutually dependent, in which co-ordination between levels or orders of governments is necessary and in which policy is typically achieved through processes of negotiations and cooperation because there is no clear hierarchical order between levels (Howlett, 1999). In the words of Roberge (2003), Multi-level governance refers to two or more levels of authority arranged vertically through formal or informal agreements, from public or private sources or both, established in a policy field so as to regulate and normalize activity in that field. This study upholds these definitions.

Parameter A numerical or other measurable factor forming one of a set that defines a system or sets the conditions of its operation; A quantity whose value is selected for the particular circumstances and in relation to which other variable quantities may be expressed; Definable, measurable, and constant or variable characteristic, dimension, property, or value, selected from a set of data (or population) (Spencer, 2012)

Transition economies According to Graham (1964), transition economy or transitional economy is an economy which is changing from a centrally planned economy to a free market economy. In other words moving from being a controlled economy to being an open economy. In this study, transition economy refers to an economy which is changing from a unitary government to a devolved or federal government.

ABSTRACT

Revenue allocation formulae are in use in over 24 federal states in the world today. In Kenya the Commission on Revenue Allocation (CRA) modelled its first generation revenue allocation formula as per the Kenya Constitution 2010. However this formula has been criticized by Kenyans, politicians and professional groups. When the CRA first unveiled its recommendations to the public, it basically released a formula alone. They did not explain to the public why it had opted for a formula nor how the formula was arrived at. The CRA held a number of forums since the formula's release, to receive public comment on it. But the Commission has never remedied the fatal flaw in its initial approach. This study investigated the influence of parameters on the revenue allocation formula, allocation of parameter weights and determined other parameters that could be used to improve the CRA formula. Kenya's 2010 Constitution declares equity to be an underlying principle of governance in the country, which is consistent with its provision for devolution. The study adopted a cross sectional survey research design. Specifically, the study adopted the causal survey research because the data gathered was quantitative in nature as well as pre-planned and structured. This helped in attempting to explain the cause and effect relationship between revenue allocation parameters and the revenue allocation formula. In the end this design helped to understand which variables were the cause and which variables were the effect. It also helped to determine the nature of relationship between the causal variables and the effect predicted. The study targeted 596 senior county officials drawn from 9 Counties. Regression models was used to examine the influence of Parameters on revenue allocation formula while Monte Carlo Simulation was used to determine the parameter weights. The study established that the CRA revenue allocation parameters positively influence the revenue allocation formula for the devolved government of Kenya. The study further revealed that other parameters need to be incorporated to make the formula more equitable. The parameters were subjected to Monte Carlo simulations which gave an output for the recommended weights of each parameter.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

This study was on the revenue allocation formula for the equitable revenue allocation by the national government to the county governments in Kenya. This Chapter constitutes the background of the study and the statement of the problem. It presents the research objectives, research questions, and further explains the significance of the study. The scope and delimitations of the study are also discussed in this Chapter.

1.1.1 Fiscal Federalism

Generally, fiscal federalism focuses on allocation of expenditure responsibilities, the revenue raising power and adjusting vertical and horizontal imbalances between the federal and the states and among the states respectively through intergovernmental fiscal transfer (Tsegaw, 2009). Federalism is a political organisational structure focused on vertical power-sharing across different levels of government and the integration of various territorial or cultural units into a single polity (Mokate, 2006)) . By dispersing powers throughout different levels of authority, federalism avoids the concentration of power evident in unitary states, providing the 'least undemocratic' form of government (Anderson, 2007). Although only 25 of the world's 193 nations are federations, their citizens constitute 40 per cent of the world's population and over 50 per cent of global GDP, including the United States, Canada and Germany (Ojo, 2009) .

Federalism is a structure able to cater to local, national and international needs with efficiency and versatility. Its multiple levels of governance provide citizens with greater access to the political system and acts as a democratic check on power (Shah, 2007a). While the many benefits of a federalist structure are recognised internationally, federalism is generally treated with disdain in most federal states the world over, both by their civic leaders and by their citizens (Olofin, Olubusoye, Bello, Salisu & Olalekan, 2012). Federations distribute expenditure responsibility and public service delivery to sub-national levels of government, but each country's

approach is influenced by historical, cultural, institutional factors, and legal-judicial interpretations. The new Constitution of Kenya adopted in August 2010, although does not mention the word federal, established two orders of government - a national government and 47 counties which are guaranteed by the constitution (Negussie, 2016).

1.1.2 Equitable Revenue Sharing

Revenue allocation refers to the re-distribution of fiscal capacity between the various levels of government, or the disposition of fiscal responsibilities between tiers of government (Adeleke, 2011). Akujuru (2015) stated that, revenue allocation in federal system of government involves two basic schemes. The first implies the vertical sharing between the federal or inclusive government and other tiers of government. The institutional arrangement adopted by a federal state for the purpose of intergovernmental relations finds corroboration in the work of Lukpata (2007) who asserts that the concept of administrative intergovernmental relations which focuses on the relationship between officials and structures that exist for administrative purposes, suggest that applicability of the concept of intergovernmental fiscal relations relatively in all cases hence he had conceptualized intergovernmental fiscal relations as the system by which revenue is collected and shared among the units and that a federal constitution, as a matter of necessity, gives rise to fiscal federalism (Anyadike, 2013).

One of the major problems facing effective discharge of function in federations and devolved governments is challenges of Revenue Allocation which arises due to corruption, undue interference from either state or federal government, use of State Joint Local Government Account and Poor Budgeting and Accounting System (Richard & Eme, 2015). This can be solve through direct federal allocation to local government, expansion of local government tax base to reduce overdependence on federal allocation, establishment and maintenance of effective accounting system to eliminate wastage and misappropriation, abolition of State Joint Local Government Account to give political and financial autonomy to Local Governments for effective and efficient service delivery (Akujuru, 2015). The revenue allocation model in a federal state could be used among other things to eradicate any disequilibria in the economy. However, more often than not it represses the entire

economy and results in difficulties in the form of poverty, unemployment, jobless growth, crises among others (Olowola, 2012; Ibrahim, 2012).

To avoid this, the higher the federal level of government has to transfer to the lower unit, the better, to enable it make up for the differences between its internally generated revenue and those required for maintaining the minimum standard of services (Ojo, 2009).

Poor governance is increasingly being cited as one of the most significant factors contributing to poor economic performance in most developing countries. The World Bank has repeatedly argued that poor economic performance in most developing countries, particularly in Sub-Saharan Africa (SSA), is attributed to poor governance (World Bank, 2004). The issue of "good governance" was further amplified by the 2009 World Bank report on SSA when the crisis in the region was termed as a "crisis of governance" (World Bank, 2010).

The finances of local governments depend heavily on intergovernmental transfers, especially from state governments. These intergovernmental transfers are, however, just one element in a complex system of intergovernmental fiscal and regulatory linkages. Local finances depend on the entire national fiscal system, because of the changing roles of Federal, state, and local governments in the provision of social assistance to low-income households. (Wildasin, 2009). For instance the United States of America is a three-tier federation consisting of central government, states and local governments of various types. There are at least three unique features of fiscal system of the USA. First, it is one of the countries where fiscal federalism has had a long history and the fiscal framework is deeply embodied in the federalist spirit of the constitution. Second, it is the most diversified and complex system. For one thing, the state fiscal system is very diverse, and so is the degree of fiscal decentralization. For another, the structure of local government in various parts of the country, and hence, there is a great deal of variety in the pattern of the local government among different states. These combined with the lack of a clear assignment of fiscal responsibilities among the various levels of governments, has led to the introduction of very complex and diversified system of change from time to time, the efficiency costs of which are large and can only be afforded by an advanced nation like the USA. The third and the most striking features of the US

fiscal federalism, in spite of its high complexity and diversity, is that there has been much stability. On the one hand, the fiscal structure has been the most flexible by any standards. This can be evidenced by the expanding role of inter-governmental transfers and the reassignments of fiscal responsibilities over times (Kincaid, 1999).

Countries with a federal form of government vary considerably in terms of federal influence on state governments. Such influence is very strong in Australia, Germany, India, Malaysia, Nigeria, Russia, Spain, and South Africa. It is weak in Brazil, Canada, Switzerland, and the United States (Ma, 1995). In the latter group of countries, federal influence over state expenditures is quite limited, and state governments have considerable authority to determine their own sources of revenue (Shah, 2007a). In a study of twelve federal countries by Shah (2007b), it was found that the federal government collects more revenue than is needed to satisfy its own expenditure/regulatory responsibilities. Such fiscal surplus enables the federal government to use its spending power to pursue national objectives through the use of fiscal transfers. These transfers help achieve national objectives while supporting decentralized decision making. Federal government fiscal transfers finance nearly two-thirds of sub-national expenditures in Spain and South Africa and less than 20 percent of such expenditures in Canada, Switzerland, and Nigeria. The design of such transfers plays a critical role for efficiency, equity, and accountability in a federal system.

1.1.3 Revenue Allocation in Post Independent Kenya

Revenue allocation in the post independent Kenya can be traced from 1963 when Kenya attained independence. During President Kenyatta era (1963–1978), the country's broad development environment was governed by a development blueprint contained in the *Sessional Paper No. 10 of 1965.* This provided a strategy that involved concentrating the small national investment capacity in the areas with the greatest absorptive capacity, with mere surpluses being directed to marginalized areas (ROK, 1965).

Another significant moment in the Kenyatta years was the release of the Public Service Structure and Remuneration Commission report in 1971 – popularly known as the Ndegwa Report (ROK, 1971) – which sanctioned public officers'

participation in private business, potentially undermining integrity over their management of state resources. The report implicitly permitted – or at least facilitated – the award of government contracts under serving officers' stewardship to their own companies. Halfway through his tenure in 1971, Kenyatta introduced the Special Rural Development Programme (SRDP), which was launched in only 5 of the 15 arid and semi-arid districts originally targeted (Ergas, 1982). Weak government support was evident in the poor implementation of an initiative characterized by excessive donor dependence, which in turn undermined grassroots participation. Nonetheless valuable lessons were learnt (although not necessarily optimized) about integrating agriculture strategies with rural development strategies (such as in the rural works programmes).

The dynamics of inequalities during the Moi years (1978–2002) were different from those of the Kenyatta years in significant ways, even though the second president fundamentally followed his predecessor's footsteps. During his years in office, poverty in Kenya reached its highest levels since independence. While his mid-1980s District Focus for Rural Development (DFRD) planning strategy could have focused the spotlight on grassroots development bottlenecks, its full implementation would have taken attention away from a highly narcissistic individual whose exploits typically accounted for more than half the news broadcasts on the monopoly national broadcaster.

Kibaki's tenure (2003-2013) saw extensive economic revival, based on growth in tourism, construction, roads and telecommunications sectors. But this revival has barely diminished poverty and regional inequalities, both of which have traditionally driven demands for devolution. GDP growth rose from 2.9 per cent (2003) to 7 per cent (2007), and per capita income declined to Ksh31,900 in the years to 2003, then rose to Ksh36,000 by 2007 (KIPPRA, 2009). However, this did not end well with the 2008post election violence which watered down the gains made in NARC's first term in office.

Kenya's 1963 Constitution did not provide for revenue sharing between national and subnational governments, a situation that led to under-provisioning at these lower levels of government, affecting their service delivery. This position has been

reversed in the new Constitution, which entrenches fiscal devolution that provides for sharing of both the revenue base and the nationally collected revenues.

1.1.4 Devolution and equitable Revenue Allocation in Kenya

Chapter eleven of the New Constitution of Kenya provides for a devolved government (Mwenda, 2010). As a form of decentralization, devolution is a process of transferring/sharing political, administrative and fiscal management powers between the central government and lower levels of government (Kiringai, 2006). This is done in a formal system with each level of government having its functions and powers clearly stated. There are also functions that are shared between the levels of government.

Devolution has been advocated as a political response to the ills plaguing fragile and plural societies i.e. inequality, conflict etc. For devolution to be effective the criteria of subsidiarity and consensus must be observed (Kimenyi & Meagher, 2004). Subsidiarity is ensuring that public goods and services provision is assigned to the lowest level of government that is competent to effectively deliver them. Consensus has to do with ensuring that the opinion and participation of the beneficiaries is sought before a policy decision is made.

Devolution can impact governance by reducing the possibility of grand corruption as resources are distributed and local communities can be able to mobilize pressure against rent seeking and corruption (Mwenda, 2009). It can make a democracy stronger by giving people more say in their local matters. It allows people living in a particular area to make their own decisions on matters that concern them directly. In addition, the 2010 Constitution sets out criteria to be followed when sharing the revenues vertically

This study was guided by the need of the devolved Government of Kenya to develop and adopt an equitable way of allocating revenue to the 47 Counties. Optimism about the positive economic effects of devolution was a strong factor in the devolution debates in the agitation for the Constitutional change in Kenya. The Constitution of Kenya provides for a two-tiered system of government in which the sovereign power of the people is exercised at the national and county levels. The

Constitution specifies that both tiers of government are entitled to equitable share of revenue raised nationally (GOK, 2010). This sets the stage for allocation of funds to run these two tier Governments. The Commission on Revenue Allocation (CRA) is charged with the responsibility of ensuring equitable revenue allocation to the Central and the local Governments. The CRA, established by Article 215 of the constitution has its functions spelled out by Article 216 and among these responsibilities is the generating of recommendations for the vertical and horizontal sharing of the revenue raised nationally (GOK, 2010). The recommendations provide a framework for the equitable shares for both levels of government and for each county. Given the diverse developmental conditions in the country, it will be critical, and in adherence to the need to build a more equal society, the funding mechanisms and instruments should not only ensure a predictable and sustained flow of funds to counties, they should also ensure that county governments are equitably funded. The CRA has since constructed two revenue allocation formulae, none of which has been accepted by Kenyans with a general consensus. The first revenue allocation formula, which has since been shelved, is shown in Table 1.1.

Table 1.1: The First CRA Formula

Parameter	**Weight**
Population	60
Basic Equal Share	20
Poverty Index	12
Land Area	6
Fiscal responsibility	2
TOTAL	**100**

Source: CRA

After incorporating feedback from the public, the commission modeled a new formula as shown in table 1.2.

Table 1.2: The Second CRA Formula

Parameter	Weights (%)
Population	45
Basic Equal Share	25
Poverty Index	20
Land Area	8
Fiscal responsibility	2
TOTAL	**100**

This formula was approved by parliament on 27th November, 2012.

1.2 Statement of the problem

The advent of the Kenya Constitution 2010 was expected to lead to the practice of fiscal federalism, transparency, accountability and devolution of power to the county governments and hence more fiscal decentralization. While a greater degree of decentralization would, no doubt, contribute to greater grassroots participation, generate more local development, increase efficiency and equity, create employment opportunity and promote poverty alleviation, it must not be done in such a way as to conflict with the national objective or unduly complicate it. The change in the internal geographic structure of the nation as a result of strong and continuous agitation for the sharing of the *"national cake"* has led to regional and political interest in manipulating the revenue allocation formula. The CRA was created by the 2010 Constitution to make recommendations on how government revenues in Kenya should be divided between the two levels of government — national and county — and among the 47 counties. The Constitution provides general criteria to inform these recommendations, but leaves the details to the Commission (ROK, 2010).

The constitution does not specify how the CRA should carry out its tasks, but there are reasons to doubt that its style of communicating with the public has lived up to its mandate. When the CRA first unveiled its recommendations to the public, it basically released a formula alone. They did not explain to the public why it had opted for a formula. The CRA held a number of forums since the formula's release,

to receive public comment on it. But the Commission has never remedied the fatal flaw in its initial approach.

CRA claims to have done a costing of the functions to be performed by counties and national government. The CRA also claims, too, to have benchmarked with the international experience and that the proposed weight of each parameter was based on "Monte Carlo simulations," as well as considerations of the Commission's own internal analyses and judgments. However the details of this information is not available to the public. The public is therefore cannot objectively debate and vet the formula because of lack of background information.

Presenting the formula without logic behind it makes the quality of its debate and interrogation to be low. Those whom the formula seems to favour will defend it while those who are disadvantaged by the formula will reject and denigrate it. People may engage with the formula's key variables, but without the information they need to actually decide whether the CRA's recommendations are sensible.

In India, the task of making recommendations on the distribution of resources between centre and state, and the distribution among states, falls to a body known as the Finance Commission (Rao, 2012). The Finance Commission produces an expansive volume every five years that estimates costs for different levels of government, analyses opinions on the proper distribution of revenues, and provides a defence of its own views. For example, In 2015 with regard to vertical distribution, the Commission recommended by majority decision that the States' share in the net proceeds of the Union tax revenues be 42%. This was a huge jump from the 32% recommended by the 13th Finance Commission. The transfers to the States saw a quantum jump. This is the largest ever change in the percentage of devolution. In the past, when Finance Commissions have recommended an increase, it has been in the range of 1-2% increase. As compared to the total devolutions in 2014-15 the total devolution of the States in 2015-16 increased by over 45%. The consequence of this much greater devolution to the States is that the fiscal space for the Centre will reduce in the same proportion. Although it is voluminous, the report is transparent, providing citizens with key information they need to debate its conclusions (ROI, 2015). To a degree, the task of the Finance Commission is simpler than that of Kenya's current CRA, because each Finance

Commission is tweaking a set of recommendations made by its predecessors over decades. In her paper 'Allocation formula in budgeting' Moore (2007) concluded that citizens tend to be accepting of allocations that are based on formulas, because they have an aura of objectivity and fairness. Nevertheless, their effectiveness can be severely hampered by data that are stale, inaccurate, and irrelevant.

But these make it all the more important that CRA set a proper foundation for future debate by interrogating deeply the rationale for different approaches to revenue sharing and providing the public with the tools they need to engage in the discussion. This poses a problem which needs to be addressed and hence necessitated the need for research and a deeper interrogation of various parameters and their weights as used by the CRA in order to come up with a more agreeable and equitable revenue allocation formula.

1.3 Objectives

1.3.1 General Objective

The major aim of the study is to determine the influence of revenue allocation parameters in modeling an equitable revenue allocation formula in Kenya.

1.3.2 Specific Objectives

The specific objectives of this study were to:

1. To establish the influence of the CRA parameters on the first generation revenue allocation formula in Kenya.
2. To identify other parameters that would model an equitable revenue allocation formula for the devolved government in Kenya
3. To determine parameter weights that would model an equitable revenue allocation formula for the devolved government in Kenya.
4. To establish whether politics in Kenya influences the revenue allocation formula.
5. To determine the moderating effect of the constitution on the revenue allocation formula in Kenya.

1.4 Research Hypotheses

The following research hypotheses were tested

1. H_0 There is no influence of the CRA parameters on the first generation revenue allocation formula in Kenya.
2. H_0 There are no other parameters that would model an equitable revenue allocation formula for the devolved government in Kenya
3. H_0 There are no equitable parameter weights that would model an equitable revenue allocation formula for the devolved government in Kenya.
4. H_0 There is no influence of Politics on the revenue allocation formula.
5. H_0 There is no moderating effect of the constitution on the revenue allocation formula in Kenya.

1.5 Justification

This study sought to improve on the first CRA revenue allocation formula for the devolved government in Kenya. Scholars and researchers in the subject area of revenue allocation models and financial devolution will find the results of the study useful as they will contribute to the advancement of knowledge in the subject area. Scholars, in particular, will benefit from the knowledge on the revenue allocation parameters that can be used in an equitable formula and their weights. The findings will support and enrich the existing revenue allocation models and theories of finance.

This study is very useful to the CRA, the Senate and the National Assembly in equitably allocating revenue to the county governments in Kenya. The results of the study will resolve the impasse amongst the stake holders in the revenue allocation process. Other devolved states may also use the study to improve their revenue allocation formulae.

1.6 Scope of the Study

This study was based on the formulation of an equitable revenue allocation model for the devolved government of Kenya. The study sought to establish whether the constitution influences revenue allocation in Kenya. The study was guided by

Article 216 of the Kenya Constitution, 2010 which articulates the constitutional guide on revenue allocation in Kenya. The views sought from respondents were therefore restricted to addressing the adequacy of the Kenya constitution on revenue allocation model. The study also investigated the CRA parameters to determine their relevance for revenue allocation in the Kenyan context. These parameters include: Population; basic equal share; poverty index; land area and; fiscal responsibility. The study also investigated other parameters which could be included in the CRA formula for an equitable revenue allocation in Kenya.

Revenue allocation models of other federal states were reviewed with respect to their successes and failures. Transition challenges faced by other states were of particular interest. The study considered the diversities in the county governments in Kenya with regard to the parameters used in revenue allocation in Kenya. The political influence on revenue allocation was also explored to bring into perspective, the impasse between the CRA and the Senate on one hand and the Senate and the Governors on the other hand.

1.7 Limitations of the Study

The time taken to collect data was very long (nine months to be precise). The number of counties covered were nine and the geographical expanse was very wide. The use of research assistants became handy and additional funds were sought. During the period of data collection, the Lamu County government was dissolved because of an election petition, the few essential staff were however used. The other limitation experienced was that it took long to obtain appointments with County Government officers and this necessitated repeat visits to some of the county offices in order to succeed. Kenya having been a centralised state, has limited local literature available on financial devolution and revenue allocation formula. This necessitated the review of literature relevant to the study from the experienced federal states worldwide. However the challenges faced were adequately addressed and did not in any significant way impair the outcome of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature by other scholars and researchers on revenue allocation models for devolved governments. The chapter reviews literature on the parameters that are used in revenue allocation models. The chapter specifically reviews literature on model development and formulation in federal and devolved governments worldwide.

2.2 Review of Theoretical Literature

2.2.1 The Fiscal Federalism Theory

This study is anchored on the fiscal federalism theory originally developed by Musgrave (1995) and Oates (1972), the "theory of fiscal federalism" concerns the division of public-sector function and finances in a logical way among multiple layers of government (King 1984). Fiscal federalism has been defined and measured in various ways, but following Riker (1964), Weingast (1995), and Rodden (2002), the following four elements can be identified: (1) Sub-central governments (SCGs) enjoy programmatic autonomy, that is, exclusive authority to decide a subset of economic policy (creating, repealing, and adjusting programs and regulations); (2) SCGs face a hard budget constraint, funding their own spending largely out of autonomous revenues, that is, revenues raised through taxes over which the SCGs enjoy the authority to set rates, base, or both, and may not have access to unlimited credit; (3) There is a common market, so that SCGs may not enact barriers to the free flow of goods, capital, and labor across their borders; (4) The system is institutionalized, so that the central government may not alter it at will. Fiscal federalism as defined here does not necessarily include the ability of SCGs to participate in central government decision-making. This aspect of federalism could be thought of as "shared rule" as opposed to mere "self-rule" (Hooghe *et al*., 2008).

Applying the fiscal federalism theory in the equitable revenue allocation model for the devolved government of Kenya will ensure the division of public-sector function and finances in a logical way among two layers of government, that is, the national government and the 47 county governments. The county governments will enjoy programmatic autonomy, that is, exclusive authority to decide their own economic policy (creating, repealing, and adjusting programs and regulations). They will face a hard budget constraint, funding their own spending largely out of autonomous revenues and may not have access to unlimited credit (Tresch, 2015).

Since there is a common market, the county governments in Kenya may not enact barriers to the free flow of goods, capital, and labor across their borders as opined by Lukpata (2013). The fiscal federalism theory provides for an institutionalized system so that the National Government may not alter it at will. Fiscal federalism theory as applicable to the devolved government of Kenya, does not necessarily include the ability of the county governments to participate in the National Government decision-making. This is in line with the definition of fiscal federalism as explained above. This aspect of federalism as applied in the devolved government of Kenya perpetuates a "shared rule" as opposed to mere "self-rule". This gives all community groups an opportunity to self-govern as opposed to the centralized system of government. It brings in the important aspects of inclusivity thus eliminating feelings of animosity.

Much of the literature of fiscal federalism consists of relatively unrelated treatments of such issue as the "decentralization theorem" (Oates 1991), discussion of inter-governmental spillovers and inter-governmental grants (France, 2007), fiscal mobility and migration (Wildasin 1991), and vertical fiscal imbalance and dependence Hyman, (2014). These treatments may not necessarily apply to the model of devolution in Kenya because of the entrenchment of the constitutional guide on revenue allocation in Kenya.

As explained above theory of fiscal federalism focuses on division of expenditure responsibilities, the revenue raising power and adjusting vertical and horizontal imbalances between the federal and the states and among the states respectively through intergovernmental fiscal transfer. This cannot be applicable to the Kenyan case since there is no provisions for adjustment of inter county imbalances.

Whereas, financial imbalances and competition among the county governments, mobility and migration of workers and professionals to the place of better payment which results from financial gap of the county governments and spill over effects of services from the region of their higher concentration to the regions of less concentration without legitimate recognition are some of the downsides of devolution in Kenya.

Much of the early research used a measure from the IMF called "fiscal decentralization." The IMF measure is simply SCG spending divided by total government spending. As Rodden (2002) points out, this variable is not a suitable indicator of programmatic autonomy, let alone full-fledged fiscal federalism. Unitary Denmark is obviously scored as more fiscally decentralized than the Kenyan devolution today, despite the fact that the Danish government has devolved only minor policy responsibilities on the counties and municipalities, since many central government programs in Denmark are administered through the county and local governments.

Wibbles (2000) finds that federal and semi-federal countries in the developing world have more debt, deficits, and inflation than their unitary counterparts. As it turns out, federal developing countries typically fall short on the hard budget constraints criterion. Jones, Sanguinetti, and Tommasi (2000) show that federal discretionary grants to state governments allowed the latter to drive the country into debt, eventually resulting in macroeconomic crisis.

Rodden (2002) examines the sub-central budget constraint (own-source revenues as a percentage of sub-central spending) and finds that "fiscal decentralization" as measured by the IMF promotes government indebtedness if sub-central spending is funded out of fiscal transfers rather than own-source revenues, and the central government has not imposed a hard limit on sub-central spending.

2.2.2 The Montecarlo Simulations and Option Model

The Monte Carlo Option Model was modelled to calculate the exact value of a specific option by use of Monte Carlo Methods (Ulam, 1964). Monte Carlo Model was introduced by Phelim Boyle and implemented for the first time in the year

1977 when it was used for option pricing. It was then used in calculating the value of European options (Carlin, 1995).

In 1996 that M. Broadie, along with P. Glasserman, revealed the specific process of applying the Monte Carlo Option Model for pricing Asian securities. A few years later, the model was used for determining the values of American options. This process was discovered by E. S. Schwartz and F. A. Longstaff (Gelman, 1995).

In financial mathematics, options containing simple or normal features are valued using the straightforward Black-Scholes process. On the contrary, the Monte Carlo Option Model, is used to calculate: Options that relate to various sources of uncertainty, and calculating their values with other models is difficult: Options that exist in the market but have very complicated features (Gelman, 1995). According to Green (1995), arbitrage-free valuation of a definite derivative that consists of a large number of dimensions. Since the model requires a great deal of time for each analysis, it is used in limited situations.

Monte Carlo simulation is used to analyse risk by building models of conceivable results by switching a range of values—a probability distribution—for any factor that has intrinsic uncertainty. It then calculates outcomes repeatedly, each time using a new set of random values from the probability functions. Depending on the number of uncertainties and the ranges specified for them, a Monte Carlo simulation could involve thousands or tens of thousands of recalculations before it is complete. Monte Carlo simulation produces distributions of possible outcome values (Congdon, 2001).

By using probability distributions, parameters can have different probabilities of different outcomes occurring. Probability distributions are a much more realistic way of describing uncertainty in parameters of a risk analysis. According to Robert and Casella (2004), common probability distributions are explained below.

Normal – Or "bell curve." The user simply defines the mean or expected value and a standard deviation to describe the variation about the mean. Values around the mean are most likely to occur. The result is symmetric and describes many natural phenomena such as weights, and heights. Examples of parameters

described by normal distributions include inflation rates, revenue allocation parameters and energy prices. Lognormal – This is where values are positively skewed and not symmetric as the case with normal distribution. It is used to represent values that are non-negative but have unlimited positive potential. Examples of parameters described by lognormal distributions include real estate property values, stock prices, and oil reserves. Uniform – All values have an equal chance of occurring, and the user simply defines the minimum and maximum. Examples of parameters that could be uniformly distributed include manufacturing costs or future sales revenues for a new product. Triangular – The user defines the minimum, most likely, and maximum values. Values around the most likely are more likely to occur. Parameters that could be described by a triangular distribution include past sales history per unit of time and inventory levels. Program Evaluation and Review Technique (PERT) - The user defines the minimum, most likely, and maximum values, just like the triangular distribution. Values around the mean are more likely to occur. However values between the most likely and extremes are more likely to occur than the triangular; that is, the extremes are not as emphasized. An example of the use of a PERT distribution is to describe the duration of a task in a project management model. Discrete – The user defines specific values that may occur and the likelihood of each. An example might be the results of a lawsuit: 20% chance of positive verdict, 30% change of negative verdict, 40% chance of settlement, and 10% chance of mistrial.

During a Monte Carlo simulation, values are sampled at random from the input probability distributions. Each set of samples is called an iteration, and the resulting outcome from that sample is recorded. Monte Carlo simulation does this hundreds or thousands of times, and the result is a probability distribution of possible outcomes. In this way, Monte Carlo simulation provides a much more comprehensive view of what may happen. It tells you not only what could happen, but how likely it is to happen (Dufour, 2005).

Monte Carlo simulation provides a number of advantages over deterministic, or "single-point estimate" analysis: Probabilistic Results. Results show not only what could happen, but how likely each outcome is: Graphical Results. Because of the data a Monte Carlo simulation generates, it's easy to create graphs of different

outcomes and their chances of occurrence. This is important for communicating findings to other stakeholders: Sensitivity Analysis. With just a few cases, deterministic analysis makes it difficult to see which parameters impact the outcome the most (Dugdale, 2007).

In Monte Carlo simulation, it's easy to see which inputs had the biggest effect on bottom-line results: Scenario Analysis. In deterministic models, it's very difficult to model different combinations of values for different inputs to see the effects of truly different scenarios. Using Monte Carlo simulation, analysts can see exactly which inputs had which values together when certain outcomes occurred. This is invaluable for pursuing further analysis (Griffoli, 2007).

2.2.3 The Legal Theory of Finance

The Law of Finance Theory or Legal Origins Theory was propagated by a group of researchers working with Andrei Shleifer. According to the Law of Finance theory, the financial status of a country and its economic development is related to the legal system of that specific country. Similarly, the legal system and the economic status is related the source from where the legal system of the country originated. The group of researchers has been publishing the research papers on Legal Origins Theory from 1997 onwards (Carruthers, 2013).

Most countries were colonized in past. During the period of colonization, the colonial masters imposed a legal system in their colonies that was prevailing in their countries of origin. For this reason, the original legal systems of the colonies (in case of multiple colonies) were transformed (Mitu, 2005). After independence, these colonies adopted the legal system of their colonial masters. Thus the economy of those countries are related to the colonizer company. The countries are therefore categorized according to their legal infrastructure. This gives rise to two types of countries. The first type of countries are those that are following common law while the second category consists of those that adapted the legal system of their colonial masters (Hudson, 2013).

The prime belief of Legal Origins Theory is that the common law existing in certain countries emphasizes the market institutions or in other words, it can be said that

the common laws are very much concerned with the market institutions than the state interventionism (Rajan *et al*., 2003). On the other hand, the legal system that has been adopted from the countries like France, Germany and Scandinavian countries are in favor of the state interventionism to some extent. So, according to the Legal Origins Theory, the countries with common law get more opportunity for economic development (Kapandia, 2013).

At the beginning, the Legal Origins Theory was concerned with the corporate laws but gradually the theory is also used in several other fields to find answers of certain questions (Carruthers, 1996). When a financial system moves from relational finance to entities and ultimately markets, it begins to depend on a formal legal system with the capacity to authoritatively assert the rights and obligations of contractual parties or to lend its coercive powers to the execution of such claims. Power as the differential relation to law discharging the legal construction of finance. This leads us to the elasticity of law and finally to the political economy of finance. Where law is elastic decisions are not predetermined by legal rules but left to the discretion of ‘‘power wielders’’ (Grant & Keohane, 2005).

According to Hodson (2013), power can therefore be defined as being the differential relation to law. Where law is elastic power becomes salient. The critical questions are (1) who exercises the power, (2) the power is exercised to whose benefit, (3) how is the exercised power legitimated and (4) to whom are the power wielders held accountable. Power is exercised at every stage of the financial system. It is exercised by those who have the resources for supporting others without being legally obliged to do so. Those who have access to unlimited resources have the highest power: Sovereigns with control over their own money and debt. Their access to unlimited resources derives from their ability to issue the legal tender, to use their means of coercion to impose taxes on their subjects and to co-ordinate political and economic resources to make credible their commitments (Kapadia, 2013). The absence of any of these three conditions can undermine the credibility of a sovereign as effective lender of last resort. By the same token it positions the sovereign towards the periphery of the global hierarchy of finance. The Eurozone crisis vividly demonstrates that the absence of either taxing power or political unity undermines the viability of the common currency (Kapadia, 2013).

The rise of law and finance has been paralleled by the rapidly expanding field of financial sociology (Carruthers & Kim, 2011). From this perspective finance is a social system like many others, and financial relations are socially and culturally embedded. Law is but one of multiple normative (or legal) orders that complement one another or compete for dominance. Markets develop within these structures and are formed by them. Detailed case studies developed in this tradition have shown how finance emerges from and is shaped by social and political structures. A good example is the City of London, where tensions between the Crown and its private financiers resulted in the creation of the Bank of England, a privately owned entity that increasingly performed public, market-stabilizing functions (Carruthers, 1996). The diamond exchange in New York (Bernstein, 1992) is embedded in social practices of Jewish diamond traders, practices that were sustained even as the trade expanded globally. For hundreds of years the global gold market has been similarly embedded in a genteel culture of London-based financial intermediaries that perceived themselves not only as market participants, but as its core stakeholders (Harvey, 2010). Differences in social structures also help explain different strategies used for introducing consumer credit markets into different countries and legal systems.

While every credit-based financial system may have a pecking order of means of pay, the particular configuration of the system, the number and complexity of financial commitments and their interdependencies are determined by contractual commitments that are sanctioned by law. In sum, LTF builds on theories that take seriously the notion of fundamental uncertainty and liquidity constraints (Bernstein, 1992). It expands on these theories by emphasizing that financial interdependencies are legally hardwired and suggesting that this can amplify liquidity constraints when past investments are adjusted in light of new facts. This allows LTF to point to critical tensions in the makeup of modern-day finance: Its dependence on law on one hand and law's potentially destructive effect on finance on the other; the tendency of law to create regulatory pluralism with corrosive effects on the efficacy of system stabilizing laws and regulations; and the interdependency between ''private'' credit and ''public'' money (Harvey, 2010).

2.2.4 Agency Theory

Agency theory has been used to study the effectiveness of various forms of intergovernmental grants. Principle agent models allow for the inherent information asymmetries between the grantor and the recipient to be formally modelled and provide prescriptions to overcome moral hazard and conflicts of interest. Clark (2004) assumed that recipient governments and the grantor agency disagreed over program goals, asymmetric information existed, and subordinates would shirk their responsibilities given the opportunity. Clark demonstrated how monitoring and oversight influence grant effectiveness. While agency theory has become ubiquitous in the policy literature, the original agency models applied to bureaucracy (Eisenhardt, 1989) and intergovernmental grants impose restrictive assumptions. Several scholars extended and adapted agency theory to include multiple principals (Fama, 1980), procedural controls (Clark, 2004) and irrational agents (Freeman 1999).

Since the mid-80s, many federations and Organization for Economic Cooperation and Development (OECD) countries have undergone important transformations of their public sector (Hood, 2000). One of the best known phenomena is no doubt the breaking down of the public sector into small specialized bodies ("agencies"). The creation of municipalities, county councils, provinces, states, or counties as the case may be, generally goes hand-in-hand with the award of a certain amount of management's autonomy. In other words, this means less interference of the political level and/or certain cross-sector administrative bodies (such as the ministries of the Budget or of Public Service) and central departments in the way administration is executed by the agencies (Lupia, 2001). These new administrative units can generally be identified by the degree of independence they are accorded. Some can freely determine usage of resources made available to them and the organization of their internal management (internal autonomy); others, conversely, have the possibility to determine (some of) their assignments and strategic objectives themselves, alongside operational independence (external autonomy) (Calhil & Lawaree, 2001). Agencies have also been created to deal with a particular territory (territorial autonomy) particularly in federal states or to manage a specific field of expertise (functional autonomy) (Chajewski, 2004).

These reforms are part of a broader decentralization framework that has seen central units devolve their public administrations under the combined pressure of budgetary constraints and social-economic evolution, to better respond to observed or suggested malfunctioning of the central administrative machinery (Strausz, 2004). The main objective of these changes was to abandon the system of centralised government in favour of decentralised units in order to increase efficiency in public service delivery and revenue sharing functions. The smaller units of governments are considered to be easier to manage and consequently they could establish much more productive ties with the policy environment (Pollit & Bouchaert, 2004). Some economic theories support this movement by affirming that greater responsibility for results and better appropriation of products and services by the civil servants should improve the quality of their results and actions (Shapiro, 2005). Finally, a responsible, specialized civil service would enable the national political authorities to focus more on strategic decisions and less on operational details. The quality of decision-making within the public sector would be improved and the influence of the political world on public policy cycles would be reinforced (Agotnes, 2003).

The agency theory underlines the management's autonomy and the functional specialization of agencies as a guarantee of the efficiency of the public sector. This newly won autonomy by the devolved states can hardly fail to affect relations between these new agencies and their supervisory authority, whether it is political or administrative. According to this theory, a new, individualized system of inter-governmental relations is therefore set up and can be defined using the principal-agent model (Shapiro, 2005). The supervisory authority thus becomes the principal, which, for reasons of efficiency, delegates part of its mission to specialized implementing parties (the agents). Their relation is mainly governed by means of a contract (formal or no), which determines the rights and obligations of each party, including the results that the principal would like to see, as well as the resources made available by the principal to enable the agencies to carry out the assignment given to them (Chajewski, 2004).

The National government in Kenya, for example, must therefore trust the expertise and professional know-how of the devolved government. Nevertheless, according

to Hood (2000), the principal-agent model starts with the idea that the players in this new relation act in a rational way and in keeping with diverging interests. Therefore, the principal would like to get maximum results while devoting as little resources as possible, whereas the agent's objective is to maximize its resources while minimizing its obligations with regard to the principal (Lupia, 2001). This divergence is stronger when accentuated by the fact that the agent has an advantage. By its specialization and many contacts with the policy environment, the agent masters the field of expertise and the assignments stipulated in the contract much better than the principal. In a rather Machiavellian way, the agent will therefore tend to limit or even deliberately manipulate the flows of information given to the principal (Shapiro, 2005).

To try to counter this information gap and achieve good implementation of the contract, the principal endeavours to establish monitoring systems to ensure sufficient, quality information flows (Strausz, 2004). But these control systems must meet two conditions. First, they cannot be organized in such a way as to neutralize the advantages associated with the autonomy and specialization of the agent. Consequently, the control can only be exercised by means of the establishment of an ex ante contract and by systems to monitor the agents' results ex post. In addition, the control systems must take account of the costs they entail. Establishing inter-relational rules and ensuring that they are applied well cannot be done without injecting human, financial and logistical resources. So the control must not entail costs higher than the improvements in efficiency produced by specialization and autonomy of the agent (Strausz, 2004; Agotnes, 2003; Kalhil & Lawaree, 2001).

It should be noted that other schools of thought began with a much more optimistic vision, considering that the ex post monitoring has the advantage of motivating the agents and making them responsible for their results. This motivation is all the greater when the principal's attitude varies with the quality of the results by means of financial or structural mechanisms of sanctions and rewards (Chajewski, 2004).

2.3 Conceptual Framework

The framework in figure 2.1 demonstrates that the revenue allocation formula (dependent variable) is influenced by the CRA parameters, other parameters and politics (independent variables) which are intended to serve the objectives of the devolution program in Kenya. There are also however, many other, relevant factors with potential to affect the revenue allocation formula. The arrows in the figure illustrate causal relations. The Kenya constitution acts as the intervening variable. The revenue allocation formula in Kenya must conform to the provisions of chapter twelve of the Kenya Constitution of 2010.

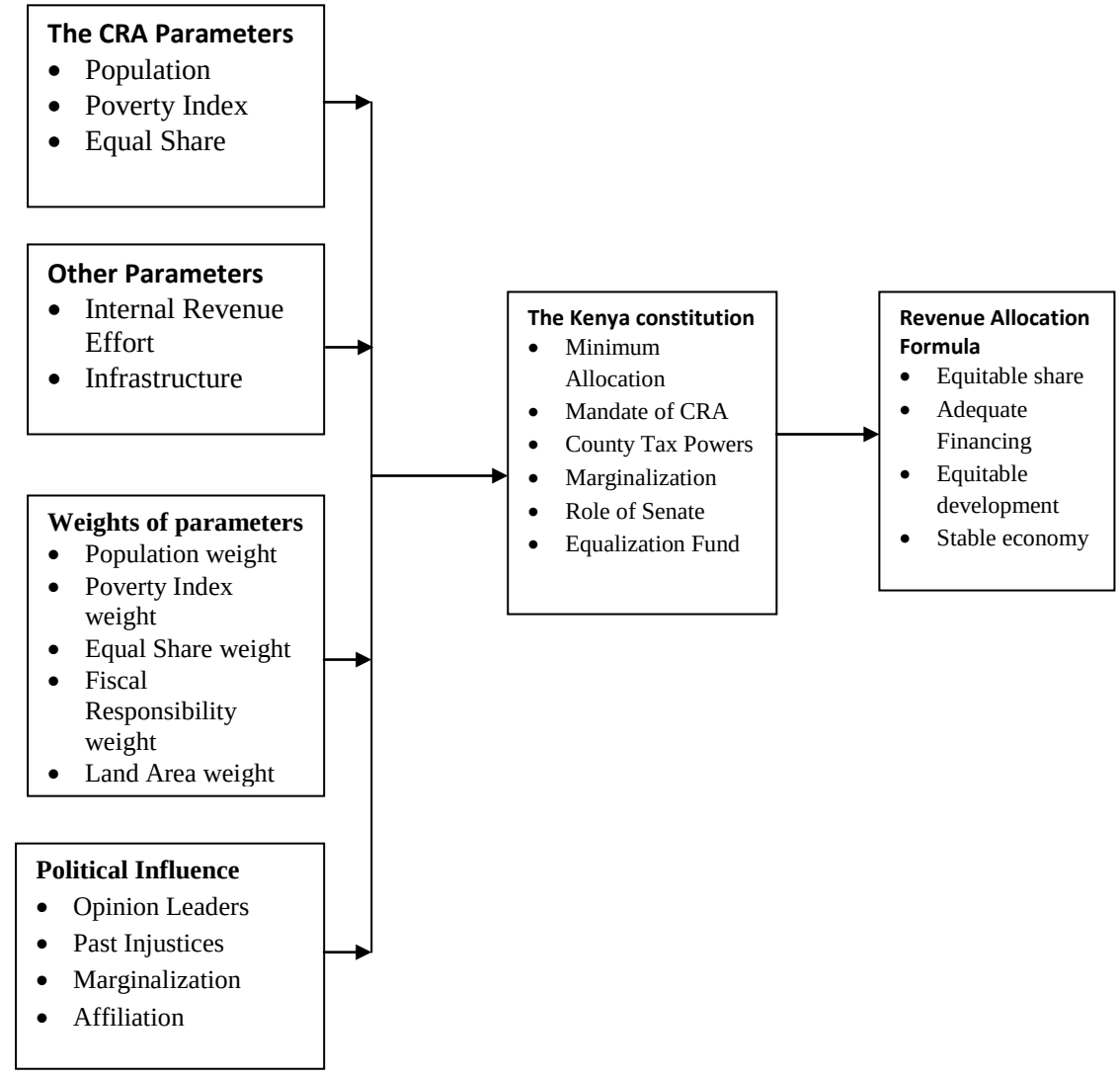


Figure 2.1: Conceptual Framework

2.4 Review of Empirical Literature

Sections 2.4.1 to 2.4.5 of this thesis reviewed studies conducted within the confines of the objectives of this research. Empirical literature reviewed in these sections covered the methodology used, the objectives and research findings of the studies. Additional literature on past studies undertaken, relevant to this research is contained in sections 2.5 of this thesis. A critique of the studies reviewed in sections 2.6 was made to bring out the research gaps.

2.4.1 The CRA Parameters

The CRA chose to use an expenditure needs approach in selecting parameters. An expenditure needs formula adjusts funding to reflect the fact that it costs more in some counties to deliver services than it costs in other counties. This approach does not consider the differences in counties' ability to collect own revenue. There are several approaches used in measuring the expenditure needs of counties (ROK, 2012). These include the equal per person, historical spending of counties, top-down per client norms, bottom-up costing of a standard basket of goods and services, and the weighted index of expenditure needs. In view of county-level data challenges, the CRA chose to use the "weighted index of expenditure needs" approach as applied most devolved states (ROK, 2012).

The CRA followed three steps in developing the formula. Step (1) Identification of potential parameters from international experiences on the basis of desk research and peer-to-peer learning, there are a number of commonly used potential parameters that the CRA could adopt. These include population, land area, equal share, education, and so on. Step (2) Selection of parameters. Out of the identified parameters, the CRA picked five parameters for sharing out revenue among the counties. The parameters picked include: (i) Population; (ii) Poverty index; (iii) Land area; (iv) Basic Equal Share; and (v) Fiscal responsibility. Step 3: Determination of parameter weights.

According to CRA, the rationale for the Choice of Each Parameter were: (i) Constitutional and legislative stipulations. They followed the criteria set out in Article 203(1) of the Constitution; (ii) Causal connection: These parameters are measures of the factors that have the greatest impact on cost differentials between

counties; (iii) Measurability: Availability of official data from the KNBS, which measure cost differentials between counties; (iv) Less susceptible to influencing: These parameters are generally less susceptible to distortionary gaming behaviour of counties seeking to increase their revenue allocation; and (v) International experiences: That of countries, which have implemented fiscal decentralization, including: South Africa, Pakistan, Nigeria, India and Indonesia (ROK, 2012). Empirical review of literature on each of the parameters is presented as follows.

Population

According to Moore (2011), allocation formulas that use population as a parameter frequently require census data; however, census data have problems. Census data tend to undercount persons living in rural areas, ghetto areas, and large cities. Critics of the use of census data maintain that large numbers of Hispanics, African Americans, American Indians, and Asians are frequently missed by the census, with the undercount resulting in a loss of federal funds to minorities. But, others argue that the debate over the significance of the undercount has been highly distorted, even misleading. In United States for example, the General Accounting Office used the causal survey research and found in their study that only 0.5% of the $185 billion distributed by the federal government was affected by the overall undercount (GAO, 2001). The reason suggested is that population is only one of several factors in most federal grant formulas, and many programs designed to help distressed communities actually reduce funding when population increases. Even when grant increases are pegged to population gains, the critical factor for a given jurisdiction is not merely its absolute population, but its population relative to other jurisdictions—a result that can obviously hurt as well as help minorities (Bowman & Kearney, 2005)

In his studies on funding formulas, Bolan (2012) concluded that funding can depend on size of population and subpopulations, examples of subpopulations include age groups, working class, poor populations and ethnic groupings. Population groups can then be weighted according to needs based priorities. The impact of population density and dispersion in allocation formula is widely acknowledged and there is possibility of updating and improving the formula (Chotai, 2010).

In Kenya, the CRA formula uses county population data from the Housing and Population Census 2009 report, as published by the KNBS (ROK, 2011). The Commission chose population as a parameter to allocate revenue because of two factors: (i) Population is a simple, objective and transparent indicator of expenditure responsibilities and needs of a county. Consequently, county expenditure responsibilities are directly proportional to the number of people living in a particular county. Thus, the higher the county's population, the higher the funds required to provide services. This is in line with the "developmental and other needs of counties" criterion as provided for in Article 203(1)(f) of the Constitution; (ii) Population ensures equal per person allocation (of revenue allocated on the basis of population only) to all counties. The population part of the horizontal formula "treats every Kenyan equally" by distributing the population-based revenue equally among all Kenyans irrespective of their county of residence. According to the CRA the total amount a county is allocated on the basis of the population parameter is equal to the per person allocation times the population of the county. In this way, it satisfies Article 201(b) of the Constitution regarding promotion of an equitable society (ROK, 2012).

County Poverty Index

Poverty index as a parameter is redistributive and proxies the objective cost of services, assuming that the need for public services is higher (and less can be collected in service charges) when people are poorer. The calculation of health expenditure needs considers poverty, treatment costs, and even a spill over compensation for two regions that provide services to others. But when total allocations for health are considered, the correlation with population is almost perfect. In India the share of the north-eastern states as well as that of Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh states (BIMARU) has gone up, the latter on account of weights attached to poverty (Bagchi, 2001).

In Brazil Sergio (2001) conducted a causal survey research and found that revenue is basically distributed between governments on a per capita basis but weighted by some of these indicators so that governments with the highest poverty indicators or lowest per capita income, for example, receive the most funds. When the State Participation Fund (SPF) was designed in Brazil, for instance, it followed this

model. It used per capita criteria to distribute revenues between the states but weighted them by the inverse of the per capita income so as to grant more resources to the poorest (Sergio, 2001). In his studies Sergio found that what distinguishes equalization systems from more traditional revenue redistribution systems such as those used in India and Brazil (participation funds) is that instead of using macroeconomic parameters like income, poverty and development levels they use a direct estimate of recipient government own-source revenues.

Economic Development Agencies {United Nations Development Program (UNDP), World Bank} have always used such indices as literacy rates, life expectancy, poverty rates, etc as benchmark for determining economic development. To parade enviable indices, a country must be prepared to fund heavily in human resources, health, road network, security, agriculture, freedom index, education, etc. Unegbu and Irefin, (2011) opines that Economic development typically involves improvements in a variety of indicators such as literacy rates, life expectancy, and poverty rates.

The CRA formula uses official county poverty data from the Kenya National Bureau of Statistics, and is based on the Kenya Integrated Household Budget Survey (KIHBS) of 2005/2006. The KNBS produced different county-level poverty data on food poverty, non-food poverty and overall poverty. The CRA used the overall poverty measure in the formula (ROK, 2012).

Poverty index was chosen as a parameter to allocate revenue among the 47 counties due to three inherent factors: (i) Poverty has a cause effect to expenditure needs differentials of counties. For instance, counties with a higher number of poor people are likely to experience greater demand for publicly provided services rather than private ones. From this perspective, the poverty parameter also gives effect to the allocation criteria in Articles 203(1)(f) regarding developmental and other needs of counties, 203(1)(g) on economic disparities within and among counties and the need to remedy them, and 203(1)(h) on the need for affirmative action in respect of disadvantaged areas and groups. (ii) Poverty introduces a re-distributive element in the formula. The poverty Index component of the formula "treats every poor Kenyan equally" by distributing the revenue shared on the basis of this parameter. The poverty index parameter directs additional resources to poor Kenyans over and

above what each and every Kenyan is allocated through the formula. In so doing, poor Kenyans are taken care of twice; first, through the population component of the formula and, second, through the poverty component. The total amount a county is allocated on the basis of the poverty parameter is equal to the per poor person allocation times the number of poor people in the county. (iii) Poverty data is less likely to be influenced by individual county governments and therefore cannot be distorted. Poverty computation comes from a large and complex survey (ROK, 2012).

The previous poverty data came from Welfare Monitoring Surveys of the 1990s (Kiringai, 2006). The KIHBS 2005/2006 updated the poverty data in addition to serving other uses. There are three different poverty indices. (i) Poverty head-count index (incidence of poverty). This measures the proportion of the population who live below the poverty line. The drawback of the poverty head-count index is that it conceals differences in the extent to which individuals are poor. Some individuals require little additional income to get to the poverty line while others require substantial amounts of money. These differences are likely to be reflected in increased demand for services by the very poor. (ii) Poverty gap (depth of poverty). This measure provides information on the average extent to which individuals fall below the poverty line. (iii) Poverty severity index. This index measures how poor the poor are (severity of poverty). Although poverty severity is the best measure of poverty, it is difficult to read and interpret intuitively. In order to utilize the poverty gap and the poverty severity, one requires adult equivalents data. The adult equivalent is an aggregate indicator of a household size. In computing the adult equivalents, children in households are treated as being equivalent to a fraction of an adult in line with international practices. The CRA chose to use the poverty gap index due to the fact that it is a good measure of poverty compared to the head count index, and is easy to interpret intuitively compared to the poverty severity index (ROK, 2012).

County Land Area

Land area is used in revenue allocation formulas to compensate regions that incur additional logistical/administrative cost due to having larger areas (Keriga, 2009). In their studies on revenue sharing parameters, Moore (2011) concluded that

because the cost of increasing the capital stock may be affected by land area, it is important to consider not only infrastructure per capita, but also infrastructure per square kilometre. Geographical, cultural and social economic factors should be taken into consideration as should the gross land mass that is viable for economic use (Spencer, 2012). According to Bagchi, (2001), however, the population and Land area basis of revenue sharing formula should be having more weight on the population density rather than considering the two parameter independently.

In Kenya the CRA formula uses county land area data also from the KNBS, which is expressed in square kilometres. According to CRA the choice of land area as a parameter for allocating revenue is based on two factors: (i) A county with a larger area has to incur additional administrative costs to deliver a comparable standard of service to its residents. Increased distances add to costs in a number of ways, including greater length of roads to build and maintain, higher freight costs of inputs, and longer distances for public servants to travel in the course of providing services. (ii) Land area as a measure is not susceptible to influence by county governments that might seek to increase the revenue allocated to them. The land size is fixed and unless there are changes in administrative boundaries, the size of a county remains constant (ROK, 2012).

The CRA noted two peculiarities which necessitate some adjustment to the above generalizations regarding increased costs associated with a larger land area. First, the differences in cost of providing services increase with the geographic size of a county but at a decreasing rate. Beyond a certain point, incremental costs of larger distances become negligible. Second, some counties with small areas have to incur certain minimum costs in establishing the framework of government machinery. Additionally, the costs of providing services in some small counties may be higher because of terrain. The CRA further noted that there is skewed distribution of land in Kenya. In particular, the five largest counties account for 48% of the total land area. This imbalance creates cost differences between small and large counties. Taking into account these considerations, the CRA used an adjustment procedure which effectively imposed upper and lower limits on the contribution of each county to the total land area. Any county which contributes less than 1% of Kenya's total land area, for example Mombasa County that contributes 0.04%) is allocated a minimum of 1% contribution. Correspondingly, any county with more

than 10% of Kenya's land area, for example, Marsabit which has 12.2% has its contribution capped at 10% (ROK, 2012).

Basic Equal Share

Since 1950s, the theory of fiscal equalization mechanism has been developed into a rich literature which results in different interpretations and applications in practice. The first paper on fiscal equalization raising the critical debates around the issue is published by Buchanan (1950). In following years, other economists such as Scott (1950, 1952), Boadway and Frank (1982a, 1982b) and Musgrave (1999) advanced their contributions on both the theoretical discussions and practical aspects which facilitate to clarify principles and implement of fiscal equalization.

In regard to the current economic crisis, a number of economists such as de Grauwe (2010, 2012), Rossi and Dafflon (2012) have recently argued in favour of fiscal equalization to complete the economic and monetary union. Historical inequality in levels of development, including critical capital backlogs, is a major determinant of disparities in development of states. Devolved states try to mitigate this using equalization parameter. It is very difficult to measure inequality and very few countries do so in a detailed way, except of course Australia where the equalization system incorporates needs in a sophisticated way to determine the horizontal allocation of grants among states (Merobe, 2001). A qualitative analysis of the historical injustices is necessary in any federal state, it helps to augment and/or complement the economic indices of poverty and marginalization of these groups and/or areas and are equally important in determining the sharing of revenue.

Basic Equal Share as a parameter has an important equalizing effect in that all counties are treated equally regardless of size or population. According to the CRA, this component was included because all counties have some basic expenses that need to be met irrespective of their size (ROK, 2012). These services include salaries and others expenses for County Executives and County Assemblies and are critical for effective governance and administration at county level. In addition, Article 176 of the Constitution requires county governments to further decentralize their functions and provision of services.

Fiscal Responsibility

Fiscal responsibility implies a government pursues the appropriate level of government spending and tax to: Maintain sustainable public finances: Ensure fiscal policy aids the optimal rate of economic growth and: Maintain appropriate levels of public investment (Anderson, 2007). The main factors underlying fiscal profligacy by county governments include limited revenue authority and dependence on national government transfers (Kiringai, 2006). Fiscal decentralization aims to improve public services but also creates new challenges for the institutions through which governments manage macroeconomic stability and growth. Lack of fiscal discipline at the local level and perverse fiscal behaviour by county governments in the case of Kenya could lead to macroeconomic risks (ROK, 2012). It is worth-noting that unsustainable fiscal policies can jeopardize the country's international creditworthiness and macroeconomic stability (Rodden, 2002). This proposes the danger of increasing the cost of future borrowing with the ultimate effect of deepening the investor confidence. Therefore, failure to maintain fiscal discipline during implementation of county government budgets could lead to imposition of in-year expenditure cuts and disruption of the county government services (ROK, 2012. Similarly, avoidance of difficult recurrent expenditure adjustments could lead to postponement or termination of discretionary types of expenditure, perhaps decreasing the quality and quantity of services. Fiscal discipline not only helps governments avoid the negative consequences of extreme fiscal stress, but also makes a positive contribution to fiscal outcomes (Kiringai, 2006).

In Kenya, Fiscal discipline is clearly stipulated both in the Constitution (2010) and the Public Finance Management Act, 2012. Article 201 of the Constitution, outlines Principles of Public Finance in Kenya, as shown in box 1 below. Subsections c) and d) are particularly clear on fiscal discipline and performance: Furthermore, Article 203(e) of the Constitution identifies fiscal capacity and efficiency of County Governments as a criterion for determining the equitable share. Equally, in formulating recommendations relating to the financing of the County Governments, the Commission on Revenue Allocation (CRA) shall consider fiscal responsibility (Article 216(3 c). The Public Finance Management Act, 2012 introduces fiscal responsibility principles meaning the principles of public finance specified in

Article 201 of the Constitution, together with the principles of fiscal responsibility referred to in section 15.

Section 107 outlines the principles of fiscal responsibility in relation to a county government as: a) The county government's recurrent expenditure shall not exceed the county government's total revenue; b) Over the medium term a minimum of thirty percent of the county government's budget shall be allocated to the development expenditure; c) The county government's expenditure on wages and benefits for its public officers shall not exceed a percentage of the county government's total revenue as prescribed by the County Executive member for finance in regulations and approved by the County Assembly; d) Over the medium term, the government's borrowings shall be used only for the purpose of financing development expenditure and not for recurrent expenditure; e) the county debt shall be maintained at a sustainable level as approved by county assembly; f) the fiscal risks shall be managed prudently; and g) a reasonable degree of predictability with respect to the level of tax rates and tax bases shall be maintained, taking into account any tax reforms that may be made in the future (ROK, 2010).

The fiscal responsibility parameter is used in order to encourage counties to manage their fiscal resources prudently and optimize revenue-raising potential. This parameter also upholds one of the key principles of public finance set out in Article 201(d) that, "public money shall be used in a prudent and responsible way." The parameter also validates the equitable revenue sharing criterion in Article 203(1) (i) on the need for economic optimization of each county and provision of incentives for each county to optimize its capacity to raise revenue (ROK, 2012). Given that there is no established history and track record of financial management of county governments it was not possible to rank each county for the first generation formula. An equal weighting in this formula puts all counties at the same level.

2.4.2 Other Parameters

According to Kiringai (2006) there are three main reasons why a nation should be concerned with marginalisation within its borders. First, marginalisation entrenches inequality in society, dampening poverty alleviation efforts. Second, the phenomenon pulls apart communities within society, thus creating tension and

lowering growth and investment potential. Empirical review on revenue allocation parameters revealed that the Human Development Index can be used as a parameter which captures most socio economic factors.

Human Development Index

Human Development Reports (HDRs) utilise the human development approach to demonstrate the multiple facets of national development challenges. Bangladesh was the first country to publish a national HDR in 1992, with more than 650 other national and sub-national HDRs, and 37 regional HDRs (from other regions). However, the human development index (HDI) has been criticised for the fact that its indicators do not take into account inequalities within countries. This has necessitated that the HDI be modified to suit local needs (Geneva, 2007).

The HDI is extensively used to determine the level of development both nationally and at regional level. The human development approach reinforces the importance of multidimensional assessment and analysis leading to policy formulation and revision, and fund allocation for human needs (Pangliani, 2010). The use of HDI in assessing levels of development has brought to light disparities and broadened policy discussions by bringing in traditionally excluded perspectives (such as those of women, the poor, ethnic minorities, and people living with HIV/AIDS or with disabilities). HDRs have brought life and additional credibility to the human development approach by adapting analytical and methodological tools to local circumstances. Many prominent national scholars and thinkers have been engaged in the application of the human development paradigm to local development challenges, especially in developing countries, with the support of UNDP. HDR innovations have contributed to the formulation of national human development policies. Examples of regional and national HDRs that have advanced the application of the human development approach in their respective domains include those discussed below (UNDP, 2012).

Depending on the HDI score, a country is classified into one of the following three rank categories: ‘low human development’, ‘medium human development’ or ‘high human development’. Although these categories are not formally tied to official development aid or imply any other direct legal consequence, today, these three mutually exclusive development categories are utilized widely. In the academic

literature, the categories are used to study health outcomes across countries (Guindon & Boisclair, 2003), and are used in academic studies in communications (Hargittai, 1998; Keiser *et al.* 2004), development economics (Kelley, 1991; Noorbakhsh, 1998; Baliamoune, 2004), and macroeconomics (Mazumdar, 2002; Noorbakhsh, 2006). In business relations, the categories have been used for international pricing purposes (Bate & Boateng, 2007). For example, since 2001 the pharmaceutical company Merck sells drugs at different prices with up to 90% discounts for countries that are classified as 'low', and a 75% reductions for 'medium' countries (UNDP, 2012; Petersen & Rother, 2001). Further, the indicator is frequently invoked to structure discussions in development-political debates (United Nations, 1997; HDR 1999 to 2006; Geneva, 2007).

The Dominican Republic used 52 indicators to measure social, political and economic empowerment in terms of health and ICT. They developed a human empowerment index (HEI) with two sub-indices (one for individual and one for collective empowerment). The index was disaggregated at the regional and district level to identify areas which lacked access to power and decision making. They recognised that social, economic and institutional inequalities in the country conditioned the enlargement of people's opportunities to one's individual or personal affiliation (UNDP, 2012)

Mongolia analysed how topography, climate and geography can lead to striking development inequalities (UNDP, 2012). It developed an HDI by urban and rural residency, and by provinces and cities. The report's recommendations were incorporated in the Mongolia State Population Development Policy, which led to increased support to regional centres and the promotion of intensive livestock herding. Following the report, an amendment of the employment promotion law was prepared and the Parliament of Mongolia approved a law on vocational training in May 2009.

India modified the HDI indicators used in developing its Development Index in order to access starvation in Bankura district, (UNDP, 2012). They adopted the concept of human development radar, (HDR), to measure eight human development indicators that compare attainments in different areas.

Mexico adopted the HDI so that it could access inequality levels in the country and the region (UNDP, 2012). It designed a HDI that is sensitive to inequalities in income, education and health. The index considered development changes if equality in only one dimension increases and the total human development gains from improvement among target group of individuals. In later applications, municipal data allowed decomposition of inequality indices to identify sources and regions contributing to overall HDI inequality. Other innovations introduced by the Mexico HDR team to enhance human development measurement include: adjusting the HDI for internal migration, local crime and violence against women; and redistributing oil revenues from producing regions to the rest of the country following national redistribution policy patterns, instead of computing oil revenues in the producing regions' GDP as per official statistics. This gave a better picture of available resources in each region.

In Chile a team of human development experts measured human development trends at the communal level, and calculated the HDI for the Mapuche populations to deter-mine inter- and intra-ethnic inequalities. The analysis revealed important insights on sub-national circumstances, with a focus on indigenous populations, informing diag-nostics and planning at the regional level, (De la Torre & Moreno, 2009).

Central America developed a HDI that looked at the incidence of violence and criminality in seven Central American countries: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. The results were used to make comparative policy analysis and recommendations, (UNDP, 2012).

Latin America used the HDI to access conflict and violence across various sub-national departments. Local authorities in Medellin, Antioquia and Meta adopted the recommendations emanating from the analysis for the prevention of guerrilla recruitment, mine action and the strengthening of local institutions (UNDP, 2012).

Beyond adaptation of the HDI, some national HDRs developed new indices to measure additional dimensions of human development. The Nepal HDR 2004 pioneered a human empowerment index (HEI) before the Dominican Republic (UNDP, 2012). Nepal HEI is composed of eight indicators reflecting education, health, information and participation in social organisations. The index is intended

to provide governments and development partners with a tool to address economic, social and political exclusion in areas of concentrated poverty and vulnerability.

The Thailand HDR, 2003 focused on community empowerment by establishing a collaboration between the National Economic and Social Development Board and community leaders from four regions (UNDP, 2012). The report proposed a human achievement index (HAI), which combined indicators on eight components of human development (health, education, employment, income, housing and living conditions, family and community life, transportation and communication, and participation) to provide a more nuanced picture of disparities among Thailand's provinces than traditional poverty assessments could do.

Australia applied the gender development index, (GDI) in addressing regional gender disparities in eight states and territories, (Saswati & Parikshit, 2002), while Europe developed a regional human development index (RHDI) to assess disparities in the regions, (Bubbico & Dijkstra 2011). The RHDI was created using the following indicators: years of healthy life expectancy, net adjusted disposable household income per capita (as an index of EU-27 average) and low and high educational attainment for people aged 25-64 (% of population 25-64 with high education attainment).

Portugal, a country marked by regional asymmetries, needed better governance and mechanism and policies, so it developed a regional human development index (RHDI) that would assess regional disparities. In addition to the indicators used in determining the HDI, they used governance and environment dimensions, (Silva & Ferreira, 2012).

The UN uses human development indices (HDI) to rank the socio-economic development of countries (World Bank, 2010). The HDIs are calculated based on life expectancy, adult literacy and per capita income. These indicators correlate positively with access to people's basic needs of food, water, healthcare, education and information. Table 2 gives the HDIs for selected countries (UNDP, 2012), and gives the values of two criteria, in addition to income, that are commonly used in determining HDI.

The higher the HDI, the better the quality of life in a country. The objective of

development is therefore to increase the quality of life of the people by raising the HDI to as close to 1.0 as possible (indicative of many developed countries). The information in table 2 reveals that the quality of life in sub Saharan African countries is substantially lower than in developed countries. The data show that Africa is globally marginalised since the HDIs for most African countries are generally below 0.5. Kenya has a HDI of 0.509, while Seychelles is at the top of the scale with an HDI of 0.773 (UNDP, 2012).

In the past, similar approaches have been used to generate objective evidence for policy formulation (Pangliani, 2010). In Kenya for example, composite indices were used to develop criteria for affirmative action in university admissions. Opportunity (access) indices, which were developed in the early 1990s, correlate well with current government classifications of disadvantaged or hardship areas, as well as poverty rates.

The classification of disadvantaged districts shown in table 3 below (1999) correlates with current literacy and poverty indices. The current poverty levels (2009) for Garissa, Narok, Lamu and Kajiado are disproportionately low compared to the statisti-cally computed education opportunity indices, while current literacy indices still remain below the national average (0.66).

County Development Indices (CDIs) were determined by the CRA for all 47 counties, which they ranked on the basis of their CDI. Counties with a relatively low CDI compared to the determined national average, were categorized by CRA as marginalized. This is shown in appendix ix, From the CDI ranking in this appendix, counties with a CDI below the national average of 0.520 were classified as the most marginalised, counties with a CDI between 0.521 and 0.51 are moderately marginalised and counties with a CDI ≥0.6 are those enjoying better services, this is shown in appendix II.

The CDI as computed by the CRA incorporates a number of socio-economic and environmental factors, most of which were proposed by our respondents. It therefore makes a fair representation of several concerns which will not only address the equalization parameter but also take care of the '*negative*' parameters. This will help in addressing issues related to equity dimension which are taken into account by the Constitution. For example, the Constitution provides for semi-

autonomous counties that will receive equitable grants from Treasury based on the recommendations of the CRA.

2.4.3 Weights of Parameters used in Revenue Allocation Models.

Parameter weights play a very key role in the overall outcome of the formula. The revenue allocation for a particular county from a given parameter is dependent on two factors: (i) The weight given to the parameter: The higher the weight, the more revenue is allocated using that parameter. (ii). The characteristics of the county: The higher the ranking of the county in a given parameter, the higher the revenue allocated to the county using that parameter. Thus, a county gets maximum revenue when a high weight is assigned to a parameter in respect of which it has comparative advantage in terms of contribution. International experience suggests that different countries use different parameters in their horizontal revenue allocation formula. What this means is that revenue allocation parameters are specific to each country, and take into account existing local dynamics. The determination of each weight by the CRA was based on experiences of other countries, Kenya's local dynamics, simulations, and broad-based consultations. The CRA followed the following steps in developing the weights: Step (1) Monte Carlo simulations, this entailed a set of experiments for different weights for each parameter. In doing this, the simulations sought to realise two objectives, namely: (i) minimum variability in total revenue allocation among counties; and (ii) minimum variability in per person revenue allocation among counties. This provided a "first guess" of the weights. Step (2): Incorporation of value judgment by the Commission - In this step, the weights were subjected to scrutiny in relation to international experience and Kenya's own national dynamics. This led to the proposed formula launched by the Commission on 28th February 2012 (ROK, 1012). The weights identified were as shown in table 1.1.

Step (3): The CRA then conducted broad-based consultations, including county visits. This was done in order to collect public views and opinions on parameters and weights. Step (4): The recommended parameter weights and results from the broad-based consultations, including county visits were analysed to develop the recommended weights for the parameters as shown table 1.2.

The proposed CRA formula revolves around five simple components. The main components of the formula—each with attached weights—are: (i) population; (ii) poverty; (iii) equal shares; (iv) land area, and; (v) fiscal responsibility. They closely mirror the Constitutional emphasis on: (i) matching resources with service delivery needs (Article 203(d) —via the population and land area criteria); (ii) redistribution (Article 203(g & h) —via the poverty criterion); and, (iii) incentives for efficient management (Article 203(e) —via the fiscal discipline component).

Unlike many equalization formulas used elsewhere, the CRA proposal is not grounded in a detailed estimation of individual county needs. By contrast to more sophisticated examples, the CRA formula has the merit of being highly transparent, and therefore easily understandable by all. Given Kenya's history of marginalization and poor transparency in the allocation of funds across regions, this is in—and—of itself a major achievement. At the same time, the potential wedge created between allocations and needs (funding and function) means that large gaps are likely to occur, on day one, at both ends of the county distribution (ranked according to existing spending commitments), for two mutually reinforcing reasons: (i) because the formula is in fact highly redistributive; and, (ii) because existing spending was not historically allocated, in Kenya, based on consideration of needs as proxied by population (ROK, 2012).

Because the proposed CRA formula is highly redistributive, managing the transition will be a tall order. Should most of the funding to future counties be channelled through the equitable share—above and beyond 15 percent—there is likely to be a significant wedge between the actual service delivery costs that counties face, and the allocation they receive. This is because population, the main driver of needs, is only a part of the formula, and because the geographic distribution of services has been historically unequal across Kenya. While equalization will need to be pursued, the transition will have to be managed carefully to avoid service delivery interruptions in leading areas, and to mitigate the risk of serious absorption bottlenecks in lagging counties.

As mentioned above CRA chose to use expenditure needs approach to selecting parameters. An expenditure needs formula adjusts funding to reflect the fact that it costs more in some counties to deliver services than it does in others. It does not

take into account differences in revenue-raising capacity (ROK, 2012). There are different approaches to measuring the expenditure needs of counties. These include the equal per person, historical spending of counties, top-down per client norms; bottom-up costing of a standard basket of goods and services, and the weighted index of expenditure needs (Spencer, 2012). The CRA chose to use the "weighted index of expenditure needs" approach as applied in many other federal states. They identified five parameters for sharing out revenue among the counties. These are: Population; Poverty index; Land area; Basic Equal Share; and Fiscal responsibility (ROK, 2012).

ICPAK (2012) proposed realignments on the CRA weights of the parameters that, in their opinion would yield a more equitable basis for revenue allocation. These were as follows: Population 40%; Equal share 20%; Poverty 20%; Land and Infrastructure Needs 20%; and Fiscal discipline 0%. It is critical to note that though population defines the service needs of a region, it also denotes the possibilities of high concentration of the basic infrastructure necessary for service delivery. Decentralizing and equalizing development across the country can be achieved by capacity to deliver services to the under-developed and rural areas. The gaps in operating systems and processes of counties vary and should be addressed by committing enough financial resources. Poverty marks the epitome of inequality. According to ICPAK (2012), the CRA formula appears to relegate poverty as a fringe causality of inequity. A sensible government will adopt policies that institutionalize pro-poor programmes aimed at getting the rich to supplement the course for the poor. Land size and terrain have a direct relationship with the cost of providing the public goods. We argue that there are aspects of inequality which are currently not measurable with some degree of objectively but are appendages to land mass. The aspects are however critical and must be addressed through revenue allocation. Allocation on the basis fiscal discipline is more of a condition rather that an absolute criterion. As a condition, it should be prudent to come to an understanding on the basis for assessment before the implementation.

2.4.4 Revenue Allocation by Formula

Allocation by formula is one of the decision rules used in federal and devolved States by budgeters to allocate scarce resources in the public sector (Mwenda,

2010a). Mikesell (2006) described an allocation formula as a quantitative mathematical equation used to distribute grant funds to eligible recipients. Wildavsky suggested that allocation formulas for public-sector program expenditures evolved out of recurrent budget processes (Wildavsky, 2004). Usually, an allocation formula is specified in legislation, but sometimes it is provided by regulation.

In the Western world, the underlying theory surrounding formula allocation seems to be a calculative logic that formulas are sensitive to the concerns of democratic government. These concerns include equity, efficiency, and effectiveness of service provision on behalf of the (voting) population. In the United States, prior to World War II, budget allocations were often based on historical precedent or negotiation; however, since that time, federal and state governments have progressively shifted in favor of distributing aid to states and localities by formulas (Fessler 2006). This shift to formula allocation may have dampened the political problems naturally arising from the annual competitive budget appropriation process in Congress at the federal and state levels of government. (Dugdale, 2007)

In Africa, revenue allocation formulas have followed a distinctive pattern where the federal government is in a superior position and sub-national levels in the inferior position (Aigbokhan, 1999). This means that the central government engages in functional expenditure obligations than both the state and local government does.

A not well-realized fact is that productive infrastructure investment is mostly provided by sub-national governments. According to Estache and Sinha (1995) most infrastructure services where benefits are mostly local –as, e.g. road construction and maintenance, urban transit, water supply, and waste management– are completely decentralized in many countries and decentralization is proceeding rapidly in many others. Big infrastructures, as airports and ports, are also locally managed and funded in many countries (Bel & Fageda, 2009). The central government retains the responsibility over utility infrastructures, as telecommunications and power, but even in this case technological improvements are facilitating the transfer of responsibilities to sub-national governments.

Both scholars and international organizations recommend a decentralized approach to the provision of infrastructure (World Bank, 2001; Brosio & Ahmad, 2009). Better matching of preferences and needs (Oates, 1972; Faguet, 2004) and increased accountability (see, e.g. Seabright, 1996) are the arguments used to support this policy. Decentralization is typically recommended if the above benefits compensate for any inefficiency generated by spillovers and/or the limitation of economies of scale. In cases where spillovers and/or scale economies are important, sub-national provision coupled with national or even supra-national funding is recommended (see, e.g. Hulten & Schwab, 1997). While the impact of expenditure decentralization is straight-forward, the impact of revenue decentralization on sub-national spending decisions is not well understood. Revenue decentralization has many dimensions (Stegarescu, 2005). Previous work has shown that revenue decentralization has a significant positive impact on governments' aggregate investment in infrastructure (Kappeler & Välilä, 2008), although it has not been examined what level of government accounts for that increase.

In Nigeria, Akinlo (1999) found that state governments' public expenditures are influenced by parameters during the period of study using ordinary least squares (OLS) technique. Similarly, in the study of Akujuobi and Kalu (2009), using the same econometric technique (OLS) finds significant effects of parameters on allocation of finance to states' real assets investment. Aigbokhan (1999) finds a significant relationship and a high concentration ratio of parameters and revenue share using OLS technique to examine fiscal decentralization and economic growth in Nigeria. The impact of fiscal decentralization of revenue parameters to individual federating units on economic growth of Nigeria is demonstrated in the studies of Akeem (2011) and Usman (2011), both utilizing OLS technique. Usman (2011) finds that both shares of federal government and local governments' revenue from federation account are contributed to by the nature of parameters used in Nigeria. The study finds no contribution of share of states revenue from federation to the parameters, which is contrary to the findings of the studies of Akinlo (1999) and Akujuobi and Kalu (2009). Usman (2011) uses the growth rate of shares of the federating units from federation account as proxies and finds direct relationship between revenue allocations to federal, states, and parameters used. All of these studies made use of OLS econometric technique which does not show causality and

direction of causality.

Other studies (such as Emengini & Anere, 2010; Olofin, Olubusoye, Bello, Salisu, & Olalekan, 2012) use different analytical techniques such as t-test correlation coefficient and cluster analysis, respectively, to examine revenue allocation in Nigeria. Emengini and Anere (2010) find no influence to socioeconomic status of states and local councils by the level of revenue accruing to them from the federation account. In Olofin *et al*. (2012), the results show a small number of states constituting each of the clusters in terms of statutory allocation. Jimoh (2003) utilizes a causality test using Error Correction Model (ECM) to ascertain the longrun causal relationship and short-run dynamics between the degree of decentralization and economic growth in Nigeria. He finds out that more decentralized governance, in terms of increase in number of local governments and increase in transfer of revenue from federation account to states and local governments influence economic activities and growth in Nigeria.

Finally, Faguet (2005) suggests that decentralization in Bolivia and Colombia made public investment more responsive to local needs. In Bolivia investment in education and sanitation rose where illiteracy was highest and sanitary connections poorest, respectively.

2.4.5 Political Influence

In his study on the politics of revenue allocation in Nigeria, Ojo (2009) concludes that Contemporary issues in Nigeria's political economy show that perhaps the most important issue of fiscal federalism is the revenue allocation formula, the sharing of national revenue among the various tiers of government (vertical revenue sharing) as well as the distribution of revenue among the state governments (that is, horizontal revenue allocation). In a similar study, Ikeji (2011) concludes that Federalism provides a framework for solving the political problem of administration and the economic problem of resource distribution. The explained further that in practice, sometimes, the optimization of administrative costs is an economic issue, where also the distribution of resources involves some political issues in determining the constitutional criteria for such allocation in such a way that will ensure equality and/or equity. Akpan and Umodong (2003) observe that

redistribution that can ensure equality will not guarantee efficiency, thus the question of balancing the inefficiency and equality in an acceptable way encompasses the use of economic and political means to induce compromise and agreement. This may involve the use of consultation approach to power balancing and the protection of rights.

At independence in 1963, Kenya ushered in a sense of great expectations among its citizenry. There was high anticipation that Kenyans would no longer experience poverty, disease and ignorance, thereby reducing the inequalities and inequities propagated by the colonialists (Boone, 2012). However, repressive policies designed by colonial and post-colonial governments resulted in dissent and gave rise of irredentism and the need for secession. The actions of the state towards the politically incorrect groups exemplify the kneejerk responses in political re alignments. A scorched-earth policy was adapted against such peoples and the injustices set in (Birch, 2003).

Infrastructural and other investments by post-colonial Kenya governments favoured the so-called high yielding areas and the presidents region (Kenyatta and Moi eras). To punish the peoples of other regions for dissension, the Kenyatta and Moi governments deprived these communities' key infrastructural investments. The government's focus of social and physical infrastructure was noticeable in key sectors such as education, health and water supply (KHRC, 2010). Even with the introduction of the District Focus for Rural Development in the 1980s, which was meant to redirect resources to formerly economically neglected areas, the unequal distribution and investment continued. Such measures were instrumental in fuelling and sustaining a sense of neglect and of not belonging to Kenya.

Weak governance and leadership presented a major challenge on issues of equity and equality within the country. In the past, public appointments paid little attention to Kenya's diversity. In this context non-appointment of citizens from some communities served to exclude them from participating in national development agenda and highlighting the regions' plight to the government. Equally, the steady mismanagement of public financial resources and increasingly autocratic and repressive presidencies did little to alleviate the situation of the peoples of the marginalized areas (Boone, 2012). Continued repression of other regions was the

order of the day and as such, these and other governance challenges did not augur well to enhance access to resources by these regions between 1963 and 1978 (Birch, 2003). There were no specific and effective economic redistributive mechanisms put in place by the postcolonial governments. National policies, such as Sessional Paper No. 10 of 1965 whose thrust was to focus public investment on areas with the highest absorptive capacity resulted in the concentration of resources away from areas largely ignored during the colonial period (KHRC, 2011).

There was little change after 1978. Despite the Nyayo philosophy of Love, Peace and Unity, there was little attention paid to past grievances among Kenyans and in particular those from marginalised areas during the 1980s and 1990s. Specifically, through the 1980s and 1990s, there was: (i) Lack of decisive land reforms and persistence of land based conflicts; (ii) Little regard for Kenya's diversity vis-à-vis public appointments and recruitment within civil service; (iii) Inequitable distribution of budgetary resources; (iv) Mismanagement of public resources; and (v) Autocratic governance, among other challenges (KHRC, 2011). In addition, constitutional changes promoted the concentration of power in the presidency. Concurrently, budgetary resources remained overly centralized and development remained disproportionate despite the launch of the District Focus for Rural Development and the fifth National Development Plan's (1984-88) under the central theme of 'mobilising resources for equitable development' (Birch, 2003). The espousal of structural adjustment programmes through Sessional Paper No. 1 of 1986 further deepened vertical and regional inequalities. The net effect of this for marginalized areas was continued exclusion from access to resources and consequently perpetuation of acute poverty (Goldsmith, 2011).

Increasing perceptions of exclusion among various groups in society resulted in an escalation of internal demands for democratic governance and the return to multi-partyism, as well as calls for a new constitutional dispensation from the 1990s well into the new millennium (Boone, 2012). The 2002 elections brought the National Alliance Rainbow Coalition (NARC), which enjoyed massive goodwill from the citizenry, to power. The goodwill yielded some positive momentum towards a shared future. However, the NARC government performed badly in terms of economic distribution and inclusiveness. They perpetuated existing nationally divisive conditions including inadequate attention to regional and other inequalities,

which kept alive feelings of selective exclusion and continued marginalization for the minorities and other perennially marginalised groups (KHRC, 2011).

The balkanization of the country and increased ethnic bigotry arising from the struggle over the control of the constitution review process only added to a sense of hopelessness in Kenyans but worse still among the marginalised. In essence, marginalised groups were not given recognition in the Proposed Constitution of 2005 and this partly explains its rejection at the referendum. Increasingly the period 2002 to 2007 was a 'failed revolutionary period'; the marginalised groups were perhaps the most frustrated since they continued to live in the lowest rank of Kenya's economic pecking.

These frustrations came to the surface bare after the debacle of the disputed elections of December 2007. The 2007/2008 post-election violence was partly a culmination of an escalation of inter-ethnic rivalry and feelings of exclusion and marginalization. Like the previous governments, the post-2003 regime perpetuated the monopolization of key public appointments by the ruling elite, but increasingly found no purpose in attending to the question of the marginalised and historical injustices meted on Kenyans by past regimes (Keriga, 2009). Issues relating to the equitable distribution of resources seem to have excluded from the agendas of successive governments or were deliberately ignored. Spatial segregation of services, intergenerational reproduction of poverty increasingly has fostered inequality in the marginalised areas (Goldsmith, 2011). The huge investment on Thika Road superhighway is just fresh in many marginalised groups minds whose areas have not had a murram road let alone a tarmacked road since independence.

The foregoing discussion provides a broad picture of the historical context of neglect, exclusion and lack of distributive mechanisms in Kenya. It is evident that little was done by post- independence regimes to promote equitable distribution of resources and specifically recognize minorities and the marginalised by positively redressing these injustices (Keriga, 2009). It was not until the promulgation of the new Constitution (2010) that the marginalised and minorities were recognized. To this end, Kenya cannot afford to make any other missteps in its bid to have an all-inclusive development.

Revenue Allocation Parameters Used by CRA

The CRA chose to use an expenditure needs approach to selecting parameters. An expenditure needs formula adjusts funding to reflect the fact that it costs more in some counties to deliver services than it does in others (ROK, 2012). It does not take into account differences in revenue-raising capacity. There are different approaches to measuring the expenditure needs of counties. These include the equal per person, historical spending of counties, top-down per client norms, bottom-up costing of a standard basket of goods and services, and the weighted index of expenditure needs. In view of county-level data challenges, the CRA chose to use the weighted index of expenditure needs‟ approach as applied in many Federal states (ROK 2012). The CRA identified five parameters for sharing out revenue among the counties. These are: Population; Poverty index; Land area; Basic Equal Share; and Fiscal responsibility.

2.4.6 Moderating Effect of Constitutional on Revenue allocation in Kenya

Kenya's counties enjoy a constitutional guarantee that at least 15 percent of national revenue will be handed over unconditionally, but the definition of the base has not always been clearly agreed upon (ROK, 2010). First, the definition of the universe of national revenues was initially the subject of some debate. Second, although the Constitution is clear that the formula will be applied to the last audited set of accounts, the implied lag in base years does not appear to be always well understood in policy circles (and much less the media or the public who understand the 15 percent as applying to the current year's budget). The ultimate definition of the base may not matter so much, although some choices appear more rational. To the extent that the CRA has the ability to recommend any percentage for the unconditional equitable share above the ceiling of 15 percent, it has the flexibility to determine what combination of base and rate corresponds to the targeted level of unconditional transfer. The CRA Act, currently the only legal definition of the base, appears sensible to the extent that it includes the main sources of revenue (tax and non-tax revenues), but excludes donor funding, appropriations in aid, domestic borrowing and 'revenues' linked to dedicated funding schemes (such as RLMF and LATF). Because the equitable share is guaranteed in terms of a percentage (and not an amount), including highly volatile elements in the base (such as domestic borrowing or donor funding) that would be detrimental to the predictability of

transfers to counties. Moreover, it would make little sense to re-channel to counties on an unconditional basis, funds that are collected (internally or externally) with specific purposes in mind, such as donor funds or earmarked funds such as RMLF or LATF (ROK, 2012).

The Constitutional provisions on how to calculate the revenue base for the equitable share, referred to as 'national revenue', have caused some confusion because it is not entirely clear which revenues should be included. In particular: Article 202(1) refers to *"revenue raised nationally"* (the phrasing here implies a consideration for revenues raised in the whole nation rather than by one level of government). Article 203 refers to *"all revenue collected by the national government"* (this might be interpreted to include donor funds, funds from domestic borrowing and AIAs). Article 206 describes the money that should go into the consolidated fund as *"all money raised or received by or on behalf of the national government"* (again this might be interpreted to include donor funds, funds from domestic borrowing and AIAs) (ROK, 2010).

During 2011 this ambiguity was exacerbated when two alternative definitions of national revenue were put forward in the Commission on Revenue Allocation (CRA) Act and the Intergovernmental Fiscal Relations Bill. The latter has now been dropped and the definition included in the CRA Act (Section 2(1)) is now accepted, namely that: *"'revenue' means all taxes imposed by the national government under Article 209 of the Constitution and any other revenue (including investment income) that may be authorized by an Act of Parliament, but excludes revenues referred to under Articles 209(4) and 206(1)(a)(b) of the Constitution."*(ROK, 2011)

The revenues excluded from the CRA Act definition referred to in Article 209(4) relate to fees and charges of national and county governments for services and those in Article 206(1) relate to money excluded from the Consolidated Fund by an Act of Parliament and payable into another public fund.

Article 201 of the Constitution sets the following principles to guide all aspects of public finance in the Republic (a) there shall be openness and accountability, including public participation in financial matters; (b) the public finance system shall promote an equitable society, and in particular, (i) the burden of taxation shall

be shared fairly, (ii) revenue raised nationally shall be shared equitably among national and county governments; and (iii) expenditure shall promote the equitable development of the country, including by making special provision for marginalized groups and areas; (c) the burdens and benefits of the use of resources and public borrowing shall be shared equitably between present and future generations; (d) public money shall be used in a prudent and responsible way; and (e) financial management shall be responsible, and fiscal reporting shall be clear (ROK, 2010).

2.5 Critique of Existing Literature Related to the Study and the CRA parameters

Problems of revenue allocation by its nature tend to have important institutional and economic dimensions that vary from one country or region to another (Ebel and Serdar, 2009). Shifting the locus of fiscal responsibility among levels of government may occur relatively incrementally, as in stable federation like the US, or they may occur with dramatic speed, as in the disintegration of the Soviet Union or the unification of Germany (Roberge, 2003).

In Nigeria several studies mainly exploratory (such as Aluko, 2000; Ekpo, 2004; Khemani, 2001; Mbanefoh & Egwaikhide, 2000; Suberu, 2006; Uche & Uche, 2004) were carried out on how revenue is shared within the federal government, state governments, and local governments and the basis of sharing the revenue to these federating components. But these studies could not empirically study the impact of the revenue allocation on economic development of Nigeria. Other studies, such as Aigbokhan (1999), Jimoh (2003), Emengini and Anere (2010), Akeem (2011), and Usman (2011) carried out empirical studies on the effects of the level of decentralization of government activities including revenue allocation on Nigeria's economic development using econometric analysis. However they did not examine the causal effect of the revenue allocation parameters on the revenue allocation formula.

Allocation formulas are often incredibly complex. Frequently, they require a bewildering combination of mathematical calculations. Quite often, they are not clearly understood by policy makers, program designers, or even the statisticians.

Mathematical models, from which policy makers derive allocation formulas, fail, even with the best available data, to produce the desired allocation pattern, because models generally represent an oversimplification of the real world.

Although proponents of allocation formulas suggest that predictability is one of their strengths (especially when compared with policy makers' caprice), in many instances, public administrators find they cannot predict the results the formula will produce. Also, often, the formula or model does not reflect the complexity of natural and social phenomena. Unpredictability, as a result, cripples long-term planning and budgeting at all levels of government. This inability to plan, ironically, makes for poor policy execution because of the simplicity of the models and formulas. It is not an easy task to design a formula that closely approximates congressional intent; however, the job gets more difficult when the legislature does not make the goals and objectives of a particular program clear. As one might expect, a decision to adopt a specific formula involves a series of distinct prior choices. An inappropriate decision at any of these steps in the process may lead to a formula, which results in skewed allocations.

A central dilemma for formula allocation is that while it simplifies justifications for budget requests, it frequently presents difficulties in reconciling various policy objectives. For instance, the U.S. Department of Transportation Highway Funding Formula attempts to meet a relatively large number of objectives, some of which are in conflict with one another. For example, one objective is to return funds to the states. At the same time, the program must address national goals and deal with "externalities," which often require redistributing resources from one state to another.

2.6 Research Gaps

The structure of intergovernmental finance varies widely from one country to another, often for distinctive historical reasons. But there is an ongoing process of evolution of public sectors in which there are opportunities for the realignment of responsibilities and of fiscal and regulatory instruments. This is nowhere more evident than in Kenya where there are reforms taking place for devolution within the country. Centralization and Decentralisation are expected to take place hand in

hand. The experience of other nations can provide useful guidance. For example, Kirchgässner and Pommerehne (1996) having examined the effects of tax competition in Switzerland, concluded that it has not seriously undermined the operation of a relatively decentralized fiscal system. More generally, fiscal decentralization itself provides potential "laboratories" for policy experimentation. As pointed out long ago by Bryce (1888) in his insightful study of the United States, "Federalism enables a people to try experiments which could not safely be tried in a large centralized country". In fact, the United States' experience involves a number of important and intriguing cases where policies were initiated at local or state levels, and after their successful operation there, were later instituted at the central level (Oates, 1999). These so-called "laboratories of democracy" can produce valuable experience with a variety of different policy options, experience that can be usefully drawn upon elsewhere. Researchers therefore need to continually use the policies available to model revenue allocation options that can inform the devolution efforts. The Kenya constitution provides a basis for researchers to model an equitable revenue allocation bearing in mind the perfectly differentiated counties.

2.7 Chapter Summary

This chapter explored theoretical literature by exploring the theory of fiscal federation on which this study is anchored. We then explored the constitutional and legal mandate of the various federal states in Europe, America, Asia and Africa. The chapter also presented the theoretical perspective of the parameters and their weights as used in federal states. We then explored the theoretical perspective of revenue allocation formulae as used in federal states. The conceptual framework was then presented to link our independent variables to the dependent variable. After this, the empirical literature review was discussed by looking at the constitutional guide on revenue allocation in Kenya, weights of revenue allocation parameters in other states and Kenya. We then gave the history of revenue allocation commissions in Nigeria to reflect the performance of commissions in Africa. Nigeria was selected because it has been the most experienced federal state in Africa, given its diversity in terms of tribes, economic imbalance and politics. The chapter then explored the historical injustices in Kenya which has created

imbalance in regional development. The empirical review was then concluded by presenting a critique of existing literature and a critique of the CRA parameters.

Kenya constitution 2010 forms the basis for revenue allocation to county governments. From one county to the other, there are variations based on the conjunction of their history, politics and development paradigms. However, one thing that is certain is that a devolved system which is not guided by an equitable revenue sharing formula invariably bogged down by persistent and perennial conflicts between the national and county governments and among the county governments until appropriate model for revenue sharing is established. The literature has stressed, quite properly, the importance of equal share for decentralized levels of government. The basic idea here is that an effective revenue sharing formula that addresses fiscal issues in federal finance in Kenya. It is interesting, in this regard, that the evolution of many of the industrialized countries over the past century or two involved long periods of fiscal centralization (Oates, 1999). And the point of departure for this evolution in many instances (like the United States) was a setting with a relatively well developed system of state and local taxation. In the United States, for example, at the beginning of the twentieth century, the central government share in public expenditure and revenues was only about one-third. Much of the industrialized world, there has existed a well-established system of decentralized revenue sharing. In the current context, in contrast, the Developing Nations have, as a starting point, a highly centralized system of finance with very limited and weak institutions for local revenue collection and hence the over-dependence on the Central Government. Finally the chapter concluded by presenting the research gaps that exist, some of which, it is hoped shall be filled by this study.

In a nut shell fiscal equalization is a prominent feature of many (but not all) systems of federal finance. Equalization measures take a number of different forms, but their basic purpose is the same: to transfer funds to fiscally weak jurisdictions. It certain cases, fiscal equalization may be imbedded in a system of revenue sharing in which the central government provides disproportionately large transfers to provincial, state, and/or local governments that have small tax bases relative to some measure of fiscal needs. The use and role of fiscal equalization varies significantly from one country to another. In many systems of federal finance,

Canada, Australia, and Germany to mention only three, equalization measures have been a major feature of inter-governmental finance. In Canada, one can argue that they have played an important political role in holding the federation together. In other cases such as Italy, they have been a source of considerable political tension resulting in resentment from the continuing transfers from the north to the south. In contrast, in the United States, there has been little interest in fiscal equalization at the central government level.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was used in the study. The chapter starts by explaining the survey research design that was adopted; according to Krathwohl and Smith, (2005). Based on the model and variables developed in Chapter two, this chapter covers the research design and research methodology which was used to test the variables. In particular, issues related to research design, the population, the type of data to be collected, sampling frame, sample and sampling techniques, data collection instrument, data collection procedure, pilot test, validity and reliability of the instrument, and the data analysis and presentation are discussed. Lastly, the chapter presents the analytic techniques used to test the hypotheses.

3.2 Research Design

The study used cross sectional survey study. Survey research design generally entails the use of sample population to analyze and discover occurrences of events. It is suitable for extensive research and provides the ability to understand populations from a part of it (Krathwohl & Smith, 2005). The design enabled the researcher to collect data using questionnaires. Interview was also conducted face to face with county government officers to collect data. The study adopted the causal survey research because the data gathered was quantitative in nature as well as pre-planned and structured. This helped in attempting to explain the cause and effect relationship between revenue allocation parameters and the revenue allocation formula. In the end this design helped to understand which variables were the cause and which variables were the effects. It also helped to determine the nature of relationship between the causal variables and the effect predicted. In their studies Sergio (2001), GAO (2001), Moore (2011), Spencer (2012), Rossi and Dafflon (2012) used the causal survey research method to determine the effects of parameters in revenue allocation and also calculate the indices used in determining parameter weights.

3.3 Population

For any study to collect information for a given research work, the researcher must specify the entire group that should embrace the information (Sekaran, 2010). Population has been defined as the totality of any group, persons or object which is defined by some unique attributes, that is all items in any field of inquiry constitute a 'universe' or population. (Krathwohl, 1988; Kothari, 2009). The population for this study consisted officers at the county level. These included the governors, the deputy governors, the county controllers of budget, the county speakers, the deputy county speakers, the executive members, the county secretaries, the county transition coordinators, the principal finance officers, the heads of internal audit, the county budget officers and the elected and nominated county assembly representatives. This constitutes a total population of 3,112. These officers were considered because they have all undergone basic training/briefing by the CRA on revenue allocation and are therefore conversant with the parameters used in the revenue allocation model. They are also constitutionally responsible for the effective day to day management of the counties. Section 179 of Kenya's Constitution defines the composition of the county Executive Committee. All these targeted public officers are assumed to have critical information regarding revenue allocation formula, and thus have the knowledge and skills that may contribute to the modelling of the formula. It is, therefore, expected that information from the stated target population can help respond to the research questions and ultimately meet the stated research objectives.

3.4 Target Population

Target population has been defined as the entire group of elements of interest from which the researcher seeks to obtain the relevant information for the study (Sekaran, 2003). The target population for this study was made up of 596 senior county officials drawn from 9 Counties sampled from the 47 Counties as explained in the sampling frame. This forms 19.15% of the total population by Counties. Gay, Mills and Airasian (2005) observe that for descriptive studies such as the proposed one, 10% of the accessible population is an adequate sample as long as it allows for reliable data analysis by cross tabulation, provides desired level of accuracy in estimating the large population and allows testing for significance of differences

between estimates. Paton (2002) contends that the sample size depends on what one wants to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility and what can be done within the available time and resources. Given that revenue allocation formula in Kenya has been an emotive issue, the researcher felt that the sample should not only be representative, but also large enough to include the divergent views of all stakeholders.

3.5 Sampling Frame

Any sample selection procedure will give some individuals a chance to be included in the sample while excluding others. Those people who have a chance of being included among those selected constitute the sample frame (Lohr, 1998). Sampling is a process of choosing a sufficient number of elements/cases/individuals from the population (Sekaran, 2003; Saunders *et al.,* 2007). In order to obtain the sampling frame, the 47 counties were ranked according to their population density as follows;

Table 3.1: County Ranking by Population

Rank	County	Population Density	Rank	County	Population Density
1	Nairobi	4,514.98	25	Embu	183.18
2	Mombasa	4,292.09	26	Machakos	176.96
3	Vihiga	982.55	27	Tharaka	138.44
4	Kisii	874.58	28	Elgeyo-Marakwet	122.12
5	Nyamira	665.25	29	Makueni	110.45
6	Kiambu	638.23	30	Kilifi	88.01
7	Kakamega	550.31	31	Kwale	78.59
8	Kisumu	464.50	32	Westpokot	55.91
9	Bungoma	453.49	33	Baringo	50.44
10	Busia	438.90	34	Narok	47.45
11	Murang'a	368.37	35	Laikipia	42.19
12	Kirinyaga	357.01	36	Mandera	39.47
13	Migori	353.31	37	Kitui	33.21
14	Siaya	332.88	38	Kajiado	31.38
15	Transnzoia	328.09	39	Taitataveta	16.66
16	Bomet	319.38	40	Lamu	16.19
17	Homabay	302.77	41	Garissa	14.10
18	Kericho	273.73	42	Turkana	12.45
19	Uasingishu	267.30	43	Wajir	11.68
20	Nandi	261.07	44	Samburu	10.65
21	Nakuru	213.92	45	Tanariver	6.25
22	Nyeri	207.83	46	Isiolo	5.66
23	Meru	195.63	47	Marsabit	4.10
24	Nyandarua	183.74			

Adapted from: *The Kenya National Bureau of Statistics (2009)*

The population density in Kenya as per the 2009 census is 66.42 persons per square kilometre. The counties were classified into very high density counties (1000 and above people per sq. Km), high density counties (500-999 people per sq. Km), medium density counties (150-499 people per sq. Km) and low density counties (less than 150 people per sq. Km). The population density was used because the most contentious issue in revenue allocation in Kenya has been whether to give the most populous counties more funds or to give the more money to counties with larger geographical area.

3.6 Sample and Sampling Technique

In order to determine the sample size of the study in Kenya, Cluster random sampling and multi-stage random sampling was used. According to Kothari (2009), cluster random sampling is considered a more practical approach to surveys because it samples by groups or clusters of elements rather than by individual elements. He further states that in multi-stage sampling the first stage may be to select large primary sampling units such as states, then districts, then towns and finally certain families within towns.

Population density was used to cluster the counties into five distinct categories namely: 1) Very High population density counties; 2) High population density counties; 3) Medium population density counties; 4) Low population density counties and 5) Very low population density counties. The following scale was used to cluster the counties.

Table 3.2: County Clusters

	Cluster	Range (people per sq. KM)
1	Very High Population Density	1000 and above
2	High Population Density	500-999
3	Medium Population Density	300-499
4	Low Population Density	100-299
5	Very Low Population Density	Less than 100

The clustering resulted in the following results.

Table 3.3: Very High Population Density

	County	Density (people/sq. km)
1	Nairobi	4,514.98
2	Mombasa	4,292.09

Table 3.4: High Population Density

	County	Density (people/sq. km)
1	Vihiga	982.55
2	Kisii	874.58
3	Nyamira	665.25
4	Kiambu	638.23
5	Kakamega	550.31

Table 3.5: High Population Density

	County	Density (people/sq. km)
1	Kisumu	464.50
2	Bungoma	453.49
3	Busia	438.90
4	Murang'a	368.37
5	Kirinyaga	357.01
6	Migori	353.31
7	Siaya	332.88
8	Transnzoia	328.09
9	Bomet	319.38
10	Homabay	302.77

Table 3.6: Low Population Density

	County	Density (people/sq. km)
1	Kericho	273.73
2	Uasingishu	267.30
3	Nandi	261.07
4	Nakuru	213.92
5	Nyeri	207.83
6	Meru	195.63
7	Nyandarua	183.74
8	Embu	183.18
9	Machakos	176.96
10	Tharaka	138.44
11	Elgeyo-Marakwet	122.12
12	Makueni	110.45

Table 3.7: Very Low Population Density

	County	Density (people/sq. km)
1	Kilifi	88.01
2	Kwale	78.59
3	Westpokot	55.91
4	Baringo	50.44
5	Narok	47.45
6	Laikipia	42.19
7	Mandera	39.47
8	Kitui	33.21
9	Kajiado	31.38
10	Taitataveta	16.66
11	Lamu	16.19
12	Garissa	14.10
13	Turkana	12.45
14	Wajir	11.68
15	Samburu	10.65
16	Tanariver	6.25
17	Isiolo	5.66
18	Marsabit	4.10

To select a fairly representative number of counties to be considered in each cluster, the number of counties in each cluster were proportionately weighted against the total number of counties used for selected nine counties from the five clusters as shown in Table 3.8.

Table 3.8: Sampled Counties

CLUSTER	**Number of Counties in the Cluster**	**Percentage**	**Number of counties picked (% X 9)**	**Rounded off to nearest unit**
Very High Population Density counties	2	4.26%	0.383	1
High Population Density counties	5	10.64%	0.957	1
Medium Population Density counties	10	21.28%	1.915	2
Low Population Density counties	12	25.53%	2.298	2
Very Low Population Density counties	18	38.29%	3.446	3
Total	**47**	**100%**	**8.999**	**9**

As shown in Table 3.8 one county was selected from the very high population density counties. Since they are only two, the researcher tossed a coin after naming the head to be Nairobi County and the tail to be Mombasa County. The coin landed and the head came up. Nairobi County was, therefore, selected. For the second and the subsequent clusters the researcher numbered the counties in pieces of uniform two inch square papers, folded them and put them in an opaque black polythene paper. After shuffling, a piece of paper was picked and the respective County was listed until the desired number of Counties was attained. The pieces of papers picked were replaced before picking the next in order to give each count an equal chance of being picked. Whenever a County was picked twice, the exercise was repeated.

From this exercise the following Counties were sampled. Nairobi, Kiambu, Bungoma, Homabay, Meru, Makueni, Kajiado, Kitui, Lamu. The distribution of targeted officers in these counties are as follows;

Table 3.9: MCAs Distribution

	County	Elected Members	Nominated Members	Others	Total
1	Nairobi	85	37	20	142
2	Kiambu	60	27	20	107
3	Bungoma	45	18	20	83
4	Homabay	40	23	20	83
5	Meru	45	24	20	89
6	Makueni	30	17	20	67
7	Kajiado	25	16	20	61
8	Kitui	40	17	20	77
9	Lamu	10	10	20	40
	Total	**380**	**189**	**180**	**749**

To determine the sample size the researcher used Yaro Yamane formula. According to Yamane, (1967), $n = N/ [1 + (Ne^2)]$, Where n = is the sample size, N is the population, e is the error limit (0.05 on the basis of 95% confidence level). Therefore, $n = 749/1 + 749(0.05)^2 = 260$. The method of proportionate allocation was used to determine the number of respondents expected from each of the sampled Counties. This is shown in table 15.

Table 3.10: Sampled Respondents

	County	Target Population	Weight in Percentage (%)	Sample Population
1	Nairobi	142	18.96	50
2	Kiambu	107	14.29	37
3	Bungoma	83	11.08	29
4	Homabay	83	11.08	29
5	Meru	89	11.88	30
6	Makueni	67	8.95	23
7	Kajiado	61	8.14	21
8	Kitui	77	10.28	27
9	Lamu	40	5.34	14
	Total	**749**	**100**	**260**

3.7 Data Collection Instruments

The main aim of the study was to model a revenue allocation formula for the devolved government of Kenya. The study analysed both primary and secondary data. The researcher developed research questions for collecting primary data. The study exploited more than one method of data collections with the aim of enhancing generation of deeper and broader insights on the area of study and to confirm the collected data (Patton, 1990; Yin, 2003). The study mainly used questionnaires and interview methods for primary data and in some instances document analysis was used as source of secondary data.

3.8 Data Collection Procedure

The procedure followed in data collection involved a pilot test which was carried out in order to identify whether the developed instruments or items or test really agreed with thewould be contents of the research questions. This was followed by data processing which involved editing, coding, classification, tabulation and

graphical presentation of data. This gave room to data analysis which aimed at establishing the statistical significance of the relationships between the various variables.

3.9 Pilot Test

Validity is the process of finding out the degree to which researcher or test indeed measures what it purports to measure". The purpose of the exercise is to identify whether the developed instruments or items or test really agreed with the would be contents of the research question and where they are not completely well understood, the researcher has to modify such areas before carrying out main study (Kothari, 2009; Creswell, 1994).

This study conducted a pilot test on equivalent to 7.6% of the study sample of 260 objects, or an equivalent of twenty (20) respondents drawn from counties other than those selected for this study. Colleagues at the workplaces (Technical University of Kenya and Kenyatta University were used in testing the quality of instrumentation used during data collection. The pilot testing exercise was conducted in a manner that mirrored the actual study. Observations made during the pilot testing exercise helped to improve the nature of questions contained in the questionnaire instrumentation. The pilot sample was conveniently selected to fast track the process and minimized time wastage in the collection of the pilot data as well as analysis.

3.10 Data Processing

Data processing involves editing, coding, classification, tabulation and graphical presentation. The data collected in research required certain amount of editing for making it unambiguous and clear as well as for maintaining consistency and accuracy (Hall, 2010). The researcher performed central editing of data, that is, data was brought together for editing. According to (Fernandes, 2009), coding refers to assigning data measured and collected to a limited number of mutually exclusive but exhaustive categories or classes. The researcher performed this as a basic step in processing. To create such mutually exclusive but exhaustive classes, it is

necessary to do classification of data by arranging data in groups or classes on the basis of common characteristics (Fernandes, 2009).

In this study, we collected data based on the following specific objectives: To establish the weaknesses and strengths of the CRA parameters in the first generation revenue allocation formulae in Kenya: To identify other parameters that would model an equitable revenue allocation formula for the devolved government in Kenya: To determine parameter weights that would model an equitable revenue allocation formula for the devolved government in Kenya: Establish whether politics in Kenya influences the revenue allocation formula and finally: Propose an equitable revenue allocation formula(e) for the devolved governments in Kenya.

3.11 Data Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) Version 21 software package. SPSS contains a set of statistical techniques that allow relationships between one or more independent variable either continuous or discrete and one or more dependent variables (Tabachnick & Fidell, 2001). The data analysis aimed at establishing the statistical significance of the relationships between the various variables. Data analysis was divided into quantitative and qualitative. The quantitative data collected was analyzed using descriptive statistics which include frequency, mean and standard deviation as well as inferential statistics like correlation and regression. Correlation and regression were used to test the model. The qualitative data was coded and prepared for analysis in form of frequencies.

This study collected and analysed primary data which was keyed into an excel table, before it was subjected to meaningful analysis through SPSS. The process involved the identification and correcting of errors in the data (data cleaning), coding the data and storing it in excel form. Qualitative data was coded and analyzed simultaneously using content analysis method. A list of key categories and themes for each variable were generated and this helped guide the nature of integration needed for the qualitative data processed. This process, according to Cooper and Schindler (2011) involved reading through the questionnaires, developing codes, coding the data, and drawing connections between discrete

pieces of data. With the data coded and summarized, the researcher then analyzed, synthesized and presented the findings using the SPSS software. Spread sheets were used to present the results in graphical forms (pie charts and bar graphs) as well as frequency tables.

3.12 Results Interpretation Guide

3.12.1 Mean Interpretation

In the preceding results, the analysis was done using mean in the range of 0 to 5 inclusive as shown in Table 3.11

Table 3.11: Mean Interpretation

Mean	Category	Scale
0 and 1.499	Very valid extent	1
1.5 and 2.499	Valid extent	2
2.5 and 3.499	Moderate extent	3
3.5 and 4.499	Invalid extent	4
4.5 and 5	Very invalid extent	5

3.12.2 Standard Deviation Interpretation

The standard deviation measures how concentrated the data are around the mean; the more concentrated, the smaller the standard deviation. Standard deviation can be difficult to interpret as a single number on its own. Basically, a small standard deviation means that the values in a statistical data set are close to the mean of the data set, on average, and a large standard deviation means that the values in the data set are farther away from the mean, on average.

The standard deviation can never be a negative number, due to the way it's calculated and the fact that it measures a distance (distances are never negative numbers). The smallest possible value for the standard deviation is 0, and that happens only in contrived situations where every single number in the data set is exactly the same (no deviation). The standard deviation is affected by outliers

(extremely low or extremely high numbers in the data set). That's because the standard deviation is based on the distance from the mean.

The standard deviation was analyzed as either low or high depending on whether the deviation value was less or more than 1.0. If the standard deviation is less than 1.0, this is low standard deviation which is an indication that the respondents did not differ much in their opinion, an indication that respondents almost said the same thing. If the standard deviation is greater than one, this is high standard deviation, an indication that respondents differed much in their opinion.

3.12.3 Correlation interpretation

Correlation refers to a technique used to measure the relationship between two or more variables. When two things are correlated, it means that they vary together. Positive correlation means that high scores on one are associated with high scores on the other, and that low scores on one are associated with low scores on the other. Negative correlation, on the other hand, means that high scores on the first thing are associated with low scores on the second. Negative correlation also means that low scores on the first are associated with high scores on the second.

The study used the Pearson r to calculate the correlations. The Pearson Correlation Coefficient is used to measure the strength and direction of association that exists between two variables measured on at least an ordinal scale. Correlation coefficients can vary numerically between 0.0 and 1.0. The closer the correlation is to 1.0, the stronger the relationship between the two variables. A correlation of 0.0 indicates the absence of a relationship.

3.12.4 Communality Interpretation

This is the proportion of each variable's variance that can be explained by the principal components (for example, the underlying latent continua). It is also noted as h^2 and can be defined as the sum of squared factor loadings. Communality analysis is a technique used to decompose R2 in multiple regression analyses into the per cent of variance in the dependent variable associated with each independent variable uniquely, and the proportion of explained variance associated with the

common effects of predictors. Communality analysis thus sheds additional light on the magnitude of an obtained multivariate relationship by identifying the relative importance of all independent variables. It indicates the amount of variance in each variable that is accounted for. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. For principal components extraction, this is always equal to 1.0 for correlation analysis.

3.12.5 Factor Analysis Interpretation

Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. It is possible that variations in four observed variables mainly reflect the variations in two unobserved variables. Factor analysis searches for such joint variations in response to unobserved latent variables. The observed variables are modelled as linear combinations of the potential factors, plus "error" terms. The information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset. Factor analysis is related to principal component analysis (PCA). Latent variable models, including factor analysis, use regression modelling techniques to test hypotheses producing error terms, while PCA is a descriptive statistical technique. Factor analysis was done to establish the relationships among the study variables.

3.12.6 Multicollinearity

According to Besley, Kuh and Roy (1980) and Green (2000), identification of multicollinearity in a model is important and is tested by examining the tolerance and the variance inflation factor (VIF) diagnostic factors. The variance inflation factor (VIF) measures the impact of multicollinearity among the variables in a regression model. Green (2000) concluded that even though there is no formal criterion for determining the bottom line of the tolerance value or VIF, tolerance values that are less than 0.1 and VIF greater than 10 roughly indicates significant multicollinearity; a conclusion supported by Tavakol and Dennick (2011) and Gujarat (2009). A multicollinearity test was performed among the variables of the study and the results obtained are discussed in chapter four of this research study.

3.12.7 Autocorrelation

Gujarat (2009) and Cameron (2005) defined autocorrelation as the correlation between members of a series of observations ordered in time or space. A Durbin-Watson test was used to detect the presence of autocorrelation between the variables and this produced a value of 1.348. According to Gujarat (2009), the Durbin-Watson statistic ranges in value between 0 and 4. A value near 2 indicates non-autocorrelation; a value closer to 0 indicates positive correlation while a value closer to 4 indicates negative correlation. An autocorrelation test was performed on the variables of the study and the results obtained are discussed in chapter four of this research study.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter measures and analyses data using various statistical tools for different constructs and variables of the study. The results from the study are summarized and discussed in this chapter. In its analysis, data from questionnaires was organised, coded, analysed and converted into quantitative summary reports for analysis using the Predictive analysis software (PAS), previously known as Statistical Package for Social Sciences (SPSS) software package. Data was first entered into the programme under specific category from which analysis was run to obtain descriptive statistics in form of frequencies and percentages. Quantitative data has been analysed using descriptive statistics. Reliability among multiple measures of variables of the study was checked using the Cronbach's alpha coefficients. In order to establish the nature of relationships between variables under investigation, scatter plots were employed and regressions done to determine the influence relationship between variables under investigation. Using content analysis technique, data was coded, put into theme categories and tallied in terms of the number of times it occurred. Qualitative and quantitative data were linked to enable confirmation and elaborate analysis of variables which included independent variable (diversification) organizational structure (moderating variable) and dependent variable (performance).

4.2 Respondents demographics

Response rate in a research context refers to the extent to which the collected set of data includes all sample members of the targeted population (Fowler, 2004). Response rate is calculated by the number of questionnaires collected or the number of people with whom interviews are completed divided by the number of the entire sample. In this study, data was collected from 9 counties in Kenya out of all the 47 counties. A total of 228 officers of the county governments responded out of the targeted 260 respondents. This represented 87.69% response rate. Table 4.1 shows a detailed response rate per county. Lamu county had the least response rate

because during data collection, the Election of the Governor had been nullified and therefore there was skeleton staff. The highest response rates were obtained from Nairobi, Homabay, Kajiado, Kiambu and Kitui. According to Babbie (2002), a response rate of above 50% is adequate for analysis and therefore, an overall response rate of 87.69 % was considered as being very good for analysis.

Table 4.1: Response Rate

	County	Target Population	Sample Population	Actual Respondents	Percentage Response
1	Nairobi	142	50	50	100%
2	Kiambu	107	37	36	97.29%
3	Bungoma	83	29	24	72.75%
4	Homabay	83	30	30	100%
5	Meru	89	30	24	80.00%
6	Makueni	67	23	15	65.22%
7	Kajiado	61	21	19	90.48%
8	Kitui	77	27	25	92.5%
9	Lamu	40	14	5	35.71%
	Total	**749**	**260**	**228**	**87.69%**

4.3 Gender Distribution

The study sought to know the gender distribution of the respondents. From the responses, the majority (71.93%) were male while 28.07% were female as shown in table 4.2. The fact that male gender was the majority to a large extent may be a confirmation that the politics in Kenya is male dominated. The highest gender disparity was witnessed in Lamu with 100% respondents being male, while the lowest gender disparity was witnessed in Makueni where 53.33% were males and 46.67% females. The gender imbalance was not likely to affect the study as the nature of the research and questions asked were not gender sensitive and any unlikely error as a result of the gender imbalance could be insignificant and tolerable. However given that most of the responses in the research questions relied on opinions and perceptions, the gender distribution was expected to accommodate perceptions and opinions of either gender.

Table 4.2: Gender Distribution

Name of County	Male	Female	Total	Percentage Male	Percentage Female
Nairobi	39	12	51	60.78	39.22
Kiambu	29	7	36	80.56	19.44
Bungoma	21	6	27	77.78	22.22
Homabay	18	12	30	60.00	40.00
Meru	14	10	24	58.33	41.67
Makueni	8	7	15	53.33	46.67
Kajiado	16	3	19	84.21	15.79
Kitui	19	4	23	82.60	17.40
Lamu	3	0	3	100%	0%
Total	**164**	**58**	**228**	**71.93%**	**28.07%**

4.4 Reliability and Validity Tests

4.4.1 Cronbach's Alpha Test

Reliability and validity tests were conducted to test whether data collection instruments produced similar results on repeated trials. A statistical coefficient, Cronbach alpha (α) was used as a measure of internal reliability. It is computed in terms of inter-correlation among the items measuring the concept. The closer Cronbach's alpha is to 1, the higher the internal consistency (Sekaran, 2010). If the Cronbach's alpha is above 0.7 the instrument is reliable.

A total of 20 questionnaires were used to test for reliability of the pilot study instruments. The questionnaires gave a Cronbach's alpha coefficients ranging from 0.538 to 0.719. While it is generally agreed that loadings from factor analysis of 0.7 and above are preferable for analysis, Rahim and Magner (2005) explained that researchers use 0.4 as a realistic measure given that 0.7 can be high for real life data to meet this threshold. As indicated in the Principle Component matrices (Appendix

VII), all the components show a value of above 0.7. or very close to 0.7 and above. None of the components was dropped. Cronbach's alpha coefficient results on the independent variables are presented in Table 4.3.

Table 4.3: Reliability Test Results

Variable Description	Nature of Variable	Cronbach's Alpha	N of Items
Constitutional guide on revenue allocation	Independent	.844	6
CRA Parameters	Independent	.949	5
Other Parameters	Independent	.758	5
Political Influence on revenue per county	Independent	.903	4

4.4.2 Factor Analyses and Principal Component

The study used Factor Analysis to reduce the number of variables by combining two or more variables into single factor and to identify groups of inter related variables to see how they were related to each other. (Zikmund *et al*., 2010). Factor analysis is a statistical data exploration technique which is used in reducing a set of correlated variables to a smaller number of unobserved, uncorrelated factors (Cooper & Schindler, 2011; Mugenda & Mugenda, 2012; White, 2000). Both exploratory factor analysis (EFA) and Confirmatory Factor Analysis (CFA) were employed to understand shared variance of measured variables that were believed to be attributable to a factor or latent construct.

Principal Component Analysis (PCA) is a variable reduction procedure that aims at decomposing many correlated measurements into a small set of uncorrelated (orthogonal) artificial variables called Principal Components (Mugenda and Mugenda, 2012). The goal of PCA was to extract maximum variance from the data set with each component. Principal Component and Factor Analyses were performed on this study and appendix vii present the results obtained.

4.4.3 Multicollinearity Test

A multicollinearity test was conducted among the independent study variables using tolerance and variance inflation factor (VIF) statistics of predictor variables. The findings of the multicollinearity test are presented in Table 4.4. These findings show that the study independent variables; the constitutional guide on revenue allocation, the CRA parameters, additional parameters and political influence on revenue share per county have a high tolerance. VIF values for study variables range between 1.006 and 5.263, an indication that the beta values of the regression equation of four independent variables would be stable with low standard errors. The results presented in Table 4.4 show that there was no multicollinearity among the variables in the study data.

Table 4.4: Reliability Test Results

Variable	Tolerance	VIF
Constitutional guide on revenue allocation	.652	1.006
CRA Parameters	.397	5.263
Other Parameters	.264	4.235
Political influence	.853	1.549

4.4.4 Autocorrelation Tests

An autocorrelation test was conducted on the study using the Durbin-Watson statistic Autocorrelation makes predictors seem significant when they are not. The value of Durbin-Watson statistic lies between 0 and 4 and 1.5-2.5 for acceptable range. As a rough rule of thumb, Verbeek (2004) and Gujarat (2009) suggested that if the Durbin-Watson value is less than 1.0 or greater than 3.0, there may be cause for concern. Verbeek (2004) concluded that the closer to 2 the value is the better. In the case of this study, the result of the autocorrelation test shows that there was no cause for concern since the Durbin –Watson value is 2.348 and close to 2. Figure 4.1, also, shows that the study residuals do not form any unique pattern; thus reinforcing the assertion that there is no autocorrelation in the variables investigated in the study.

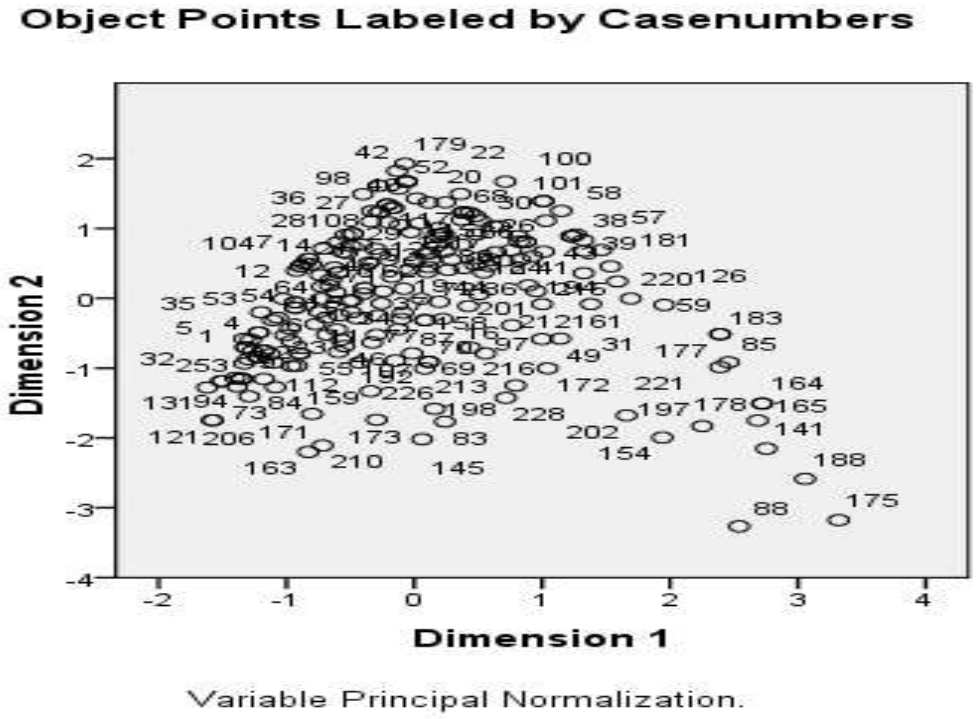


Figure 4.1 - Scatter Plot for Auto Correlation

4.5 Research Findings

This section presents descriptive analyses based on the findings and results obtained from the study. Results from each of the statements or questions used in collecting data have been corroborated with the literature reviewed in chapter two. Inferences have been drawn on the study findings obtained at the end of each question. Measures of central tendency, regression and correlation analyses, t-tests and ANOVA have been used to interpret the results obtained and draw conclusions on the study. Regression models for each of the variables and an integrated one have been fitted.

4.5.1 The influence of CRA Parameters on Revenue Allocation

The study analysed the various parameters used in the CRA revenue allocation formula. Some of their recommendations which are discussed in details in this section include: Increasing the weight on the parameter on population; considering historical injustices and environmental factors; including the level of infrastructural

development; addressing population dynamics as well as demographic variations; abolishing the Land area parameter since service delivery is to the people and not land; considering industrialization level of counties and disease burden as parameters given that health is a devolved function; addressing the credibility of the census of 2009 data; enhancing the fiscal responsibility Parameter; addressing the credibility issues on the data on poverty levels; addressing the capacity of counties to generate own revenue; providing incentives to counties that make the highest contribution to GDP; addressing the peculiarities of the counties; abolishing negative parameters like poverty index and high population as they encourage counties either to remain poor or populous and; Considering a parameter on the quality of life as represented by Human Development Index (HDI) which is substituted effectively in Kenya by the County Development Index (CDI).

Weighted Mean Statistics for the influence of CRA Parameters in Revenue Allocation Formula

The mean and standard deviations of the findings are indicated in table 4.5. The mean range used in the study is 0 to 5 inclusive. The mean obtained for the findings are between 2 and 3. The scale 2 is valid extent and 3 moderate. We can conclude the findings are valid since the means of the data obtained are within acceptable range.

The standard deviation is used to measure how concentrated the data are around the mean. The more concentrated the data, the smaller the standard deviation. A small standard deviation means that the values in a statistical data set are close to the mean of the data set. Table 4.5 findings indicate all the standard deviations are close to 1 for all the data findings. This implies all the data sets are concentrated around the mean scores hence valid for interpretations.

Table 4.5: Mean and Standard Deviation for CRA Parameters

	Mean	Std. Deviation
Population	3.10	1.241
Poverty Index	3.25	1.236
Equal Share	2.82	1.296
Fiscal Responsibility	3.10	1.110
Land Area	2.75	1.254

Coefficients of the CRA Parameters

Table 4.6 shows a positive beta coefficient of 25.1%, which further confirms that the CRA Parameters, have a positive influence on the formula in Kenya.

Table 4.6: Coefficients of CRA Parameter

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	18.884	.349		5.398	.000
Strategy Formulation and Execution	.265	.075	.251	3.556	.000

Using the summary presented in Table 4.6, a linear regression model of the form, $Y = \alpha + \beta X_i$ can be fitted as follows:

$Y = 18.884 + 0.265X_1 + \mu$

.....**Equation 1**

Pearson Correlation Coefficient for CRA Parameters

There is a 25.1% positive correlation between the CRA Parameters and the revenue allocation formula county in Kenya. The Pearson correlation coefficient is shown in table 4.7.

Table 4.7: Pearson Coefficients

		Revenue Allocation Formula	The CRA Parameters
Revenue Allocation Formula	Pearson Correlation	1	.251
	Sig. (2-tailed)		.000
	N	228	228
The CRA Parameters	Pearson Correlation	.251	1
	Sig. (2-tailed)	.000	
	N	228	228

Table 4.7 indicates that the CRA Parameters is statistically significant since its p-value is less than .05 (*p*-value =.000).

Regression Analysis for the CRA Parameters

The coefficients obtained indicate that the correlation coefficient (R) between the independent variable (CRA Parameters) and the revenue allocation Formula in Kenya was .251 which is a positive correlation relationship. Table 4.8 shows a coefficient of determination (R^2) of .063, which means that this variable alone can explain up to 6.3% of the variations in the dependent variable, revenue allocated Formula in Kenya.

Table 4.8: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.251[a]	.063	.092	1.246

ANOVA for the CRA Parameters used in the Revenue Allocation Model

An ANOVA test for the CRA parameters revealed that the variable has a P- value equal to .000, demonstrating that the model is statistically significant in explaining the change in the dependent variable. This is because the P-value is less than .05 at the 95% level of confidence.

Table 4.9: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	43.335	5	8.667	5.584	.000[a]
	Residual	344.595	222	1.552		
	Total	387.930	227			

According to the empirical results presented in Table 4.9, the Null Hypothesis (H_{01}) is rejected and a conclusion reached that, at 5% level of significance that the CRA parameters play a significant role in the revenue allocation model adopted by the CRA in revenue sharing amongst the 47 county governments in Kenya. This corroborates with the results of Fessler (2006) who found out that in the Western world, the underlying theory surrounding formula allocation seems to be a calculative logic that formulas are sensitive to the concerns of democratic government. These concerns include equity, efficiency, and effectiveness of service provision on behalf of the (voting) population. In the United States, prior to World War II, budget allocations were often based on historical precedent or negotiation; however, since that time, federal and state governments have progressively shifted in favor of distributing aid to states and localities by formulas (Fessler 2006). This shift to formula allocation may have dampened the political problems naturally arising from the annual competitive budget appropriation process in Congress at the federal and state levels of government. (Dugdale, 2007)

4.5.2 Other Parameters in Revenue Allocation

The study investigated the suitability of a number of parameters to be incorporated in the revenue allocation formula. The parameters investigated in this study are:

Internal revenue effort, Infrastructure development, Natural resource endowment of a county, Social service burden, and Accessibility to grants and other sources of funds by a county. Further the study asked respondents to suggest more parameters that they thought could be included in an equitable revenue allocation formula. The results obtained are shown in figure 4.6. Internal revenue effort had the highest response of 54%, Infrastructure development 53%, social service burden 50% while accessibility to grants by a county had 45%. Respondents were also asked to suggest at least three other parameters.

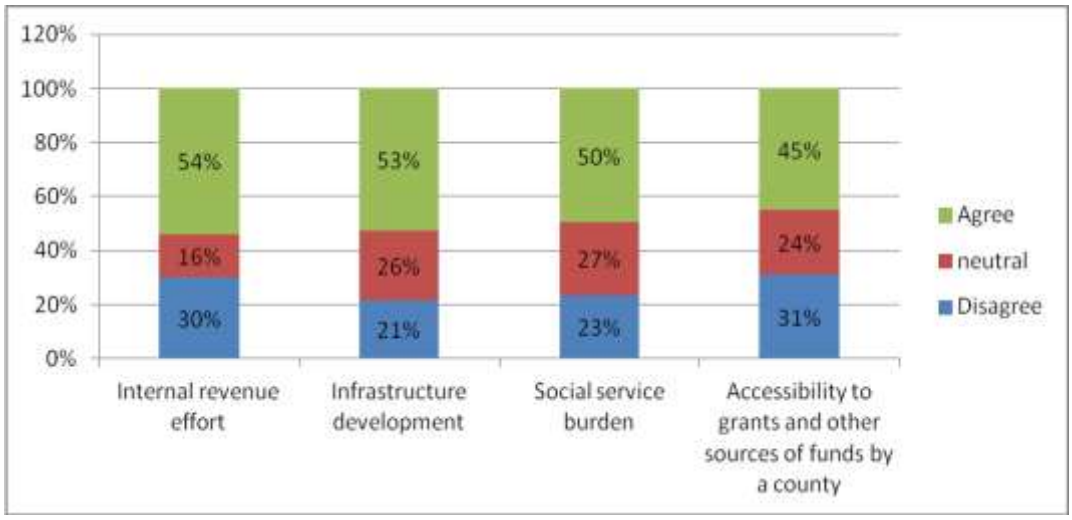


Figure 4.2: Other Parameters to be incorporated in Revenue Allocation

A number of parameters were also suggested by the respondents. These include; Infrastructure/ Distance from the city; location of county; Terrain; Natural resource; Tax Structure; Literacy level; Level of marginalization; Urbanization/ Industrialization; Absorption capacity by counties; Dependency ratio; Food security Index; Health Index; Disease prevalence; Level of Economic Activity/County Contribution GDP; Aridity/Land Productivity; Human Development Index; Historical Injustices; Environmental Conservation/ Environmental Pollution/Wildlife conservation; Climatic Condition; Sector Based Approach and Disability Gender Index.

Respondents were further asked to suggest whether the existing parameters should be retained as they are; more parameters should be introduced; all the parameters should be replaced with new ones or the revenue should be shared equally amongst the 47 counties. In response to this, 13% of them were of the opinion that we retain

the existing parameters as they are, another 13% suggested that there is no need of parameters and the revenue should be shared equally, 17% were of the opinion that we replace all the parameters with new ones, 57% however suggested that we introduce more parameters. This is shown below.

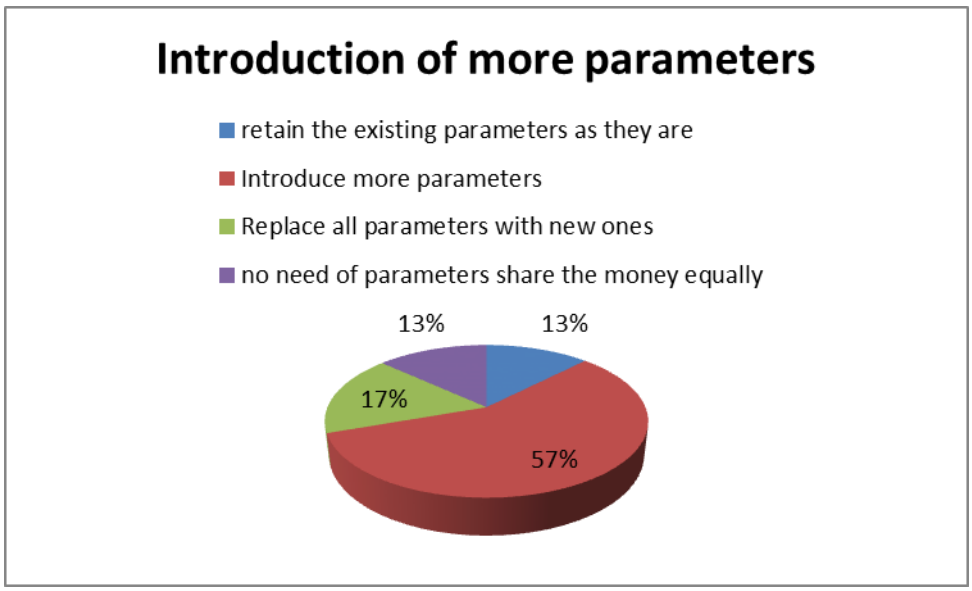


Figure 4.3: Introduction of more Parameters

Coefficients of other Parameters to be Considered in the revenue Allocation Model

A positive beta coefficient of 14.3%, was generated which confirms that more parameters may have a positive influence on the revenue allocation Formula for the devolved county governments in Kenya.

Table 4.10: Coefficients of other Parameters

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.013	.319		3.178	.002
	Other Parameters to be Considered in the Revenue Allocation Model	.148	.073	.143	2.025	.044

Using the summary presented in Table 4.10, a linear regression model of the form, $Y = \alpha + \beta X_i$ can be fitted as follows:

$Y = 1.013 + 0.148X_1 + \mu$ .....**Equation 2**

Pearson Correlation Coefficient for Other Parameters to be Considered in the Revenue Allocation Model

The study revealed that there is a 14.3% positive correlation between other parameters to be considered in the revenue allocation model and revenue allocation Formula for the devolved government in Kenya.

Table 4.11: Pearson Correlation Coefficient for Other Parameters

Correlations			
		Revenue Allocation Formula	**Other Parameters to be Considered in the revenue Allocation Model**
Revenue Allocation Formula	Pearson Correlation	1	.143
	Sig. (2-tailed)		.000
	N	228	228
Other Parameters to be Considered in the revenue Allocation Model	Pearson Correlation	.143	1
	Sig. (2-tailed)	.000	
	N	228	228

Correlation is significant at the 0.05 level (2-tailed).

Table 4.11 indicates that strategy formulation and execution is statistically significant since its p-value is less than .05 (*p*-value =.000).

Regression Analysis for Other Parameters

The coefficients obtained in the regression analysis indicate that the correlation coefficient (R) between the independent variable and the revenue allocation Formula in Kenya was .143 which is a positive correlation relationship. Table 4.12 shows a coefficient of determination (R^2) of .020, which means that this variable alone can explain up to 2.0% of the variations in the dependent variable, other parameters to be used in the revenue allocation model in Kenya.

Table 4.12: Model Fitness for Other Parameters

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.143	.020	.018	1.232

Analysis of Variance for Other Parameters to be used in Revenue Allocation Model

An ANOVA test was performed on the variable, other parameters and the results are summarised in Table 4.13. The table shows that the variable has a P- value equal to .000, demonstrating that the model is statistically significant in explaining the change in the dependent variable, considering that the P-value is less than .05 at the 95% level of confidence.

Table 4.13: ANOVA for Other Parameters

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	32.977	4	8.244	5.434	.000[a]
	Residual	338.334	223	1.517		
	Total	371.311	227			

Based on the empirical results presented in Table 4.13, the Null Hypothesis (H_{02}) is rejected and a conclusion reached that, at 5% level of significance that other parameters play a significant role in the revenue allocation model for the devolved governments of Kenya. This corroborates with the findings according to Pangliani (2010) which revealed that composite indices were used to develop criteria for affirmative action in university admissions. Opportunity (access) indices, which were developed in the early 1990s, correlate well with current government classifications of disadvantaged or hardship areas, as well as poverty rates. The United Nations also uses the same principle to rank socio economic development of countries.

Frequency distribution of Other Parameters

Respondents were further asked to suggest any three more parameters that they thought could be incorporated in the revenue allocation formula. The following frequency table shows their proposals. The parameters suggested in table 4.14 are majorly socio-economic and environmental indicators. From our study of secondary data, the socio-economic and environmental indicators in Kenya are best represented by the County Development Index (CDI) as computed by the CRA (see appendix).

Table 4.14: Other Parameters

	Parameter	Frequency	Percentage
1	Internal revenue effort	44	11.22
2	Infrastructure development	42	10.71
3	County Development Index	28	7.14
4	Social Service Burden	43	10.97
5	Human Development Index	35	8.93
6	Accessibility to health facilities	23	5.87
7	Literacy	3	0.77
8	Education level	25	6.38
9	Road network	16	4.08
10	Accessibility to water	7	1.79
11	Life expectancy	9	2.30
12	Disease burden	6	1.53
13	Aridity index	11	2.81
14	Agricultural productivity	21	5.36
15	Political participation	11	2.81
16	Historical injustices	45	11.48
17	Unemployment level	23	5.87
	Total	**392**	**100**

4.5.3 The influence of Parameter Weights on Revenue Allocation

Weight of Population Parameter on Revenue Allocation Model

Some respondents noted that Counties with high population already have a high concentration of the basic infrastructure necessary for service delivery and therefore should not continue getting undue advantage over the others. A high population is therefore considered as a source of revenue. For example the first generation formula awarded: Nairobi County which had 3.1 million people- Kshs. 7.7 billion, Nakuru County which had 1.6 million people - Kshs. 1 billion, Kiambu County which had 1.6 million people - Kshs. 869 million (GoK, 2012). On the other hand Counties with high population also enjoy low cost of service delivery due to economies of scale. For example the cost of meeting the medical needs of 10,000 people concentrated in one square kilometer is much lower than that of meeting the medical needs of 10,000 people spread over 500 square kilometers. Most respondents argued that the population parameter does not reveal the purchasing power of the people as the poverty index reveals. Some respondents observed that the census data of the year 2009 has failed the test of data integrity and therefore should not be relied upon.

It was also observed that densely populated counties have more sources of revenues such as property taxes. However, population density is inversely related to the ideals of service delivery and therefore cannot be used. Some respondents noted that urbanization should be considered because it provides for per unit cost of service delivery, this will serve the objective of redistribution of services, however, the Urban Areas and City Act is still being prepared in Kenya. It was also noted that Counties capacity to generate revenue should be considered under urbanization. At the moment there is no data available on Counties contribution to the GDP and therefore this may apply in future. Other parameters which were proposed by the respondents but are closely related to population and urbanization include industrialization, dependency ratio, and level of economic activity. Generally population should be given less weight than it has currently. When asked to indicate whether the population parameter should be retained as it is; retired immediately; retired gradually or increased,49% of the respondents proposed that we increase the weight of the population parameter, 27% proposed that we retain

the weight of the population parameter as it is, 16% of the respondents were of the view that the weight of the population parameters should be reduced gradually while only 8% of the respondents were of the view that we do away with the population parameter altogether. This is shown in figure 4.1.

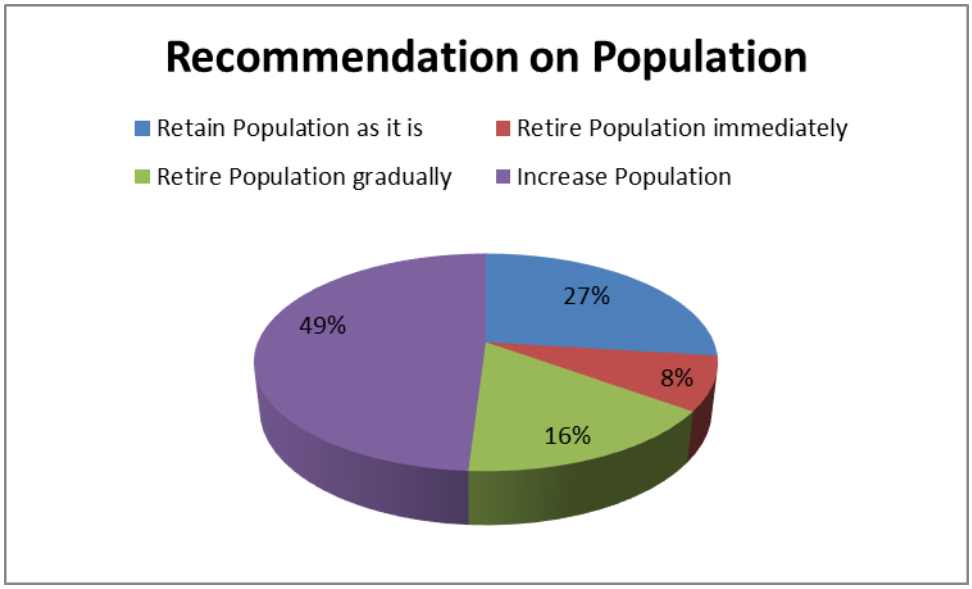


Figure 4.4: Recommendation on Population

Weight of Poverty Index as a Parameter on Revenue Allocation Model

Poverty is an important measure of Human development that should be considered in the sharing of the *National Cake.* Poverty is therefore a key parameter that can be used to address inequality and welfare of the citizens. Poverty level is a key measure of peoples' standard of living and can therefore be used to address economic empowerment of poor counties in Kenya. The CRA has chosen to use Poverty Index as a parameter that measures the level of poverty in a county. However it has a negative connotation and has been contested politically. It still remains an important parameter used to address unique challenges such as drought, disease and famine faced by poor counties. There are other measures of poverty, for example the income approach, poverty head count, poverty gap, human development index, poverty severity, some of which are difficult to interpret, that could still be considered.

This study sought to (1) determine the need that poverty index is meant to address (2) assess the strength of the parameter in meeting the service delivery objective

and redistribution objective and (3) establish how the parameter can be revised to accommodate the concerns of the various stakeholders. From our findings, poverty index addresses economic empowerment, inequality and welfare of the citizens. The parameter is also strong in providing for the redistribution objective. Respondents were asked to give their opinion whether the weight of poverty index as a parameter should be; retained as it is; removed completely; reduced gradually or increased. 41% of the respondents were of the opinion that the weight of poverty index should be reduced gradually, 24% suggested that we increase the weight of poverty index in the formula, 23% of the respondents were of the view that poverty index should be eliminated from the formula immediately while 12% of the respondents were of the view that the weight of the poverty index should be retained in the formula as it is. Most of the respondents were of the view that more data is needed for a more accurate measure of poverty instead of using the income approach. For example Human Development Index (HDI) and County Development Index (CDI). However these indices currently do not have sufficient data in Kenya and therefore may not be tenable in the near future. Substitute it with a multifaceted parameter, parameter to be linked to fiscal responsibility. This is illustrated in figure 4.5.

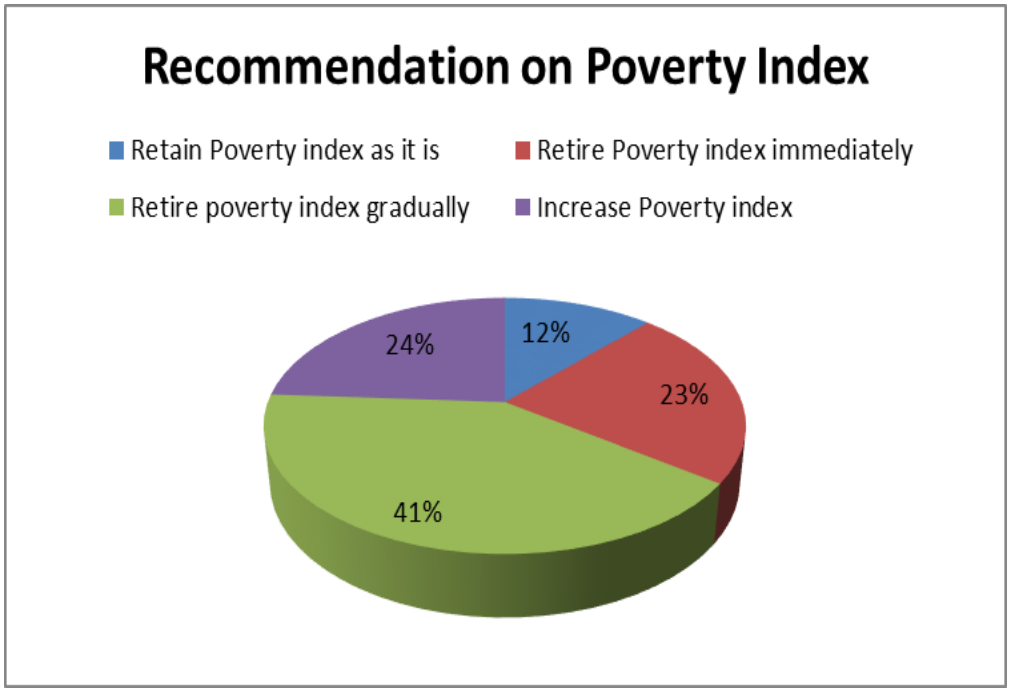


Figure 4.5: Recommendation on Poverty Index

Weight of Land Area as a Parameter on the Revenue Allocation Model

In this study, land area was used from the data provided by the Kenya National Bureau of statistics. Specifically the 2009 census was considered. The land area coverage by a county was used because it is the data which is readily available besides the cost of service delivery depends on the size of a county. The land size and terrain have a direct relationship with the cost of providing public goods. It happens that in Kenya, the large counties in terms of size are also the poorest in terms of wealth. It should be noted however that the provision of services should be on people as opposed to land and that some counties have large chunks of land that are national parks, game reserves, privately owned ranches and plantations. Also it should be noted that some counties are small in size but characterized with very bad terrain.

According to Cardew (1996) other forms of land density need to be considered in revenue sharing rather than the raw land mass. For example, residential density could be a good measure because it provides the ratio of the number of dwellings to the area of land they occupy including all the land areas included in gross residential density, plus regional uses such as education (schools, universities and colleges), open space (regional parks, environmental protection reserves), larger scale commercial uses (employment, shopping centres) and transport (railways, arterial roads). In our case such data is not available per county and therefore may not be applicable.

The respondents were asked whether the weight of land area should be retained as it is; done away with; decreased gradually or increased. 31% of the respondents were of the opinion that the weight of land should be reduced, 28% recommended that land should be eliminated from the formula, 27% wanted the weight of land to be retained as it is while 14% of the respondents were of the view that the weight of land area should be increased in the formula. This is shown in figure 4.3.

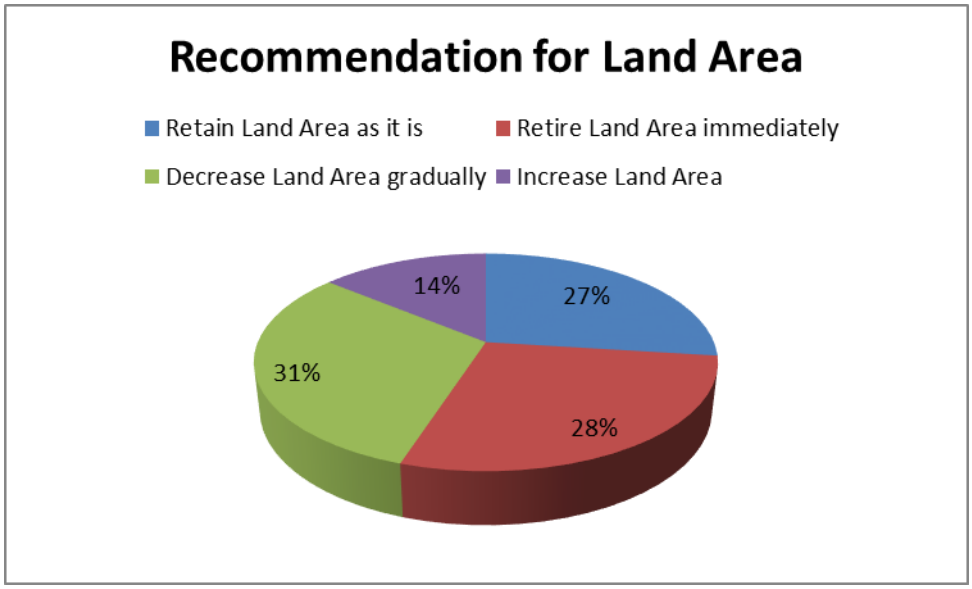


Figure 4.6: Recommendation on Land Area

Weight of the Basic Equal Share as a Parameter in the Revenue Allocation Model

Basic Equal Share as a parameter has an important equalizing effect in that all counties are treated equally regardless of size or population. According to the CRA this component has been included because all counties have some basic expenses that need to be met irrespective of their size. These services include salaries and others expenses for County Executives and County Assemblies and are critical for effective governance and administration at county level. In addition, Article 176 of the Constitution requires county governments to further decentralize their functions and provision of services.

All the counties are facing different inherited costs especially on personnel. These are costs which were inherited from their respective local governments which were largely riddled with corruption, political patronage and nepotism. This parameter gives advantage to those counties that inherited infrastructure over those that had to start from a scratch given that they are all allocated an equal amount.

The respondents were asked whether the weight of the basic equal share should be retained as it is; done away with; decreased gradually or increased. 15% of the respondents wanted the basic equal share to be retained as it is; 21% of the respondents suggested that the parameter be eliminated from the formula

immediately; 28% of the respondents were of the opinion that basic equal share should be increased to cushion counties that have inherited huge recurrent from the national government and 36% of the respondents recommended that the parameter be revised downwards in order to free more funds for sharing among counties on a more substantive basis. This is shown in figure 4.4.

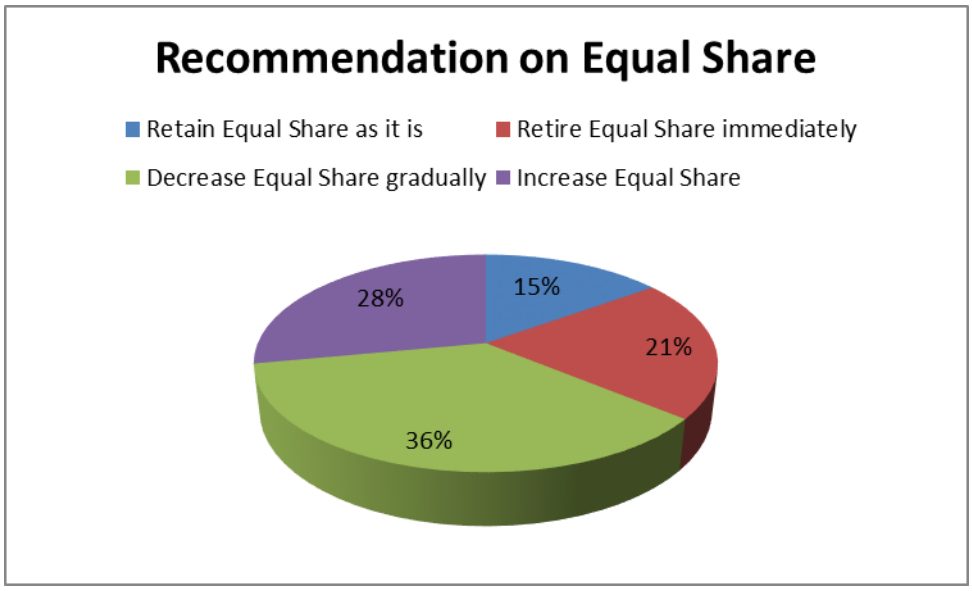


Figure 4.7: Recommendation on Equal Share

Weight of the Fiscal Responsibility as a Parameter in the Revenue Allocation Model

The Fiscal Responsibility parameter should mainly concern itself with Fiscal gap and Absorption Capacity. The parameter addresses service delivery objective with a direct impact in re-distribution in the long-run. Fiscal responsibility parameter is a critical parameter in the formula and would address the following needs:

Article 201 of the Constitution sets the following principles to guide all aspects of public finance in the Republic there shall be openness and accountability, including public participation in financial matters; (a.) the public finance system shall promote an equitable society, and in particular; the burden of taxation shall be shared fairly; revenue raised nationally shall be shared equitably among national and county governments; and expenditure shall promote the equitable development of the country, including by making special provision for marginalized groups and areas. (2.) The burdens and benefits of the use of resources and public borrowing

shall be shared equitably between present and future generations; (3.) Public money shall be used in a prudent and responsible way; and (4.) financial management shall be responsible, and fiscal reporting shall be clear.

It is only the Fiscal Responsibility parameter in the formula that would encourage compliance to the above constitutional requirement. Further, the Public Finance Management Act, 2012 sets out fiscal responsibility principles to both levels of government. Section 15(2) of the PFMA sets out the following *FR principles to the national government;* (i) Over the medium term a minimum of thirty percent of the national and county governments budget shall be allocated to the development expenditure; (ii) The national government's expenditure on wages and benefits for its public officers shall not exceed a percentage of the national government revenue as prescribed by regulations; (iii) Over the medium term, the national government's borrowings shall be used only for the purpose of financing development expenditure and not for recurrent expenditure; (iv) Public debt and obligations shall be maintained at a sustainable level as approved by Parliament for the national government and the county assembly for county government; (v) Fiscal risks shall be managed prudently; and (vi) A reasonable degree of predictability with respect to the level of tax rates and tax bases shall be maintained, taking into account any tax reforms that may be made in the future.

In this study, respondents were asked whether the weight of the basic equal share should be retained as it is; done away with; decreased gradually or increased. Only 2% of the respondents were of the opinion that the weight of fiscal Responsibility should be reduced, 14% recommended that fiscal Responsibility should be eliminated from the formula, 30% wanted the weight of fiscal Responsibility to be retained as it is while 54% of the respondents were of the view that the weight of fiscal Responsibility area should be increased in the formula. The details are shown in figure 4.5.

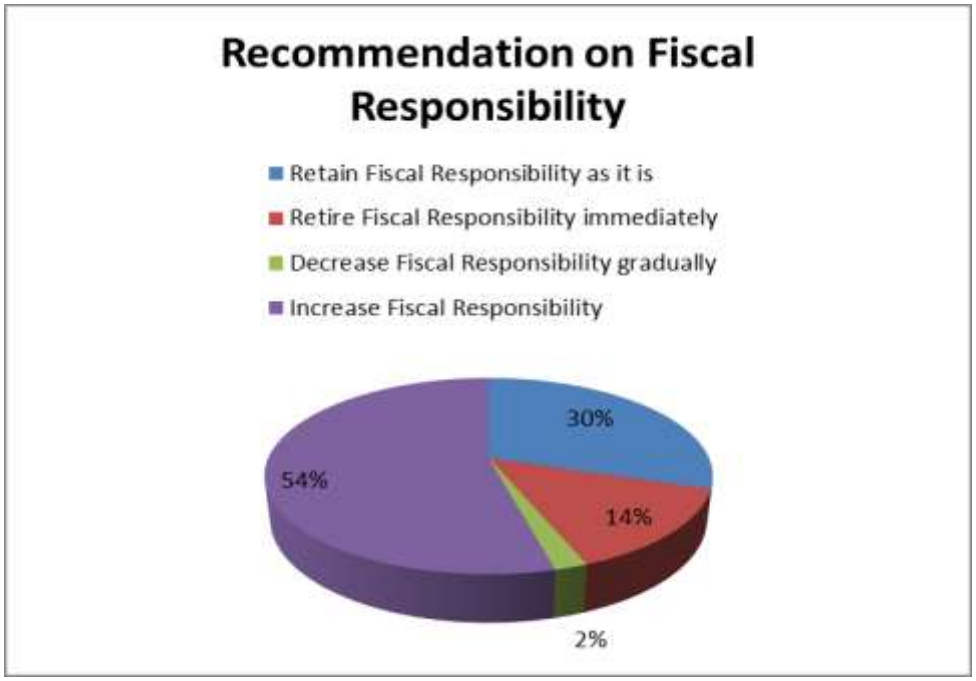


Figure 4.8: Recommendation on Fiscal Responsibility

Monte Carlo Simulations for Weights of Revenue Allocation Parameters

In a Monte Carlo simulation, a random value is selected for each of the tasks, based on the range of estimates. The model is calculated based on this random value. The result of the model is recorded, and the process is repeated. A typical Monte Carlo simulation calculates the model hundreds or thousands of times, each time using different randomly-selected values. When the simulation is complete, we have a large number of results from the model, each based on random input values. These results are used to describe the likelihood, or probability, of reaching various results in the model.

The Monte Carlo Sample Mean

The sample mean, muhat, is an unbiased estimator of mu. This means that the average value of muhat over many simulated sample is equal to the true mu. Also the sample variance is an unbiased estimator of the true variance while the sample SD is a slightly biased estimator of the true SD.

Table 4.15 : Montecarlo Sample Mean for Weights of Parameters

	Sample mean
Muhat	0.050
Sigma2hat	0.010
Sigmahat	0.099

Monte Carlo Sample Standard Deviation

[muhat,sigmahat] = normfit(data) returns an estimate of the mean μ in muhat, and an estimate of the standard deviation σ in sigmahat, of the normal distribution given the data in data. The mean and standard deviations of the findings are indicated in table 4.15 and table 4.16, show that the results are within acceptable range. We can conclude the findings are valid since the means and standard deviations of the data obtained are within acceptable range.

Table 4.16 : Montecarlo Sample Standard Deviation for Weights of Parameters

	Standard Deviation
Muhat	0.015
Sigma2hat	0.002
Sigmahat	0.011

The Monte Carlo Simulations

The various weights suggested by the respondents were subjected to Monte Carlo simulations and the outcomes are shown in figure 4.9. Like any forecasting model, the simulation will only be as good as the estimates you make. It is important to remember that the simulation only represents probabilities and not certainty.

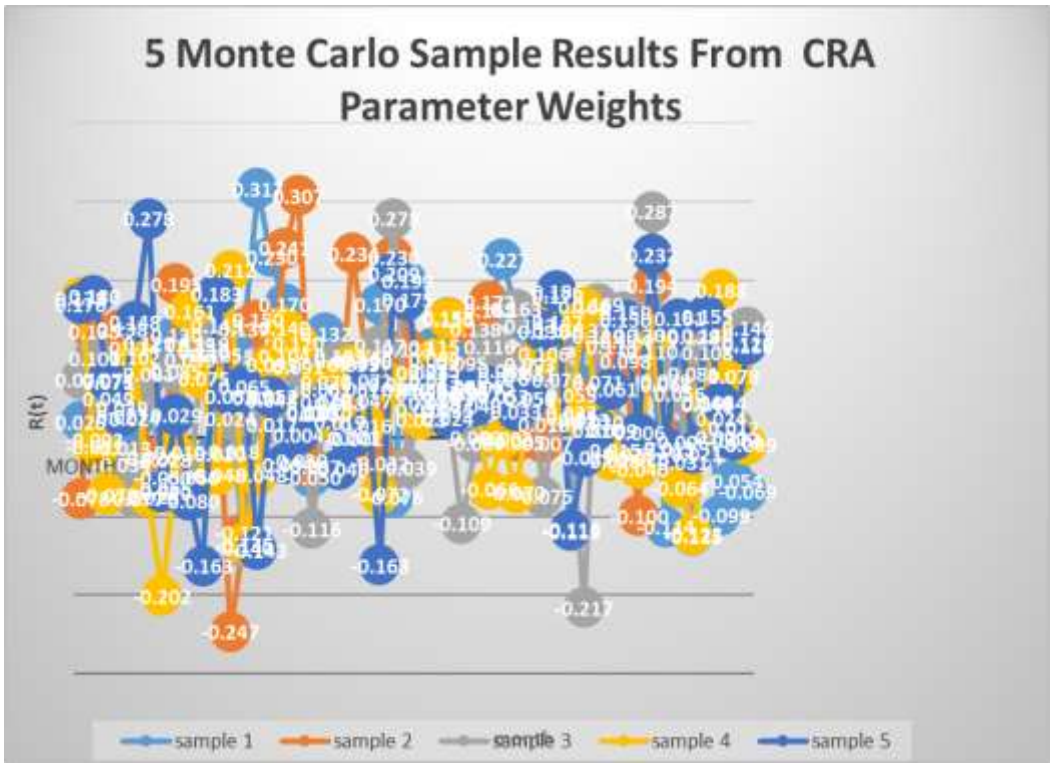


Figure 4.9: Monte Carlo Simulation

Monte Carlo Probability Output

The Monte Carlo output table indicates that the Population Parameter is ranked first with a weight of 0.465 or 46.5%, Basic Equal share ranks second with a weight of 0.225 or 22.5%, Poverty Index is ranked third with a parameter weight of 0.15 or 15%, Fiscal responsibility is ranked fourth with a parameter weight of 0.09 or 9% and finally Land Area as a parameter is ranked fifth with a parameter weight of 0.07 or 7%. This result is represented in table 5.1. The results are summarised in the table 4.17

Table 4. 17: Monte Carlo Probability Output

Parameter	Population Parameter	Basic Equal Share	Poverty Index	Land Area	Fiscal Responsibility	Total
Probability Weight	S1=0.465	S2= 0.225	S3=0.150	S4=0.070	S5=0.090	1
Rank	1	2	3	5	4	

The Optimal Revenue Allocation Model

From the results the optimal revenue allocation model, considering the CRA parameters allocates 46.5% weight to population, 22.5% to Basic Equal Share, 15% to Poverty Index, 7% to land area and finally 9% weight to Fiscal Responsibility. These confirm the popular view with the respondents that the weights of negative parameters should be reduced as the positive parameters are strengthened. The optimal model is presented in table 4.18.

Table 4.18: The Modified CRA Formula

Parameter	Weights (%)
Population	46.5
Basic Equal Share	22.5
Poverty Index	15
Land Area	7
Fiscal responsibility	9
TOTAL	**100**

4.5.4 Political Influence on Revenue Allocation

The study sought to establish the influence of politics on revenue allocation in Kenya. The frequency and percentage distribution of the findings on the independent variable; Political Influence on revenue allocation are displayed and discussed below.

Opinion leaders' perception

The study revealed that 7.9% strongly agree that the opinion leaders' perception on revenue allocation to county influences the revenue allocation Formula, 21.1% agreed with the statement. This makes a total of 29% of the respondents agreeing to the statement as shown in table 4.18. 12.7% of the respondents were undecided while 29% and 28.5% disagreed and strongly disagreed respectively. A mean response of 2.5 and a standard deviation of 1.312 is an indication of the need to critically evaluate the opinions of the political leaders because of the political patronage in Kenya.

Table 4.19: The Opinion Leaders's Perception

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	65	28.5	28.5	28.5
	Disagree	68	29.8	29.8	58.3
	Neutral	29	12.7	12.7	71.1
	Agree	48	21.1	21.1	92.1
	Strongly Agree	18	7.9	7.9	100.0
	Total	**228**	**100.0**	**100.0**	

Table 4.20: Weighted Mean Statistic

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
The opinion leaders's perception on revenue allocation to county influences the revenue allocation Formula	228	2.50	.087	1.312
Valid N (listwise)	228			

The Past political Injustices are Critical in Allocating Revenue to Counties

The study revealed that only 32.9% (8.8% and 24.1%) were in agreement that the past political injustices are critical in allocating revenue to county governments in Kenya. 28.1% were indifferent while 39% (29.8% and 9.2%) disagreed with this statement. A mean response of 2.93 and a standard deviation of 1.122 is an indication of the need to consider past political injustices in revenue allocation in Kenya.

Table 4.21: The past political injustice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	9.2	9.2	9.2
	Disagree	68	29.8	29.8	39.0
	Neutral	64	28.1	28.1	67.1
	Agree	55	24.1	24.1	91.2
	Strongly Agree	20	8.8	8.8	100.0
	Total	**228**	**100.0**	**100.0**	

Table 4.22: Weighted Mean for the Past Political Injustices

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
The past political injustices are critical in allocating revenue to county governments in Kenya	228	2.93	.074	1.122
Valid N (listwise)	228			

Marginalization Policies of Past Political Regimes

The study revealed that a paltry 9.6% strongly agreed that the marginalization policies of past political regimes has an impact on revenue allocation to county governments in Kenya, further 22.8% agreeing with the statement. 28.9% of the respondents were undecided while 38.6% of the respondents were of a contrary opinion as shown in table 4.22. A mean response of 2.43 and a standard deviation of 1.220 as represented in table 4.23 is an indication of the need to consider marginalization policies of past political regimes when formulating the revenue allocation formula for sharing revenue amongst the devolved county governments of Kenya.

Table 4.23: Marginalization policies of past political Regimes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	44	19.3	19.3	19.3
	Disagree	44	19.3	19.3	38.6
	Neutral	66	28.9	28.9	67.5
	Agree	52	22.8	22.8	90.4
	Strongly Agree	22	9.6	9.6	100.0
	Total	**228**	**100.0**	**100.0**	

Table 4.24: Weighted Mean for Past Political Regimes

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Marginalization policies of past political regimes has an impact on revenue allocation to county governments in Kenya	228	2.43	.081	1.220
Valid N (listwise)	228			

Political Affiliation has an influence on the Revenue Allocation to County Governments in Kenya.

The study revealed that only 7% of the respondents strongly agreed that Political Affiliation has an influence on the Revenue Allocation to County Governments in Kenya. A further 19.3% agreed with the statement while 30.7% were neutral. On the other hand 25.9% of the respondents disagreed with the statement while 17.1% strongly disagreed as shown in table 4.24. A mean response of 2.73 and a standard deviation of 1.162 as shown in table 4.24 is an indication of the need to consider Political Affiliation when formulating the revenue allocation formula.

Table 4.25: Political Affiliation Statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	39	17.1	17.1	17.1
	Disagree	59	25.9	25.9	43.0
	Neutral	70	30.7	30.7	73.7
	Agree	44	19.3	19.3	93.0
	Strongly Agree	16	7.0	7.0	100.0
	Total	228	100.0	100.0	

Table 4.26: Weighted Mean for Political Affiliation

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Political Affiliation has an influence on the Revenue Allocation to County Governments in Kenya	228	2.73	.077	1.162
Valid N (listwise)	228			

Coefficients

Table 4.26 shows a positive beta coefficient of 18.4%, which further confirms that Political Influence on revenue allocation, has a positive influence on the revenue allocated to each county in the revenue allocation formula in Kenya.

4.5.5 Pearson Correlation Coefficient for Political Influence on Revenue Allocation

Pearson's Correlation indicates the extent of interdependence between two variables. There is an 18.4% positive correlation between Political Influence on revenue allocation and the revenue allocated per county to the devolved governments in Kenya. This confirms that politics play a critical role in determining the revenue allocation formula.

Table 4.27: Pearson Coefficients for Political Influence

		Revenue Allocation per County	**Political Influence**
Revenue Allocation Formula	Pearson Correlation	1	.184
	Sig. (2-tailed)		.000
	N	228	228
Political Influence	Pearson Correlation	.184	1
	Sig. (2-tailed)	.000	
	N	228	228

Table 4.26 indicates that Political Influence on revenue allocation is statistically significant since its p-value is less than .05 (*p*-value =.000).

Table 4.28: Coefficients of Political Influence

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.549	0.279		5.563	.000
Political Influence on Revenue Allocation	.180	.067	.184	2.680	.008

Using the summary presented in Table 4.27, a linear regression model of the form, $Y = \alpha + \beta X_i$ can be fitted as follows:

$Y = 1.549 + 0.180X_1 + \mu$ .....**Equation 3**

4.5.6 Regression Analysis for Political Influence on the Constitution

This was carried out in order to determine whether the independent variable, political influence can be relied on in explaining the change in the dependent variable, revenue allocation Formula for the devolved government of Kenya. The coefficients obtained indicate that the correlation coefficient (R) between the independent variable and the strategic management of counties in Kenya was .184 which is a positive correlation relationship. Table 4.28 shows a coefficient of determination (R^2) of .034, which means that this variable alone can explain up to 3.4% of the variations in the dependent variable, revenue allocation Formula.

Table 4.29: Model Fitness for Political Influence

Model Summary				
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
	.184	.034	.032	3.46189

4.5.7 ANOVA for Political Influence on Revenue Allocation

An ANOVA test was performed on the variable, Political Influence on revenue allocation and the results are summarised in Table 4.29. The table shows that the variable has a P- value equal to .018, demonstrating that the model is statistically significant in explaining the change in the dependent variable, considering that the P-value is less than .05 at the 95% level of confidence.

Table 4.30: ANOVA for Political Influence

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	18.406	4	4.602	3.055	.018
Residual	335.909	223	1.506		
Total	354.316	227			

Based on the empirical results presented in Table 4.33, the Null Hypothesis (H_{04}) is rejected and a conclusion reached that, at 5% level of significance, the Kenyan Politics has an influence on revenue allocation in Kenya. As discussed in section 2.55 of this paper, Ojo (2009) concludes that contemporary issues in Nigeria's political economy show that perhaps the most important issue of fiscal federalism is the revenue allocation formula, the sharing of national revenue among the various tiers of government (vertical revenue sharing) as well as the distribution of revenue among the state governments (that is, horizontal revenue allocation). In a similar study, Ikeji (2011) concludes that Federalism provides a framework for solving the political problem of administration and the economic problem of resource distribution. The explained further that in practice, sometimes, the optimization of administrative costs is an economic issue, where also the distribution of resources involves some political issues in determining the constitutional criteria for such allocation in such a way that will ensure equality and/or equity. Akpan and Umodong (2003) observe that redistribution that can ensure equality will not guarantee efficiency, thus the question of balancing the inefficiency and equality in an acceptable way encompasses the use of economic and political means to induce compromise and agreement. This may involve the use of consultation approach to power balancing and the protection of rights.

4.5.8 Influence of Constitutional on Revenue Allocation

The study sought to establish the adequacy of the constitutional guide on revenue allocation, most of the respondents agreed that minimum revenue allocation to county governments of 15% of all revenue collected nationally is adequate (58.33%), the mandate/powers conferred on the Commission for Revenue

Allocation in revenue allocation are sufficient (39.04%), The County revenue taxes are adequate in running county governments (22.37%), Marginalized areas are adequately catered for by the current constitution (38.59%), The role of the senate in revenue allocation is sufficiently provided for in the constitution (38.16%), Equalization fund is sufficiently addressed by the constitution (42.98%). The results of the respondents are presented in Table 4.29.

Table 4.31: Constitutional Guide Statistics

	Agree Percent (%)	Neutral Percent (%)	Disagree Percent (%)
The minimum Revenue allocation to county governments of 15% of the GDP is adequate.	58.33	12.72	28.95
The mandate/powers conferred on the Commission for Revenue Allocation in revenue allocation are sufficient	39.04	28.07	32.89
County revenue taxes are adequate in running county governments	22.37	21.93	55.70
Marginalized areas are adequately catered for by the current constitution	38.59	28.95	32.46
The role of the senate in revenue allocation is sufficiently provided for in the constitution	38.16	26.75	35.09
Equalization fund is sufficiently addressed by the constitution	42.98	30.70	26.32

Weighted Mean Statistics for Constitutional Guide on Revenue Allocation

The mean and standard deviations for constitutional guide on revenue allocation are indicated in table 4.31. As discussed in chapter three the mean range used in the study is 0 to 5 inclusive. The mean obtained for the findings are between 2 and 3. The scale 2 is valid extent and 3 moderate. We can conclude the findings are valid since the means of the data obtained are within acceptable range.

The standard deviation is used to measure how concentrated the data are around the mean. The more concentrated the data, the smaller the standard deviation. A small standard deviation means that the values in a statistical data set are close to the mean of the data set. The findings as shown in table 4.31 indicate that all the standard deviations are close to 1 for all the data findings. This implies all the data sets are concentrated around the mean scores hence valid for interpretations.

Table 4.32: Weighted Means Constitution

	N	Mean		Std. Deviation
		Statistic	Std. Error	
The minimum Revenue allocation to county governments of 15% of the GDP is adequate.	228	2.09	.083	1.245
The mandate/powers conferred on the Commission for Revenue Allocation in revenue allocation are sufficient	228	3.19	.093	1.147
County revenue taxes are adequate in running county governments	228	3.63	.062	1.135
Marginalized areas are adequately catered for by the current constitution	228	2.58	.087	.967
The role of the senate in revenue allocation is sufficiently provided for in the constitution	228	2.48	.091	1.081
Equalization fund is sufficiently addressed by the constitution	228	2.10	.088	1.113

Standardized Coefficients on Constitutional Guide on Revenue Allocation

Standardized coefficients beta was used to interpret the relative ranking of the factors in the model. It refers to how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable. Standardization of the coefficient is usually done to answer the question of which of the independent variables have a greater effect on the dependent variable in a multiple regression analysis, when the variables are measured in different units of

measurement. As shown in table 4.32 the standardized coefficient indicates that the constitutional guide on revenue allocation is significant with a positive beta coefficient of 30.8%, which further confirms that constitutional guide on revenue allocation, has a positive influence on the revenue allocation model for the devolved government of Kenya.

Table 4.33: Coefficients of Constitutional Guide

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	17.130	2.214		7.381	.000
Constitutional Guide on revenue Allocation	.435	.073	.308	4.898	.000

Using the summary presented in Table 4.32, a linear regression model of the form, $Y = \alpha + \beta X_i$ can be fitted as follows:

$Y = 17.130 + 0.435X_1 + \mu$ .....**Equation 4**

Pearson Correlation Coefficient for Constitutional Guide on Revenue Allocation

Pearson's Correlation indicates the extent of interdependence between two variables. As already noted from Table 4.31, there is a 30.8% positive correlation between constitutional guide on revenue allocation and the revenue share per county in Kenya. The Pearson correlation coefficient is shown in table 4.33

Table 4.34: Pearson Coefficients for Constitutional Guide on Revenue Allocation

		Revenue Allocation Per County	Constitutional Guide on Revenue Allocation
Revenue Allocation per County	Pearson Correlation	1	.308
	Sig. (2-tailed)		.000
	N	228	228
Constitutional Guide on Revenue Allocation	Pearson Correlation	.308	1
	Sig. (2-tailed)	.000	
	N	228	228

Table 4.33 indicates that constitutional guide on revenue allocation is statistically significant since its p-value is less than .05 (*p*-value =.000).

Regression analysis for Constitutional Guide on Revenue Allocation

In order to rank the various factors in the order of their ability to influence revenue allocation, the study utilized regression. R is a measure of the correlation between the observed value and the predicted value of the criterion variable. R Square (R^2) is the square of this measure of correlation and indicates the proportion of the variance in the criterion variable which is accounted for by our model. In essence, this is a measure of how good a prediction of the criterion variable we can make by knowing the predictor variables. However, R square tends to somewhat over-estimate the success of the model when applied to the real world, so an adjusted R square value is calculated which takes into account the number of variables in the model and the number of observations (participants) our model is based on. This Adjusted R Square value gives the most useful measure of the success of our model. The results show an Adjusted R Square value of 0.074; this means that the model has accounted for 7.40% of the variance in the criterion variable. The findings are shown in table 4.34.

Table 4.35: Model Fitness

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.308[a]	.095	.074	1.118

Analysis of Variance on Constitutional Guide on Revenue Allocation

The study used ANOVA to determine the Model Significance. ANOVA assesses the overall significance of the model, determining if the test data fit to the model. A significance value of P<0.05 is allowed. The model has significance value of .000, the model is significant. Table 4.35 presents the result of these findings.

Table 4.36: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	29.011	5	5.802	4.639	.000[a]
	Residual	277.668	222	1.251		
	Total	306.680	227			

Based on the empirical results presented in Table 4.35, the Null Hypothesis (H_{05}) is rejected and a conclusion reached that, at 5% level of significance, The Kenya Constitution plays a significant role in revenue allocation model for the devolved governments in Kenya. These results are in agreement with the findings the study done by Borck (2005) in Germany where he revealed that a notable characteristic of the German federation is the extensive constitutional and political interlocking of the federal and state governments as discussed in section 2.4.1 of this study. Similar findings were observed in South Africa where the Constitution did not leave the important matter of budget resource allocations to be subjected to the vagaries of day-to-day political machination (Morobe, 2001). In Nigeria the assignments of fiscal instruments are guided by constitutional provision. The federal constitution gave the federal government exclusive power to collect levies like customs and

excise, company tax, education tax and mining rents, VAT etc. All these revenues (with the exception of education tax) are paid into the federation account for distribution among the three tiers of government in line with national constitution (Anderson, 2007). Theoretically this supports the legal theory of finance which states that the financial status of a country and its economic development is related to the legal system of that specific country. The legal system of any country is anchored on its constitution. Constitutional guide in revenue allocation is therefore a Key factor in determining the revenue share to the devolved governments in Kenya.

4.6 The Revenue Allocation Formula for Horizontal Share

This section presents the findings based on the responses to the questions asked in relation to the dependent variable, revenue allocation formula. A normality test was performed on the independent variable and results are presented in section 4.5.2.

Normality Test for the Dependent Variable

A normality test for the dependent variable was conducted using the Q-Q test. The results generated are shown in Figure 4.10 The data plot indicate an insignificant deviation of observations from the normal line hence a high level of normality. This means that inferences on assumption of normality can be made on the dependent variable.

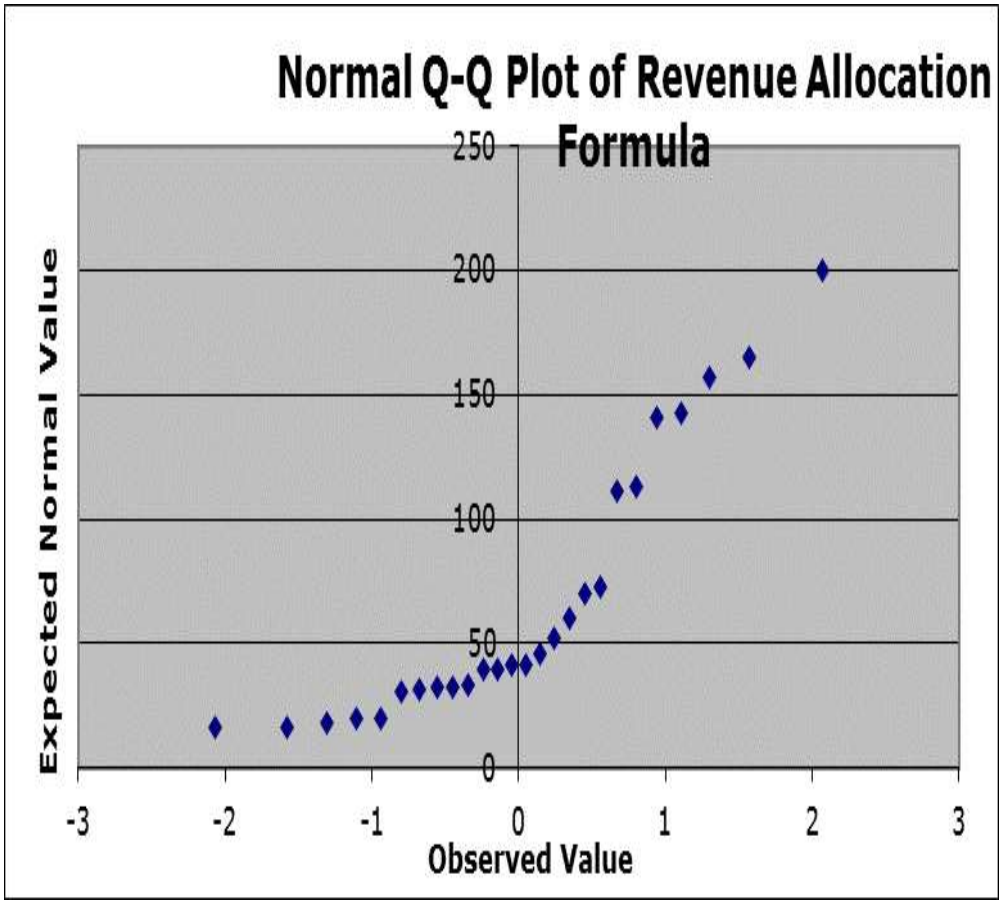


Figure 4.10: Normality Test for Revenue Allocation Formula

Statistical Results for Revenue Allocation Formula

Figure 4.11 presents cumulative percentage results on the dependent variable, Revenue allocation formula. Based on these results, a majority (65%) of the respondents agreed that the revenue allocation formula for the devolved government in Kenya is the best method of sharing revenue amongst the 47 counties. These results are consistent with arguments by Akilno (1999) that revenue allocation formula has a cause effect on redistribution of resources and that parameters, if well thought out have an influence on economic prosperity of devolved states. Other studies Emengini (2010) and Olofin *et al*. (2012) concur that revenue allocation formula is the best for use in federal states.

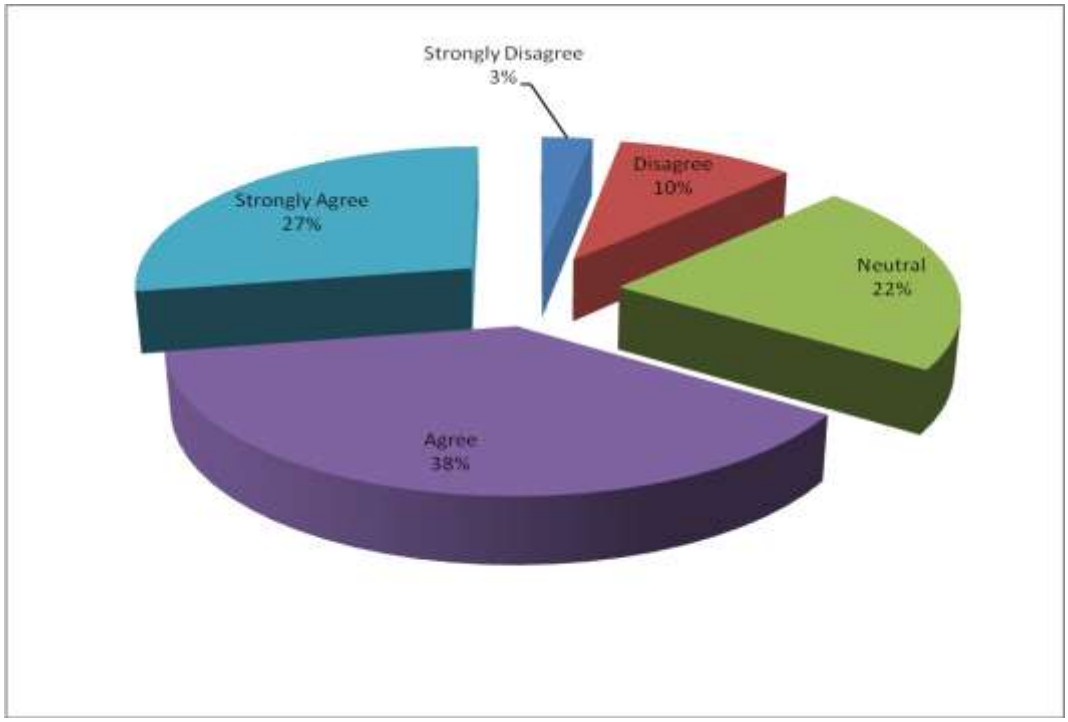


Figure 4.11: Average Percentage for Dependent Variable

The weighted means for the dependent variable are shown in Figure 4.36. As discussed in chapter three the mean range used in the study is 0 to 5 inclusive. The mean obtained for the findings are between 2 and 3. The scale 2 is valid extent and 3 moderate. We can conclude the findings are valid since the means of the data obtained are within acceptable range.

The standard deviation is used to measure how concentrated the data are around the mean. The more concentrated the data, the smaller the standard deviation. A small standard deviation means that the values in a statistical data set are close to the mean of the data set. The findings as shown in table 4.36 indicate that all the standard deviations are close to 1 for all the data findings. This implies all the data sets are concentrated around the mean scores hence valid for interpretations.

Table 4.37: Weighted Means for Revenue Allocation Formula

	N	Minimum	Maximum	Mean	Std. Deviation
Redistribution	228	1	5	3.73	.973
Service Provision	228	1	5	3.71	.893
Less tax burden	228	1	5	3.76	1.007
Public Approval	228	1	5	3.78	1.129
Adequacy	228	1	5	3.99	1.100
Fiscal Probity	228	1	5	3.71	1.131

4.7 Integrated Regression Model for the Study

Integrated regression models were generated at two levels as shown in table 4.37. In the first level, the four combined independent variables, constitutional guide on revenue allocation, adequacy of the CRA parameters in revenue allocation, other parameters to be considered in revenue allocation and Political influence on revenue allocation while controlling for the moderating variable and; (b) on all the independent variables and un-controlling for the moderating variable, government policy.

Hierarchical Regression Analysis with Moderating Variable Controlled

When regression analysis was performed with the moderating variable controlled, the result showed a 74.7% positive correlation (R) between the independent variables and the dependent variable (Revenue allocation per County in Kenya), Table 4.37. Up to 55.8% (R^2) of the change in the revenue allocated per county in Kenya can be explained by the combined effect of the four independent variables of the study.

From the integrated coefficients shown in table 4.37 a linear regression model, combining all the independent variables while controlling for the moderating variable, was fitted and is presented in equation 5. All the coefficients of the independent variables are positive, an indication that they all have a positive contribution to the revenue allocation formula in Kenya.

When all the independent variables were taken together, while holding for the moderating variable, the CRA parameters have the strongest positive beta, 64.5% contribution to the revenue allocation per county followed by Other Parameters, Constitutional Guide and Political influence respectively. The negative y-intercept means that in the absence of all the independent variables (i.e. when X_i is zero), the dependent variable is negative. This further demonstrates that the independent variables play a meaningful role in influencing the desired change at the counties.

$Y = -1.367+0.138X_1 +0.645X_2 +0.164X_3 + 0.043X_4 + \mu$ ..... **Equation 5**

The *p-value* for the overall model is .000, less that .05 which means that the model is statistically significant. This confirms that all the independent variables have a significant positive effect on the change in the dependent variable, revenue allocation per county 95% level of confidence.

Table 4.38: Regression Model Fitness for the Independent Variables

Model	R	R^2	Adj R^2	Std. Error of the Estimate	Change Statistics				
					R^2	F Change	df1	df2	Sig. F Change
1	.747	.558	.537	3.93299	.558	30.960	4	223	.000
2	.766	.587	.503	3.86271	.027	6.813	1	222	.008

Hierarchical Regression Analysis Un-controlling the Moderating Variable

A Hierarchical regression analysis un-controlling the moderating variable was done to establish whether government policy had any moderating effect on the relationships between the independent variables and the revenue allocated per county in Kenya. Table 4.37 presents the results obtained after introducing the moderating variable. The results show that the moderating variable accounted for significantly more variance than just the independent variables and that R^2 changed from .558 to .587, a change of .029. The P value also changed by .008. These changes after the introduction of a moderating variable show that there is significant moderation effect on the variables of the study.

Further, a linear regression model combining all the independent variables and the moderating variable are fitted as shown in equation 6. The beta coefficients of all the independent variables, are positive, demonstrating that they all have a positive contribution to the dependent variable, revenue allocation per county in Kenya. This is consistent with equation 5 and further confirms that the CRA parameters have the strongest weight on the revenue allocation model. Similarly, the negative y-intercept reduces with the introduction of the moderating variable.

$Y = -7.002+0.138X_1 +0.136X_2 +0.207X_3 + 0.062X_4 + 0.197X_m + \mu$...**Equation 6**

The *P*-value for the second integrated regression model is also less that 0.05 (i.e. .000), meaning that the model is statistically significant to the study.

ANOVA for Hierarchical Integrated Regression Model

Two ANOVA tests were performed on: (i) all the independent variables controlling for the moderating variable and (ii) all the independent variables while un-controlling the moderating variable. In both scenarios, the results obtained (Table 4.38) show that the *p- values* are equal to .000; a demonstration that both regression models (6) and (7) for the study are statistically significant considering that their *p values* are less than .05 at the 95% level of confidence.

Table 4.39: ANOVA on the Independent Variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1527.277	4	390.099	30.960	.000[b]
	Residual	1906.141	223	13.813		
	Total	3433.418	227			
2	Regression	1608.317	5	321.663	27.042	.000[c]
	Residual	1825.102	222	13.322		
	Total	3433.418	227			

Table 4.40: Integrated Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.367	.369		3.702	.000
	Constitutional Guide on Revenue Allocation	.138	.062	.142	2.218	.028
	The CRA Parameters	.645	.066	.540	8.186	.000
	Other Parameters	.164	.077	.224	3.438	.001
	Political Influence	.043	.067	.042	.640	.523
2	(Constant)	-7.002	4.345		-1.039	.059
	Constitutional Guide on Revenue Allocation	.138	.062	.142	2.303	.023
	The CRA Parameters	.667	.065	.612	8.821	.000
	Other Parameters	.207	.070	.192	3.034	.005
	Political Influence	.062	.071	.032	.480	.513
	Government Policy	.197	.081	.376	.498	.005

The hierarchical regression above show that the variables explain a statistically significant amount of variance in the Dependent Variable (Revenue Allocation Formula) after accounting for all other variables. This means that parameters in revenue allocation formulas are important in determining equitable revenue allocation formula.

4.8 Summary of Data Analysis and Results

This chapter presented data analysis and results based on our objectives. It began by presenting the response rate, giving the extent to which the collected set of data includes all sample members of the targeted population a response rate of 87.69% was realised. The study sought to know the gender distribution of the respondents. From the responses, the majority (71.93%) were male while 28.07% were female.

Reliability and validity tests were presented. Cronbach's alpha coefficient results on the independent variable show a value of above 0.7. or very close to 0.7 and above, none of the components was dropped. A multicollinearity test was conducted among the independent study variables, the findings show that the study independent variables have a high tolerance ranging between 1.006 and 5.263. An autocorrelation test was conducted on the study using the Durbin-Watson statistic. The autocorrelation test shows that there was no cause for concern since the Durbin –Watson value is 2.348. Each of the independent variable was subjected to mean and standard deviation test to test the validity and how data is concentrated around the mean and hence valid for interpretation. Pearson correlation coefficient test was used on each independent variable to confirm whether they play a critical role on revenue allocation formula (dependent variable). Simple linear regression analysis was done on each independent variable to demonstrate whether the independent variables can explain the variations in the revenue allocation formula. Analysis of variance was done on all the independent variables to find out whether the model is statistically significant in explaining the change in the dependent variable. Based on the empirical results, all the null hypotheses were rejected and conclusions reached at 5% level of significance that all the independent variables namely CRA parameters, Other Parameters, Parameter weights and Politics have an influence on the revenue allocation formula. A normality test for the dependent variable was conducted using the Q-Q test, the data plot indicate an insignificant deviation of observations from the normal line hence a high level of normality. An integrated regression models was generated which revealed that all the independent variables have a positive contribution to the revenue allocation formula in Kenya. From the Monte Carlo Simulation results the optimal revenue allocation model, considering the CRA parameters allocates 46.5% weight to population, 22.5% to Basic Equal Share, 15% to Poverty Index, 7% to land area and finally 9% weight to Fiscal Responsibility.

CHAPTER FIVE.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study by first, giving an introduction, explaining the objectives of the study, literature review, methodology, and the findings of the study. Secondly, gives conclusions of the study based on the study variables and finally recommendations for further research are given according to the gaps identified. The influence of the constitution in revenue allocation in Kenya.

5.2 Summary of Findings

The main purpose of the study was to determine the influence of revenue allocation parameters in modelling the revenue allocation formula in Kenya. Specifically the study established the influence of the CRA parameters on the first generation revenue allocation formula in Kenya, identified other parameters that would model an equitable revenue allocation formula for the devolved government in Kenya, determined parameter weights that would model an equitable revenue allocation formula for the devolved government in Kenya, established whether politics in Kenya influences the revenue allocation formula and finally, the study determined the moderating effect of the constitution on the revenue allocation formula in Kenya. The study established that there is a significant influence of revenue allocation parameters on the revenue allocation formula in Kenya.

5.2.1 The Influence of Revenue Allocation Parameters on Revenue Allocation Formula in Kenya

The results from this study reveal that there is a positive correlation between the CRA Parameters and the revenue allocation formula in Kenya. An ANOVA test for the CRA parameters revealed that the variable has a P- value equal to .000, demonstrating that the model is statistically significant in explaining the change in the dependent variable. According to the empirical results from this study, the Null Hypothesis (H_{01}) is rejected and a conclusion reached that, at 5% level of

significance that the CRA parameters play a significant role in the revenue allocation model adopted by the CRA in revenue sharing amongst the 47 county governments in Kenya. Other Parameters that Would Model an Equitable Revenue Allocation Formula in Kenya

Apart from the CRA Parameters, the study sought to establish if there are other parameters which could be used in modelling an equitable revenue allocation formula in Kenya. The Study found that there are other socio-economic factors that can be used to model an equitable revenue allocation formula. The study singled out the human development index (HDI) which reflects the County Development Index (CDI) encompassing such factors as education, health, and infrastructure. The coefficients obtained in the regression analysis indicate a strong positive correlation coefficient (R) between Other Parameters and the revenue allocation Formula in Kenya. An ANOVA test was performed on the variable, other parameters and the results show that the variable has a P- value equal to .000, demonstrating that the model is statistically significant in explaining the change in the dependent variable, considering that the P-value is less than .05 at the 95% level of confidence.

5.2.2 Parameter Weights that would model an equitable revenue Allocation formula for Kenya

The mean and standard deviations of the parameter weights subjected to Monte Carlo Simulations show that the results are within acceptable range. The findings are therefore valid since the means and standard deviations of the data obtained are within acceptable range. The various weights suggested by the respondents were run in an excel Monte Carlo Simulator and the outcomes reveal that the Population Parameter is ranked first with a weight of 0.465 or 46.5%, Basic Equal share ranks second with a weight of 0.225 or 22.5%, Poverty Index is ranked third with a parameter weight of 0.15 or 15%, Fiscal responsibility is ranked fourth with a parameter weight of 0.09 or 9% and finally Land Area as a parameter is ranked fifth with a parameter weight of 0.07 or 7%.

5.2.3 The Influence of Politics on Revenue Allocation Formula in Kenya

The study sought to establish whether Politics in Kenya influences revenue allocation in Kenya. The findings reveal that indeed there is a positive correlation between Political Influence on revenue allocation and the revenue allocation Formula for the devolved governments in Kenya. This confirms that politics play a critical role in determining the revenue allocation formula. Based on the empirical results from this study, the Null Hypothesis (H_{04}) is rejected and a conclusion reached that, at 5% level of significance, the Kenyan Politics has an influence on revenue allocation in Kenya. The Moderating Effect of the Kenya Constitution on Revenue Allocation Formula for the Devolved Government

The study further investigated the moderation effect of the Kenya Constitution on the entire model. It was established that the Kenya Constitution plays a major role in determining the parameters to be used in revenue allocation formula in Kenya. According to the empirical results, the Null Hypothesis (H_{05}) is rejected and a conclusion reached that, at 5% level of significance, The Kenya Constitution plays a significant role in revenue allocation model for the devolved governments in Kenya. The Overall Model Fitness

Finally integrated regression models was generated which revealed that all the independent variables have a positive contribution to the revenue allocation formula in Kenya. Further, a linear regression model combining all the independent variables and the moderating variable were fitted. The results indicate that the beta coefficients of all the independent variables, were positive, demonstrating that they all have a positive contribution to the dependent variable, revenue allocation formula in Kenya. This further confirms that the CRA parameters have the strongest weight on the revenue allocation model.

5.3 Conclusions

This study has established that the CRA revenue allocation parameters positively influence the revenue allocation formula for the devolved government of Kenya. The study further revealed that other parameters need to be incorporated to make the formula more equitable. The parameters were subjected to Monte Carlo

simulations which gave an output for the recommended weights of each parameter. It was also determined that politics play a major role in shaping the revenue allocation formula. Finally the entire revenue allocation formula was found to be anchored on the constitution of Kenya. This study forms the basis of interrogating the CRA revenue allocation formula since it has systematically probed the formula and explained how the parameter weights are arrived at.

5.4 Recommenations

Based on the study findings and conclusions, the study recommends that the CRA Parameters be enhanced so that their impact on the revenue allocation formula meets the basic principles of equity. This can be done by considering broad based parameters which eliminates financial deprivation to various facets of the Kenyan population. In light of this, the second recommendation is that other parameters should be incorporated in the formula to strengthen it, for example, this study has revealed that human development index can be considered because it encompasses several socio-economic factors. The Human Development Index as demonstrated can be reviewed annually, biannually or triennially to keep improving the formula. The third recommendation is that the weights of revenue allocation parameters should be reviewed regularly to improve on the formula this would help the nation to adjust to the changing times. Politics, it has been established, play a crucial role in the revenue allocation formula, the political players and regulators like the National Cohesion and Integration Commission (NCIC), the Independent Electoral and Boundaries Commission (IEBC), the Ethics and Anti-Corruption Commission, the Judiciary, the Legislature and the Executive anms of government should play their regulatory and leadership roles responsibly to ensure that Kenya has mature and responsible political players who can influence the revenue allocation formula for the wellbeing of the nation at large. Finally this study recommends that the revenue allocation by formula be entrenched in the constitution so that the method of revenue allocation is not left to manipulation by regimes as is the case elsewhere.

5.5 Recommendations for Further Research

This study has turned out to be a milestone in this field of finance in Kenya because it is a contemporary issue. The findings have emphasized the importance of revenue

allocation parameters in the revenue allocation by formula. Available literature indicates that as an avenue for future research, there is need for research to examine the changing nature of the individual parameters so that their weights can be adjusted as level of development of Counties change. More importantly, Fiscal Responsibility parameter and County Development Index need to be emphasized in research. Further the Equal share parameter in meant to bring about equalization in counties, however as it is now, this parameter seem to be emphasizing equality as opposed to equity. The study therefore recommends further research to determine how equalization fund should be shared in such a manner that it meets its objective.

REFERENCES

Adeleke, S. (2011). Taxation, Revenue Allocation and Fiscal Federalism in Nigeria: Issues, Challenges, and Policy Options, *Economic Annals, 189.*

Afolabi, L. (1999). *Monetary Economics.* Ibadan, Nigeria: Heinemann Educational books (Nigeria) Plc.

Aigbokhan, E. (1999). *Fiscal Federalism and Economic Growth in Nigeria.* In: Fiscal Federalism and Nigeria's Economic development. Proceedings of the Annual Conference of the Nigerian Economic Society, pp. 333-352.

Akeem, U. (2011). Revenue allocation formula and its impact on economic growth process in Nigeria. *Journal of Economics and Sustainable Development, 2*, 29-37.

Akinlo, A. (1999). *A cross-sectional analysis of the expenditure responsiveness of states to federal allocations during civilian era in Nigeria.* 1999 Annual Conference of Nigerian Economic Society, Nigerian Economic Society, Abuja, Nigeria.

Akpan, G. & Umodong, E. (2003). *Majority Rule over Minority Rights: Subversion of Derivation Criterion in Revenue Allocation in Nigeria.* Uyo: University of Uyo.

Akujuobi, L., & Kalu, U. (2009). State government finances and real assets investments: The Nigerian experience. *African Journal of Accounting, Economics, Finance and Banking Research, 4*, 22-29.

Akujuru, C. (2015). Revenue Allocation in Nigeria and the Dependency on Oil Revenue: The Need for Alternative Solutions. *Global Journal of Arts, Humanities and Social Sciences, 3*(2), 19-36. Retrieved from http://www.eajorurnals.org/journal

Anderson, G. (2007). *Nigerian Fiscal Federalism Seen from a Comparative Perspective*, *Notes for Address to Governors* Forum *Short Versus Long Coalitions: Electoral Accountability and the Size of the Public Sector.* Abuja , Nigeria.

Anyadike, N. (2013). New Sharing Formula Clamour by the Nigerian state Governors: Propelling Factors and Matters Arising. *Public Policy and Administration Research, 3*(2), 27-37. Retrieved from http://www.iistes.org/journal/2224-5731.

Bagchi, A. (2001). *Fifty years of Fiscal Federalism in India: an appraisal*, Kale Memorial lecture delivered at Gokhale Institute of Politics and Economics, Pune, 8 December.

Baliamoune, M. (2003). *On the Measurement of Human Well-Being: Fuzzy Set Theory and Sen'S Capability Approach.*" World Institute for Development Economic Research (UNUWIDER), Research paper 2004/16.

Bate, R & Boateng, K. (2007). Drug Pricing and Its Discontents: At Home and Abroad. *Health Policy Outlook, 9*(August).

Birch, I. & Halakhe, D. W. (2003). *Oxfam GB Funded Peace building Initiatives in the Arid Districts of Kenya: Lessons and Challenges,* Nairobi: Oxfam.

Boadway, R. & Flatters, F. (1982a). *Equalization in a federal state on economic analysis*, a study prepared for Economic Council of Canada, Ottawa: Minister of Supply and Services.

Boadway, R. &Flatters, F. (1982b). Efficiency and equalization payments in a federal system of government: a synthesis and extension of recent results, *Canadian Journal of Economics, 15*(4), 613-633.

Boix, C. (2003). *Democracy and Redistribution,* New York: Cambridge University Press.

Bolan, G. (2012). *Funding formulas and efficiencies in service provision,* Toronto: Gage Educational Publishers.

Boone, C. (2012). Land Conflict and Distributive Politics in Kenya, *African Studies Review, 55*(1).

Borck, R. (2005). Fiscal competition, capital-skill complementarity, and the composition of public spending. *German Institute for Economic Research Discussion Paper No. 504*

Bowman, A. & Kearney, R. (2005). *State and Local Government.* Boston: Houghton Mifflin Company.

Bubbico, R. & Dijkstra, L. (2011). *European Union Regional Focus.* The European regional Human Development and Human Poverty Indices.

Buchanan, J. (1950). *Federalism and fiscal equity, American Economic Review, 40*(4), 583-599.

Carlin, B. & Chib, S. (1995). *Bayesian model choice via Markov chain Monte Carlo methods.* J. Royal Statist: Society Series.

Carruthers, B. (1996). *City of Capital: Politics and Markets in the English Financial Revolution.* Princeton: Princeton University Press.

Carruthers, B. (2013). Diverging derivatives: law, governance and modern financial markets. *Journal of Comparative Economics, 41*(2), 386–400.

Carruthers, B., & Kim, J. (2011). The sociology of finance. *Annual Review of Sociology, 37*, 239–259.

Chotai, N. (2010). *Focus on Global Sum Allocation Formula,* England: Leicestershire.

Commonwealth Grants Commission. (2009). *The Relativities: What Assessment is important?* Discussion Paper CGC. 2001/13.

Congdon, P. (2001). *Bayesian Statistical Modelling.* England: Wiley.

Conlan, T, & John, D. (2007). Federalism, the Bush Administration, and the Transformation of American Conservatism. Publius, *The Journal of Federalism, 37*(3), 279-303.

Creswell, J. (1994). *Research design: Qualitative and Quantitative Approaches.* Thousand Oaks. CA: Sage.

De-Grauwe, P. (2010). *Fighting the wrong enemy*, Vox- CEPR's Policy Portal, Retrieved from: http://www.voxeu.org/article/europe-s-private-versus-public-debtproblem-fighting-wrong-enemy.

De-la-Torre, N. & Moreno, Y, (2009). *Advances in sub national measurement of the Human Development Index: the case of Mexico*, submitted for the preparation of HDR 2010, unpublished.

Dufour, J. M. (2005). *Monte Carlo tests with nuisance parameters: a general approach to finite-sample inference and non-standard asymptotic.* Montreal: Centre for interuniversity research.

Dugdale, P. (2007). *The better practice program funding formula.* Australia: J. Public Adm

Dwass, M., (1957). Modified randomization tests for non parametric hypotheses. *Annals of mathematical statistics. 28*.

Ebel, R. & Serdar Y. (2009). *Concept of Fiscal Decentralisation and Worldwide Overview.* International Symposium Quebec Commission of Fiscal Imbalance, (Sep. Ed.). Singapore: McGraw-hill Book Coy.

Edwards, D. & Berry, J. (1987). The efficiency of simulation-based multiple comparisons. *Biometrics, 43,* 913928.

El-Amudy, A. (2012). *Memorandum on Historical Land Injustices in Lamu,* presented to The Truth Justice and Reconciliation Commission (TJRC) on January 9.

Emengini, S. & Anere, I. (2010). Jurisdiction impact of revenue allocation on states and local government councils in Nigeria. *International Multi-Disciplinary Journal, 4*, 76-95.

Endawke, T. (2009). *Fiscal Federalism,* The Justice and Legal System of Ethiopia, Addis Ababa.

Faguet, J. (2013). *Decentralization and Governance.* Elsevier, Retrieved from http://dx.doi.org/10.1016/j.worlddev.2013.01.002 on 26th June 2016.

Federal Republic of Ethiopia). (1994). *Constitution of the Federal Republic of Ethiopia,* Addis Ababa: FRE.

Fernandes, M. (2009). *Statistics for business and economics.* Marcelo: Fernandes and ventus Publishing.

Fessler, W. (2006). *T*he Politics of the Administrative Process*.'*'New Jersey: Chatham House Publishers.

France, S. (2007). *Fiscal Gaps and Imbalances: The New Fundamentals of Canadian Federalism.* Queens University Montreal: The Institute of Intergovernmental Relations.

Freinkman, L. (2007). *Intergovernmental Relations in Nigeria: Improving Service Delivery in Core Sectors*," Munich Personal RePEc Archive (MPRA), Retrieved from: http://mpra.ub.uni-muenchen.de/10032/1/MPRA_paper _10032.pdf accessed on 26/03/2014.

Gadinis, S. (2012). From Independence to Politics in Financial Regulation. *Journal of Comparative Economics, 41*(2).

Garth, S. (1989). *Unfulfilled Union: Canadian Federalism and National Unity.* Toronto: Gage Educational Publishers.

Gay, L. (1981). *Educational Research: Competencies for Analysis and Application***."** Toronto, Canada: Charles, E. Mairill Publishing Company

A. Bell and Howell Company.

Gay, L., Mills, G.E., & Airasian, P. (2005). *Competencies for analysis and applications.* Upper Saddle River: Pearson Prentice-Hall.

Gay, L., Mills, G.E., &Airasian, P. (2005). *Competencies for analysis and applications.* Upper Saddle River: Pearson Prentice-Hall.

Gboyega, A. (2004). *The Place of Traditional Rulers in the Commune and the Centralized State.* In: Autonomy of Communes in Africa and Germany Speaking Countries in Europe. Oyediran, O., ed. Ibadan: Vantage Publishers.

Gelman, A., Carlin, B., Stern, S. & Rubin, B. (1995). *Bayesian Data Analysis.* London: Chapman and Hall.

Gelpern, A. & Gulati, M. (2013). The wonder-clause. *Journal of Comparative Economics, 41*(2), 367–385.

General Accounting Office, (2001) Federal Funding 2001, Retrieved from: http://financenet.gov

George, E. & McCulloch, R. (1993). *Variable selection via Gibbs sampling*. J. American Statist.Association.

Goldsmith, P. (2011). *The Mombasa Republican Council,* Nairobi: Government printers.

Goss, S. (2007). *Making Local Governance Work.* New York: Palgrave.

Graham, J. E. (1964). *Fiscal Adjustment in a Federal Country*. Toronto. Canada: Canadian Tax Foundation.

Grant, R. & Keohane, R. (2005). Accountability and abuses of power in world politics. *American Political Science Review, 99*(1), 29–43.

Green, P. (1995). *Reversible jump MCMC computation and Bayesian model determination.* Biometrika.

Griffoli, T.M. (2007). *DYNARE User Guide: An Introduction to the Solution and Estimation of DSGE Models.* Retrieved from: http://www.cepremap.cnrs.fr/dynare/download/manual/

Grizzle, G., Rabin, J., Bartley, H. & Miller, G. (1989). *Five Issues in Budgeting and Financial Management Handbook of Public Administration.* New York: Marcel Dekker Publishers.

Grossman, P. J. & West, E.G. (1994). *Federalism and the Growth of Government Revisited.* Public Choice.

Hall, J. (2010). *Encyclopedia of survey research methods.* Beverly Hills: Sage Journals.

Hamilton, J. D. (1994). *Time Series Analysis.* N.J: Princeton University Press.

Hargittai, E. (1998). *Holes in the Net: The Internet and International Stratification Revisited.* Proceedings of the Internet Society's Internet Summit meetings.

Harvey, R. (2010). *The normative order of financial markets: gentility and the London gold market.* In: American Sociological Association Annual Meeting, Atlanta, Georgia.

Hodgson, D. L. (2011). *Being Maasai Becoming Indigenous: Postcolonial Politics in Neoliberal World,* Indiana: Indiana University Press.

Hodgson, M. (2013). Observations on the legal theory of finance. *Journal of Comparative Economics, 41*(2), 331–337.

Hope, A. C., (1968). A simplified Monte Carlo test procedure. *Journal of the Royal Statistical Society, Series B 30.*

Howlett, M. (1999). *Federalism and Public Policy."Canadian Politics.* Toronto: Canada Broadview Press.

Hughes L. (2005). Malice in Maasailand: the Historical Roots of Current Political Struggles. *African Affairs, 104*(415), 207-224.

Hughes L. (2006). *Moving the Maasai: a Colonial Misadventure*, Retrieved from: http://www.palgrave.com/products/catalogue.aspx?is-140399661x

Human Development Report, (1990 to 2006). *Human Development Report,* UNDP: Oxford University Press.

Hunter, J. (2007). *Federalism and Fiscal Balance.* Canberra: Australia National University Press.

Hussein, A., & Mustafa, B. (2007). *Fighting for inclusion: Conflicts among Pastoralists in Eastern Africa and the Horn,* Nairobi: Development Policy Management Forum.

Hyman, D. (2014). *Public Finance: A Contemporary Application of Theory to Policy.* USA: North Carolina State University Press.

Ibrahim, S. (2012). An Alternative Approach to Ending Economic Insecurity in Nigeria: The Role of Revolving Credit Association. *International Journal of Economics and Financial Issues, 2*(4), 395-400.

Ikeji, C. (2011). *The Politics of Revenue Allocation.* , Nigeria: University of Calabar.

Institute of Certified Public Accountants of Kenya, (2012). "*Enhancing Professionalism in Kenya, Nairobi:* ICPAK Retrieved from:www.icpak.com

Ishi, H. (1993). *Local taxation and intergovernmental fiscal relations, in the Japanese tax system.* Oxford: Oxford University Press.

Ishikawa, T. (1995). *Growth Human Development and Economic policies in Japan,* Tokyo: University of Tokyo.

Jimoh, A. (2003). *Fiscal federalism: The Nigerian experience. Paper presented at the Ad-Hoc Expert Group Meeting—Economic Commission for Africa,* Addis Ababa, Ethiopia: UNCC.

Jockel, K. (1986). Finite sample properties and asymptotic efficiency of Monte Carlo tests. *The Annals of Statistics, 14*.(2).

Jones, M., Goodwin, M., & Jomes, R. (2005). State Modernization, Devolution and Economic Governance: An Introduction and Guide to Debate. *Regional Studies, 39*(4), 397-403. Routledge Taylor Francis Group.

Jun, M. (1997). *Intergovernmental Fiscal Transfer: A Comparison of Nine Countries" (Cases of the United States, Canada, the United Kingdom, Australia, Germany, Japan, Korea, India, and Indonesia).* Macroeconomic Management and Policy Division. Economic Development Institute. The World Bank

Kantai, P. (2007). In the Grip of the Vampire State: Maasai Land Struggle in Kenya Politics. *Journal of Eastern Africa Studies, 1*(1), 107-122.

Kanyinga, K. (1997). *Agrarian Reforms and Squatters in Coastal Kenya – Politics of Land Rights and Social Domination,* Paper presented at the Nordic African Institute Research.

Kapadia, A. (2013). Europe and the logic of hierarchy. *Journal of Comparative Economics*, *41*(2), 436–446.

Kappeler, A, Kolev, A. & Välilä, T. (2008). Composition of government investment in Europe: Some forensic evidence. *EIB Papers (*13/1), 23–54.

Keiser, J., Jürg, U., Marcel, T., & Burton, H. (2004). Representation of authors and editors from countries with different human development indexes in the leading literature on tropical medicine: survey of current evidence. *British Medical Journal, 328*, 1229- 1232.

Kelley, C. (1991). The Human Development Index: Handle with Care. *Population and Development Review, 17*(2), 315-324.

Kenya Human Rights Commission. (2010). *Moran No More: The Changing Face of Cattle-rustling in Kenya*, Nairobi: KHRC.

Kenya Human Rights Commission. (2011). *Position Paper on Engendered and Rights-Based Land Reforms in Kenya*, Nairobi: KHRC.

Kenya Land Alliance. (2004). *The National Land Policy in Kenya Addressing Historical Injustices,* Nakuru: KLA.

Keriga, L. (2009). *Social Policy, Development and Governance in Kenya: An Evaluation and Profile of Education in Kenya*. Nairobi: Government printer.

Kerlinger, F. (2000). *Foundations of the Behavioural Research.* San Fransisco: Winston Limited Inc.

Khumalo, K., Bongani, N. & Renosi, M.(2007). *Republic of South Africa; in the practice of fiscal federalism. Comparative perspectives.* Montreal: McGills-Queens University Press.

Kiai, M. (1998). Commentary: A Last Chance for Peaceful Challenge in Kenya, Africa *Today, 45*(2).

Kincaid, J. (1999). *Federalism and Economic Policy-making: Advantages and Disadvantages of the Federal Model.* Lafayette College. Centre for the study of state and local governments.

King, D. (1984). *Fiscal Tiers: The Economics of Multi-Level Government*. London: George Allen and Unwin.

Kiringai, J. (2006). *Public Spending in Kenya: An Inequality Perspective. In Readings on Inequality in Kenya*. pp11-55, Society for International Development.

Kiringai, J. (2006). *Public Spending in Kenya: An inequality perspective, in Society for International Development Readings on inequality in Kenya.* Nairobi: Society for International Development (SID).

Kombo, D. & Tromp, K. (2006). *Proposal and Thesis Writing.* Nairobi: Pauline's publications.

Kothari, C. (2009). *Research Methodology: Methods and Techniques.* India: New age Publications.

Krathwohl, D. R. & Smith, N. L. (2005). *How to Prepare a Dissertation Proposal Proposal: Suggestions for Students in Education and the Social and Behavioural Sciences.* Syracuse, NY: Syracuse University Press.

Lehmann, E., (1986). *Testing statistical hypotheses,* New York: John Wiley and sons,

Liu, P. (2006). *A Small New Keynesian Model of the New Zealand Economy.*Reserve Bank of NZ, RBNZ DSGE Workshop, Retrieved from: http://ideas.repec.org/p/nbz/nzbdps/2006-03.html

Lohr, S. (1998). *Sampling design and analysis.* New York; Brooks/Cole.

Lubik, T., & Schorfheide, F. (2005). *A Bayesian Look at New Open Economy Macroeconomics.* NBER Macroeconomics Annual, Vol. 20 NBER, MIT Press.

Luck, D. J. & Rubin, R. S. (1987). *Marketing Research.,* Englewood Cliff: Prentice Hall.

Lukpata, V. (2013). *Revenue Allocation Formulae in Nigeria: A Continuous Search." International Journal of Public Administration and Management Research, 2*(1), 32-38. Retrieved from http://www.rcmxss.com/journal/2350-2231.

Ma, J. (1995). *Macroeconomic Management and Intergovernmental Relations in China.* Policy Research Working Paper No. 1408. Viena. Austria. The World Bank.

Ma, J. (1996). *Intergovernmental fiscal transfer: A comparison of nine countries, Paper presented at the workshop on intergovernmental fiscal transfer; the experiences from Japan and other countries,* March, Hanoi.

Manning, M. & McMurray, D. (2010). *Quantitative Research methods*. Australia: Southern Cross University.

Mazumdar, K. (2002). A Note on Cross-Country Divergence in Standard of Living. *Applied Economic Letters, 9*(2), 87-90.

McLean. I. (2002). *Fiscal Federalism in Australia.* Research School of Social Sciences, Australian National University Working Papers in Social and Political Theory Programme, Retrieved from: http://www.nuff.ox.ac.uk/Politics/Papers.

Mefor, L. (2009). *Revenue Sharing Formula In Nigeria – A Time Bomb,* Nigeria Village Square. Retrieved from: http://www.nigerniavillagesquare.com/articles/law-mefor/revenue-sharing-ormula-in-nigeria-a-time-bomb.html accessed on 26/03/2014.

Mehrotra, A. & Välilä, T. (2006). *Public investment in Europe: evolution and determinants in perspective. Fiscal Studies, 27*(4), 443-471.

Merobe, M. (2001). *Federalism and Public Finance,* Ottawa Canada: Forum of Federations.

Mikesell, J. (2006). *Fiscal Administration: Analysis and Applications for the Public Sector*. Orlando, FL: Harcourt Brace Publishers.

Mokate, R. (2006). *South Africa: Fiscal Federalism in Transition,* Ontario, Canada: Forum of Federations.

Moore, P. (2007). *Allocation formula in budgeting,* New Jersey: Union.

Moore, M. A., Harvey, P. A. & Beach, D. I. (2010). *The Financing of Canadian Federation: The First hundred years.* Ottawa: Canadian Tax Foundation.

Moore, P. (2011). *Allocation Formula in Budgeting,* Union, New Jersey: Kean University.

Morobe, M. (2001). *Federalism and public finance south Africa's evolving intergovernmental finance regime,* Ceracruz, Mexico: Forum of Federations.

Musgrave, R. A. (1959). *The Theory of Public Finance.* New York: McGraw-Hill.

Musgrave, R. & Musgrave, P. (1995). *Public Finance in theory and practice.* Tokyo: McGraw-Hill International Editions.

Muyia-Odada, F. (2012). *Ugatuzi, Kenya's Anticipated new Devolved Government.* ACT. Retrieved from: ww.act.or.ke

Mwenda, A. (2010a). *Introduction' in IEA Devolution in Kenya: Prospects, challenges and the future.* IEA Research Paper Series No. 24, Institute of Economic Affairs, Nairobi.

Mwenda, A.K. (2010b). *Devolution in Kenya: Prospects, Challenges and Future.* Nairobi: IEA Kenya.

Negussie, S. (2016). *Fiscal Federalism and Decentralization in Selected IGAD Member Countries.* The Horn Economic and Social Policy Institute (HESPI) Working Paper 04/16.

Noorbakhsh, F. (2006). *International Convergence or Higher Inequality in Human Development?* Evidence for 1975 to 2002. World Institute for Development Economic Research (UNU-WIDER). Research Paper No. 2006/15.

Oates, W. E. (2006). An Essay on Fiscal Federalism. *Journal of Economic Literature, 37*(3), 1120–1149. Retrieved from: http://www.jstor.org/stable/2564874.

Oates, W. E. (1972). *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.

Oates, W. E. (1991). An Essay on Fiscal Federalism. *Journal of Economic Literature, 37*(3), 1120–1149. Retrieved from: http://www.jstor.org/stable

Ojo, O. E., (2009*). Mechanisms of National Integration in a Multi-Ethnic Federal State: The Nigerian Experience.* Nigeria, Ibadan: John Archers Limited.

Olofin, S., Olubusoye, E., Bello, A., Salisu, A. & Olalekan, S. (2012). Fiscal federalism in Nigeria: A cluster analysis of revenue allocation to states and local government areas. 1999-2008. *CBN Journal of Applied Statistics, 3*, 65-83.

Olowola, A. (2012). *State Budgetary Allocations: an Appraisal of Budget Implementation and Effect in Nigeria.* Paper Presented at the NISER Research Seminar Series Held at the Nigerian Institute of Social and Economic Research. Pp 1-27.

Olowononi, G.D. (2000). An Evaluation of Revenue Allocation Formula in Nigeria. *NCEMA Policy Analysis Series*, *6*(2), 107-140.

Olson, M., Jr. (1982). The Principle of 'Fiscal Equivalence: The Division of Responsibilities among Different Levels of Government. *The American Economic Review 59*(2), 479–487.

Ovwasa, L. O., (1995*). The Politics of Revenue Allocation in Nigeria.* Ibadan, Nigeria: Sunnad Publishers Limited.

Owolabi, U. (2011). *Revenue Allocation Formula, its impact on Economic Growth.* International Institute for Science, Technology and Education. Retrieved from: www.iiste.org

Pagliani, P. (2010). *Human Development Report Reports: Influence of regional, National and sub-national HDRs,* Toronto: Gage Educational Publishers.

Parish, T. (2005). *Removing Incentives for Restrictive Placements. Fiscal Issues in Special Education.* US Department of Education Washington, DC series: *CSEF Policy Paper 4* ED.377608

Paton, M. (2002). *Qualitative evaluation and research methods.* Newbury Park. Programme on Structural Adjustment, Final Evaluation Workshop. Abidjan

Petersen, M. & Rother, L. (2001). *Maker Agrees to Cut Price of 2 AIDS Drugs in Brazil.* New York: New York Times.

Prud'homme, R. (1995). *Decentralization and Economic Growth.* Washington DC: The World Bank.

Rajan, G. & Zingales, L. (2003). The great reversals: the politics of financial development in the 20th century. *Journal of Financial Economics, 69*(July), 5–50.

Rao, G. (2012).*Fiscal Federalism in India: Emerging Challenges.* Toronto, Canada: Forum of Federations.

Republic of India, (2015). *14th Finance Commission (FFC) Report Tabled in Parliament,* Press Information Bureau, Government of India, Ministry of Finance Retrieved from: http://pib.nic.in/newsite/PrintRelease.aspx?relid=115810

Republic of Kenya, (2010). *The Kenya Constitution.* Nairobi: Government Printer.

Republic of Kenya, (2012). *Recommendations on Sharing of Revenue Raised Nationally Between The National And County Governments For The Fiscal Year 2012/2013.* Nairobi: Government Printer.

Republic of South Africa, (2011). *Division of Revenue Bill, Bill published in Government* Gazette No. 33959 of 24 January 2011.

Roberge, I. (2003). The internalization of public policy and the prospects for a theory of Multy Level Governance. Canada. *Graduate journal of theory and politics, Forum of Federations.*

Robert, C. & Casella, G. (2004). *Monte Carlo Statistical Methods*, New York: Springer-Verlag

Rodden, J. (2002). The Dilemma of Fiscal Federalism: Grants and Fiscal Performance Around the World. *American Journal of Political Science, 46*(3), 670-87.

Salami, O.A. (2007). Fiscal Federalism and Revenue Allocation in the Federal Republic of Nigeria. *Journal of Development Perspectives, 2*(2), 1-33.

Saunders, M., Lewis, P. & Thornhill, A. (2007). *Research methods for business students.* UK: Pearson Education limited.

Scott, A. (1952). Federal grants and resource allocation, *Journal of Political Economy, 60*(6), 534-536.

Sekaran, U. (2003). *Research methods for business: a skill building approach,* (4th ed.). US: John Wiley and sons, Inc.

Sekaran, U. (2010). *Research Methods for Business: A Skill Building Approach*. New Delhi: John Wiley and Sons.

Shah, A. (2007a). *Comparative conclusions on fiscal federalism.* Ontario, Canada: Forum of federations.

Shah, A. (2007b). *Jostering Responsiveness and Accountable Governance: Lessons from Decentralization Experience.* Presented at the World Bank Conference on Evaluation and Development, April 12, Washington, D. C.

Silva, R. & Ferreira, A. (2012). *A Regional Human Development Index for Portugal.* Portugal: Lisbon Press.

Skerry, P. (2010*). Race, Group Identity and the Evasion of Politics.* Washington, DC: Brookings Institution Press.

Smets, F. & Wonters, R. (2003**).** An Estimated Dynamic Stochastic General Equilibrium Model of the Euro Area. *Journal of the European Economic Association, 1,* 1123-1175.

Spahn, P .B. & Fottinger, W.. (2007). *Fiscal Federalism in Theory and Practice.* Teresa Ter-Minassian ed. Washington: International Monetary Fund.

Spencer, B. (2012). Technical issues in allocation formula design. *Public Adm. Rev. 42*

Stansel, D. (2005). Local Decentralization and economic Growth: A Cross-Sectional Examination of US Metropolitan Areas. *Journal of Urban Economics, 57,* 55-72.

Stegarescu, D. (2005). *Public Sector Decentralization: Measurement Concepts and Recent International Trends.* ZEW Discussion Paper No. 04-74, Retrieved from: ftp://ftp.zew.de/pub/zew-docs/dp/dp0474.pdf.

Stepan, A. (2009). Federalism and Democracy: Beyond the U.S. Model. *Journal of Democracy, 10,* 19-33.

Tanzi, V. (1995). *Fiscal Federalism and Decentralization: A Review of some Efficiency and Macroeconomic Aspects*. In: Annual World Bank Conference on Development Economics. Bruno, M. and B, Pleskovic, eds. World Bank, 317-322.

Tewfik, H. (2010). *Transition to federalism, the Ethiopian experience.* Ottawa. Canada: Forum of Federations.

Treisman, D. (2004). *Decentralization, Fiscal Incentives, and Economic Performance: A Reconsideration.* Retrieved from: Treisman @polisci.ucla.edu.

Tresch, W. (2015). *Public Finance – a Normative Theory.* Oxford. UK: Academic Press.

Tsegaw, E. (2009). *Fiscal Federalism,* Justice and Legal System Research Institute

Ulam, S. (1964). *Problems in modern mathematics*, Science Editions, New York: Wiley.

Unegbu, A. & Irefin, D. (2011). Impact of VAT on Economic Development of Emerging nations, *Journal of Economics and International Finance*, *3*(8), 492-503.

United Nations Development Programme, (2012). *Application of the HDI, NHDR Network Discussion,* Retrieved from http://hdr.undp.org/en/nhdr/nettworks/replies/140.pdf

Usman, O. (2011). Fiscal federalism and economic growth process in Nigeria. *European Journal of Business and Management, 3*, 1-11.

Verbeek, M. (2004). *A Guide to Modern Econometrics.* Chichester: John Wiley and Sons.

Wantchekon, L. & Asadurin, T. (2002). *Transfer Dependence and Regional Disparities: The case of Nigeria.* Paper Presented at the Federalism Conference, June 6-7, Standford University.

Watts, R. L., & Chattopadhyay, R. (2008). *Emerging issues in Fiscal Federalism.* New Delhi, India: Viva books Private limited.

Watts, R. L & Hobson, P.. (2009). *Fiscal Federalism in Germany*. Institute of Intergovernmental Relations, Ontario, Canada: Queens University Kingston.

Wibbles, E. (2006). *Federalism and the Politics of Macroeconomic Policy and Performance. American Journal of Political Science, 44* (4), 687-702.

Wildasin, D. (1991). *Intergovernmental transfer to Local Governments,* IFIR Working Paper No. 2009-11, Toronto, Cananda: Forum of Federations.

Wildasin, D. (2009). *Intergovernmental transfer to Local Governments.* IFIR Working Paper No. 2009-11, Toronto, Cananda: Forum of Federations.

Wildavsky, A. (2004). *The Politics of the Budgetary Process*. Boston, MA.: Little Brown.

Wilkins, R. (2004). *Canada – An overview of fiscal Arrangements.* Toronto, Canada: Forum of Federations,.

World Bank, (2004). *Mainstreaming Anti-Corruption Activities in World Bank Assistance - A Review of Progress since 1997.* Washington, DC: World Bank.

World Bank, (2006). *Fiscal Management in Argentina.* Washington, DC: World Bank.

World Bank, (2009). *Fiscal Management in Brazil.* Washington, DC: World Bank.

World Bank, (2010). *Human Development Index and its components.* Washington, DC: World Bank.

World Bank, (2010). *Adjustment Lending: An Evaluation of Ten Years of Experience.* Washington, DC: World Bank.

Yamane, T. (1967). *Statistics: an introductory analysis.* New York: Harper and Row.

Zikmund, K. & Babin B., Carr, C., and Griffin, M. (2010). *Business Research Methods,* South Western: Cengage Learning.

APPENDICES

Appendix I: County Development Index and the Component Indices

KEY

P – POVERTY **I – INFRASTRUCTURE** **H - HEALTH** **E – EDUCATION**

	COUNTY	COMPONENT INDICES				CDI
		P	I	H	E	
1	TURKANA	0.3250	0.4540	0.1853	0.1380	0.2697
2	MANDERA	0.5430	0.2767	0.3317	0.1910	0.3107
3	WAJIR	0.6190	0.3693	0.2917	0.1760	0.3334
4	MARSABIT	0.5780	0.4017	0.3970	0.1755	0.3652
5	SAMBURU	0.5760	0.4483	0.3953	0.1770	0.3779
6	WEST POKOT	0.7420	0.3263	0.3457	0.2655	0.3812
7	TANA RIVER	0.7010	0.3337	0.3747	0.2765	0.3879
8	NAROK	0.8980	0.2690	0.5380	0.2430	0.4377
9	BARINGO	0.7840	0.3310	0.4110	0.3950	0.4438
10	KWALE	0.7160	0.3830	0.4623	0.3640	0.4532
11	KITUI	0.7780	0.3183	0.5110	0.3690	0.4600
12	GARISSA	0.7970	0.4717	0.4373	0.3100	0.4688
13	HOMA BAY	0.8480	0.2827	0.4970	0.4255	0.4731
14	THARAKA	0.8800	0.2277	0.5760	0.4090	0.4803

	NITHI					
	TRANS					
15	NZOIA	0.8490	0.4520	0.5080	0.3125	0.4921
16	KILIFI	0.7420	0.4447	0.5230	0.3765	0.4951
17	BUSIA	0.7320	0.4917	0.5840	0.3330	0.5115
18	TAITA	0.8240	0.4487	0.6290	0.2870	0.5139
	TAVETA					
19	BOMET	0.8780	0.2823	0.6220	0.4305	0.5142
20	MIGORI	0.8100	0.3603	0.5997	0.4275	0.5181
21	ISIOLO	0.7160	0.5687	0.5380	0.3475	0.5217
22	KAJIADO	0.9750	0.5017	0.4830	0.3395	0.5268
23	KISUMU	0.8580	0.3880	0.6350	0.3940	0.5340
24	ELGEYO	0.8340	0.3740	0.6247	0.4410	0.5365
	MARAKWET					
25	MACHAKOS	0.8020	0.3400	0.6110	0.5130	0.5382
26	MAKUENI	0.7780	0.3797	0.5710	0.5305	0.5392
27	SIAYA	0.8820	0.3383	0.7210	0.3850	0.5455
28	NANDI	0.8630	0.3803	0.6513	0.4260	0.5462
29	MERU	0.9380	0.3500	0.7130	0.3615	0.5489
30	BUNGOMA	0.8230	0.4670	0.6790	0.3575	0.5527
31	LAMU	0.9370	0.4937	0.5710	0.4145	0.5641

COUNTY		COMPONENT INDICES				CDI
		P	I	H	E	
32	LAIKIPIA	0.8590	0.4187	0.6457	0.4640	0.5654
33	VIHIGA	0.8810	0.4793	0.6330	0.4145	0.5685
34	KAKAMEGA	0.8260	0.4527	0.6907	0.4185	0.5695
35	KERICHO	0.8850	0.4213	0.6553	0.4520	0.5696
36	EMBU	0.8580	0.3690	0.6470	0.5410	0.5732
37	MURANGA	0.8930	0.3667	0.6700	0.5030	0.5740
38	NYANDARUA	0.8250	0.3790	0.7880	0.4480	0.5842
39	KIRINYAGA	0.9410	0.3940	0.7920	0.4325	0.6037
40	NAKURU	0.8790	0.4383	0.7333	0.4830	0.6039
41	KISII	0.7830	0.4143	0.7970	0.5190	0.6098
42	NYAMIRA	0.8570	0.4653	0.6793	0.5825	0.6207
43	UASIN GISHU	0.8860	0.5580	0.6823	0.4730	0.6215
44	NYERI	0.8840	0.4543	0.7663	0.5635	0.6410
45	MOMBASA	0.9130	0.5533	0.8077	0.5055	0.6687
46	KIAMBU	0.9350	0.5863	0.7760	0.5235	0.6776
47	NAIROBI CITY	0.9310	0.7683	0.8573	0.5790	0.7663
	AVERAGE	**0.8098**	**0.414326**	**0.5881**	**0.3935**	**0.5204**

Appendix II: Questionnaire

SECTION I BACKGROUND INFORMATION

A. Letter of Introduction

Date: _____

Dear Respondent,

This questionnaire is aimed at collecting data for academic research purposes on "equitable revenue allocation model for the county governments in Kenya". The study is in partial fulfilment of the requirements for the award of a PhD degree in Business Administration of Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Please be assured that any information collected through this questionnaire will be treated with utmost confidence and will be used for research purposes only. Thank you in advance for your time and cooperation.

Yours faithfully,

Jared O. Abongo
Student, PhD, Business Administration
Reg. No. HD433-C004-0961/2011

SECTION I: BASIC INFORMATION

1. Name (Optional) _____

   County_____

2. Institution of Affiliation _____

   Position_____

3. Gender (M/F/Other)_____

4. For how long have you resided in this county?

☐	☐	☐
0-2years	2-4 years	5 years and above

5. Please tick the highest academic level attained.

☐	☐	☐	☐
Primary	High school	College/University	Graduate school

Section IV: Adequacy of CRA Parameters in Revenue Allocation

6. To what extent do the following statements apply to your County? Please tick as appropriate in a corresponding box? **Use a scale of 1 to 5, where 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree**

	CRA Parameters	**1**	**2**	**3**	**4**	**5**
a	The public was extensively involved in determination of Revenue Allocation parameters.					
a	Population is adequate as one of the parameters in revenue allocation					

b	Poverty Index is adequate as one of the parameters in revenue allocation					
c	Equal Share is adequate as one of the parameters in revenue allocation					
d	Fiscal Responsibility is adequate as one of the parameters in revenue allocation					
e	Land Area is adequate as one of the parameters in revenue allocation					

7. Do you agree with the use of (POPULATION, POVERTY, LAND AREA, BASIC EQUAL

SHARE and FISCAL RESPONSIBILITY) in the CRA's proposed revenue allocation formula?

Yes ☐ No ☐ Don't ☐ Know

8. If your answer in (8) is No, which parameter don't you agree with and why?

Parameter…….

Reasons 1……

2. ……

3. ……

Parameter…….

Reasons 1……

2. ……

3. ……

Parameter…….

Reasons 1……

2. …….

3. …….

Parameter…….

Reasons 1……

2. …….

3. …….

9. CRA has allocated weights for the 5 parameters listed in the table below. If you do not agree with the weights, make suggestions. You may also suggest other parameters and corresponding weights to be considered.

CRA Parameters	CRA Weights	Your suggestion (tick only one box for each parameter)					
		Under 10%	11-20%	21-30%	31-40%	41-50%	Over 50%
Population	45%						
Land Area	8%						
Basic Equal share	25%						
Poverty	20%						
Fiscal Responsibility	2%						
Other Parameter							

10. In your opinion should the stated weight of CRA parameter be retained as it is; done away with completely; decreased gradually or increased gradually? (tick only one box for each parameter)

PARAMETER	**Retained as is**	**Removed completely**	**Increased**	**Decreased**
Population				
Poverty Index				
Land Area				
Equal Share				
Fiscal Responsibility				

Section V: Other Parameters in Revenue Allocation

11. To what extent do the following statements apply to your County? Please tick as appropriate in a corresponding box? **Use a scale of 1 to 5, where 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree**

	Other Parameters	**1**	**2**	**3**	**4**	**5**
a	Internal revenue effort should be incorporated as a parameter in the revenue allocation model					
b	Infrastructure development should be incorporated as a parameter in the revenue allocation model					
c	Natural resource endowment of a county should be incorporated as a parameter in the revenue allocation model					
d	Social service burden(i.e. education, health, water etc) should be incorporated as a parameter in the revenue allocation model					
e	Accessibility to grants and other sources of funds by a county should be incorporated as a parameter in the revenue allocation model					

12. State any three parameters that you would wish to be incorporated in the CRA formula.

    i.) …….
    ii.) …….
    iii.) …….

Section IV: Political Influence on Revenue Allocation Formula

13. To what extent do the following statements apply to your County? Please tick as appropriate in a corresponding box? **Use a scale of 1 to 5, where 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree**

	Other Parameters	**1**	**2**	**3**	**4**	**5**
a	Opinion leaders' perception has an impact on the revenue allocation formula					
b	The past political injustices are considered in revenue allocation in Kenya					
c	Marginalization policies of past political regimes are considered when formulating the revenue allocation formula in Kenya					
d	Social service burden(i.e. education, health, water etc) should be incorporated as a parameter in the revenue allocation model					
e	Political affiliation of a county determines how the revenue allocation medel is formulated					

SECTION V: Constitutional Guide on Revenue Allocation

14. To what extent do the following statements apply to your County? Please tick as appropriate in a corresponding box? **Use a scale of 1 to 5, where 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree**

	Constitutional guide	**1**	**2**	**3**	**4**	**5**
a	The minimum Revenue allocation of 15% of the GDP is adequate					
b	The mandate/powers conferred on CRA in revenue allocation are sufficient					
c	County revenue taxes are adequate in running county governments					
d	Marginalised areas are adequately catered for by the current constitution					
e	The role of the senate in revenue allocation is sufficiently provided for in the constitution					
f	Equalization fund is sufficiently addressed by the constitution					

Section VI: Other relevant issues in Revenue Allocation

15. To what extent do the following statements apply to your County? Please tick as appropriate in a corresponding box? **Use a scale of 1 to 5, where 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree**

	Other relevant Issues	**1**	**2**	**3**	**4**	**5**
a	The revenue allocation formula should provide for a basic amount that should be given to each county.					
b	All counties are entitled to equal share in the revenue allocation and hence there is no need for a formula.					
c	Kenya should adopt the formulas used by other successful federal states instead of designing their own					
d	The county assemblies should be directly involved in designing the revenue allocation model.					
e	Revenue allocation to the counties should be done by way of a pre determined formula					

SECTION III **Interview Guide**

Constitutional Guide on Revenue Allocation

1. Do you consider the mandate of CRA as contained in the Constitution to be sufficient **Y[ ] N[ ]**
2. If **No**, what in your view should be included?
3. Do you consider the minimum of 15% Constitutional revenue allocation as sufficient

   Y[ ] N[ ]
4. If **No,** what would you consider adequate?.....
5. Can you propose how the minimum allocation of 15% should be distributed across all the counties……

   …

   ……

   ……

   ……

   ……

   ……..

Adequacy of CRA Parameters in Revenue Allocation

1. In your opinion, was the public extensively involved in determination of Revenue Allocation parameters. **Yes[ ] No[ ]**
2. Should **population of a county** be considered as one of the parameters in revenue allocation formula? **Yes[ ] No[ ]**

If **no,** why?

.....
.....

3. Should **Poverty Index** be considered as one of the parameters in revenue allocation formula? **Yes[ ] No[ ]**

If **no,** why?

.....
.....

4. Should the **Equal Share** be considered as one of the parameters in revenue allocation formula? **Yes[ ] No[ ]**

If **no,** why?

.....
.....

5. Should the **Fiscal Responsibility** be considered as one of the parameters in the revenue allocation formula? **Yes[ ] No[ ]**

If **no,** why?

.....
.....

6. Should the **Land Area** be considered as one of the parameters in revenue allocation formula? **Yes[ ] No[ ]**

If **no,** why?

.....
.....

Other Parameters in Revenue Allocation

1. In your opinion, should **internal revenue effort** be incorporated as a parameter in the revenue allocation formula in Kenya? **Yes[ ]**

   No[ ]

   Please give reasons for your answer

   .....
   .....

2. In your opinion, should **infrastructure development** be incorporated as a parameter in the revenue allocation formula in Kenya? **Yes[ ]**

   No[ ]

   Please give reasons for your answer

   .....
   .....

3. In your opinion, should the **natural resource endowment** of a county be incorporated as a parameter in the revenue allocation formula in Kenya?

   Yes[ ] No[ ]

   Please give reasons for your answer

   .....
   .....

4. In your opinion, should the **social service burden** (i.e. education, health, water etc) be incorporated as a parameter in the revenue allocation formula in Kenya?

   Yes [ ] No[ ]

   Please give reasons for your answer

.....
.....

5. In your opinion, should the **accessibility to grants** and other sources of funds by a county be incorporated as a parameter in the revenue allocation formula in Kenya?

   Yes[ ] No[ ]

   Please give reasons for your answer

   .....
   .....

Diagnostic tests (to be answered by, institutions that have developed a form of revenue allocation model)

1. What are the best scientific models for modelling revenue allocation formulas?

   .....
   .....
   .....
   .....
   ...

2. Is Monte Carlo simulations relevant to the Kenyan situation in modelling revenue allocation formula? **Yes[ ] No[ ]**

   Please give reasons for your answer

   Is Bayesian Theorem appropriate in modeling the revenue allocation formula for Kenya? **Yes[ ] No[ ]**

   Please give reasons for your answer .....
   .....
   .....
   .....

ther relevant issues

1. In your opinion, should the revenue allocation formula provide for a basic amount that should be given to each county equally? **Yes[ ]**
   No[ ]

   Please give reasons for your answer .....
   .....

2. Do you agree that all counties are entitled to equal share in the revenue allocation and hence there is no need for a formula. **Yes[ ]**
   No[ ]

   Please give reasons for your answer. .....
   .....

3. Should Kenya adopt a formula used by other successful federal states instead of designing their own? **Yes[ ]** **No[ ]**

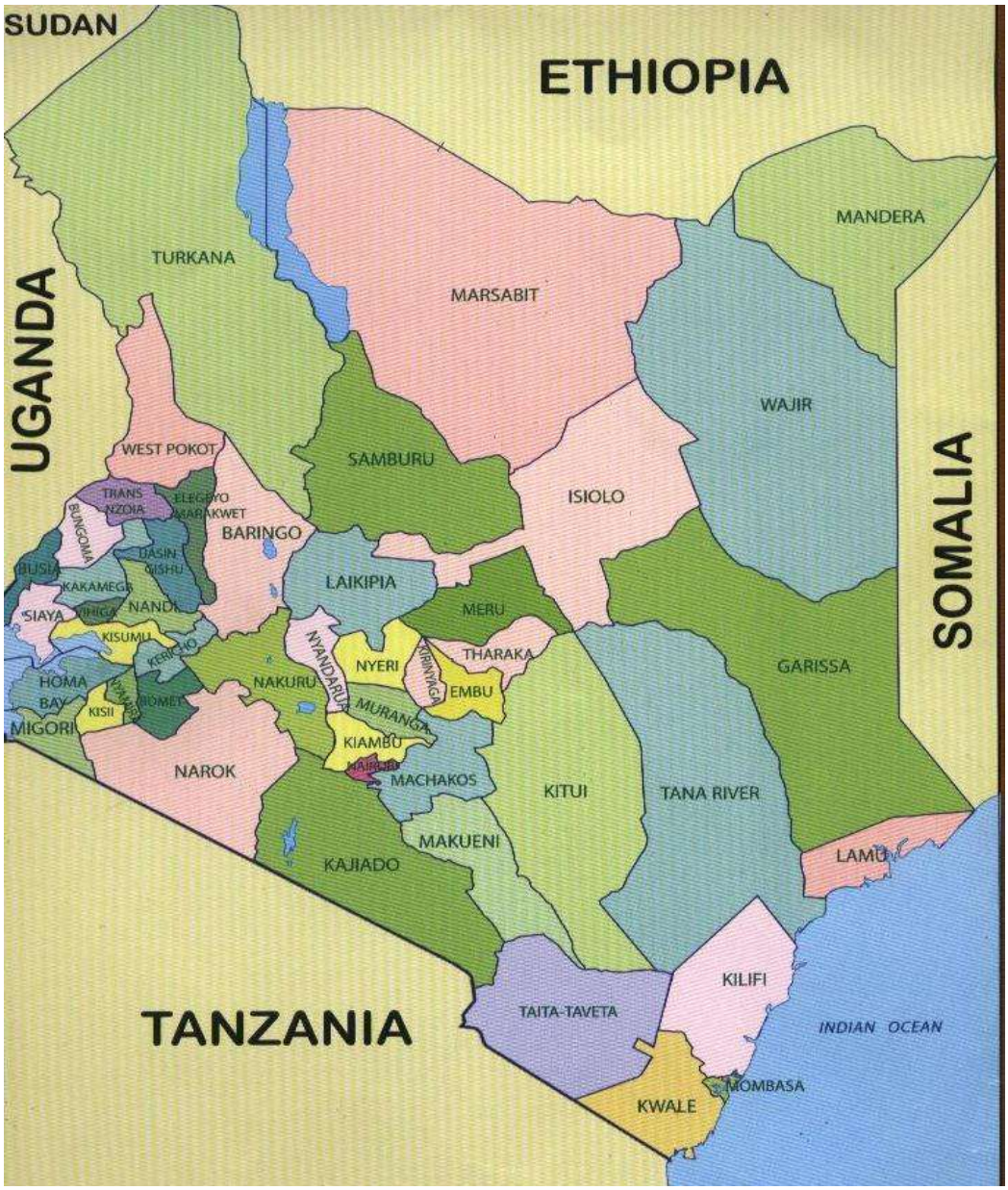
   Please give reasons for your answer. .....
   .....

4. In your opinion should the county assemblies be directly involved in designing the revenue allocation model. **Yes[ ]** **No[ ]**

   Please give reasons for your answer. .....
   .....

5. In your opinion, should the Revenue allocation to the counties be done by way of a pre determined formula. **Yes[ ]** **No[ ]**lease give reasons for your answer. .....
   .....

Appendix III: Counties on Kenyan Map



Source: Commission of Revenue Allocation (2011)

Appendix IV: Kenya County Profiles

	County	Male	Female	Total	Households	Area Km^2	Density
1	Nairobi	1,605,219	1,533,150	3,138,369	985,016	695.10	4,514.96
2	Nyandarua	292,152	304,116	596,268	143,879	3,245.25	183.74
3	Nyeri	339,724	353,834	693,558	201,703	3,337.09	207.83
4	Kirinyaga	260,628	267,426	528,054	154,220	1,479.09	357.01
5	Murang'a	457,860	484,721	942,581	255,696	2,558.82	368.37
6	Kiambu	802,603	820,679	1,623,282	469,244	2,543.42	638.23
7	Mombasa	486,924	452,446	939,370	268,700	218.86	4,292.09
8	Kwale	315,994	333,937	649,931	122,047	8,270.15	78.59
9	Kilifi	535,531	574,204	1,109,735	199,764	12,609.74	88.01
10	Tanariver	119,857	120,218	240,075	47,414	38,436.91	6.25
11	Lamu	53,045	48,494	101,539	22,184	6,273.12	16.19
12	Taitataveta	145,333	139,324	284,657	71,090	17,084.04	16.66
13	Marsabit	151,110	140,056	291,166	56,941	70,961.19	4.10
14	Isiolo	73,693	69,601	143,294	31,326	25,336.07	5.66
15	Meru	670,656	685,645	1,356,301	319,616	6,933.01	195.63
16	Tharaka	178,447	186,883	365,330	88,803	2,638.83	138.44
17	Embu	254,302	261,910	516,212	131,683	2,818.04	183.18
18	Kitui	481,283	531,426	1,012,709	205,491	30,496.51	33.21
19	Machakos	543,138	555,446	1,098,584	264,500	6,208.24	176.96
20	Makueni	430,708	453,819	884,527	186,478	8,008.75	110.45
21	Garissa	334,941	288,119	623,060	98,590	44,175.02	14.10
22	Wajir	363,775	298,166	661,941	88,574	56,685.75	11.68
23	Mandera	559,938	465,818	1,025,756	125,497	25,991.47	39.47
24	Siaya	398,650	443,654	842,304	199,034	2,530.38	332.88
25	Kisumu	474,756	494,153	968,909	226,719	2,085.93	464.50
26	Homabay	462,450	501,344	963,794	206,255	3,183.29	302.77

	County	Male	Female	Total	Households	Area Km^2	Density
27	Migori	444,358	472,812	917,170	180,211	2,595.94	353.31
28	Kisii	550,451	601,831	1,152,282	245,029	1,317.53	874.58
29	Nyamira	287,045	311,207	598,252	131,039	899.28	665.25
30	Turkana	445,071	410,328	855,399	123,191	68,680.11	12.45
31	Westpokot	254,826	257,864	512,690	93,777	9,169.45	55.91
32	Samburu	112,003	111,944	223,947	47,354	21,022.27	10.65
33	Transnzoia	407,170	411,587	818,757	170,117	2,495.53	328.09
34	Baringo	279,081	276,480	555,561	110,649	11,015.32	50.44
35	Uasingishu	448,990	445,189	894,179	202,291	3,345.21	267.30
36	Elgeyo-Marakwet	183,736	186,262	369,998	77,555	3,029.78	122.12
37	Nandi	376,488	376,477	752,965	154,073	2,884.18	261.07
38	Laikipia	198,625	200,602	399,227	103,114	9,461.92	42.19
39	Nakuru	804,577	798,748	1,603,325	409,836	7,495.07	213.92
40	Narok	429,027	421,893	850,920	169,220	17,933.05	47.45
41	Kajiado	345,143	342,169	687,312	173,464	21,900.97	31.38
42	Kericho	298,878	291,812	590,690	127,581	2,157.89	273.73
43	Bomet	442,830	449,005	891,835	174,914	2,792.40	319.38
44	Kakamega	800,977	859,674	1,660,651	355,679	3,017.66	550.31
45	Vihiga	262,718	291,904	554,622	123,347	564.47	982.55
46	Bungoma	671,548	703,515	1,375,063	270,824	3,032.15	453.49
47	Busia	356,119	387,827	743,946	154,225	1,695.03	438.90
	Total	*38,610,097*	*581,313*	*27,089,600*	*11,520,497*		*2,592*

Appendix V: Land Area by County

Land area by county

RANKING	COUNTY	AREA	
		KM SQUARE	% CONTRIBUTION
1	MARSABIT	70,961	12.21
2	TURKANA	68,680	11.81
3	W AJIR	56,686	9.75
4	GARISSA	44,175	7.60
5	TANA-RIVER	38,437	6.61
6	KITUI	30,497	5.25
7	MANDERA	25,992	4.47
8	ISIOLO	25,336	4.36
9	KAJIADO	21,901	3.77
10	SAMBURU	21,022	3.62
11	NAROK	17,933	3.08
12	TAITA-TAVETA	17,084	2.94
13	KILIFI	12,610	2.17
14	BARINGO	11,015	1.89
15	LAIKIPIA	9,462	1.63
16	W EST POKOT	9,169	1.58
17	KW ALE	8,270	1.42
18	MAKUENI	8,009	1.38
19	NAKURU	7,495	1.29
20	MERU	6,936	1.19
21	LAMU	6,273	1.08
22	MACHAKOS	6,208	1.07

23	BUNGOMA	3,593	0.62
24	UASIN-GISHU	3,345	0.58
25	NYERI	3,337	0.57
26	NYANDARUA	3,245	0.56
27	HOMA-BAY	3,183	0.55
28	KAKAMEGA	3,051	0.52
29	ELGEYO-MARAKW ET	3,030	0.52
30	NANDI	2,884	0.50
31	EMBU	2,818	0.48
32	THARAKA-NITHI	2,639	0.45
33	MIGORI	2,596	0.45
34	MURANG'A	2,559	0.44
35	KIAMBU	2,543	0.44
36	SIAYA	2,530	0.44
37	TRANS-NZOIA	2,496	0.43
38	KERICHO	2,479	0.43
39	BOMET	2,471	0.43
40	KISUMU	2,086	0.36
41	KIRINYAGA	1,479	0.25
42	KISII	1,318	0.23
43	BUSIA	1,134	0.20
44	NYAMIRA	899	0.15
45	NAIROBI CITY	695	0.12
46	VIHIGA	531	0.09
47	MOMBASA	219	0.04
	TOTALS	**581,313**	**100.00**

Source: Data from Table 1a of the 2009 Kenya Population and Housing Census: Population Distribution by Political Units, Volume I B, Kenya National Bureau of Statistics.

Appendix VI: Costing of Devolved Functions

Costing of devolved functions

	County	KShs. Millions
1	Mombasa	4,632
2	Kwale	2,161
3	Kilifi	3,163
4	Tana River	1,908
5	Lamu	1,270
6	Taita Taveta	2,002
7	Garissa	3,107
8	Wajir	2,887
9	Mandera	2,525
10	Marsabit	2,191
11	Isiolo	1,854
12	Meru	3,346
13	Tharaka – Nithi	1,460
14	Embu	3,349
15	Kitui	3,465
16	Machakos	3,559
17	Makueni	3,066
18	Nyandarua	2,397
19	Nyeri	4,222
20	Kirinyaga	3,142
21	Murang‟a	2,650
22	Kiambu	4,921
23	Turkana	2,447
24	West Pokot	2,857
25	Samburu	1,690
26	Trans Nzoia	2,017
27	Uasin Gishu	2,986
28	Elgeyo/ Marakwet	1,909
29	Nandi	4,010
30	Baringo	2,990
31	Laikipia	2,132
32	Nakuru	5,010
33	Narok	2,846
34	Kajiado	2,124
35	Kericho	2,799
36	Bomet	1,896
37	Kakamega	5,668
38	Vihiga	2,120
39	Bungoma	3,247

40	Busia	2,829
41	Siaya	3,098
42	Kisumu	5,093
43	Homa Bay	3,608
44	Migori	2,815
45	Kisii	3,863
46	Nyamira	2,638
47	Nairobi City	12,032
Total		**148,001**

Note: *For 2012/2013 costing does not include administrative cost and full projected amount of CDF. SourceDraft Budget Policy Statement 2012/2013.*

Appendix VII: Reliability, Factor and Principal Component Analyses

i. Constitutional Guide on Revenue Allocation

Reliability Statistics

Cronbach's Alpha	N of Items
.844	6

	Initial	Extraction
The minimum Revenue allocation to county governments of 15% of the GDP is adequate.	1.000	0.857
The mandate/powers conferred on the Commission for Revenue Allocation in revenue allocation are sufficient	1.000	0.800
County revenue taxes are adequate in running county governments	1.000	0.757
Marginalized areas are adequately catered for by the current constitution	1.000	0.740
The role of the senate in revenue allocation is sufficiently provided for in the constitution	1.000	0.617
Equalization fund is sufficiently addressed by the constitution	1.000	0.513

Extraction Method: Principal Component Analysis.

ii. The CRA Parameters

Reliability Statistics

Cronbach's Alpha	N of Items
.949	5

	Initial	Extraction
Population is adequate as one of the parameters in revenue allocation	1.000	0.918
Poverty Index is adequate as one of the parameters in revenue allocation	1.000	0.836
Equal Share is adequate as one of the parameters in revenue allocation	1.000	0.815
Fiscal Responsibility is adequate as one of the parameters in revenue allocation	1.000	0.808
Land Area is adequate as one of the parameters in revenue allocation	1.000	0.759

Extraction Method: Principal Component Analysis.

iii. Other Parameters

Reliability Statistics

Cronbach's Alpha	N of Items
.758	5

	Initial	Extraction
Internal revenue effort should be incorporated as a parameter in the revenue allocation model	1.000	0.768
Infrastructure development should be incorporated as a parameter in the revenue allocation model	1.000	0.723
Natural resource endowment of a county should be incorporated as a parameter in the revenue allocation model	1.000	0.707
Social service burden(i.e. education, health, water etc) should be incorporated as a parameter in the revenue allocation model	1.000	0.696
Accessibility to grants and other sources of funds by a county should be incorporated as a parameter in the revenue allocation model	1.000	0.634

Extraction Method: Principal Component Analysis.

iv. Political Influence

Reliability Statistics

Cronbach's Alpha	N of Items	
.903	4	

	Initial	Extraction
The opinion Leaders' Perception	1.000	0.887
The past political injustices	1.000	0.878
Marginalization policies of past political regimes	1.000	0.838
Political Affiliation	1.000	0.776

Extraction Method: Principal Component Analysis.

v. Government Policy

Reliability Statistics

Cronbach's Alpha	N of Items
.799	5

	Initial	Extraction
Financial Probity	1.000	0.916
Transparency	1.000	0.908
Democracy	1.000	0.605
Governance	1.000	0.559
Resource Exploitation	1.000	0.544

Extraction Method: Principal Component Analysis.

vi. Revenue Allocation per county

Reliability Statistics

Cronbach's Alpha	N of Items
.883	4

Factor Analysis Component Matrix

	Initial	Extraction
Equitable share	1.000	0.938
Adequate Financing	1.000	0.951
Equitable development	1.000	0.890
Stable economy	1.000	0.691

Extraction Method: Principal Component Analysis.

Appendix VIII:Human Development Index (HDI) in selected sub-Saharan countries

Country	Mean years of Schooling	Life expectancy at birth	HDI
Seychelles	9.4	73.6	0.773
Mauritius	7.2	73.4	0.728
Gabon	7.5	62.7	0.674
Botswana	8.9	53.2	0.633
Namibia	7.4	62.5	0.625
South Africa	8.5	52.8	0.619
Cape Verde	3.5	74.2	0.568
Ghana	7.1	64.2	0.541
Equatorial Guinea	5.4	51.1	0.537
Congo, Republic of	5.9	57.4	0.533
Swaziland	7.1	48.7	0.522
Kenya	7	57.1	0.509
Sao Tome Principe	4.2	64.7	0.509
Angola	4.4	51.1	0.486
Cameroon	5.9	51.6	0.482
Madagascar	5.2	66.7	0.48
United Republic of Tanzania,	5.1	58.2	0.466
Sub- Saharan Africa	4.5	54.4	0.463

Nigeria	5	51.9	0.459
Senegal	4.5	59.3	0.459
Mauritania	3.7	58.6	0.453
Lesotho	5.9	48.2	0.45
Uganda	4.7	54.1	0.446
Togo	5.3	57.7	0.435
Comoros	2.8	61.1	0.433
Zambia	6.5	49	0.43
Rwanda	3.3	55.4	0.429
Benin	3.3	56.1	0.427
Gambia	2.8	58.5	0.42
Cote d'lvoire	3.3	55.4	0.4
Malawi	4.2	54.2	0.4
Zimbabwe	7.2	51.4	0.376
Ethiopia	1.5	59.3	0.363
Mali	2	51.4	0.359
Country	**Mean years of Schooling**	**Life expectancy at birth**	**HDI**
Guinea- Bissau	2.3	48.1	0.353
Eritrea	3.4	61.6	0.349
Guinea	1.6	54.1	0.344
Central African Republic	3.5	48.4	0.343
Sierra Leone	2.9	47.8	0.336

Burkina Faso	1.3	55.4	0.331
Liberia	3.9	56.8	0.329
Chad	1.5	49.6	0.328
Mozambique	1.2	50.2	0.322
Burundi	2.7	50.4	0.316
Niger	1.4	54.7	0.295
Democratic Republic of Congo	3.5	48.4	0.286

Source UNDP HDI report 2012

Appendix IX: Education opportunity indices for disadvantaged districts

	District	Opportunity Index (1999)	Literacy Index (2009)	Poverty Index (2009)
1.	Marsabit	0.019	0.26	79.3
2.	Turkana	0.024	0.18	92.9
3.	Wajir	0.024	0.26	84.4
4.	Mandera	0.053	0.10	85.7
5.	Garissa	0.056	0.52	54.5
6.	Tana River	0.199	0.50	75.4
7.	Samburu	0.599	0.29	77.7
8.	Narok	0.893	0.41	33.7
9.	West Pokot	1.111	0.47	68.7
10.	Isiolo	1.155	0.60	63.1
11.	Lamu	5.014	0.73	30.6
12.	Kajiado	6.720	0.55	12.1
13.	Kitui	8.426	0.64	62.5
14.	Kilifi	8.889	0.68	66.9
15.	Kwale	10.322	0.67	72.9

Source: Report of the sub-committee of the admission board of the University of Nairobi on disadvantaged districts (1989).

Appendix X: County Classsifications in Kenya

County classification by Marginalization

Most Maeginalised (0.27-0.518)		Moderately Marginalized (0.519-0.564)		Well Off (Above 0.6)
Turkana	Migori	Isiolo	Nyandarua	Nakuru
Wajir	Bomet	Kajiado	Muranga	Kirinyaga
Mandera	Taita Taveta	Kisumu	Embu	Kisii
Marsabit	Busia	Elgeyo Marakwet	Kericho	Nyamira
Samburu	Kilifi	Machakos	Kakamega	Uasin Gishu
West Pokot	Trans Nzoia	Makueni	Vihiga	Nyeri
Tana River	Tharaka Nithi	Nandi	Laikipia	Mombasa
Narok	Homa Bay	Siaya	Lamu	Kiambu
Baringo	Garissa	Meru	Bungoma	Nairobi City
Kwale	Kitui			

County Classification By Poverty Index

Components	Population	Poverty Index	Equal share	Land area	Fiscal responsibility
Year/Source	2009 Census				
Weight	45%	20%	25%	8%	2%
Objective	Resource counties to deliver services equally on a per capita basis	Promote redistribution in favour of historically lagging areas	Provide each county with resources to cover the fixed costs of running county administrations irrespective of population or size	Factor in the higher cost of delivering services in remote, sparsely populated areas	Provide incentives for prudent fiscal management

Adapted from CRA, 2012