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Abstract

Regional disparity is still a key development challenge in Kenya, despite government efforts to reduce it since independence. Given that regional production defines the relative state of a region's welfare, this study focuses on factors that influence regional investment (both public and private) in accounting for regional disparity in Kenya. These factors include: literacy level, proportion of members of parliament in government, availability of security services, proportion of arable land, electricity connection, access to medical care, financial services, portable water, quality communication and transport infrastructure. The study therefore regresses poverty index, used as a proxy of regional disparity, on these factors. Overall, about half of Kenyans live below the poverty line, and only 38 per cent of the population have adequate access to medical care. The average fertility rate in Kenya is 5.4, with 73 per cent of the population being literate and only 7 per cent connected to electricity. Further, 76.5 per cent and 74.3 per cent of Kenyans travel at least 5Km to the nearest postal services and tarmac road, respectively. Regression results show that regional disparity in Kenya has mainly been as a result of differences in education levels, communication network, and access to medical and financial services across districts. Though better access to water, electricity connection and higher tarmac road density relate positively with increase in a region's welfare, differences in these factors across regions do not explain regional disparity in Kenya. This implies that the relatively well-off regions in Kenya are not necessarily the areas with better access to water, electricity and tarmac roads. The study therefore recommends policy reforms that prioritize improvement in health, education and financial services in less developed areas. Specifically, the study proposes identification of a critical minimum level of literacy that the government should target to achieve in all districts (counties), with adequate interventions being put to ensure that all regions achieve that level. Similarly, the government should liaise with the private sector to identify appropriate incentives to attract investment in financial services in areas not adequately served by the existing financial institutions. Finally, in addition to improving the overall infrastructure, enhancing communication services through appropriate incentives is a crucial step in reducing regional disparity in Kenya.

Abbreviations and Acronyms

CSAE	Centre for the Study of African Economies
GDP	Gross Domestic Product
KIHBS	Kenya Integrated Household Budget Survey
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
MDG(s)	Millennium Development Goals
R&D	Research and Development
SID	Society for International Development
TFP	Total Factor Productivity
IFPRI	International Food Policy Research Institute
OLS	Ordinary Least Squares

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1. Introduction

In ordinary usage, the term disparity or inequality implies differences among units of observation. Regional disparity highlights differences in income and living standards from one region to another (Tiepoh Dressler and Burns, 2004). While analyzing the role of financial development on regional disparity in China, Liang (2006) equates regional disparity with differences in income level between regions. Increase in economic growth accompanied by economic development result in improvement in individual well-being. Whereas the term 'region' may take a slightly different meaning depending on the context in which it is being used, disparity among regions connotes differences in well-being of people among sub-nation units such as districts, provinces or local authorities.

The concept of well-being is multidimensional and therefore difficult to measure. Yet, empirical work on regional disparity assumes a measurement of welfare, ideally as a monetary indicator. Suppose that higher income earners afford more and wider choice of products, good health, social support and fairness; income level will accurately measure welfare. Indeed, higher incomes will not only restructure an individual's indifference map, but will put one on a higher utility function. From this perspective, regional disparity is perceived as the differences in income levels between groups of people living in two or more geographical areas within a country.

However, using regional income per capita to capture regional disparity has its own methodological challenges. For instance, the aggregate regional income may be substantially disconnected from regional households. A substantial portion of income generated within a region may be in form of enterprises' retained earnings, with owners repatriating or investing the same way in other regions. This results in minimal 'spread-effects,' if majority of regional labour force do not participate in the activities of local enterprises. Guided by Alasia (2002),[1] observation that disparity encompasses the variation in wealth, social economic conditions and opportunities, the region's poverty levels as an epitome of regional disparity can be visualized.

Do differences in access to education, health and transport and communication infrastructure suggest regional disparity? Contrary to some literature, such as Society for International Development (2004), the argument in this study is that these

[1] Quoted in Tiepoh, Dressler and Burns (2004).

variables constitute the enablers to development process that result in welfare improvement. These factors influence the usage and productivity of resource inputs, which subsequently lead to regional disparity.

1.1 Background

Regional disparity has been an issue in Kenyan history (Society for International Development, 2006). The government has in the past made various efforts to address it. Initial efforts in the 1960s and 1970s revolved around injecting funds to specific programmes in regions characterized with high poverty levels. The 1980s saw creation of regional development authorities and District Focus for Rural Development (DFRD) strategy. From mid-1990s, the focus has been on higher development allocations to marginal areas through line ministries and devolved funds such as the Constituency Development Fund (CDF), Local Authorities Transfer Fund (LATF), Roads Maintenance Levy Fund (RMLF), and Rural Electrification Fund (REF).

Despite these efforts, regional disparity still persists. There is glaring variation in welfare levels among provinces, districts, local authorities and also between rural and urban areas. For instance, by taking the level of poverty as an indicator of regional disparity,[2] the absolute poverty prevalence in rural areas was 49.1 per cent compared to urban Kenya with 34.4 per cent in 2006. Similarly, the rural absolute poverty levels in the two poorest districts (Turkana at 94.9% and Marsabit at 91.9%) were almost nine times that of the least poor district, that is Kajiado at 11.6 per cent (Government of Kenya, 2007).

Though regional disparity is sometimes perceived as a natural consequence of development process, excessive disparity may create social and political instability. To boost investors' confidence, any nation would strive to achieve a cohesive society that is the fountain of long-term stability and achievement of social goals. Unbalanced growth that is not accompanied by resource mobility that allows trickling-down effects will ultimately lead to social tensions and marginalized sections of society clamoring for separation from the rest of the community.

In Kenya, the constitution crisis experienced in 2005 that pitied those opposed to '*majimbo*' (regionalism), was based on the perception

[2] Poverty line is a reference level of welfare. Variation of regions' per capita income from the poverty line indicates relative differences in well-being between regions.

that existing regional disparities are as a result of uneven distribution of public resources. The political sensitivity of regional inequality in Kenya is well put by Okello (2006), who observes that 'the reason why inequality in Kenya attracts emotion has less to do with income inequalities, but more to do with horizontal or regional inequality'. The nature of regional inequality is seen as a manifestation of asymmetry in centralization of power. Similarly, the social conflicts between Hans Chinese and minority groups in China are associated with regional disparity that discriminates against the latter (Wen and Tisdell, 2001).

Economic theory stipulates that income payments, which influence individual's well-being, principally result from labour and capital injections into a production process. This suggests that policy interventions to increase production in less-developed regions will have more impact if they target production processes either in terms of increasing the level of resource inputs or augmenting the inputs' productivity, and improving the market access of the output.

Consequently, policy support to increase growth and reduce regional disparity requires interventions that will influence the regional investments (public or private) and support institutions and reforms that integrate populations from poor regions into mainstream market activities. The various regions in Kenya are characterized by different agro-ecological zones, with unique resource endowments that influence the nature of economic activities in those regions. Regional growth complements the national growth, since most economic activities are based on resource inputs that are region-specific. It is the differences in regional growth that contribute to regional disparity. Understanding the factors that influence regional investments in different areas is a pre-requisite in formulating appropriate interventions to reduce regional disparity in Kenya.

1.2 Motivation of the Study

Regional disparity has been a development challenge in Kenya since independence, despite past government interventions. Excessive regional disparity may create social and political instability and derail the process of economic development. Writing on effects of inequality, Rasna Warah (2009) argues that recent research shows that the relationships between people in unequal societies are dysfunctional as consumerism, isolation, alienation, social estrangement and anxiety all follow from inequality.

Any government should therefore put in place appropriate interventions to reduce regional inequality in a country. However, such interventions require a clear understanding of the factors that account for regional disparity. Economic theory stipulates that regional disparity arises if differences exist in level and productivity of investments between various regions. Thus, an understanding of determinants of regional disparity requires an analysis of the factors that influence regional production. Despite the existence of a wide range of literature on the extent of regional disparity in Kenya, little has been done to explain the major causes of this disparity.

Kenya visualizes being a globally competitive and prosperous nation with a high quality of life by the year 2030. This calls for increase in living standards and reduction of inequality. The government therefore recognizes that without minimizing regional disparity, economic development objectives will not be achieved. Indeed, in the first Medium Term Plan (2008-2012), the government commits itself to pursue policies and programmes that will reduce intra-regional and inter-regional disparities. This study is motivated by the need to inform the formulation of appropriate policy reforms in addressing regional disparity in Kenya.

1.3 Purpose of the Study

The overall aim of the study is to examine the causes of regional disparity in Kenya. Specifically, the study attempts to answer the questions: (i) What factors determine regional production patterns in different districts in Kenya?; and (ii) What does it take, in form of public investment, to reduce regional disparity?

2. Literature Review

2.1 Investment, Regional Growth and Disparity

Investment drives production and productivity in a region and therefore plays a major role in achieving regional balanced growth. For example, Soludo and Kim (2003), while trying to account for growth in developing countries, note that economic growth is attributable to the rate of accumulation of factors of production (capital and labour) and the efficiency in the utilization of these factors, as measured by Total Factor Productivity (TFP). O'Connell and Ndulu (2000) found that very low capital accumulation in Africa is correlated with very low TFP. Therefore, capital accumulation and resource use efficiency influence growth prospects of a region. Further, Cai and Wang (2002), when analyzing the impact of labour market distortions on regional disparity and economic growth in China, observed that such distortion affects regional growth and widens regional disparity.

Regional growth, however, is influenced by various forms of investment. While private investment is driven by private net returns, public investment is driven by the net social returns, which are characterized by improvement in social welfare of the society. In decomposing the contribution of various types of public investment to regional disparity in rural China, Zhang and Fan (2004) note that public investment can promote growth directly by providing various public goods such as research and development (R&D), infrastructure and education, and also by indirectly creating an environment that attracts private investment. Khan and Reinhart (1990) also argue that by providing the necessary infrastructure, public sector investment can have a strong influence on the rate and productivity of the private capital investment, hence accelerated growth in developing countries. Thus, there are complementarities between private and public investment, implying that for private investment to make significant contribution to economic growth, it must be supported by appropriate public investment.

Also, Zhang and Fan (2004) find that investments in education and agricultural research and development are very crucial in enhancing labour and agricultural productivity. Kuyvenhoven (2004), looking at the enabling environment of the less favoured areas in China, indicates that to sustain development of such areas requires institutional and

policy support. This calls for identification of sources of growth, in addition to investment in physical and human capital and appropriate technology. Further, Kuyvenhoven suggests that relevant market and trade policies should complement these regional investments.

Citing the case of Pennsylvania, Cronin *et al* (1991) note that economic growth in the rural areas is low due to fewer economies of scale, less access to health and education facilities, and information and technology. They further argue that telecommunication infrastructure is central in alleviating under-development in rural areas. However, the direction of causality between infrastructure investment and economic growth is controversial. While infrastructure may affect the productivity and output, economic growth can shape the demand and supply of infrastructure services. For example, Esfahani *et al* (2003) note that population density and urbanization has implications on the supply of infrastructure services.

Besides the level of investment, other factors that influence regional growth and consequently the nature of regional disparity, according to the 2004 World Bank/KIPPRA study on *Investment Climate*, are corruption, poor infrastructure and insecurity, which are major constraints to private sector growth. Regions where these problems are more prevalent are likely to experience relatively low growth.

Ravallion (2004) notes that geographical and sectoral pattern of growth influences regional disparity. He argues that the concentrations of poor people in specific regions and/or sectors, a common scenario in many developing countries, shows the importance of the pattern of growth to overall reduction of regional disparity. In addition, the extent to which overall growth favours the rural sector influences its impact on reducing aggregate poverty.

2.2 Choosing to Invest in High Growth Areas Versus Marginal Areas

The tendency of a government to invest more heavily in regions that are better endowed with resources may result in regional disparity, as is the case in Rural India (Fan, Hazell and Haque, 2000). In most cases, the government's expectation is that increase in agricultural output will lead to lower food prices, which are beneficial to the poor. Further, the government expects that such investments will result in more employment and higher wages in marginal areas, as labour mobility tilts

towards high potential areas. However, this does not always work. The trickle down effect is hampered by, among other things, the insufficient attention given to the development of factor and commodity markets. Fan *et al* (2000) suggest that for governments to be more successful in reducing regional disparity, they should focus on agricultural research, rural roads and education as opposed to more investment in irrigation and targeted welfare programmes.

The governments' investment bias in favour of high potential or irrigated areas in South and Southeast Asia in the 1970s and 1980s, increased agricultural productivity and reduced overall rural and urban poverty (Shenggen and Chan-Kang, 2004). However, the marginal returns in the favoured regions have declined over time, with new environmental problems arising accompanied by increase in regional disparity. Thus, governments need to re-channel investments in marginal areas to achieve balanced growth and environmental protection.

2.3 Economic Growth and Regional Disparity

A couple of studies have addressed the impact of economic growth on regional disparity. One school of thought suggests that regional disparity is a phenomenal outcome of a development process in a country. Fan (1997) refers to neoclassical regional growth theorists such as Myrdal (1957) and Williamson (1965), who postulated that regional disparity is an inevitable stage of development, but differed on how the situation develops in the long run. The work by Petrakos *et al* (2003) on regional inequality within the European Union identifies the convergence of Williams (1965) and Myrdal (1957) views. They observed that in the short run, higher growth tends to increase regional disparity, but the country later experiences long-run equilibrating effects of growth. The begging question from these studies is the time threshold at which growth promotes reduction in regional disparity. Quoting from the 1998 China development report, Zhang and Fan (2004) note that the Chinese economy experienced phenomenal growth of an average of 10 per cent for at least two decades. However, this growth has been accompanied by an increase in regional disparity.

Ravallion (2004) cautions that higher growth in a number of developing countries such as China and India has come with widening regional disparities, and often little or no growth in poor areas. He

advises that to help inform policy, there is need to probe more deeply into the relevant sources of disparity. He notes that there are a number of dimensions that influence regional disparity, including access to capital and public goods. Particularly, he noted that lack of access to infrastructure and social services naturally make it harder for poor people to take up the opportunities afforded by aggregate economic growth. Thus, he proposed giving priority to reducing the constraints that limit the prospects for poor people to access opportunities in a growing economy. For instance, the government should put effort to improving skills and maintaining poor people's health so that they participate in the growth process. He further observes that usually, there are biases against the poor in public spending such as the infrastructure allocations. He concludes that pro-poor growth requires a combination of higher growth and more pro-poor distribution of the gains from growth, with these efforts ultimately reducing regional disparity.

Young (2003) notes that although rapid economic growth in China has reduced overall poverty, regional disparity has increased, stemming from preferential policy, geography (access to cheap transportation), education, urbanization and industrial structure (agriculture versus manufacturing and services).

These studies point to the fact that the issues of economic growth and regional disparity are intertwined to the extent that one cannot analyse one without referencing the other. The issues of growth and regional disparity are multifaceted and require various broad ranges of variables to analyse the interdependence between the two.

2.4 Overview of the Empirical Literature

By and large, research on regional disparity suggests two broad causes of inequality between regions. Firstly, it may be a natural outcome of differences in resource use and efficiency in different agro-ecological zones. Economic growth stems from regional growth, but how much each region grows is dependent on the level and efficiency of resource use. The entrepreneurial attributes/competencies and environment responses to the economic activities (state of technology, market access, infrastructure and institutional support), are the basic factors that influence regional investment and growth. Empirical work on regional disparity, particularly in China and India, show that infrastructure, education and research and development are the most critical public investment inputs in regional growth.

Secondly, the government's choice to invest more in high potential areas may also result to regional disparity, if trickling effects to marginal areas are hampered by constraints in input and product markets. Distortions in input markets constraint resource mobility from areas or sectors where they experience diminishing returns. Indeed, regional disparity may be reinforced if increasing returns to scale are experienced, with favoured regions getting the advantage of agglomeration of capital and knowledge.

Since the regional disparity problem remains a key challenge in Kenya, it is important to understand the critical determinants of differences in regional growth and design a strategy that will facilitate higher and efficient use of resources. In light of the factors identified in the literature, this study traces how access to transport and communication infrastructure, water, electricity, medical services, education and credit level account for regional disparity in Kenya.

2.5 Theoretical Exposition on Determinants of Regional Disparity

Following Solow's (1956) neoclassical growth model, a number of theorists predict regional disparity to decline with growth due to declining marginal returns of resources in relatively developed areas. The neoclassical model argues that economies have their own steady-state income, which is determined by exogenous variables such as savings and population growth. The growth theory predicts that countries with high investment (saving) rates, low population growth rates and low depreciation rates will register higher growths.

Building on the foundation of neoclassical growth theory is the convergence theory. Williams (1986) postulates that dispersion in income per capita across regions/nations declines as the poor regions tend to grow faster than the rich regions. Thus, regional disparity is expected to correlate positively with growth in the early stages of economic development, since growth is not uniform across regions. However, the situation is reversed as the infrastructure and technology diffusion becomes strong, and capital experiences diminished marginal returns in high-wage areas. Ultimately, all regions/economies in the long run converge in terms of per capita income and productivity. In a competitive environment, resource mobility is induced by falling returns on capital and labour in relatively developed areas, resulting

in convergence of all regions/economies in terms of per capita income and productivity.

Thus, the neoclassical thinking is that regional disparity is a patch in a country's development process that accompanies growth in early stages. However, what neoclassical theorists do not suggest is the time thresholds when technology and infrastructure develop enough to reverse regional disparity. Moreover, if constraints to technology diffusion and infrastructure are dominant, regional disparity may end up as a permanent feature of a country's development profile. Such development will then confirm Myrdal (1957) views of non-convergence occasioned by accumulation of capital and knowledge in already developed areas. Similarly, Krugman and Venables (1995) warn that if increasing returns to scale are experienced, with labour mobility, some regions will have the advantage of agglomeration of capital and knowledge, hence perpetuating regional disparity.

3. Conceptual Framework and Methodology

3.1 Conceptual Analysis of Determinants of Regional Disparity

Regional disparity reflects differences in growth rates of regional economies. Conceptually, lack of growth presupposes low employment/ productivity of resources in a given region, leading to poor returns to the households. Regional growth may be visualized as a process that results from interaction between human potentiality and environmental variables.

Human potentiality consists of entrepreneurial attributes and competencies that are necessary for successful industrial and/or commercial undertakings. Environmental variables include availability of resources and external situations that facilitate the use of these resources. Availability of markets, technology, infrastructure, in addition to public utilities such as water and electricity, define the environment that enhances human efforts in creating income generating opportunities in various regions, ultimately reducing regional disparity in a society. Public services such as water and electricity are key inputs in production processes and household consumption bundle, while market response to a region's economic activities and institutional support in terms of networks and alliances defining an industry influence household earning levels.

Regional disparity may therefore stem from either one or a combination of these factors. In addition, the Kenya landscape reflects diversity of terrain, with different agro-ecological zones being suitable for both agricultural and pastoral activities. Since most economic activities in rural areas are agro-based, the proportion of arable land may impact on the region's welfare level. Further, a region's output is dependent on skills augmenting characteristics of labour force (e.g. health and education level) and credit availability. These factors influence household productivity.

One possible measure of regional welfare level is the poverty indices. Poverty and disparity are distinct but related concepts. Poverty entails the inability of a person to afford the basic needs for living. It is therefore a measure of the level of well-being seen from the perspective of a pre-defined threshold, the so-called poverty line. Disparity entails differences in well-being, that is how distinct are two people or groups of people. If income inequality within regions is assumed not to differ

significantly across different regions in Kenya, regions with low per capital income will reflect regions with high levels of poverty. Poverty measurement assumes a critical level of income (poverty line) below which individuals are classified as poor. Thus, poverty line is a reference level of welfare. A region with a lower income per capita than another region is relatively poorer than the latter. For this reason, this study uses the level of poverty across regions as a proxy of regional disparity.

3.2 Specification of the Model and Data Source

From the foregoing, regional disparity is accounted for by factors that influence regional production. They include: literacy level, proportion of members of parliament in government, availability of security services, proportion of arable land, connection to electricity, and access to medical care, financial services, portable water, quality communication and transport infrastructure, market availability for goods and institutional support to region's economic activities. However, market access and institutional support variables are omitted in the analysis due to lack of systematic data to capture them.

The factors that potentially influence regional disparity are assumed to be linearly related to the region's welfare level, due to the additive effect each factor has on the level of output in a region. Using a district to represent a region as the unit of analysis, the estimated model is:

$$Y_i = \alpha_0 + \alpha_1 LIT_i + \alpha_2 DEAST_i + \alpha_3 CREDIT_i + \alpha_4 VPOST_i + \alpha_5 TARDIS_i + \alpha_6 SECURI_i + \alpha_7 WATER_i + \alpha_8 ELTRITY_i + \alpha_9 PAL_i + \alpha_{10} PGM_i + \varepsilon_i$$

where *i* represents the district.

The Rural Absolute Poverty index[3] (ABRU) is used as a proxy for regional welfare level. Since poverty line is a reference level of welfare, variation of a regions' per capita incomes from the poverty line indicates relative differences in well-being between regions. Table 3.1 shows the definitions and measurements of the various variables used in this study.

[3] The poverty headcount index adopted in the 2005/2006 Kenya Integrated Household Budget Survey is used as a proxy for regional production per capita. This index measures the proportion of the population that cannot afford to purchase the basic baskets of goods and services. In using it as a proxy for regional production per capita, the study assumes that consumption levels typically represent income earnings of the households. Consequently, inability to purchase a basket of goods and services is a consistent scale for measuring household income levels.

The data for these variables is sourced from the 2005/06 Kenya Integrated Household Budget Survey (KIHBS) for 68 districts.[4] The KIHBS was conducted by the Kenya government to avail various social-economic data on health, energy, housing, education, water and sanitation for purposes of, *inter alia*, updating poverty, welfare and employment statistics.

3.3 Analytical Approach

For this study, descriptive analysis is initially done on the data to highlight social-economic characteristics of the welfare situation in Kenya. Using Ordinary Least Squares (OLS) method, the level of rural absolute poverty, a proxy of regional disparity, is regressed on factors that influence the level of regional production, which ultimately impact on regional disparity in Kenya.

[4] The 2005/6 KIHBS did not include Ijara District.

Table 3.1: Variables definitions and measurements

SN	Variable	Description	Measurement	Dependent variable
	ABRU		Rural Absolute Poverty Index	The index measures the incidence of poverty; that is the population proportion that cannot afford to purchase the basic basket of goods and services
				Expectation
Explanatory variables				
1.	LITT	Ability to read and write	% distribution of population (15+) by ability to read and write	-ve
2.	DEAST	Access to medical care	% distribution of children (0-59 months) born with the help of a doctor or midwife/nurse	-ve
3.	CREDIT	Average amount borrowed	Total amount borrowed per household in the district (Ksh)	-ve
4.	VPOST	Nearness to post office	% of communities by distance to the post office (5 or more Kms)	+ve
5.	TARDIS	Nearness to tarmac road	% of communities by distance to the nearest Tar/ Asphalt road (5 or more Kms)	+ve
6.	SECURI	Availability of police services	% of communities by availability of police services (perception that security had improved)	-ve
7.	WATER	Access to water	Households who take more than one hour to fetch drinking water	+ve
8.	ELTRITY	Access to electricity	% proportion of households whose main source of lighting is electricity	-ve
9.	PAL	Proportion of arable land	Arable land area as a percentage of total land area in a district	-ve
10.	PGM	Proportion of MPs in Government	Number of MPs in a district who are ministers or assistant ministers divided by the total number of MPs in a district	-ve

4. Results and Findings

4.1 Socio-economic Characteristics of Welfare Situation in Kenya

About half of Kenyans live below the poverty line (Table 4.1). Though Kenya is primarily dependent on agricultural production, only 56 per cent of the country's land surface is arable. On human development indicators, Kenya's literacy level stands at 73 per cent, slightly above Uganda (66.8%) and Tanzania (69.4%) but far below new industrialized countries such as Malaysia (88.7%), China (90.9%) and Singapore (92.5%).[5] Further, only 38 per cent of the population have adequate access to medical care. Access to public utilities is also poor, with only 7 per cent of Kenyans connected to electricity. Further, 76.5 per cent and 74.4 per cent of Kenyans travel at least 5Kms to access postal services and a tarmac road, respectively. In addition, households cover a distance of 9Kms, on average, to access the nearest portable water point. However, these socio-economic characteristics differ across districts in Kenya, and possibly account for regional disparity in Kenya.

Table 4.1: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
DEAST	68	4.20	87.60	38.1397	20.66832
CREDIT	68	.00	451.93	30.1463	57.01816
VPOST	68	.00	100.00	76.5574	17.18807
TARDIS	68	29.1000	100.0000	74.385294	20.2224957
SECURI	68	.0010	92.2000	39.488250	25.4197278
ELTRITY	68	.0000	47.9000	7.148544	8.8387846
ABRU	68	11.6000	94.9000	51.154412	17.6359574
LIT	68	18.5000	94.8000	72.945588	18.5916322
WATER	66	.50	300.00	9.5162	36.85568
PAL	67	.003163	.956864	.56213679	.286342626
PGM	68	.0000	1.0000	.614859	.2160629
Valid N (listwise)	65				

[5] The data for the comparator countries is sourced from KIPPRA (2010).

4.2 Factors that Influence Regional Disparity

Absolute Rural Poverty was regressed on ten explanatory variables to determine the factors that influence regional disparity. The underlying hypothesis of the study is that literacy levels, access to medical care, nearness to quality communication and transport infrastructure, access to credit, access to electricity, availability of security services, access to water, political representation in government and quality of land influence the level of regional production, thus influencing the region's position in poverty index. The regression model[6] was evaluated for both multicollinearity using variance inflation factor and heteroscedasticity using White test (Table 4.2 and Table 4.3, respectively). The variance inflation factor indicated that collinearity among the analysed variables was not high, while the White test indicated that there was no heteroscedasticity in the model.[7]

Table 4.2: Test for multicollinearity

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CREDIT	.786	1.273
	VPOST	.894	1.118
	TARDIS	.833	1.201
	SECURI	.849	1.177
	WATER	.703	1.422
	ELTRITY	.666	1.502
	PAL	.473	2.116
	LIT	.575	1.740
	DEAST	.356	2.807
	PGM	.562	1.853

[6] The variance inflation factor measures the impact of collinearity among the independent variables in a regression model on the precision of estimation. It shows how the variance of an estimator is inflated by the presence of multicollinearity. A variance inflation factor will be 1 if there is no collinearity between any two independent variables, while it will increase as the extent of collinearity increases. A value of at least 10 will be considered high.

[7] Since $p=0.534$ for (Obs*R-squared)> 0.05, the null hypothesis that there is no heteroscedasticity is accepted. Any reported probability value below 0.05 leads to rejection of the stated null hypothesis, unless otherwise indicated, thus we do not reject the stated hypothesis.

Table 4.3: White heteroskedasticity test

F-statistic	0.895839	Probability	0.585911
Obs*R-squared	16.83693	Probability	0.534342
Test Equation:			
Dependent Variable: ABRU			
Method: Least Squares			

All the independent variables exhibited a prior expected relationship with absolute rural poverty level. However, only four of the variables are significant. The F-statistic of 11.775 is significant, implying that the model is well fitted. In addition, the explanatory power of the model (R^2=0.627) is relatively high, suggesting that about 63 per cent of regional disparity is explained by differences among districts in respect to proportion of arable land, representation in government, and access to health, education, financial services and public utilities (Table 4.4).

Conceptually, access to health facilities and personnel increases regional production, since disease infections among the populations are addressed, reducing the possibility of non-participation and low productivity in economic activities. Using the delivery-assistance of children under 5 years by doctors and/or midwife as the proxy, access to health was found to have a significant influence (*p=0.000*) on poverty levels. This observation supports the hypothesis that availability and quality of health personnel and facilities determines the amount and quality of available manpower. This implies that districts with better health facilities and personnel register higher production and, consequently, higher per capita income.

The increase in literacy level positively contributes to regional production, and hence impacts on regional poverty level, as exemplified by significant and negative relationship (*p=0.017*) between level of poverty and percentage of households with ability to read and write. Being literate possibly facilitates the rural households and businesses to keep records, reduce transaction costs and enhance their capacity to identify threats and opportunities in the environment. Thus, the significant contribution of literacy level on regional disparity, as indicated by the data findings, could be linked to the extent regions differ in terms of literacy levels. Thus, the current government efforts to increase access to education by offering subsidized primary and

Table 4.4: Model summary

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
1	.828(a)	.686	.627	10.9465520

a. Predictors: (Constant), TARDIS, VPOST, SECURI, PGM, PAL, WATER, CREDIT, ELTRITY, DEAST, LIT

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14109.256	10	1410.926	11.775	.000(a)
	Residual	6470.658	54	119.827		
	Total	20579.914	64			

a. Predictors: (Constant), TARDIS, VPOST, SECURI, PGM, PAL, WATER, CREDIT, ELTRITY, DEAST, LIT

b. Dependent variable: ABRU

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	89.954	13.289		6.769	.000
	DEAST	-.392	.093	-.455	-4.206	.000
	CREDIT	-.083	.028	-.263	-2.911	.005
	VPOST	.147	.082	.144	1.799	.078
	SECURI	-.066	.061	-.093	-1.083	.284
	ELTRITY	-.099	.237	-.039	-.418	.677
	LIT	-.284	.116	-.296	-2.455	.017
	WATER	-.008	.041	-.016	-.189	.851
	PAL	-3.924	6.777	-.062	-.579	.565
	PGM	-6.238	6.735	-.075	-.926	.358
	TARDIS	.036	.077	.041	.465	.644

a. Dependent variable: ABRU

secondary education, in addition to giving secondary school bursaries, may reduce regional disparity through enhanced productivity in various districts.

Creation and growth of various economic activities requires credit access, especially where the economic players lack equity financing. Increased production in various regions requires upgrading or more

efficient use of physical plants, embedded in production processes. Easy access to credit facilities will assist households to get start-up and expansion capital. The significant and negative relationship ($p=0.005$) between absolute rural poverty and access to financial services, with average amount borrowed per households used as a proxy, underscores the important role of financial services in promoting regional growth. Businesses with deficits in capital budgeting require access to credit facilities for them to perform well and grow. It is therefore possible that regions with a relatively high number of poor households lack access to credit (both in economic and physical sense), which inhibits the growth of businesses in those regions.

Notably, politics in Kenya and various political pronouncements seem to suggest that regions with high parliamentary representation get higher government allocations and are, therefore, relatively less poor. Whereas data findings show a positive relationship between lower representation in government and level of poverty, this relationship is weak. This observation suggests that political representation in government has not significantly influenced the level of development in a region. Similarly, the findings indicate that regions with more arable land are relatively better off, but influence of amount of arable land on level of poverty is not significantly strong.

Potentially, communication infrastructure facilitates economic activities by minimizing information asymmetry and lowering transaction costs. This observation is confirmed by positive, though insignificant relationship between longer distances covered to get postal services and level of poverty. Efficient means of communication and better transport infrastructure reduce the cost of doing business. The ease of communication reduces transaction costs associated with information asymmetry. Information on sources and prices of inputs, products' distribution and credibility of suppliers/consumers, enhances production in terms of making relevant business decisions.

Communication through postal services has characterized the mode of communication in Kenya for more than three decades after independence. The communication sector has undergone substantial revolution due to developments in information technology, and provision of new ways of communication such as use of mobile phones. This possibly explains the insignificant impact of postal services to regional per capita income. However, the positive association between poor access to postal services and level of poverty underscores the

importance of differences in access to communication infrastructure across districts in explaining regional disparity in Kenya. In addition, transport costs constitute part of production and marketing costs. Consequently, access to tarmac roads eases the transportation of inputs and distribution of products, thereby increasing production in a given region.

A productive environment that promotes economic activities in a country requires security, both for property and people. Access to police services was therefore expected to be associated with low poverty levels. Due to lack of data on ratio of population per policeman in different districts, perception that 'security had improved' was used as a proxy for access to police services. The perception that security had improved related positively, as expected, with lower poverty level. The perception of improvement in security is important in building investors' confidence in a particular region. This implies that increase in crime and activities of outlawed groups[8] may indeed hinder new investments, contributing to lower production in some areas and consequently increased regional disparity.

Moreover, easy access to portable water is crucial in reducing water-borne diseases and costs associated with resources used to access clean water. This suggests that lack of access to clean water will impact on productivity, and consequently on people's welfare in a given region. Our assumption that the longer the distance covered by households to get water in a given region positively relates with level of rural absolute poverty is confirmed by the data findings, which show a positive relationship between level of poverty and average distance a household covers to the nearest portable water point. Though insignificant, the direct relationship suggests that households in relatively poor regions have relatively less access to water.

In addition, data findings show that access to electricity, as measured by proportion of households whose main source of lighting is electricity, positively influences the level of the regions welfare. Access to electricity may not reduce the cost of production, but may also be a welfare indicator in the inter-fuel substitution ladder.

[8] Such groups include: Mungiki, Sungu Sungu, Chinkororo, Taliban, Siafu, and Kamjeshi. The negative impact of these groups' activities in some regions in Kenya is well documented in local daily newspapers, particularly between January and June 2009.

5. Conclusion and Policy Recommendations

5.1 Conclusion

Regional disparity is still a development challenge in Kenya, despite the various interventions since independence. Availability of markets, resources, relevant technology, infrastructure and public utilities such as water and electricity complement entrepreneurial attributes and competencies in creating income generating opportunities in various regions, ultimately reducing regional disparity in a society. The aspects of human potentiality are mainly influenced by access to education and health services. This study, therefore, focuses on how these factors influence regional production, which defines relative poverty level of a region. Due to data limitations, market access, technology and institutional support variables are omitted in the analysis.

By examining a number of indicators associated with welfare level, Kenya's overall performance is relatively poor. For instance, compared to the situation in Newly Industrialized Countries, Kenya's literacy levels fall behind those of China, Singapore and Malaysia. With only 7 per cent of households connected to electricity, and households covering a distance of 9Kms on average to access the nearest potable water point, the country's development level needs a substantial shift.

Regression results show that literacy levels, access to medical facilities and credit, proportion of arable land, region's representation in government and proximity to infrastructure in terms of road, security, communication and water account for 63 per cent of regional disparity in Kenya. However, despite the fact that the proportion of arable land, regions representation in government, nearness to tarmac road, access to water, security services and electricity connection are positively related to regional disparity in Kenya, these factors do not account to regional disparities observed in the country. The implication of this finding is that relatively better regions in Kenya are not necessarily those with better access to water, security, electricity connection and higher tarmac road density.

The study findings show that reducing regional disparity requires the government to improve access to health (more and well equipped medical facilities and personnel), education and communication, and financial services particularly in relatively worse-off regions. This is in

addition to ensuring better transport infrastructure, security and water access in all districts in Kenya.

5.2 Policy Recommendations

Whereas setting of credit facilities and other financial services is mainly a private incentive, the government should liaise with the private sector to identify appropriate incentives (for instance, enabling regulatory framework, adequate security, land for hire and lower corporate tax) to attract investment in financial services in areas not adequately served by the existing financial institutions. Recent developments in legal and regulatory legislation in banking are an important step in improving rural access to credit.[9] In addition, it is important to note that the last three years have seen dramatic changes in the financial sector landscape in Kenya. Technological innovations have now made it possible to extend financial services to millions of poor people at relatively low cost, for example mobile telephone money transfer services that allow mobile phone users to make financial transactions across the country at a low cost.

Similarly, study findings suggest that the government should prioritize access to health in its public expenditure in favour of less developed areas. Since the early 1990s, the Kenyan government has introduced a number of decentralized funds, but only less than 40 per cent of the population report improved livelihoods despite availability of funds.[10] Therefore, in addition to additional public allocation on health, it is important that the government puts in place governance structures that will guarantee proper management of decentralized funds.

Decentralized funds are not only likely to enable improved health access, but can play a critical role in developing education, a critical determinant in reducing regional disparity. Though the Constituency Development Fund and the Free Primary Education fund are expected to play an important role in improving education status in all districts, the government should identify critical minimum levels of literacy that all regions should achieve, with adequate interventions being put in regions that lag behind the critical literacy level. The Newly

[9] Faulu Kenya has become the first Deposit Taking Microfinance to be licensed by the Central Bank of Kenya to accept customer deposits. See www.faulukenya.com.

[10] See the Baseline Report on Decentralized Funds, KIPPRA (2006).

Industrialized Countries have an average literacy level of 90 per cent; this could be the critical target for Kenya.

Whereas the study shows that access to postal services has had significant contribution in determining the level of regional growth and therefore the level of regional welfare, it is important to note the recent rapid development in Information, Communication and Technology (ICT). Thus, any government initiative in improving communication infrastructure in marginal areas should be cognisant of the development impact of the revolution in ICT. The recent tax reduction for mobile phones is important, but the government can supplement access to communication by giving incentives to the private sector, for instance in extending the fibre optical cable to all regions in the country.

5.3 Limitations of the Study and Areas for Further Research

The study used absolute rural poverty as a measure of regional disparity. The extent to which the level of absolute rural poverty is used as a measure of regional disparity is not without criticism. Comparison of poverty levels across districts may have no direct bearing on their differences in regional production. The poverty headcount index measures the proportion of the population that cannot afford to purchase the basic basket of goods and services. In using it to measure regional disparity, the study assumes that consumption levels typically represent income earnings of the households. However, the inability to purchase a basket of goods and services is not a consistent scale for measuring household income levels among different regions, since the poverty measure, in this context, considers only two groups of individuals; those who can afford a certain basket and those who cannot. The differences in income levels within the two groups are not taken into account. Consequently, disparities in poverty incidence can only reflect regional disparities if we assume similar income inequality levels within the regions.

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