INSTITUTIONS, POVERTY AND ECONOMIC PERFORMANCE IN EASTERN AFRICA

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A RESEARCH PAPER PREPARED FOR PRESENTATION IN THE HORN ECONOMIC AND SOCIAL POLICY INSTITUTE, ADDIS ABABA

[IGAD Economic Conference 2014, 23 – 25 October 2014 at the UNECA Conference Hall in Addis Ababa, Ethiopia]

JULY 2014

ADDIS ABABA

ABSTRACT

East African countries are poor due to several factors particularly due to vicious circle of poverty prevalence, conflict and civil war trap, natural resource trap, land locked with bad neighbors and bad governance. These are traps discouraging the incentive for economic growth and brought about poor performance of the economy; thus, leads to difference in income associated with difference in institutional arrangement and structure. The average per capita income of the region is $333 with minimum average of $82.64 and maximum average of $882.46. Dummy intercept indicated that each country has its own unique features. On average, Kenya is performing better from members in the region followed by Tanzania, Rwanda and Eritrea respectively. Panel data technique is employed to identify factors affecting economic performance of the region and the random effects outcome shows that investment, inflation and exploded population growth affects economic performance.

Key Words: Poverty, Institution, Economic Performance, East Africa, Panel Data.

1. Introduction

Living standard and conditions are different among different countries of the world[1]. Though it is difficult to have a precise comparison intuitively, there has been higher per capita income in countries like the United States of America, France and Germany; and lower income per capita, especially in Sub-Saharan Africa (SSA). Besides, there is variation in human and physical capital accumulations, technological advancement, and natural resource endowment (Romer, 1996; Acemoglu, 2009). The distinction between countries is also taken into account for kilo calorie intake, infant mortality rate per 1000 and life expectancy (Nafziger, 2006). What is the reason behind such living standard and conditions differences?

Does the choice of economic system matter? Notably two extreme sides of economic systems exist to examine and explain economic activities and performance of nations. These extreme sides are the market economic system and the command economic system. The classicalists' economic theory, nepotism of free market economic system, was in a place for almost two centuries to analyze economic performance. The neoclassicalists assume the role of the state is limited only to assure smooth interaction of economic agents, to govern peace and security, keep sovereign of the state. They pretend the intervention (involvement) of government in economic activities brought stagnation due to the inefficiency of the system (Hayami and Godo, 2004; Barro and Sala-i-Martin, 2004).

The market has the power to decide on economic activities; resource allocations, productions and distributions (Krugman and Wells, 2006; Hall and Lieberman, 2007; McConnell and Brue, 2008). However, great depression that hit the world especially the United States of America from 1929 through 1933 challenged the neoclassical assumption of limited role of the state thus failed to respond to the problem of Great Depression (Krugman and Wells, 2006; Gartner, 2006). The problem initiates the intervention of government in economic activities.

Keynes (1936) explained in his book entitled 'The General Theory of Employment, Interest, and Money' proposed a solution for great depression (Romer, 1996; 2006; McConnell and Brue, 2008; Slavin, 2009). Keynes's theory emphasized the involvement of government to stabilize the economy and the idea was prominent till the mid of 1960s. However, it has failed to respond to the problem of 'stagflation' in 1970s (Blanchard and Fischer, 1989; Mankiw, 2009). The recent economic and financial crisis of 2008/2009 also challenged economists why and how the problem is solved.

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[1] Acemoglu (2009) describe the income of developed countries is higher than 30 more than developing countries and the income per capita of Unites States of America was more than $34,000; in China almost $4,000; and less than $1,000 in sub-Saharan African countries like Ethiopia, Chad and Senegal. The per capita income of USA is more than 34 times higher than in Ethiopia, Chad and Senegal.

The command economic system is the other wing which gives due role for the central government to design, plan and implement economic activities. The system was not efficient and effective due to several reasons. The outstanding reasons most economists agreed on the inefficiency arises from the bureaucrat system in production, allocation and distribution of economic resources. Countries like the former Soviet Union (Russia) and Cuba, following command economic system experienced collapsing in their economic growth (Acemoglu *et al.,* 2004; Rodrik, 2006).

Currently, there is no one country that follows either totally free market or command economic system; rather, there exist a mixes of the two. The private and government sectors co-exist in any economy. Thus, the interaction of economic agents/units determines the behavior of economic activities and outcome. The misbehavior[2] of economic agents may bring undesirable outcome. At large, the major factor for the fluctuation of economic activities depends on the behavior of economic agents. What are the factors that govern economic actors' action and reaction to sustain economic growth through reduction of poverty and enable better living conditions of the people?

There has been debate over poverty reduction, living conditions, economic growth; and the fundamental causes of development. North and Thomas (1973) emphasized the importance of capital accumulation, education, skills and the capacity to innovate in the society. Others debate over the importance of financial (economic) liberalization and investment (Ayogu and Ross, 2005), social wellbeing and political economic development. The way out of poverty to economic growth and development is not one way. It is a road of multidirectional and complex. Practically, there are three binding forces according to Lindauer and Pritchett (2002); the role of government, the role of capital accumulation and the role of trade. In each of these entities there are binding forces of interactions.

Human and physical capital accumulation, innovation, social wellbeing and political economic development are not fundamental causes; they are growth by themselves. Acemoglu (2009) explain the fundamental cause's lays at least on two reasons. The first reason relies on a theory that dictates the proximate causes alone would be 'incomplete' without understanding the major factor driving these growths. Second, if economic growth is motivated by improving the performance of certain sector and the living standards of the nation, understanding the fundamental causes of growth merely by focusing on these performances would be synonymous to dealing with symptoms of diseases without identifying and understanding what the diseases are.

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[2] Misbehavior can be occurred due to scarcity of resources. Individuals are always wants to maximize their objectives. Houses holds want to maximize their contentment and happiness, business firms examine how profit can be maximized and government too. In each economic unit's behavior, self interest is involved whereby the means to satisfy those ends are limited. Thus, create uncertainty in the behavior of one over the other which later may bring misbehavior.

Acemoglu ascertains four principal hypotheses of the fundamental causes of economic growth: luck, geography, culture and institution. Of these principal causes, institution is the key for economic performance and defined as 'rules', 'regulations', 'laws' and 'policies' which are favorable for proximate economic growth to flourish (ibid).

Institutions matter for economic growth or stagnation (North, 1990; 1991; Acomoglu *et al.,* 2001). This paper argues in favor of the proposition that institutional differences are fundamental causes of national economic growth differences and falling in poverty. The failure of institutions is responsible for a nation's impoverishment. The paper tries to explain institutions as the fundamental causes of economic performance and income per capita between nations; analyze poverty and institutions; examine the link between poverty, institution and economic growth.

2. Objectives of the paper

The general objective of this paper is to review and analyze the fundamental relationship between poverty, institutions and economic growth. Specifically, the paper is to:

- examine the role of institutions for economic performance;
- identify factors affecting performance of economic activities.

3. Definitions and Concepts

North (1991) defines institution as "humanly devise constraint" in the interaction of actors through arrangement and structure of politics, economic and social affairs whereas Schmid (2004) describe as a human relation that plans benefits through constrain and enablement. The constraint for a certain group is an opportunity for others. Institution enable individuals what they cannot do alone and encourages cooperation among them. Hence, it is the rules of relationships and cooperation in a society that provide a framework for incentives in shaping economic, political, and social interactions and behavior. Veliz (1994) has stated that institutions are related to the culture and social norms.

Institutions are sets of rules and customs in relationships that define the rights and opportunities of economic participants; experience to the rights and responsibilities of others (Adams, 1993). Thus, economic performance largely depends on the institutional arrangement[3]. Institutions are

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[3] According to Ostrom institutional arrangement refers to diversified types consists of markets, hierarchies, firms, families, voluntary associations, national governments, and international administration. In each of these arrangements there is interaction among the players. For instance, in market, the power of demand and supply interact to determine the amount of output to be produced and the price to be charged. In the family arrangement, the family head determine economic inquiry of the family. Government head and officials are the responsible body in government investment undertakings and expenditure, and revenue collections. These are within interactions of institutional arrangement. There is also between agents an interaction. The decisions of a given business firm to

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constraints designed to govern; rules to deal and techniques to tackle the problems involved in human behavior entailed in interactions[4]. Institutions constrained human misbehavior and to have smooth relations in the society (North, 1990; Lal, 1998; Davis, 2010). They are a bound composed of both formal and/or informal rules to govern the behavior of economic actors (North, 1990).

Formal institutions tend to be backed by the force of law; informal institutions are typically enforced through social customs and relations (North 1990; 1991; Lal, 1998; Acemoglu *et al.,* 2004). An important relationship exists between formal and informal institutions: the enforcement costs associated with formal institutions will be a function of the extent to which the alignment with informal institutions. Whether it is formal or informal by providing the rules, constrains or techniques; institutions facilitate economic growth (Acemoglu *et al.,* 2004; Schmid, 2004). High transaction costs, instability in macroeconomic variables and politics traps a nations to poverty. Particularly, institutions play in resource allocation and distributions among the most competing areas of economic sectors.

According to Chang (2005) the nature of institutions are categorized into the forms and functions: the later reveals the style of governance like dictatorship versus democrat. Functions are the institutional aspects of 'rule of law', enforceability of contracts and property right protection. Chang believed that differences in economic performance across borders are not due to forms of governance; rather, due to differences in functions of institutions. Whenever 'rule of law' are not respected leads to failure of the system operating in the interaction of economic actors; loss of loyalty and creates frictions.

Institutions are the major determinant of the cross-country differences (Lal, 1998; Acemoglu *et al.,* 2001) and the outcome relies on the functioning rather than the forms of institutions. Institutional functioning difference matter more and leads to diversity of economic performance and growth, and different living standards across borders (North, 1991; Acemoglu *et al.,* 2001; Chang, 2005; Acemoglu, 2009).

The Koreans, are the natural experiment, had similar per capita income before 1950[5] s. Afterwards they had followed different economic and political ideology and motivated towards very different economic outcomes: South Korea is categorized under the Newly Developed

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produce or to engage in certain economic activities can be influenced by the policy of a government. Relationship and economic interaction not only have effects within a country but also has international implications.

[4] Interactions according to North are prevailed in social, political and economic form. However, interaction can be extended to human relations to natural resources use and management, culture and beliefs, even luck.
[5] Before World War II; Korea was under the administration of Japan. Following Japanese depart from Koreans peninsula; the former Soviet Union came to the northern part of the country with Kim II Sung. United States of America closely examined the USSR's situation and came to the south part. In 1948, Korea was divided into two independent states; however, they had similar topography, cultural and social lives besides similar per capita income.

Countries and one of the 20 members of the rich group nations – G20 groups. The Northern however remained one of the poor nations similar to the African's (Acemoglu *et al.*, 2004). The choice of different institutions has a pervasive effects and leads to a very different economic growth outcome and living status (Romer, 1996; Ulubasoglu and Doucouliagos, 2004; Acemoglu and Robinson, 2006; Acemoglu, 2009).

In recent time, institutions and their impact on the economy have become focal points in the economic growth literature. Several studies have shown that quality of institutions have positive impacts on economic growth, which is a necessary condition for poverty reduction. Institutions also affect the distribution of economic growth benefits across various social and political groups in a society (Acemoglue, 2004; 2005; Lopez, 2004; Chang, 2010).

4. Institutions and Economic Performance

Institutions are governing rules; to enable and constraint human behavior in interactions. Human interact through creating structure and arrangement in politics, economy and social affairs. People also have relations in religion, culture and norms. Institutions have the capacity to create smooth interactions which enable to govern and change the behavior of actors in each ends. The structure and arrangement in politics determine and affect directly or indirectly; positively or negatively the outcomes in other strands, in which the outcome depends on the de jure and de facto political formulation (Acemoglu *et al*, 2004).

De jure and de facto are different forms of political power whereby society formulate governance scheme (Chang, 2005). The de jure political power is designed by the political institutions whereas the de facto political power arises out of illegal power exercising: like revolt, protest, use of armed forces. Revolt for instance comes at the interest of the 'disadvantageous people'. De facto political power may results from changing decisions in resource allocation to overall collapse of political administration and economic institutions (Acemoglu *et al.*, 2001).

Political and economic institutions are the major determinant factors in explaining income difference across countries. There is evidence showing strong correlation between political and economic institutions with economic performance. Economic institutions enable for efficient resource allocations (Acemoglu *et al.*, 2004). In economic institutions, interactions and misbehavior is resolved through political interventions (Acemoglu *et al.*, 2004; Acemoglu and Robinson, 2008).

However, in Africa unlike that of developed countries the effectiveness of political and economic institutions is inefficient. Inefficiency of institutions discourages economic performance. For instance, to engage in business, Djankov *et al.,* (2002) found that, the cost of opening a medium-size in the United States of America was less than 0.02 percent of GDP per capita in 1999; the same cost was 2.7 percent of GDP per capita in Nigeria and 1.16 percent in Kenya. The costs of

opening business in African countries are associated with confiscation, bribe, corruption; the bureaucracy related to registration and licensing and etc affecting economic performance; economic growth and aggravate the problems of poverty trap in the continent.

The fact no one can deny is that USA is different in many aspects from African countries in terms of GDP, GDP per capita, human and physical capital, and technology. Consequently, evidence based on correlation does not establish whether institutions are important determinants of economic outcomes difference. To examine the role of institutions on economic performance, one needs to isolate source of exogenous differences in institutions. The ultimate approximation is to consider a situation in which similar societies choosing different sets of institutions and end up with different economic performance (Acemoglu and Robinson, 2008).

4.1 Theoretical relationship between Institutions and Economic Performance

Considering a case where different institutions brought about different economic performance and growth. The major determinants of economic growth lie on the performance and effectiveness of political and economic institutions (Acemoglu and Robinson, 2008). The impact of modeling institutions on economic performance depends on the formulation of Acemoglu, Johnson and Robinson (AJR) research works of different years.

AJR's assertion is that institutions are the major determinants of economic performance and classified into political power, political institutions and economic institutions. The major determinant factor, economic institution, is an endogenous. Economic institutions in interactions; shape economic incentives for key economic actors in the society. Economic performance and distribution of resources lies on economic institutional arrangement and structure which affect aggregate economic growth. The economic institutions affect the performance through resource allocation and distributions. Distribution of resource among competing areas cannot satisfy the whole actors; creates problems in the society and raises a question of 'equity' versus 'efficiency'.

Figure 1: The link between economic institutions and economic performance
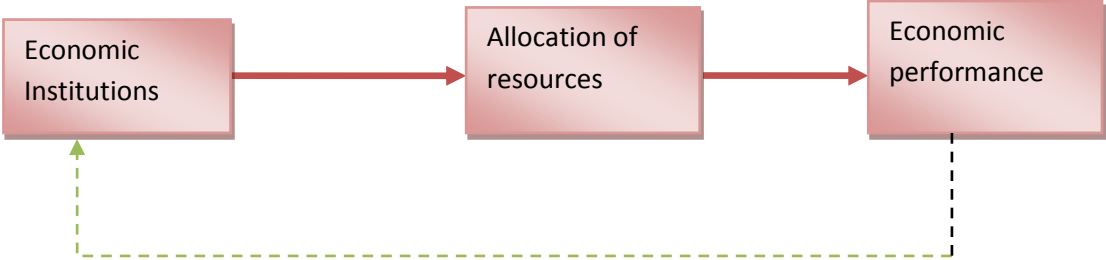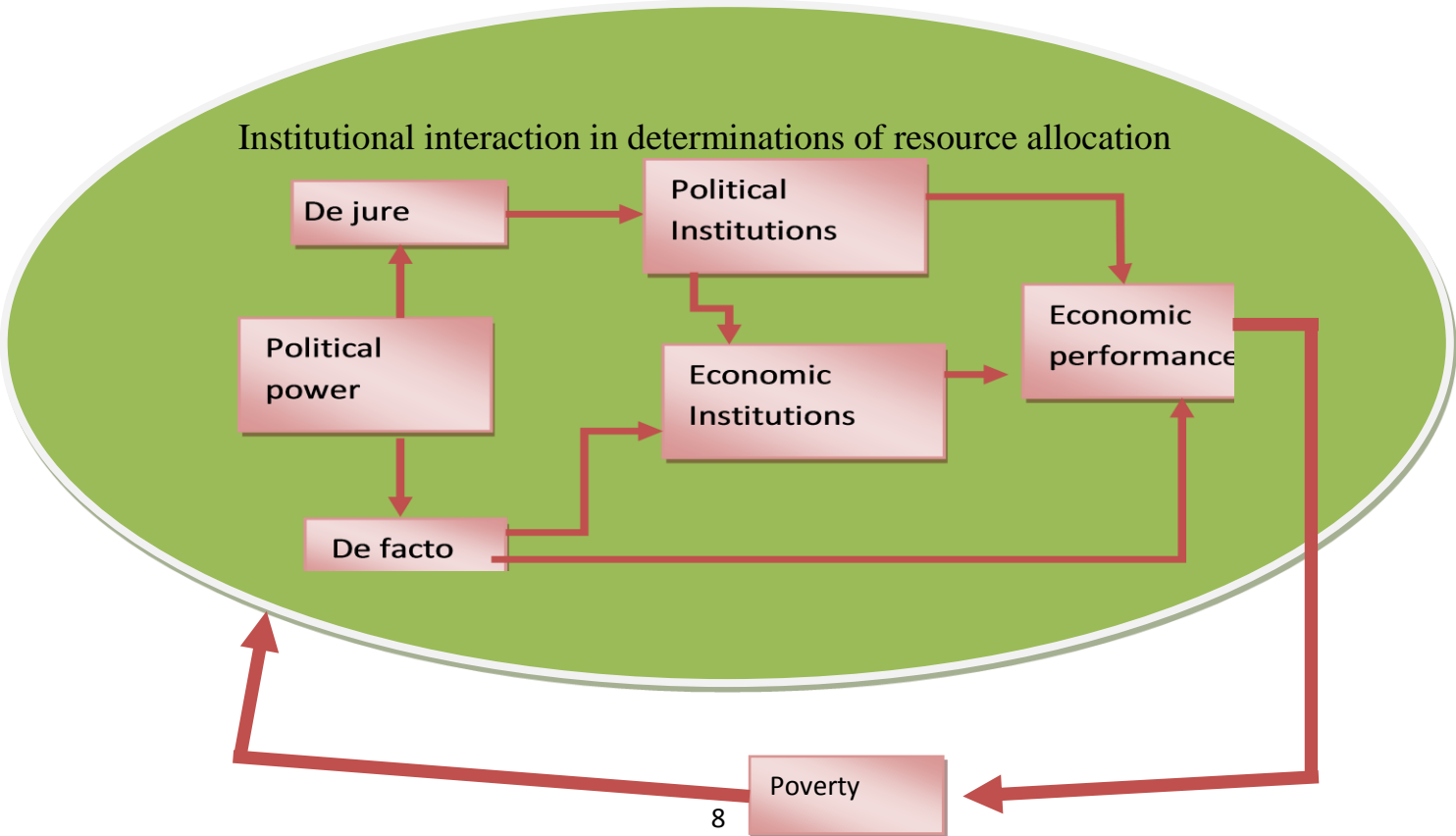

Economic institutions determine the allocations of resources which affect economic performance of the society. The decisions of resource allocation among the most competing areas may not satisfy the interest in the society, willingness and preference of people, and accordingly it entails enablement for one group and constrains for others (Schmid, 2004). Hence, not all individuals

and society prefer the same economic institutions to operate in the economy. This leads to conflict of interest over the selection and operations of the types of economic institutions in resource allocation for better economic performance. The ultimate resolution will be made with the intervention of political power.

The decision made by political power is also dogenous in determination of economic institutions. Political power has two forms: de jure and de facto (Acemoglu and Robinson, 2006b). Both de jure and de facto political power determine the nature and types of economic institutions. De jure political power comes from political institutions in the society whereas de facto political power originates from revolting, co opt, or using mercenaries.

De jure political power consists of structures, forms and types of governance – the established rule of the law: capitalist or socialist. De jure political power determines the choice of resource allocation in political institutions which in effect determines performance of economic activities. Political institutions are endogenous determined by the model. In political institutions, conflict of interest evolves creating difficulty to satisfy all behavior and preference of the society. The part of the society dissatisfied will use de facto political power so as to impose their preferences on the allocations of resources. Economic and political institutions are endogenous determined by the wish of the society.

Figure 2: The role of institutions affecting economic performance through resource allocations

Political power and political institutions are the determinant factor in designing economic institutions. De jure political power determines the structure and types of political institutions which directly affects the performance of economic activities or indirectly through affecting economic institutions. The de facto political power which is the act of exercising power out of the legal authority determines economic performance directly or through affecting economic institutions. Economic institutions directly determine the nature of economic performance and activities. In each institutional category, economic activities and performance determines economic growth. Perturbation of economic institutions affects economic performance which has a direct fundamental cause for the retardation of economic growth. Retardation in economic activities has profound effects on innovation, incentives for capital accumulations, education and skill development later leads to poverty. Poverty is also affects the quality of institutions in smoothing interaction and behavior of resource distribution.

5. Institutions, Poverty and Economic Growth

Economic institutions are the major determinant of economic performance. Failure of institutions in enforcing the rule of law, customs and traditions discourages economic performance; hinder economic growth which later leads to poverty. Institutions, poverty and economic growth are linked in that better institutional performance encourages economic growth and reduce poverty.

5.1 Institutions and poverty traps in Africa

Poverty is multi dimensional, complex and reveals low level of well being. According to Mary (2008) poverty is becoming a 'rule' that guide humanity lives in most parts of developing countries. Particularly, it is wide spread in African countries and FAO (2012) estimated 1 out of 3 is exposed to hunger which is actually a manifestation of wide spread problem of poverty.

Why poverty reigns in less developing countries in general and Africa in particular? There are many touting issues and Acemoglu (2009) asked similar question as "Why some countries are much poorer than others?" The fundamental causes for these disparities as differences in proximate economic growth: differences in human and physical capital, technological innovation, production and productivity, which brought per capita income and output differences.

There is an assertion that poor are caught by vicious circle of poverty. Vicious circle of poverty is characterized by supply side and demand side constraints. The vicious circle of poverty is a trap which leads communities, societies and countries into worst poverty (Todaro and Smith, 2012). Breaking the cycle is the ultimate way to end poverty in developing countries (Alemayehu, 2004).

Collier (2007) explains challenges of the billion poor and examined through 'poverty trap' by classifying into four natures: the conflict trap, natural resource trap, landlocked with bad neighbor and bad governance; and asked whether these are the 'real causes' of poverty traps in less developing countries?

Civil war and conflict is becoming a norm in the land of Africa. The dismal effects range from losing of innocent individuals' life to change of political administration. Civil war and conflict within Somalia leads to stateless country in the world. The conflict manifested in rivalry between different Islamic parties is for supremacy (Dave-Odigie, 2011). Scarcities of resource are also accounted in civil war and conflict. According to Fekadu (2007) scarcity of natural resources creates tribe conflicts (ethnic conflicts) in pastoralists and agro pastoralists in Mieso in eastern Ethiopia particularly for grazing land.

The endowments of natural resources are the essential inputs in economic growth of nations. Acemoglu (2009) ascertain that the better a country endowed with natural resource the better the economy performs, however, Collier dealt as it is one of poverty trap: The discovering of natural resources creates civil war and conflict. The conflict between North Sudan and South Sudan is mainly due to the investigation of natural oil at the border shared by the two nations.

The third trap is related to geographical neighborhood. Ethiopia is a nation of landlocked and bounded by Eritrea and Somalia. The country was clashed with both neighbors due to different reasons. Ethiopia was in bloody shed conflict with Eritreans in 1998 which comes to an ended in June, 2000 due to border dispute. Ethiopia was also in war with Somalia in 1964; in 1977 – 1978 partially over Somali regions (CHF International, 2006) with Islamic courts in 2006 (Bamfo, 2006). Both Eritrea and Somalia have ports and Ethiopia is a landlocked. It would be beneficial if there had been an agreement between these three neighboring nations to cooperate through creating institutional structure that benefits the whole societies.

Bad governance is another factor that traps into poverty. Governance becomes bad when political elites and governors failed to act to the challenges and obstacles faced by the people; and run after their own benefits. Good governance promotes economic performance and bad governance leads to stagnation and poverty. Collier's poverty trap is related to misbehavior and the failure of interaction in actors and hence leads to institutional failure.

The major challenges African countries facing are being trapped by vicious circle of poverty and Collier's poverty trap. These poverty traps are the responsible for economic stagnation and retardation.

To come out of poverty, institutional performance and functions takes a lion share. Well functioning institutions have a positive spillover to engage in economic activities. Economic growth and development requires technological advancement, human capital, physical capital,

and natural resources and have occupied a central role in explaining the importance of institutions (Acemoglu *et al.,* 2001; 2004; 2005).

The framework below tries to link the relationship between poverty, institutions and economic growth. The framework was designed to examine institutional failure is responsible for poor performance of the aggregate economy and wide prevalence of poverty trap in developing countries. Economic growth and development largely depends on the interactions and behavior of actors in the economy. Misbehavior of actors minimizes the overall interactions leads to economic stagnation and poverty traps.

Figure 3:The link between Poverty, Institution and Economic Growth

- Civil war and conflict
- Bad neighboring and land locked
- Natural resource endowment
- Bad governance

Vicious Cycle of Poverty

Collier's Poverty trap

- Economic institutions

Economic Growth and Development

De facto

- Political institutions

- Political power

De jure
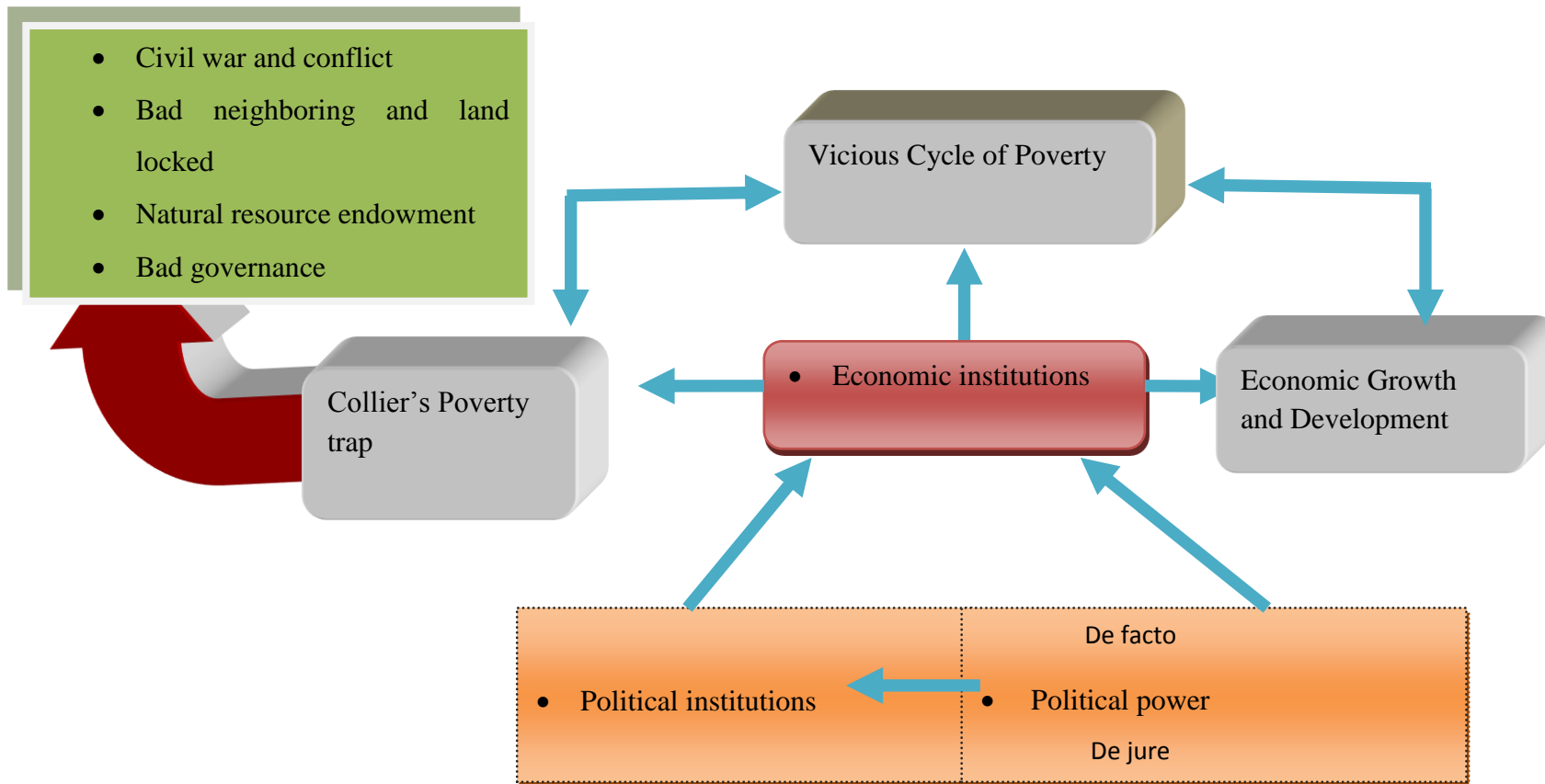
Developed from Collier (2007), Acemoglu, Johnson and Robinson and

Framework of the relationship between Poverty, Institutions and Economic Growth

Better performance and functioning of institutions are the determinant factor for poverty reduction and play great role in economic growth (Acemoglu *et al.,* 2005). The concept of institution is broad encompassing human interaction and behavior. Institutions are a human devise (North, 1990) to govern these interactions and behavior in economic and political institutions, and political power.

Economic institutions are basically consists of the structure and functioning of markets since they create conducive situations and incentives for the society at large (Acemoglu *et al.,* 2004). Economic institutions enable to allocate scarce resources to the most competing use; encourages individuals to take risk and innovate, creates the structure of property right, and the market perform more efficiently. Failure of well functioning of the market, unsuitable property right protection, mischief, corruption, confiscation discourages individuals to trust the market which plays a great role in the failure of economic institutions (North and Thomas, 1973).

Effective property right scheme, stability of macroeconomic variables and sound contractual agreement enable to reduce the marginal transaction and information costs attributed in production, distribution and consumption (Lal, 1998; Khalil *et al.,* 2007). Consequently, economic institution is the determinant factor in the change process of de jure (political institutions) and de facto (political power). Accordingly, the fundamental causes of economic growth across countries are difference in economic institutions (Acemoglu *et al.,* 2001; 2005).

African countries, if not all, lack institutions and caught by vicious circle of poverty characterized by low investment, high inflation, primary agricultural export and import more industrial output, higher unemployment, less human and physical capital accumulation (Barro and Sala-i-Martin, 2004; McConnell and Brue, 2008; Mankiw, 2009). Moreover, Collier's poverty trap is challenging people in these countries.

Whenever economic institutions failed to respond to the demand of economic activities, the outcome is adverse. The adverse outcomes are first brought economic stagnation, failure in political institutions and power; a wide spread prevalence of poverty trap prevailed.

6. Methodology

6.1 Data

Institutions are organization of society in which the society devices rule, "rules of the game", a major determinant of economic performance and a key factor in understanding the vast cross-country differences in prosperity. To analyze cross country economic performance of East Africa panel data is organized. Data is gathered from International Monetary Fund (IMF) World Economic Outlook database, and Fraser Institutes reports.

6.2 Definitions of variables

Economic growth can be measured in different ways. Gross Domestic Product is one measures of the performance of a country (Nafziger, 2006). However, according to Sen (1981) it is not appropriate measure because of the shortcomings entailed with. GDP does not ensure the living standard and proportion of income an average individual will receive. A better measurement is to take the per capita income which indicates a proportion of income an average citizen will earn per annum. Hence, for the computation of the determination of the effects of performance of economy of the region, per capita income is considered.

Dependent variables

Per capita income at US constant dollar = (Gross Domestic Product)/(total population)

Independent variables

Total investment as a percent of GDP: total investment is encouraged if institutional structure attracts more investment.

Export as a percentage ratio of GDP: more export encourages domestic businesses, creates employment opportunities and enhances better economic performances.

Inflation (average consumer price index) is used to examine the cost of living. The independent effect of inflation and the associated increased price level variability in hindering economic growth is empirically tested by most researchers (Hassan, 2003; Stroup and Heckelman, 2001). There exists cross country variation in monetary policies which exacerbate inflation. This variation can be controlled by including the annual growth rate of the M1 (money supply) less the growth in potential GDP for the preceding year. This explanatory variable does not reflect the variability of price level; it rather reflects evidence of poor policies that may cause inflation (Stroup and Heckelman, 2001).

Population growth: The number of population is taken to measure the extent of the size on economic growth in each country. There are controversial issues however between the relationship between population size and economic growth. An increase in population growth increases the labor force growth. The labor as a factor of production enhances economic growth. However, with a shortage of capital, an increase labor force may result in lowering marginal product of labor.

6.3 Panel Data Modeling

Hsiao (2003) explain the advantages of using a panel data set over a cross section and time series. Using a panel data set enable to handle heterogeneity or individual effects, give more

informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency.

It also enables to study dynamics of adjustment, identify and measure effects that are simply not detectable in pure cross-section or pure time-series data (Gujarati, 2004; Baltagi, 2005). A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables, and specified as:

$$y_{it} = \beta_0 + x_{it}\beta + z_i\gamma + u_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots[\text{ Eq 1}]$$

Where y_{it} - is the per capita income of country i over time period t and $x_{it}\beta$ - is the explanatory variables with β – coefficients of explanatory variables, and β_0 is a constant. i denotes individual country and t implies the time period.

$z_i\gamma$ is heterogeneity effect and z_i might be observed like location or unobserved like individual specific ability, and cannot be estimated directly by fixed model (because z_i is taken to be constant over time) but can be estimated by random effect, they are time invariant factors. It is constant and having a set of individual or group specific variables.

u_{it} is unobserved random error term

We have two strategies to deal with z_i basically; there are assumptions about the unobserved individual country specific effects. The first assumption, we can use the fixed effect model. The fixed effect model assumes that z_i to be constant and correlated with the independent variables. And time invariant factors will be excluded from the model by taking the difference between each observation with the 'within group mean' values in order to remove the individual specific term.

Taking the average of Eq 1 over time

$$\bar{y}_i = \beta_0 + \bar{x}_i\beta + z_i\gamma + \bar{u}_i \dots\dots\dots\dots\dots\dots\dots\dots[\text{Eq 2}]$$

Subtracting Eq 2 from Eq 1

$$y_{it} - \bar{y}_i = \beta(x_{it} - \bar{x}_i) + (u_{it} - \bar{u}) \dots\dots\dots\dots\dots\dots\dots\dots[\text{Eq 3}]$$

Fixed effect model is explained as

$$E(z_i / x_{it}) \neq 0$$

So, z_i is correlated with at least one of the explanatory variable

Fixed effect model has defects. It failed to take into consideration the time invariant, suffers from a large loss of degree of freedom and may aggravate the problem of multicollinearity among the explanatory variables for large K explanatory variables (Baltagi, 2005).

Testing for fixed effects

For a large sample size, it is possible to transform and use the restricted residual sum of square being that of OLS on the pooled model and unrestricted residual sum of square being that of least square dummy variable as:

$H_{0:} \gamma_1 = \gamma_2 = \gamma_3 = \cdots = \gamma_n$

Run OLS and fixed effect version of the model; the test statistics is given as

$$F = \frac{(RRSS - URSS)/(N-1)}{URSS(NT - N - K)} \sim F_{N-1, \ N(T-1)-K}$$

A large value of F indicates the statistical significance and the restricted residual is invalid (Gujarati, 2004). It reveals that the model is ok. This is a test (F) to see whether all the coefficients in the model are different than zero.

Random effect model

It is another form where there is no correlation between individual specific effects with the independent variables. Coefficients of all variables in the model, time variant and time invariant will be estimated. In a random effect, there is no fixed individual specific effect. The rational behind random effect model is that, unlike the fixed effect model, the variation across entities is assumed to be random and uncorrelated with the explanatory variables included in the model. It is assumed as

$E(x_{it}, z_i) = 0$

Testing for random effects

Specification of the model: Consider the following model

$y_{it} = \alpha_0 + x_{it}\beta + \alpha_i + \varepsilon_{it}$

Let us assume that α_i unobservable random variables having a probability distributions.

Lagrange Multiplier test is given as

$$LM = \frac{NT}{2(T-1)} \left[\frac{\sum (\sum \varepsilon_{ti})^2}{\sum \sum \varepsilon_{ti}^2} - 1 \right]^2 \sim x^2{}_1$$

The LM test is a test statistic with a chi-square distribution of 1 degree of freedom

Choosing between Random Effect and Fixed effect

If individual specific effect is uncorrelated with the X_{it}^s then random effect model is appropriate otherwise, fixed effect is advisable and can be examined using a Hausman-Wu test. The usual techniques to choose from random effects model to fixed effects model is done with Hausman tests. To conduct the test we need to run both FE and RE models and save the results. The null hypothesis for choosing FE or RE states that 'there is no difference in the coefficient estimated by the efficient RE and the consistency of the FE estimator. If there is no statistical difference, then we have to use RE.

7. Case Analysis and Discussion

Poverty is a real phenomenon in East African countries. These countries are characterized by poverty trap of Collier and vicious circle of poverty, recurrent drought, famine, civil war and conflict, high and pervasive inflation rate, high unemployment rate, less human and physical capital accumulation. However, there is also a difference in economic performance of each country. Per capita income is used as a proxy to measure economic performance of east African countries. In terms of per capita income as a proxy for economic performance, Kenya is best performing relatively in the region passing $880 per person. Tanzania, Rwanda and Eritrea are performing well with a per capita income ranges of $400 to $600. Whereas Burundi's economy is at the bottom performing poorly in the region with a per capita income of less than $200 per annum and Ethiopia is the second relatively poorly performing in the region with a per capita income of $351 in 2011.

The average per capita income of the region from 2000 to 2011 is $333.13 per person with minimum of $82.64 and maximum of $882.46. The standard deviation (183.54) indicated the deviation of the income per capita of members of the region from the average. Thus, there is a wider deviation in per capita income across countries and over a span of time, which implies that there is also disparity between economic performances. The income disparity across the region is different from country to country and from time to time. This seminar paper is tried to examine the disparity of income per capita and economic performance within the region is associated with difference in inflation rate, investment as a percentage of GDP, export as a percentage of GDP and number of population though the explanatory variables considered are not sufficient – there are other variables that has to be taken to measure the relative economic performance of the region, which is left for other researchers want to conduct a research on a similar theme.

Inflation is becoming a phenomenon for the region and it is advised to have a moderate rate encourages producers and innovation. By moderate inflation rate, the rate per annum must not exceed 10 per cent. However, the case of east African countries; for inflation rate is on average

190 per cent per year indicating that a high costs of living perverse the region and a wider deviation between countries. With the average inflation rate difference, the minimum registered rate is 48.5 percent to a maximum of 592.88 percent per annum. The region is running to a hyperinflation – a case where 'barter' system is preferred unless, there is institutional change to tackle the problem, if not, consequently leads to the 'lost' region in the world.

There is also difference in terms of investment as a percentage ratio of GDP between countries and over the span of time considered though the deviation is unlike inflation rate and GDP per capita. The average export as a percentage ratio of GDP for the region is $7.8 and deviated by 13.73. The deviation of the region in terms of export is moderate between countries but deviate across time within a country is high implying that the export sector of the region is growing. The number of population distribution of the region ranges from 23 million and extends to the maximum of 86 million overall. The deviation in population distribution between countries is different from within countries across time. More generally, observation reveals that there is difference in GDP per capita income between countries and across time within a given country. This is also true for total investment, export, and inflation and population growth between countries and across time within the country.

Table 1: Descriptive Statistics

Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations	
GDPcap	overall	333.1319	183.5426	82.639	882.464	N =	84
	between		153.8151	125.9378	614.066	n =	7
	within		114.7359	118.2159	601.5299	T =	12
Invest	overall	19.99143	5.71922	6.141	35.261	N =	84
	between		3.365885	14.43642	23.74692	n =	7
	within		4.783487	10.78885	36.78585	T =	12
export	overall	7.846214	13.72629	-28.238	37.132	N =	84
	between		4.118925	1.742333	13.56558	n =	7
	within		13.17929	-24.85595	43.23588	T =	12
Inflat~n	overall	189.5831	124.0348	48.472	592.882	N =	84
	between		101.6697	74.21025	369.0104	n =	7
	within		80.11131	3.251793	496.1338	T =	12

Popula~n overall	28.54165	23.56206	3.706	86.834	N =	84
between		25.0508	4.598417	75.8805	n =	7
within		3.285812	18.17615	39.49515	T =	12

7.1 Fixed effect model outcome

Fixed effect model is no more used for the explanation and empirical examination of the variables. In such case, random effect is used. The selection of fixed or random; Hausman test for Fixed or Random effect is conduced favoring for random effect model. Hausman test is not significant and we failed to reject H_0 (Prob > chi2 = 0.2972) because it is less than 5%. Testing for random effects using Breusch and Pagan Lagrangian multiplier test for random effects also favors for using random effect model. So that we have to run random effect model and analyze the outcome.

7.2 Random effect model outcome

We have said that if the error term is correlated with one of the explanatory variable, it is good to use a random effect model assuming that there is no correlation between error term and explanatory variables. Different tests was conducted and favored for the use of random effect model. The following is the outcome of running a random effect model

Table 2: Random Effects Model without considering dummy variable

. xtreg GDPcap Invest export Inflation Population, re

Random-effects GLS regression   Number of obs   =   84

Group variable: Country   Number of groups   =   7

R-sq: within = 0.6649   Obs per group: min =   12

between = 0.0030   avg =   12.0

overall = 0.0658   max =   12

Random effects u_i ~ Gaussian   Wald chi2(4)   =   137.72

corr(u_i, X)   = 0 (assumed)   Prob > chi2   =   0.0000

GDPcap	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Invest	7.216111	1.821927	3.96	0.000	3.6452	10.78702

export	.2111613	.6055889	0.35	0.727	-.9757712	1.398094
Inflation	.8507502	.1186442	7.17	0.000	.6182119	1.083289
Population	7.065755	2.528988	2.79	0.005	2.109031	12.02248
_cons	-175.7415	105.9201	-1.66	0.097	-383.3411	31.85813

sigma_u   222.7631

sigma_e   69.775739

rho   .91065387   (fraction of variance due to u_i)

$$GDPcap_{it} = -175.7415 + 7.22invest_{it} + 0.21export_{it} + 0.85Inflation_{it} + 7.1populatio_{it}$$

(3.96)   (0.35)   (7.17)   (2.79)

The estimated model above with z value in the bracket reveals that investment as a percentage ratio of GDP, inflation and number of population are statistically significant at 1 percent whereas export as a percentage of GDP is not statistically significant. If we increase investment as percentages of GDP across time and between countries by one unit it will have in effect an average of 7.22 units increase in GDP per capita. This is a large magnitude which can create basic difference if a country give due attention on total investment out of the gross domestic product it will increase the per capita income and improves the performance of economic activities.

By including dummy variables all the estimated coefficients are individually highly significant except for export as percentage share of GDP; as the p value of the estimated t coefficients are extremely small. The dummy is included to capture whether there is a difference in intercept or not among countries in the region. We have seven countries taken and only six dummy variables are used to avoid in falling in dummy variable traps.

Table 3: Random Effects model with dummy variable include

Random-effects GLS regression Number of obs =   84

Group variable: country Number of groups   =   7

R-sq: within = 0.6747   Obs per group: min   =   12

between = 1.0000		avg =	12.0			
overall = 0.8729	max =	12				

Random effects u_i ~ Gaussian   Wald chi2(10)   =   501.31

corr(u_i, X)   = 0 (assumed)   Prob > chi2   =   0.0000

Gdpcap	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Invest	5.989088	1.868841	3.20	0.001	2.326228	9.651948
Inflation	.7251351	.1314803	5.52	0.000	.4674384	.9828318
populatio	12.1894	3.338565	3.65	0.000	5.645928	18.73286
Export	.1844787	.5918735	0.31	0.755	-.975572	1.344529
d2bur	791.4334	222.4783	3.56	0.000	355.384	1227.483
d4key	935.1775	131.9879	7.09	0.000	676.4861	1193.869
d3eri	862.4433	246.7098	3.50	0.000	378.9009	1345.986
d5rwa	1025.526	214.6533	4.78	0.000	604.8134	1446.239
d6tan	653.1239	128.0549	5.10	0.000	402.1409	904.107
d7uga	551.6598	176.0373	3.13	0.002	206.633	896.6866
_cons	-961.9055	223.0294	-4.31	0.000	-1399.035	-524.7758
sigma_u	0					
sigma_e	69.775739					
Rho	0	(fraction	Of	variance	due	To	u_i)

Here, Ethiopia is considered as a base comparison country. The value of the intercept tells us that there is an intercept difference or not.

$$GDPcap_{it} = -961.9055 + 5.98\ invest_{it} + 0.18export_{it} + 0.72Inflation_{it} + 12.\ 18populatio_{it} + 791d2bur_{it} + 862d3eri + 935d4ken_{it} + 1025d5rwa_{it} + 653d7tan_{it}$$

The intercept value of each country: − 961.91 for Ethiopia, −170.47 for Burundi, −99.46 for Eritrea, − 26.73 for Kenya, 63.62 for Rwanda, −308.78 for Tanzania and −410.25 for Uganda. These differences in intercept may be due to unique nature of each country like the rule of law, well behaved institutional setup and the like.

There have been debates over the importance of population on economic growth. Basically, there are economists like Thomas Malthus describe the negative relationship between economic growth and population number. Others like Arthur Lewis who profoundly describes the importance of population to economic growth. Others are explaining as if there is not relationship between population and economic growth. Surprisingly, the outcome favors Lewis' idea of positive relationship and is statistically significant. When population changes across time and between countries by one unit, the average effect on per capita income will increase by 7.1 units. This is also a large magnitude where governments of the region should not spend in planning for reducing of fertility because the coefficient is positive implying a positive relation between number of population and economic performance.

8. Summary and Conclusions

Countries in the world are different in economic growth and development. The difference between countries is explained through proximate and principal causes of economic growth. Countries are different in proximate economic growth like human capital, physical capital, and technology. These proximate economic growths are growth by themselves. The principal economic growth is the devise measured in terms of income which reveals the levels of living conditions.

Developing countries are poor due to several factors. One of the major factor lies on the fact that they are caught by vicious cycle of poverty: low savings and investment, low income and output, low productivity. Breaking of the cycle of poverty leads for better development of the nations.

Developing countries are also tap by Collier's poverty trap which challenges many. The poverty trap has four natures: the conflict and civil war trap, natural resource trap, land locked with bad neighbors and bad governance. These are traps discouraging the incentive for economic growth.

The major factors driving income difference between countries is associated with difference in institutional arrangement and structure. Institutions are constraints, rules and techniques to deal with the dynamic human behavior and interactions and are the factors in driving countries from poverty and leads to economic growth.

Better performance and functioning of institutions are the determinant factor for poverty reduction and play great role in economic growth. The concept of institution is broad encompassing human interaction and behavior. Institutions are a human device to govern these interactions and behavior in economic and political institutions, and political power.

The major factor behind nations' income difference lies on the economic institutions arrangement and structure. Economic institutions determine political power and political institutions; minimize impact of vicious cycle of poverty and Collier's poverty trap.

In addition to these explanations, this seminar paper tried to examine empirically East African countries by considering their respective GDP per capita as a dependent variable. As independent variables inflation rate, export as a percentage ratio of GDP, total investment as a percentage ratio of GDP and total number of population is considered. A panel data from 2000 to 2011 for seven countries namely Burundi, Eritrea, Ethiopia, Kenya, Rwanda, Tanzania and Uganda were taken from IMF world economic outlook. Moreover, OECD, World Bank and Fraser institute were testified.

Both fixed and random effect models were taken. However due to the correlation between the error term and explanatory variables the fixed effect model is kicked out and instead random effect model was run. The outcome of running random effect model indicates that total

investment, inflation and number of population are statistically significant in explaining GDP per capita across countries and over a time span considered.