ECONOMIC GROWTH AND THE QUALITY OF LIFE NEXUS IN ETHIOPIA: A TIME SERIES ANALYSIS

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This is to certify that the thesis prepared by Esubalew Asmare, entitled: "*Economic growth and the quality of life nexus in Ethiopia: a time series Analysis"* and submitted in partial fulfillment of the requirements for the Degree of Master of science (Economic policy analysis) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

Economic growth and the quality of life nexus in Ethiopia: A Time series analysis.

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To what extent are improvements in quality of life (material living levels, consumption, education/literacy, urban dwelling, political and civil rights, and the like) associated with economic growth? International comparisons of quality of life (QOL) conditions usually point to a strong positive association with real GDP per capita. This study investigates the nexus between economic growth and quality of life using objective indicators (economic, social and political representative variables) in Ethiopia for the period 1981 to 2011. Applying both descriptive and econometric analyses, the study uses the long run and short run estimation approaches for econometrics part. The results from the descriptive analysis confirmed that on average, all the variables in the objective indicators of quality of life have shown a rising trend. Moreover, among these, education enrollment and per capita consumption expenditure have shown strong correlation with economic growth. The empirical results indicated that, the relationship between economic growth and objective indicators of quality of life is significant (at 1 %) with a positive sign in the long run. In the short run, economic growth has significant (at 5%) relationship with per capita consumption expenditure and gross education enrollment ratio and insignificant relationship with political freedom. The study also identified the existence of considerable relationship among the QOL indicators. It suggests adjustments in the short run path of economic growth and urbanization.

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Abbreviations and Acronyms

ADF = Augmented Dickey-Fuller test

AIC = Akaikia Information Criteria

AR = Auto Regressive

ARDL = Autoregressive-Distributed Lag

CRGE = Climate Resilient Green Economy

CSA = Central Statistics Authority

DLMs = Dynamic Linear Models

EFY= Ethiopian Fiscal Year

EG= Economic Growth

EIU = Economists' Intelligence Unit

EPA= Environmental Protection Authority

EPI = Environmental Performance Index

ESDP = Education Sector Development Program

EU = European Union

FDRE= Federal Democratic Republic Of Ethiopia

FEVD= Forecast Error Variance Decomposition

FPE = Final Prediction Error

GDP=Gross Domestic Product

GER= Gross Enrolment Ratio

GLS = Generalized Least Square

GMM = Generalized Method of Moment

GNI = Gross National Income

GTP = Growth and Transformation Plane

HCA = Human Capital

HDI = Human Development Program

HQ = Hannan-Quinn Information Criteria

IID = Identically and Independently Distributed

IMF = International Monetary Fund

IRF= Impulse Response Function

JB = Jarque-Berra Test

LDCs = Less Developing Countries

LM = Lagrange Multiplier

MDGs = Millennium Development Goals

MOFED=Ministry Of Finance and Economic Development

MOH= Ministry Of Health

MOED=Ministry Of Education

OECD = Organization for Economic Co Operation and Development

OLS = Ordinary Least Square

QOL=Quality Of Life

PP = Phillips-Perron Test

PPP = Purchasing Power Parity

RGDP = Real Gross Domestic Product

SDPRP= Sustainable Development and Poverty Reduction Program

SIC = Schwarz (Bayesian) Information Criteria

SWB=Subjective Wellbeing

USA = United States of America

UN = United Nation

UNDP = United Nations Development Program

VAR = Vector Autoregression

VD = Variance Decomposition

VECM = Vector Error Correction Model

WB = World Bank

WDR = World Development Report

WDI = World Development Indicators

WTO = World Trade Organization

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CHAPTER ONE

1. INTRODUCTION

1.1 Back ground of the study

It is obvious that every creature in the world is striving to have a better life. Animals, insects, even plants are doing their best up to their highest capacity to have quality life. People at different level, at household, firm and government level, are toil day and night to bring quality life to themselves and their subjects. Being it is through hard work their desire can be realized, people have been giving due emphasis to rise the output and fair distribution of their activity. Many economic policy specialists, public policy experts and the concerned in the government body give much attention mainly on how to boost output, particularly of economic activity, which is economic growth (EG).

However, through time, it is found a mere economic growth without improvement in the quality of life (QOL) will be less relevant. Many scholars from great philosophers like Aristotle up to political economists like Adam smith , Karl Marks, Joan Stuart mill and others had argued that human beings should be the end of development not a mere means's. Conceicao and Bandura (2010) states that, while it is often asserted that economists are primarily concerned with gross domestic product (GDP) levels and growth, it is important to step back a little and remember that what matters most as an "objective function" is people's wellbeing.

In Ethiopia, it is repeatedly stated and publicized that the country is experiencing a continuous and fast economic growth. Beginning from the recent years back 2003/04, the performance of the country's economy measured by the GDP is rising fast. It has achieved registering a double-digit growth rate and it is usually associated with the programs and strategies adopted by the government.

According to the African Development Bank Group (2010), Ethiopia is experiencing a fast economic growth with a real GDP growth at or near double digit in recent years since 2003/04 and it is higher than the continent wide average. The country has consistently outperformed most other countries in Africa and expanded much faster than the continent-wide average. Real GDP growth averaged 11.2% per annum during the 2003/04 and 2008/09 period, placing Ethiopia among the top performing economies in Sub-Sahara Africa. This growth performance is well in excess of the population growth rate and the 7 percent rate required for attaining the millennium development goals (MDG) of halving poverty by 2015.

The ministry of finance and economic development (MOFED) (2011) also has reported that, in contrary to the previous three and four decades of 1980s and early 1990s where the growth rate of the economy was in a downward trend, with average GDP growth of 2.3% and per capita GDP growth of -0.4%. Currently, beginning from the 1990s and 2000s, following economic reforms and introduction of integrated development plans in different rounds, the economy have registered a positive and fast growth.

However, there is no sufficient study and evidence, that indicates whether such fast economic growth has resulted in improvements in the QOL of the people or not. No studies have been undertaken concerning its nexus with the quality of life even though, many studies, scholars and development policy makers worried not for a mere economic growth rather improvement in the wellbeing of the general people. Therefore, Policies designed to bring economic growth needs to take into account that the ultimate goal that people need is not the mere production but wellbeing improvement. It is fundamental to know whether economic growth is resulting approximately equal improvement in the quality of life or not.

For policy makers in the country, an assessment of quality of life is necessary to answer several questions. Has the society progressed over time? Are the current policies achieving goals that meet the needs of the society (wellbeing improvement)? Have investments succeeded in bringing the desired outcomes? Is QOL changing or not with the changing economy? These are some of the fundamental questions requiring empirical assessment of EG and QOL.

Given these and the rising economy, the study intends to dig out the connections of EG with QOL and to analyze whether this economy is bringing about improvement in the quality of life or not?

1.2 Statement of the problem

Detail analysis, empirically tested and understanding of Ethiopian economy and wellbeing of the society is essential to improve the Ethiopian quality of life. Given the economy is rising, what ultimately matters to the people is, the rising economy has to be reflected in the form of quality life, the wellbeing. There is a need for a detail study and analysis on the relationship between economic growth and QOL, the way on how economic growth influences the wellbeing of the society.

In the study, economic growth is defined as the average growth in the per capita real GDP over time.[1] Concerning quality of life[2], there is no a single standard and generally accepted definition of quality of life. "It is an ambiguous concept, lacking a universally acceptable definition and often faced with competing interpretations." (Conceicao and Bandura, 2010). Different scholars define QOL in different way. Liu (1976) states that there are as many quality of life definitions as people try to define it. For Felce and Perry (1995) QOL is a concept, which is difficult to define and can be approached at different levels of generalization from assessment of social and community level to evaluation of individual level.

[1] *In some literatures' the latter definition is expressed by the term "Modern economic growth"*

[2] *McGillivray and Clarke (2006, p. 3) point out that concepts such as "quality of life, welfare, well-living, living standards, utility, life satisfaction, prosperity, needs fulfillment, development, empowerment, capability expansion, human development, poverty, human poverty, land and, more recently, happiness are often used interchangeability with wellbeing without explicit discussion as to their distinctiveness."*

Even though such vagueness is about the concept, there are lot trials to define it. Quality of life is a common term used to indicate the overall level of wellbeing or welfare of a person or group of people, taking into account both monetary and non-monetary factors. It is the state of being happy, healthy and satisfied (Easterlin, 2007). Quality of life embraces the multiple dimensions of human experience that affect wellbeing. It has been defined at macro (societal, objective) and micro (individual, subjective) terms (Rosenberg 1992; Bowling and Windsor, 2001).

In the Ethiopian context, quality of life is related with the state of individuals' life to do with having economic security (having their own source of income) to satisfying their needs and wants. The study by Aklilu and Dessalegne (2000) indicates that, wellbeing has to do with having farmland, cattle, farm implements and a house in rural settings. It is having some job or business (some income) in the urban setting. Hence, those without land, ox/cattle, or income are poor and their wellbeing is in jeopardy (Aklilu & Dessalegne, 2000).

Even if there are different ways of defining the concept, almost all the trials are about welfare, happiness, comfort, sense of freedom, security, safety and related issues demanded by individuals. Given this, the question of the study here is what is and in what way does these relate to economic growth in terms of per capita GDP? Does the rising economy rally round to raise the wellbeing of the society or not?

Clearly, there are a number of benefits from economic growth; it helps to deal with serious problem of poverty, lack, homelessness, food crisis, lack of basic and luxury products. Besides, it contributes a lot for material wellbeing of the society. Usually, wellbeing has been equated with the material position of a country, measured by its Gross Domestic Product (GDP).

According to Conceicao and Bandura (2010), traditionally, wellbeing has been viewed from a single dimension of material wellbeing measured by the gross domestic product and GDP per capita based on the assumption that, growth in GDP leads to have more consumption that ultimately improves wellbeing.

The same authors however, indicated that there is a disagreement on how consumption can improve the wellbeing of the society for wellbeing is a multi dimensional concept; its measurement has to encompass the social, political and economic aspects in both objective and subjective indicators.

Besides, GDP measurements have many flaws and gaps that can influence wellbeing of the society. According to Paris and Wiesbaden (2010), GDP does not capture all the aspects of human life. It has many flaws and gaps as an indicator of material wellbeing. They are mainly due to three factors. First, a given volume of GDP can be distributed in very different ways, across borders, between the private and the public sector, labor and capital and different income groups. Secondly, a given volume of GDP can be used in very different ways, for consumption or investment purposes. Thirdly, in addition to the

market transactions recorded in the national accounts, there are important non-market activities by households that create material wellbeing. Hence, GDP alone is not sufficient to determine quality of life.

Beyond these, there are even instances where economic growth (EG) contributes for deterioration of wellbeing (QOL). Literatures indicate economic growth can contributes to many serious social, environmental and economic problems usually in terms of pollution and health problem. Even the study made by (Steve, et al, 2013) indicates, by giving due attention to the negative effects of economic growth on climate, the government of Ethiopia has developed its Climate Resilient Green Economy strategy (CRGE) as an anticipatory strategy to get ride from the problems.

This is not to say economic growth is doomed to bring improvement in wellbeing. The challenge is to yoke the potential of economic growth to make sure it really does increase sustainable welfare improvements.

Consequently, there is no well-established relationship between EG and QOL. In most definitions and measurements of QOL, even if EG is considered as one variable among the determinants of QOL, empirical, studies show mixed results on the impact of EG on QOL. It is common for studies based on time serious analysis and for countries at different levels of development (Esterline, 2007), and Conceicao and Bandura, (2010) confirm this.

Hence, for a rising economy to be transferred to the improvement into the quality of life it needs the concerned body to have a detail knowledge and understanding on the relationship between economic growth and quality of life.

In Europe, USA and Latin a number of studies have been done concerning the nexus between QOL and EG by a number of scholars Like Easterlin, (2007), Venhooven, (2000), Conceicao and Bandura, (2010). But empirical studies are scanty in Africa.

> *Most of the studies on happiness have been centered on industrialized countries, as the data is readily available for lengthy time periods. But what do the people living in developing countries self-report in terms of happiness and wellbeing? To this important question, there is still very little that we know systematically to provide a definitive answer. For developing countries, long-run series comparable to those available for developed countries are inexistent.* (Conceicao and Bandura, 2010 pp.16).

Nevertheless, currently, data are being collected though not sufficient. Even if surveys in Africa are short which starts from 2000, since the economy is showing increasing trend starting from 2000 onwards, the study relating economic growth with quality of life is crucial.

With regard to Ethiopia, relatively QOL analysis of economic growth is untouched. Even those studied, give much emphasis on inequality and psychological issues, and have not aimed at relating QOL with EG[3].

[3] *Example can be mentioned for the study made by Habtamu wondimu, 2005.*

This study examines the impact of economic growth in enhancing the quality of human life in Ethiopia. It tries to through a light on the nexus between EG and QOL. The focus is on testing the existence of improvements on the basic objective indicators of QOL-representatives of social, economic and political aspects – consumption, geographical distribution, education enrollment and political freedom -newly developed indicators[4].

1.3 Objective of the study

The main objective of the study is to find out the nexus between economic growth in terms of per capita real GDP and quality of life through its objective indicators in Ethiopia over the period 1981 to 2011. It aims at examining how much the recent economic growth in Ethiopia is bringing about improvement in the quality of life.

The specific objectives of the study include;

- ✓ Reviewing economic growth in Ethiopia
- ✓ To examine the change in the quality of life (through indicators) for the period 1981 to 2011.
- ✓ To look at the multi directional connections of economic growth and quality of life indicators.

[4] *These are not the only but commonly used objective indicators in different qol indexes and studies. selected to represent three aspects of social, economic and political.*

1.4 Significance of the study

- It provides the needed information that guides policy makers to make informed decisions concerning QOL.
- It provides individuals, the scientific understanding of QOL that can guide important decisions in life such as where and how to live.
- It encourages better communication and cooperation between citizens and their local government.
- Provide valuable input for policy makers to make informed decisions about EG and QOL nexus.
- It serves as a good reference for politicians to advocate the people.
- It provides the basis for further discussion between the public, policy makers and academics.

1.5 Working Hypothesis

In this study, the hypothesis to be tested is that economic growth leads improvement in QOL in Ethiopia, i.e., economic growth contribute positively and significantly to the QOL indicators of the country. In addition, it hypothesizes a positive relationship among the indicators themselves.

1.6 Limitation of the study

- ✓ Absence of generally accepted definition and indicator of QOL may challenge the applicability of the result.
- ✓ Absence of well-documented time series data particularly concerning subjective wellbeing/happiness at the national level even at the continent level makes the study not to fully discover trend of QOL.
- ✓ Problems associated with vector autoregressive (VAR) model may defy its applicability.

1.7 Organization of the study

The study is designed to have six chapters. The first chapter includes points in the introductory part. Second chapter is designed for review of related literatures. The Third chapter will be devoted to review economic growth and quality of life in Ethiopia. The fourth chapter is designed to include the methodology part. The fifth chapter will reveal the estimation results and the last chapter will include conclusion and suggestions.

CHAPTER TWO

2. RELATED LITERATURES REVIEWED

2.1 Theoretical literatures

2.1.1 Definition of quality of life

Different intellectuals from different angles define the term quality of life (QOL) in different ways. Scholars define it from the view of fulfillment of elements in the QOL they thought. However, it seems all the definitions are circulating around stating to the wellbeing of the society and individuals when they refer to QOL.

According to Bowling, Brown and Flynn (2004), quality of life is a multi dimensional and amorphous concept that lacks universally accepted definition. It is usually taken as an end in the evaluation of policies particularly of health and social care policies. Despite the use of objective and subjective indicators in many researches, there is no widely accepted theory or measurement of quality of life. They further point out , models used to capture quality of life ranges from needs based approaches including elements like deficiency needs and growth needs: learning, mastery and self-actualization, to models based on psychological wellbeing, happiness, morale, life satisfaction, social expectations or the individual's unique perceptions. Quality of life is thus a complex collection of interacting objective and subjective dimensions (Lawton, 1991).

Along with Rosenberg (1992); Bowling (1995a); (1995b); (1996); Bowling and Windsor (2001), quality of life can be defined as at a macro and micro level, where the former is concerned with the use of social/objective indicators like income, education, employment, health status , environmental aspects and the like, the latter is concerned with the use of individual or subjective indicators of quality of life. These include, the use of the overall perception of individuals about their life accordingly, specifically, wellbeing, happiness and general life satisfaction, can be used to capture it,

Veenhoven (2000), on the other hand has, distinguished four categories of quality of life. (i), livability of the environment (environmental chances/social capital); (ii), life-ability of the individual (personal capacities/psychological capital); (iii), external utility of life (a good life must have an aim other than the life itself, or higher values); (iv), inner appreciation of life (inner outcomes of life/the perceived quality of the life). For these categories can have a knock on each other, makes quality of life is multidimensional and its parts affect each other as well as the sum. He further adds quality of life is a dynamic concept, which is made up of both positive and negative experiences of life, makes evaluation of life to change over time in response to the changes.

Others also defined QOL from different angles. Brock (1993) uses three philosophical approaches to define and determine quality of life. The first approach is to define by describing the characteristics of good life directed by normative ideas like religion, philosophical or other systems. I.e. For good life to exist, it requires to keep and follow

the ideas of these systems and ultimately improve quality of life. This approach has nothing to do with subjective perception of individuals about their life or objective indicators of life.

The second approach is based on satisfaction of preferences. Quality of life here is defined based on whether the needs and wants of individuals are satisfied or not with the assumption people prefer things that give them more satisfaction. Hence, if individuals are satisfied with their desires, with the assumption of limited resources, quality of life is assumed to be improved. This approach to utility or the good life based on people's choices undergirds much of modern economic thinking.

The third approach to define quality of life is related with the feeling of individuals about their overall life. Quality of life is associated with the overall evaluation of people life. Life is assumed to be quality if individuals respond positively for factors like, their joy, pleasure, happiness, life satisfaction etc. Obviously, this approach to defining the quality of life is most associated with the subjective wellbeing tradition in the behavioral sciences (DIENER and SUH, 1997).

Landsman (1986) suggests quality of life is the sum of objectively measurable life conditions of an individual. This may include physical wellbeing, personal circumstances, social relationships, functional activities, pursuits, and other social and economic influences. Subjective responses to such conditions are within the domain of personal satisfaction with life.

Edgerton (1990) defines quality of life as a condition under which life is lived. Moreover, he cautioned not to be solely depend on objective standards/measures, rather perceptions of individuals about their life and has to be taken into account when defining and measuring quality of life.

On the other Felce & Perry (1995) argued that quality of life is dynamic and may change over time depending on circumstances. Again, equating quality of life with only personal satisfaction has its own problems without the assumption of independence and autonomy of actions. If individuals are not independent and their actions are to be influenced by others, report of personal satisfaction will be misleading. Moreover, they stressed the definition and measurement of quality of life needs to consider both the subjective and objective indicators. Accordingly, they define quality of life as the overall wellbeing of life.

Cummins (1992) indicated quality of life needs to comprise both the objective and subjective indicators with emphasize on individuals assessment on each life domain. The significance of either the objective or subjective assessment of a particular life domain is interpretable only in relation to the importance the individual places on it. For example, size of income (the objective measure) may contribute little to quality of life for a person whose values are non-materialist, although satisfaction with income might carry a high weight.

The meaning of "objective" or social indicators of quality of life

Social indicators are societal measures that reflect people's objective circumstances in a given cultural or geographic unit. The hallmark of social indicators is that they are based on objective, quantitative statistics rather than on individuals' subjective perceptions of their social environment. Under the conceptual umbrella of social indicators, variables representing a wide range of societal domains have been measured and studied. For instance, variables such as material fulfillment quantity and quality consumption and geographical distribution (urbanization) are in the economic domain, political freedom manifested through democratic administration are assessed to detect political related quality of life (Esterlin, 2007). Indices derived from areas such as ecology, human rights, welfare, and education also have been sampled frequently as social indicators (DIENER and SUH, 1997).

The Meaning of subjective indicators of quality of life or Subjective Wellbeing

McGillivray and Clarke (2006, p. 4) state that subjective wellbeing (SWB) involves a multidimensional evaluation of life, including cognitive judgments of life satisfaction and affective evaluations of emotions and moods. Some use the phrase "subjective wellbeing" as a synonym for "happiness" but in psychology, happiness is a narrower concept than (SWB). Despite the differences, economists have used the terms "happiness" and "life satisfaction" interchangeably as measures of subjective wellbeing (Easterlin, 2004).

2.1.2 Measurements of quality of life

The same to its definition, measuring quality of life is challenging. There is no single standard and generally accepted way of measuring it. It is a tiresome task to measure for it needs the overall assessment of wellbeing of the society. Even Cummins (1995) has indicated that, interpreting of research studies on subjective wellbeing is hampered by the absence of the gold standard measures.

There are numerous attempts to construct for measuring the quality of life. Different individuals, scholars, scientists, as well as institutions both at national and international level and at group level have suggested various indices with specific indicators to capture for the quality of life. However, the challenging issues for is on how to select for indicators and more seriously on how to assign weights for the different indicators. A technocratic and unsatisfying device that is sometimes used is to resort to expert opinion" (Rogerson et al. 1989; bowling 2001).

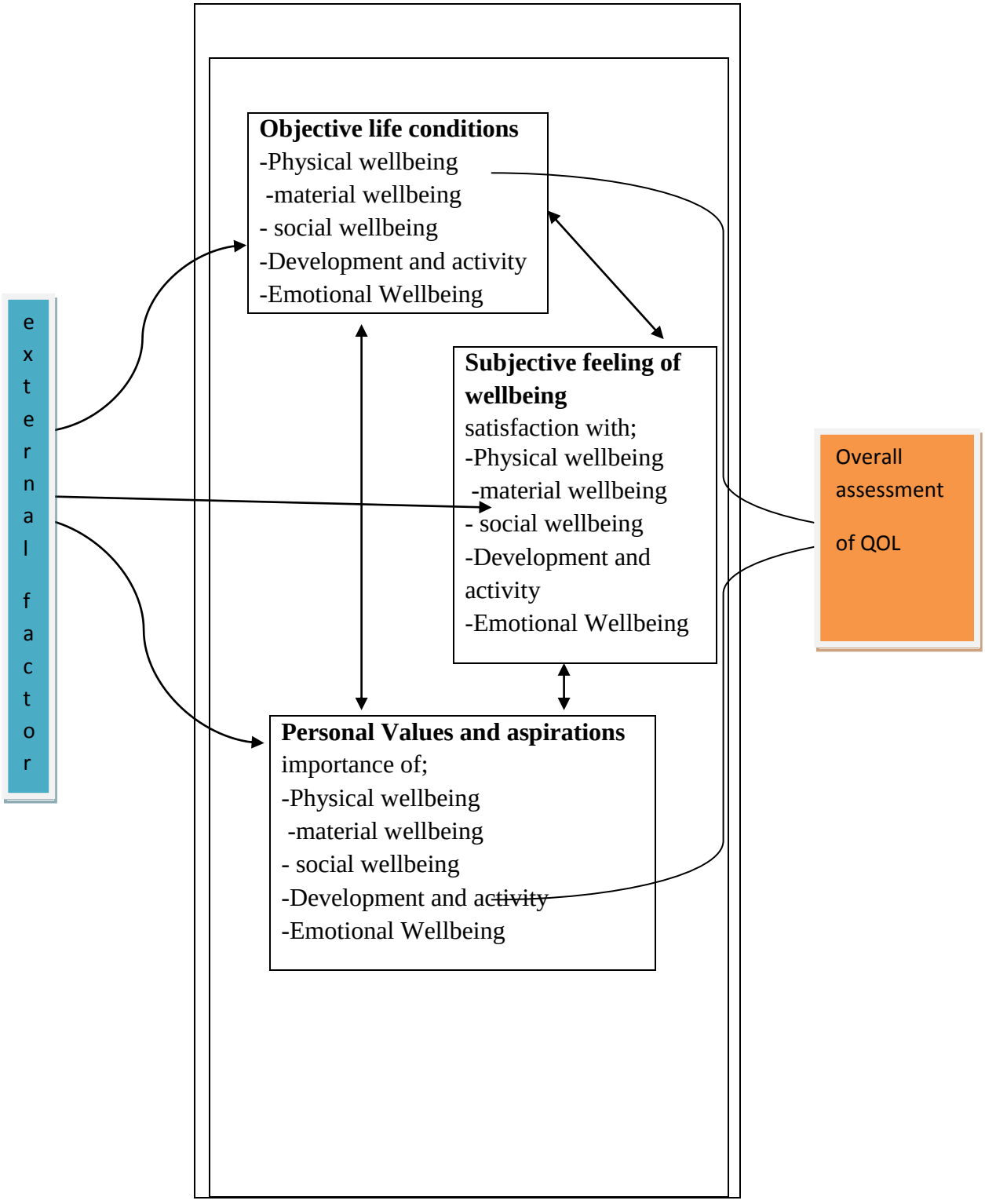
Venhooven (1996) suggests measurement of quality of life has changed and widened from time to time. In the first half of 20th century, quality of life was largely measured by the gross national product (GNP) related measures, like GDP per head. Yet by the 1960s, the base has widened to the broader indicators of quality of life called social indicators.

Felce & Perry (1997) suggests the life domains quality of life should incorporate and agreed by many researchers. In their survey of many literatures, they have found the life

domains /aspects mentioned can be categorized into five under the objective and subjective classification. A) Physical wellbeing sub assumes health, fitness, and physical safety. B) Material wellbeing contains income, quality of the living environment, privacy, possession, meals or food etc. C) Social wellbeing includes the strength of family relationships and with other relatives. D) Development and activity concerned with the possession and use of skills and choice and control of functional activities. E), Emotional wellbeing affects mood and satisfaction. In their assessment of an overall model of quality of life, they categorize the life domains into the three-element model of quality of life where each of the life domains need to be evaluated from objective life conditions, subjective feeling of wellbeing and personal values and aspirations on each sub classifications.

In general, Felce & Perry (1997) propose a model of quality of life which integrates both the objective and subjective indicators with the aspirations and value individuals set on each indicators. The objective assessments should not be taken solely without reference to the subjective perceptions and aspirations of individuals to the life domains.

Figure 2.1: A model of quality of life.



Adopted from: Felce & Perry (1997) page 61

The three elements are shown with a dynamic interaction with each other. The change in one category may result for a change in the others. A change in the objective indicators may lead to change of satisfaction of individuals over the other domains or on the values, individuals assign on the domains or both. Moreover, other way interactions are kept assumed

On the other, the model assumes the three elements are free to change independently affected by the external factors which may include, genital, social and material inheritance, age and maturity, development history, employment, peer pressure, reference points and other socio economic and political influences. Hence, they states, the measurement of quality of life needs to asses and evaluate all the three elements with the assumption their interaction may not be constant.

Venhooven (2000) further adds quality of life is dynamic which may change over time with the changing situations which makes its measurement challenging. Thus, when measuring change in quality of life, several variables need to be taken into account, including actual changes in circumstances, including the circumstances of interest (e.g. Health), stable or dispositional characteristics of the individual (personality); behavioral, cognitive or affective processes which might accommodate the changes, such as making social comparisons, reordering of goals and values; and response shift.

As the concept of quality of life spans a wide range of topics and disciplines, it has been measured using a diverse range of indicators. Most disciplines have based their concepts

and measures on experts' opinions, rather than those of lay people (Rogerson et al. 1989; Bowling 2001). This has the consequence that there is little empirical data on the extent to which the items included in most measurement scales have any relevance to people and their everyday lives. In addition, a pragmatic approach prevails in the literature, clarification of the concept of quality of life is typically by-passed, and justified with reference to its abstract nature, and the selection of measurement scales often appears ad hoc.

In general, by summarizing the whole approaches above, wellbeing measures can be classified into two broad categories: *objective* and *subjective* measures. Widening their definitions as given above objective and subjective indicators can incorporate the above approaches. The first category measures wellbeing through certain observable facts such as economic, social and political statistics. People's wellbeing is assessed indirectly using cardinal measures. On the other hand, subjective measures of wellbeing capture people's happiness general life satisfaction and feelings or real experience in a direct way by assessing wellbeing through ordinal measures (mcgillivray and Clarke 2006; van Hoorn 2007).

Georgiou (2009) further adds although there appears to be no universal definition of the concept of QOL, it is usually measured in terms of 'objective' and 'subjective' indicators (O-QOL and S-QOL indicators). "Quality of Life is both objective and subjective, so its measurement should include how people think about their lives" (Eckersley, 1999, p. Ix).

While all the above are attempts about the measurement of quality of life and are proposed by writers, researchers and scholars, there are also attempts by the group of scholars and institutions to measure the quality of life by establishing of indexes and get acceptance at the international level. Numerous indices attempt to measure the quality of life of individuals using different indicators. The most prominent indices among them are the Economist's quality of Life Index, the UN Human Development Index, and the quality of Life chapter in the OECD Fact book. These indices utilize a range of methodologies and examine diverse components of Quality of Life. In the following paragraphs, the study will look for these indices by emphasizing on the indicators each approach uses.

The Economists intelligence unit index

The Economist Intelligence Unit (EIU) is the research arm of The Economist Group, the publisher of The Economist magazine by collecting data from Varity of sources like UN. The index is formulated by combining the subjective indicators with the objective determinants of quality of life across nations Published by "The Economist" in the year 2005,The EIU Quality of Life Index identified the following nine factors that best predict Quality of Life:

- Material Wellbeing - Measured by GDP per capita.
- Health - Measured by life expectancy at birth.
- Political Stability and Security - Measured by political and security ratings developed by the EIU.
- Family Life - Measured by the divorce rate.

- Community Life - Measured through church attendance or union membership.
- Climate and Geography - Measured by latitude to distinguish between warm and cold climates.
- Job Security - Measured by the unemployment rate.
- Political Freedom - Measured by the Freedom of the World Index.[6]
- Gender Equality - Measured by the ratio between female to male average earnings.

Human development index

Initially created by economist Mahbub ul Haq, followed by economist Amartya sen in , (1990) and published by the United Nations Development Program (UNDP) it is the index used to measure and compare the level of social and economic development across nations. The breakthrough for the HDI is to set a single statistic and measure the level of development among nations. It has the minimum and maximum goal points ranges from 0 to 1 for each indicators used. It uses the following indicators to measure human development and rank countries accordingly.

Life expectancy at birth: number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life.

Mean years of schooling: average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.

Expected years of schooling: number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life.

Gross national income (GNI) per capita: aggregate income of an economy generated by its production and its ownership of factors of production, less the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars using purchasing power parity (PPP) rates, divided by midyear population.

GNI per capita rank minus HDI rank: Difference in rankings by GNI per capita and by the HDI. A negative value means that the country is better ranked by GNI than by the HDI.

Non-income HDI: Value of the HDI computed from the life expectancy and education indicators only.

The OECD Fact book.

Organization for economic development and cooperation (OECD fact book) in its chapter of quality of life index, uses and generates data for more than 100 indicators. It include areas of population, economic production, foreign trade and investment, energy, labor force, information and communications, public finances, innovation, the environment, foreign aid, agriculture, taxation, education, health and quality of life for its member countries and in some cases for others. In line with this, it uses the following indicators to measure the quality of life.

-Infant mortality	-Suicides	-Tourism: hotel nights
-Obesity	-Subjective wellbeing	-Prison population
-Income inequality	-Social benefits of education	- life expectancy
-Poverty rates and gaps	-Youth inactivity	-Road fatalities (OEC, 2010)

Journal of "international living"

Another set of indicators is used to derive a quality of life index by the journal "international living." this magazine assigns percentages to its analysis of the value of each nation's cost of living, economy, infrastructure, culture, leisure, environment, health, safety versus risk, and climate.

Cost of living (20% of the final ranking)**,** this is a guide to how much it will cost you to live in a style comparable to or better than the standard of living you're likely enjoying in the U.S. by the use of sources from the U.S. state department's index of overseas living costs, and each countries national debt.

Culture and leisure (10%)**,** calculated based on a look at literacy rates, education as a percentage of GDP, the number of UNESCO sites per square kilometer and a subjective rating of the variety of cultural and recreational offerings.

Economy (15%)**,** consider economic variables of interest rates, GDP, GDP growth rate, GDP per capita and the rate of inflation, to determine each country's economy score.

Environment (5%)**,** use the environmental performance index (EPI) from Yale University,

Freedom (10%)**,** freedom house's survey is the main source for these scores, with an emphasis on a citizen's political rights and civil liberties.

Health (10%)**,** in this category, the number of people per doctor, the number of hospital beds per 1,000 people, the percentage of the population with access to safe water, the infant mortality rate, life expectancy, and public health expenditure as a percentage of a country's GDP.

Infrastructure (10%)**,** it looks at the length of railways, paved highways, and navigable waterways in each country, and equated these things to each country's population and size. It also considers the number of airports, motor vehicles, telephones, internet service providers, and cell phones per capita.

Safety and risk (10%), for this category, use the U.S. Department of state's hardship differentials and danger allowances, which are based on extraordinarily difficult, notably unhealthy, or dangerous living conditions.

Climate (10%)**,** when deciding on a score for each country's climate, it looks at its average annual rainfall and average temperature and considers its risk for natural disasters.

From all the above approaches, we can grasp that both individual scholars and institutes have their own basis and objectives when identifying the indicators to measure quality of life. Further, as suggested by Rogerson et al. (1989); bowling (2001) to use the experts' opinion, in this study, the indicators to be selected is by taking the representative variables from the social, political and economic aspects of life, which are assumed to capture all objective aspects. Accordingly, consumption expenditure and urbanization as a representative from economic aspect, education enrollment as a representative variable from the social aspect and political freedom from political aspect are selected to be analyzed.

2.2 Empirical Literatures

2.2.1 Empirical studies on the nexus between economic growth and quality of life

A number of studies have been done concerning the nexus between QOL and economic growth. A study made by Easterlin, Angelescu, and Laura (2007) using both cross sectional and time serious analysis indicated that, economic growth on average brings improvement in the quality of life. In particular, concerning objective indicators, a rise in economic growth per capita GDP, results advancement in objective indicators of QOL for a cross sectional analysis. It states consumption of the society in terms of quality and quantity and choosing the place where to live is influenced positively by economic growth. Similarly, they have shown economic growth has a positive impact on social and political indicators of QOL. Life expectancy measured through the number of years an individual is expected to live has shown an increase with the growth of the GDP per

capita. A strong positive association also exists between GDP per capita and education measured by the gross school enrolment ratio.

The study shows quite mixed results for time serious analysis for objective indicators. While economic indicators of QOL have shown a positive association with growth of GDP per capita, though their impact on QOL, is also mixed and doubtful, social and political indicators have no clear-cut association with change in GDP per capita.

Concerning the subjective indicators of QOL, in the cross sectional analysis, the study shows economic growth and subjective wellbeing in terms of happiness have a positive association. The study concluded that, an increase in GDP per capita increases happiness but at a decreasing rate.

The time serious analysis on the other, come up with the result, as there is no a clear-cut relationship between EG and SWB. In both rich and poor countries, the study found countries with similar GDP per capita growth might have different happiness trends. and even the study indicates the need for more comprehensive time series studies that examine the effect on happiness, not just of economic growth, but the variety of factors at work, such as health, family circumstances, unemployment and the like, including the effects of public policies.

2.2.2 Empirical literatures on Economic growth and objective indicators

A study made by Esterly (1990), based on cross-country and time-series analysis of the relationship between GDP growth and improvements in objective indicators of wellbeing using approximately 81 indicators of QOL categorized into 7 classes, come to the conclusion that, there was only robust indication that GDP growth was the prime cause for the improvement in three out of possible 81 indicators (calorie intake, protein intake, and telephones) (Easterly 1999). In addition, the evidence indicates that economic growth is associated with "bads" that lower quality of life, such as higher levels of pollution and, beyond a certain income threshold, the consumption of more fat that increase obesity. Thus, growth sometimes brings with it the consumption of aspects that tend to lower wellbeing.

Brown, Bowling and Flynn (2004), in their review of the literature on the taxonomy of models of quality of life, among the elements included under the objective indicators, higher levels of wellbeing have been reported to be associated in the expected directions with higher incomes and socio-economic status, employment, being married (without young children under the age of 5 in the household), nation of residence, good health and functional ability (Haug and Folmar, 1986).

Headey and Wearing (1992), in their review of the literatures, found no significance difference in indicators of quality of life between the deprived and more affluent societies in the USA, where people report high level of wellbeing regardless of economic circumstance.

The most consistent associations between objective indicators of wellbeing across Europe and the USA are health and functional status, particularly among older people (although this is often measured subjectively using self-rating scales and cannot be classified strictly as objective) and level of income (Markides et al. 1989; Kushman and Lane 1980; Usui etal. 1985; Waters et al. 1989). For example, Gardner and Oswald (2001) reported that receiving a financial windfall of a threshold of £50,000 was associated with an increase in wellbeing of between 0.1 and 0.3 standard deviations.

Darnton-Hill (1995) indicated that the underlying importance of income in determining health, life expectancy, health behavior, lifestyle, leisure pursuits and quality of life in all age groups, and older age in particular. Adequate income has implications for health, standard of housing, education, nutrition, clothing, transport, opportunities for leisure and social participation. Of course, particularly in relation to older people, the influence of level of income reflects both past income, present income and accumulated income over their life course.

Bowling and Windsor (2001) reported, on the basis of a population survey of adults in Britain, their objective variables (age, sex, marital status, income, housing tenure, social class, economic activity, household size, having children under the age of 5, age left full-time education, region of residence) explained collectively just 5% of the variance in their model of overall quality of life ratings. Adding self-reported long-standing illness did not contribute anything to the model, suggesting this is not a sufficiently sensitive

indicator of health status. However, the subjective variables including (relationships, finances, own health, health of close others, work, and social life) by self-ratings of respondents own lives on each indicator from the range of "As good as can be" to "As bad as can be" explained a further 11% of the variance in overall quality of life ratings. That the total variance explained by both the objective and subjective variables was still just 16% reflects the complexity of measuring quality of life. The study supported the power of subjective over objective indicators with the finding that while objective indicators of income and economic activity explained a small proportion of the variance in the model, respondents themselves self- nominated finances, standard of living and housing as one of the top six most important area of life (mentioned by 48%, rank 2 out of 6 areas nominated), and ability to work and satisfaction with work was mentioned by 26% (rank 5 out of 6 areas nominated). This is consistent with Bowling and Gabriel.s (2004) finding from their national survey of QOL in older age, that while actual income explained little of the variance in self-rated QOL, people nominated finances as one of the main contributors to quality of life.

The study of Bowling and Windsor (2001) also find explanations for the relatively low predictive power of objective indicator. Beyond the collection and interpretation of objective facts, it is subjected to a series of subjective biases, errors, inaccuracies, and political and perceptual influences. On the other hand, possibly they are less relevant, and therefore have less explanatory power, in societies, which have achieved a certain level of affluence, and subjective perceptions become more influential. According to Inglehart and Rabier (1986), quality of life is the very omission of a subjective element, which taps

how these areas affect a person's life. It has also been argued that QOL is additive, reflecting the sum of one's experience, adjustment and satisfaction in several domains of life.

Of course, defenders of the objective approach argue that the data is needed to inform social policy, undistorted by, and independent of, public opinions surveys which can reflect random errors and biases (Johansson 2002). Burholt (2001) has summarized some of this literature, and emphasizes the need for a multidimensional approach. Heylighen and Bernheim (2000) have defined the dimensions that make up wellbeing and quality of life, including happiness, as the sum of mainly relative subjective factors but with a small contribution from objective factors.

In sum, the objective approach is essentially a needs based approach, which assumes that there are basic needs in society, and that satisfying these needs determines people's wellbeing (Delhey et al. 2002). Besides, most current approaches to quality of life incorporate both objective and subjective dimensions

CHAPTER THREE

3. OVERVIEW OF THE ETHIOPIAN ECONOMY AND QUALITY OF LIFE

3.1 Macro economic performance in Ethiopia

Sources of information demonstrate beginning from the recent two decades, the performance of the Ethiopian economy has been showing a positive change. Both national and international sources acknowledge the change in terms of GDP growth, change in sectoral composition of the economy, poverty reduction and a change in socio economic and political affairs.

The ministry of finance and economic development (MoFED) annual report (2010/11) shows that, the Ethiopian economy witnessed an era of sustained and double-digit growth rates over the period spanning between 2003/04 and 2010/11 in abroad-based manner. The report further point out, it is through the formulation of policies and implementation of programs and putting in place appropriate institutional arrangements the county has registered such a sustained and fast growth (MoFED, 2010/11).

In accordance with the United Nation (2011), the Ethiopian economy is on ascendance and has sustained a double-digit growth rate over the past five years. However, this growth has been scarred by rising inflation in 2008-2009 driven largely by the high food

and fuel crises and sending home a strong message of to enhance macro-economy resilience as the country pursues high and fast growth strategies.

The report by MOFED in 2012 indicates the country has registered sustained record of strong economic growth, during the last decade contributing significantly to the sustainable development agenda. GDP has nearly tripled since 1992 with a corresponding reduction in head count poverty from 56 percent in 1992 to 29.5 percent in 2011 (MOFED, 2012).

According to a new report by the World Bank (2012), over the past decade, the Ethiopian economy has been growing at twice the rate of the Africa region, averaging, 10.6 percent GDP growth per year between 2004 and 2011 compared to 5.2 percent in Sub-Saharan Africa

Sources also make known the change in the structural composition of the economy. Commonly, all sources signify the share of the service sector in GDP has been rising while that of agriculture has been declining steadily. For example, according to MOFED (2011), the contribution of agriculture to overall GDP was 47% in 2003/04. The share declined gradually but steadily and reached 41.1% in 2010/11. The share of industry showed no significant change, accounting on average for 13.3% of the total value added over the period 2003/4 to 2010/11. On the other hand, during this period, the service sector became the dominant in the economy with its share increasing from 39.7% in 2003/04 to 46.6% in 2010/11. UN (2011) adds even if the growth in the economic is

emanating from all the sectors it is the service sector, especially construction and retail, which is leading the growth curve. During 2011/12, Agriculture, Industry and Services grew by 4.9 percent, 13.6 percent and 11.1 percent respectively (MOFED, 2012).

On the other way, there are challenges and problems policy maker need to be worried about. For example, the African Development Bank group (2010), cautions the country's growth is faced with many problems, among others, structural weakness in the economy is significant. The growing domestic supply-demand gap, in the context of the surge in growth, contributed to a rise of inflation and the depletion of foreign exchange between 2007/08 and 2008/09. Beside, the Ethiopian economy is highly vulnerable to exogenous shocks like drought and adverse terms of trade. It is because of its dependence on primary commodities and rain fed agriculture. MOFED (2011) also adds the prevailing international economic crisis had some consequences on the growth performance registered during 2008/09. The high price level occurred led to high level of nominal growth rate.

3.2 Quality of life in Ethiopia

In case of Ethiopia, quality of life is the issue not studied at a satisfactory level. It is not much studied at least from the economic perspective. Despite the fact, there are trials to relate it with poverty and inequality from psychological viewpoints. Aklilu and Dessalegn, (2000) define quality of life in Ethiopia as something to do with the availability and fulfillment of resources and material needs. It is related with having

farmland, cattle, farm implements and a house in rural settings. It is having some job (employment) or business (some income) in the urban setting.

From the angle of measurement and identification of factors influence quality of life in Ethiopia, the study made by Habtamu,(2005) has tried to set factors influence quality of life related to economic, political and social issues. These includes economic and material condition - commodities, health (state of health), nutritional/food, job, work, employment, political situation - freedom, human rights and liberties, education, relationships, family, religion, beliefs, etc

3.3 Economic growth and objective indicators of quality of life in Ethiopia

The national assessment report prepared by the Ethiopian Environmental protection Authority (EPA, 2012) shows economic growth in Ethiopia is contributing a lot to socio economic developments. In a recent study made by Dercon, Hoddinott & Tassew (2012) even if there are sections of the society live with chronic poverty, these people are found to benefit from economic growth. Because of economic growth, the per capita income has increased from USD 377 in 2009/10 to USD 387 in 2010/11 and further to USD 513 in 2011/12. According to the Household Income and Consumption Expenditure Survey, the total population living below the poverty line has gone down to 29.6 percent in 2010/11 from the level of 38.7 percent in 2004/05, showing a decline of 9.1 percentage points over the five years. The Survey results show that, poverty headcount index is declining in all regional states and city governments (MOFED, 2012). The UN (2011) on

the other reveals that, poverty in urban areas is decreasing at slower rate and inequity is increasing at higher rate than rural Ethiopia. Despite these declines, there is an increase in the absolute number of poor people. Poverty continue to have a strong regional bias with Afar and Somali Regions registering a rise in poverty between 1995/96 -2004/05.

With regard to food poverty, the Survey results indicate that food poverty index has declined from 38 percent in 2004/05 to 33.6 percent in 2010/11, registering a decline of 4.4 percentage points. Disaggregated estimation of poverty levels across areas of residence also indicates that poverty is declining in both rural and urban areas (MOFED, 2012). On the other way, the report of UN (2011) argues despite growth in agricultural production, food security remains extremely fragile.

With the introduction of education and training policy in 1994, through the implementation of Education Sector Development Programme (ESDP), commendable achievements were made in the education sector. The number of primary schools increased from 11,780 in 2000/01 to 25,217 by the end of 2009/10. Primary school gross enrollment rates increased from 20.3% in 1993 to 51% in 2000 and more than quadrupled to 94.2% in 2010. The disparity in enrollment rates between female and male gross enrollment ratio narrowed from 0.75:1 in 1997 to 0.93:1 in 2010 (MOFED, PASDEP, 2006) and (FDRE, GTP, 2010).

The average expenditure on education in the1980s and early 1990s was around 2.3% of GDP. With shifts in government priorities to the pro-poor sectors, it started changing. In

1992, it was increased to 3.6% and reached as high 5% of the GDP by 2003/4. The government maintained the high level of spending, always above 4% of the GDP since then. The overall government expenditure in education has been maintained at around 20% of the total public expenditure during the last decade (MOFED, 2002).

Expenditure in education sector complemented with massive investments in road rehabilitation and construction, potable water supply, telecom services, and electric supply, these have a direct bearing on reducing poverty and improving the welfare of citizens. In a nutshell, the rapid economic growth has been pro-poor as can be observed from the reduction in poverty and unemployment, as well as improvements in the welfare of citizens. However, the level of poverty is still very high. Thus, it remains critical to sustain the rapid economic growth and social development over the coming years (MoFED, 2012).

With regard to the health sector, Ethiopia has made impressive developments in and is expected to achieve the millennium development goal related to health care. The UNDP Human Development Index (HDI) has improved over the years: in 1991, 0.166; in 2000, 0.274; in 2005, 0.313; in 2009, 0.352 and in 2011, 0.363 (UNDP, 2011). Life expectancy at birth has shown improvement from 46.4 in 1991 to 59.3 in 2011, though it have declined from 52 in 1984 to 46.4 in 1991 probably because of HIV, according to the UNDP Human Development Report of 2011.

Based on this report, Ethiopia has the fastest growth rate in improving HDI (UN, 2011). The value of the HDI for Ethiopia for 2011 was 0.363 putting the country as the 174th out of 187 countries. Between 2000 and 2011, the index for Ethiopia increased from 0.274 to 0.363. This is an increase of 32% or an annual average increase of about 2.57%. As mentioned in the Report, in 2011, the average education used in the HDI, which combines information on enrollment and literacy, shows the extensive progress made in education. Even these reported increases, however, may underestimate progress because literacy and years of schooling in the Report reflect the average number of years of education received by people aged 25 and older, converted from education attainment levels using official durations of each level (HDR 2011, page130). Thus, measured progress may not reflect recent advances in schooling for the young population.

Table 3.1 Ethiopia's HDI*

Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (PPP US$)	HDI value
1980	43.9	2.5	..	..	..
1985	44.4	3.0	..	539	..
1990	47.0	3.1	..	588	..
1995	49.2	2.6	..	522	..
2000	51.4	4.4	1.5	567	0.274
2005	53.8	6.7	1.5	683	0.313
2010	56.1	8.3	1.5	992	0.358
2011	59.3	8.5	1.5	972	0.363

Source: UNDP, Human Development Report 2011

*Trends based on consistent time series data, new component indicators and new methodology

The Table above shows the trend of HDI for Ethiopia, between 2000 and 2011 based on consistent time series data, new component indicators and new methodology. Between

2000 and 2011, Ethiopia's life expectancy at birth increased by almost 8 years, the mean years of schooling remained the same and expected years of schooling increased by 4 years. Moreover, Ethiopia's GNI per capita has increased by 71 percent between 2000 and 2011.

Based on the findings, as compared to the average of Sub-Saharan Africa, low human development countries and the world, the HDI for Ethiopia is relatively lower mainly for mean years of schooling and GNI per capita. In terms of the HDIs on other dimensions, such as 'life expectancy', the index for Ethiopia is not far from that of the Sub-Saharan average, while performance regarding the index for 'expected years of schooling' is by far better than Sub-Saharan African countries. 'Life expectancy' is even better than that of South Africa. This indicates the importance of consolidating the development programs that are under implementation in Ethiopia in order to narrow the gap that exists between Ethiopia and the sub-region (MOFED, 2010/11).

CHAPTER FOUR

4. DATA AND METHODOLOGY

4.1 Data

Indicators of quality of life are broadly classified as objective and subjective indicators. In this study, however, due to several reasons mainly of inexistence and insufficiency of data for time series analysis of subjective indicators -happiness and general life satisfaction (two most important measures of subjective wellbeing), only objective indicators of QOL-representative variables from the social, economic and political aspects were analyzed against per capita real GDP.

The data set refers to the yearly time sires data observed for the period ranges from1981 to 2011[5]. Secondary data has been employed in this study for the specified period. Different sources were exploited for data collection purpose. Both national and international institutions were surveyed for the purpose. Data relating to economic growth, and some indicators of quality of life like, education enrollment and per capita consumption expenditure at constant local currency unit were collected from the World Bank (WB), national accounts data, and organization for economic co-operation and development (OECD), national accounts data files. Other indicators; political freedom is

[5] *It is for variables used in the econometric analysis. The period varies for additional variables in the descriptive analysis,*

obtained from polity IV[6] project and data about urbanization is taken from the central statistics agency (CSA).

The change in variables of indicators, per capita gross domestic product (PCGDP) and per capita house hold final consumption expenditure (PCHHFC) is measured in logarithmic form, simply not to deal with more digits; percentage change was taken for urbanization (UR) and education (EDU) data; an index polity composite index (PCI) range from -10 to 10 was taken for political freedom variable.

4.2 Methodology

Quality of life depends on many factors (Venhooven, 1994). Generalizations about economic growth and quality of life, however, have typically been based on multivariate comparisons of national measures of indicators and GDP per capita income; hence, the study too employ a Multivariate methodology, with the growth rates of quality of life - objective indicators and GDP per capita the variables of interest.

The method includes statistical and econometric analysis tools such as multiple regression analysis using Eviews 7. In addition, to estimate the parameters corresponding to variables of interest from the secondary data considered the study employ OLS estimation method on the model of VAR.

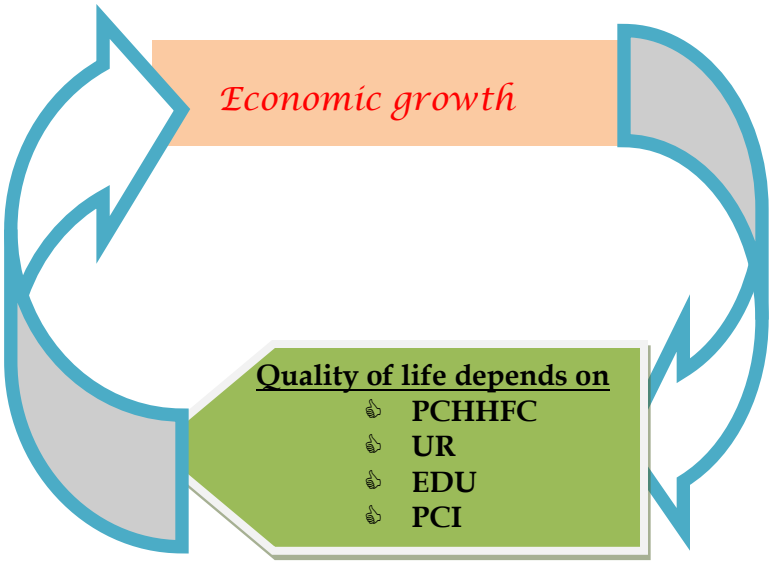
[6] Detail is found below.

4.2.1 Model specification and Variable description

4.2.1.1 Theoretical model specification

For the sake of capturing relevant QOL indicators and to investigate the nexus between QOL and economic growth in Ethiopia the study and analysis made by R. Easterlin, 2007 was employed. This study uses the recently developed model of objective and subjective indicators of QOL by land (2007). It also consists quality of life indicators as the dependent variable and economic growth per capita as the independent variables[7]. In this study, emphasis was given to only objective indicators mainly because of data availability. In what follows, based on above and insights from the literature, the study develops a theoretical model using diagrammatic illustration in order to highlight the linkage between variables of interest.

Figure 4.1: Model of interaction of economic growth and quality of life (objective indicators)



Source: own construction

[7] *Because the aim of the study is to show the impact of economic growth on indicators, even though the VAR model considers all variables as an endogenous.*

The above diagram shows the representation of the interaction of economic growth and quality of life indicators with representative variables from social, economic and political aspects. The model signifies economic growth directly affects consumption expenditure, urbanization, education enrollment and political freedom. The change in these variables is also assumed to affect economic growth by the reverse impact.

4.2.1.2 Empirical model specification

The empirical framework /laying on the structural equations/ of this study is focused on modeling the nexus between quality of life through its objective indicators and economic growth through GDP per capita.

Modeling multivariate time series is of course more interesting and more challenging than studying univariate models, and in this case dynamic linear models (DLMs) offer a very flexible framework for the analysis.

In equation form, the structural equation can be specified by expressing each QOL indicators to be explained by economic growth and other variables. It can be expressed as:

$$QOL = f(C, UR, EDU, PCI) \quad \text{.....3.1}$$

$$C = fc(UR, EDU, PCI, EG) \quad \text{.....3.2}$$

$UR = fur(C, EDU, PCI, EG)$……3.3

$EDU = fedu(C, UR, PCI, EG)$……3.4

$PCI = fpci(C, UR, EDU, EG)$……3.5

Hence, the model tries to capture the impact of EG and other possible exogenous variables on the QOL indicators. Further, the study attempts to show the long run and short run analysis of the existence of causality.

VAR approach superficially resembles simultaneous equation modeling in that we consider several endogenous variables together. Nevertheless, each endogenous variable is explained by its lagged values and the lagged values of all other endogenous variables in the model.

The Econometric model

The advantage of considering the components simultaneously in the VAR model include that the model may be more parsimonious and includes fewer lags, and that more accurate forecasting is possible, because the information set is extended also to include the history of the other variables. To boot, the distinction between endogenous and exogenous variables does not have to be made a priori, and arbitrary constraints to ensure identification are not required. Like a reduced form, VAR is always identified.

In our case, the vector of the VAR model, therefore, incorporates per capita house hold final consumption expenditure (PCHHFC), urbanization (UR), education (EDU), polity composite index (PCI), and GDP per capita (PCGDP).

Hence, the econometric model through the reduced form of the general linear dynamic model of this process, a vector autoregression of order P, VAR(P), based on Johansen and Juselius formulation (1990) can be set as;

$$Y_t = A_o + A_1 Y_{t-1} + A_2 Y_{t-2} + A_3 Y_{t-3} + ... + A_p Y_{t-p} + U_t \quad \text{.....3.6}$$

Where,

Yt = (PCHHFCt, PCGDPt , URt, EDUt, PCIt)' is a vector process (5×1) of variables.

Ao = is a (5x1) vector of deterministic terms like trends and intercepts

A1...Ap are (5×5) matrix of coefficients for dependent variables.

Ut s are a (5x1) vector the stochastic error terms, called impulses or Innovations or shocks in the language of VAR and are iid[8](0, $\sum$) Vector of error terms with Σ representing the contemporaneous covariance matrix.

[8] *Identically and independently distributed*

Alternatively, assuming the roots of the polynomial in the lag operator lie outside the unit circle the VAR model in 3. 6 can be written as;

Yt= Ao+ $\sum_{j=1}^{p} AjYt - j$ + Ut.....3.7

Estimating a vector autoregression is very easy. As the conventional one, it is appropriate to estimate a linear system like 3.6 in which the same regressors appear in every equation, by ordinary least squares (OLS). In such a case, OLS is like both the efficient generalized least square (GLS) estimator and the maximum likelihood (ML) estimator under the assumption of multivariate normal errors (Davidson & Makinno, 2004).

4.2.1.3 Variable description

Per capita gross domestic product (PCGDP)

GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is a macroeconomic measure of the size of an economy adjusted for price changes (that is, adjusted for changes in the value of money inflation or deflation). It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency.

Objective indicators

The variables of interest used to capture QOL are based on the use of objective indicators. These are external to individuals, and designed to be obtained and measured from documented data over time

The seal of objective indicators is based on the objective, tangible and quantitative statistical measure rather than subjective feeling of individuals about their environment (DIENER and SUH, 1997). Objective indicators broadly include; economic, social and political indicators.

Economic indicators of quality of life: can be generalized and captured by the use of consumption expenditure and geographical distribution (urbanization).

Consumption: refers to the behavior of individuals by which they tries to satisfy their needs and wants by having and using varieties of products. These may include all types of necessity, normal, and luxuries products purchased for consumption purpose. The quality of life is to be identified with the quantity and quality of products consumed. This study tried to show how much the change in the quantity and quality of consumption is accompanied with the rise in the economy.

The change in consumption in terms of both quantity as well as quality was obtained from the expenditure made for consumption purpose and access to improved water and sanitation service. Consumption in these case has to be noted that, it is the consumption of various products resulted from the growth of the economy. In line with this, the change in the size of household final consumption expenditure per capita (using constant 2000 US$) which is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased by households excluding purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditures of nonprofit institutions serving households, as defined by the World Bank. In short, the following variables were taken into consideration for the analysis;

- ✓ Private Consumption expenditure per Capita (constant 2000US$)
- ✓ Access to improved sanitation facilities
- ✓ Access to improved water sources
- ✓ Internet users per 100 people
- ✓ Mobile subscribers per 100 people.

Consumption not always improves the quality of life. Sometimes consumption of some products may result in deteriorating QOL. When consumption is associated with high emission of carbon dioxide, and consumption of fatty foods may result for environmental and health problems and bad consequences on QOL. This linkage can be described by the

statement from (Steve et al, 2013)[9] but adopted to the study setting: "Ethiopian society, economy and environment are so intimately interlinked". It indicates, economic growth if doesn't follow green growth strategy, may lead for environmental problem and deterioration of QOL of the society. The negative impact of economic growth is assumed to be captured by the following variables.

- ✓ CO2 emissions from liquid fuel consumption (kt) as an energy source
- ✓ CO2 emissions from transport (metric tons).
- ✓ CO2 emissions from fuel combustion in households (metric tons).

Geographical distribution: it is concerned with the level of urbanization. On average, peoples' quality of life is positively associated with living places where living facilities are available.

Here even if there are opposite arguments, whether urbanization of population would improve QOL or not, analysts praise the benefits of urban life, such as opera, theatre, and spectator sports that require a large population base to sustain them, though surveys suggest that a fair proportion of urban dwellers would prefer a rural environment (Fuguitt and Zuiches, 1975, Fuguitt and Brown, 1990). This study supports the proponents of urbanization to improve QOL on the ground of benefits. Further, obviously, it is in urban

[9] *Steve, Shannon, Tadele and Daniel (2013), "Making Growth Green and Inclusive: The Case Of Ethiopia", OECD Green Growth Papers, 2013-07, OECD Publishing, Paris. doi: 10.1787/5k46dbzhrkhl-en*

areas much of the living facilities are available. Consequently, percentage of population in urban areas over time against per capita GDP has been taken for analysis.

Social indicator of QOL: The most commonly used social indicators are educational level. Gross school enrolment ratio is often used to capture for the general level of education in a given nation. It shows the general level of participation in a given level of education. It indicates the capacity of the education system to enroll students of a particular age group (UNISCO, 2009).

An elementary formula used by most countries to calculate the Gross Enrollment Ratio is that, the country divides the number of individuals who are actually enrolled in schools by the number of children who are of the corresponding school enrollment age. Gross primary school enrollment ratio considers children usually between the ages of 6 - 11. Gross secondary school enrollment ratio considers children usually between the ages of 12 - 17. Gross tertiary education enrollment ratio considers the number of young people in the five-year age group following the secondary school leaving age that is usually, 17. GER is given by the number of students enrolled in educational sector of different levels - 'Primary ','secondary' and 'tertiary' level of education by the population of school age children of these levels. The aim of the study here is to show the change in gross school enrollment ratio (GER) accompanied with economic growth.

Political indicators of QOL: refers to the relevance of political democracy to the wellbeing of the society. Political democracy provides people with a sense of freedom,

right to speech, right to form a group, right to vote and to be elected, and other democratic and human rights which ultimately improve the general life satisfaction and wellbeing of the society (Inkeles 1991, p. x). The relationship between economic growth and political freedom is termed as the "lip set hypothesis" (Lipset 1959)[10], one of the greatest achievements in the political science. It states that:"The more well-to-do a nation, the greater the chances that it will sustain democracy." As well, some literatures assurance economic progress leads the people to stand for their right and ask for political freedom.

The relevance of political freedom to quality of life is to be captured by the use of polity composite index. It is calculated and formed as a value of the difference between democracy and autocracy measures or values. Where the values are to be obtained from polity IV database. It is a scheme originally designed by (Gurr and informed Eckstein, 1975) to examine the concomitant qualities of democratic and autocratic authority in governing institutions. It is the polity research tradition of coding the authority characteristics of states in the world system for purposes of comparative, quantitative analysis. It is a measure of political inclusiveness/ comprehensiveness nature of political system. It serves as an important source for many researchers for monitoring the regime change and studying the effects of regime authority

This dataset contains an annual measure of a regime's institutionalized democracy (DEMOC) and autocracy (AUTOC), as well as the variable (POLITY2) that combines

[10] *Seymour martin Lipset, "some social requisites of democracy: economic development and political legitimacy," American political science review 53 (1959): 69–105.*

the two measures by taking their difference as well as extrapolates missing values to facilitate time-series analysis. The Polity IV data has the advantage of describing the institutional qualities of regime along both the democratic and autocratic dimensions at the same time. The institutionalized democracy measure runs on a scale of 0 to 10. The score is based on researchers' systematic evaluation of four components: the (1) competitiveness of executive recruitment, (2) openness of executive recruitment, (3) constraint on chief executive, and (4) competitiveness of political participation. Each component have sub components with their weights, when added ranges from 0 to 10. Likewise, the institutionalized autocracy measure also ranges between 0 and 10, and is based on the above four components and the additional component of regulation of participation. Similar to democracy, each components of autocracy have sub components with their weights, when added ranges from 0 to 10. This design is intended to deliver a picture of the overall level of public participation in government by examining the combined democracy-autocracy score (POLITY2)[11].

Accordingly, Historical measure of polity2 has been used over time by the use of

- ✓ Polity Composite Index and GDP per Capita

[11] *Detail discussion about polity IV is attached in appendix XII*

4.2.2 Method of Data Analysis

4.2.2.1 Testing stationery

To apply standard estimation or testing procedures in a dynamic time series model, it is typically required that the various variables are stationary, because the majority of economic theory is built upon the assumption of stationarity. According to Davidson and Mackinnon (1999), empirical work based on time-series data assumes that the underlying time series is stationary.

According to Verbeek (2004), stationary of a stochastic process requires that the variances and auto co variances are finite and independent of time. Moreover, for it to be strictly stationary, the joint distribution of a variable with its all lagged value needs to be independent of time. If a time series is stationary, its mean, variance, and auto covariance (at various lags) remain the same no matter at what point we measure them; i.e. they are time invariant. Such a time series will tend to return to its mean (called mean reversion) and fluctuations around this mean (measured by its variance) will have broadly constant amplitude.

Non-stationarity of a time series presents problems on the consistency of estimation, misleading estimators and the problem of test statistic techniques and inference is greatly complicated (Taylor et al, 1992). Hence, it is necessary to check for the stationarity of all the variables under consideration. Why are stationary time series so important? Because

if a time series is non-stationary, we can study its behavior only for the period under consideration. Each set of time series data will therefore be for a particular episode. Consequently, it is not possible to generalize it to other periods. Therefore, for forecasting, such (non-stationary) time series may be of little practical value. There are several methods used to test for stationary of time series variables. The most commonly used tests are (1) graphical analysis and (2) the correlogram test and (3) unit root test.

Because of the importance attached to it in the recent past and for it become a widely popular approach to test for stationarity, this study employs the unit root test explained in the next section.

Testing for Unit Roots

There are several ways of testing for the presence of a unit root for a given series; in this study, the Augmented Dickey-Fuller (ADF) test and the Phillips-Peron test were employed.

The Dickey-Fuller (DF) test

For a time series process given by

$Yt= \rho Yt-1 + Ut$,..... 3.8

Where, $-1 \leq \rho \leq 1$

Ut is a white noise error term.

To test for the presence of a unit root in the above model the null and the alternative hypothesis are given by

Ho; ρ =1 corresponds to a unit root and non stationarity

H1; ρ <1 corresponds to absence of unit root and stationarity of the series

It is possible to use the standard *t*-statistic to test the above hypothesis, However, as shown in the seminal paper of Dickey and Fuller (1979), under the null hypothesis that ρ =one the standard *t*-ratio does not have a *t*-distribution, not even asymptotically. The reason for this is the non-stationarity of the process invalidating standard results on the distribution of the OLS estimator ρ.

Usually, a slightly more convenient regression procedure is used, in which case, the model is written as: subtract Yt-1 from both sides of 3.8 to obtain;

$$Yt - Yt\text{-}1 = \rho Yt\text{-}1 - Yt\text{-}1 + Ut$$

$$= (\rho - 1)Yt\text{-}1 + Ut$$

This can be alternatively written as:

$$\Delta Yt = \delta Y_{t-1} + Ut \quad \text{.....3.9}$$

Where, $\delta = (\rho - 1)$ and Δ, is the first-difference operator.

In practice, therefore, instead of estimating 3.8, we estimate *3.9* and test the (null) hypothesis that $\delta = 0$. If $\delta = 0$, then $\rho = 1$, that is we have a unit root, meaning the time series under consideration is non stationary. However, if it is negative, we conclude that Yt is stationary.

The Dickey-Fuller (DF) test depending on the nature of the unit root process (may have no drift, or it may have drift or it may have both deterministic and stochastic trends) have shown that under the null hypothesis that $\delta = 0$, the estimated *t* value of the coefficient of *Yt*−1 in 3.9 follows the τ (tau) statistic. These authors have computed the critical values of the *tau statistic* based on Monte Carlo simulations. It is this statistics we call The Dickey-Fuller (DF) test**,** in honor of its discoverers. Interestingly, if the hypothesis that $\delta = 0$ is rejected (i.e., the time series is stationary), we can use the usual (Student's) *t* test.

Augmented Dickey-Fuller (ADF) Test

In conducting the DF test, it was assumed that the error term *Ut was* uncorrelated. But in case the *Ut* are correlated, Dickey and Fuller have developed a test, known as the augmented Dickey–Fuller (ADF) test. This test is conducted by "augmenting" equations for different unit root process by adding the lagged values of the dependent variable ΔYt . To be specific, suppose we use the following equation, the ADF test here consists of estimating the following regression:

$$\Delta Yt = \beta_1 + \beta_{2t} + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha i \Delta Yt - i \quad + \varepsilon t \text{.....} 3.10$$

Where ε_t is a pure white noise error term and where $\Delta Yt-1 = (Yt-1 - Yt-2)$, $\Delta Yt-2 = (Yt-2 - Yt-3)$, etc. The number of lagged difference terms to include is often determined empirically, the idea behind is to include enough terms so that the error term in (3.10) is

serially uncorrelated. In ADF, we still test whether $\delta = 0$ and the ADF test follows the same asymptotic distribution as the DF statistic, so the same critical values can be used.

The Phillips–Perron (PP)

An important assumption of the DF test is that the error terms U*t* are independently and identically distributed. The ADF test adjusts the DF test to take care of possible serial correlation in the error terms by adding the lagged difference terms of the regressand. Phillips and Perron use *nonparametric statistical methods* to take care of the serial correlation in the error terms without adding lagged difference terms. The asymptotic distribution of the PP test is the same as the ADF test statistic,

4.2.2.2 Estimation technique and interpretations

4.2.2.2.1 Cointegration Analysis

An important exception to the spurious regression is when two or more I (1) variables are cointegrated, that is, if there exists a particular linear combination of these non-stationary variables that is stationary, a long-run relationship between these variables exists. Often economic theory suggests the existence of such long run or equilibrium relationships.

Cointegration means that despite being individually non-stationary, a linear combination of two or more time series can be stationary. Cointegration of two or more time series suggests that there is a long run, or equilibrium, relationship between them. The long run

equilibrium exists due to the fact non-stationarity of variables implies each are dominated by the long wave unlike their linear combination.

As articulated by Engle and Granger (1987), the *m x* 1series y_t is cointegrated and that they share a common trend if y_t is I (1) yet there exists β, $m \times$ r , of rank *r*, such that $z_t = \beta' y_t$ is *I* (0) . The *r* vectors in β are called the co integrating vectors.

Consider two series, integrated of order one, Yt and Xt, and suppose that a linear relationship exists between them. If there exist some value of β such that Yt-βXt is I(0) , although Yt and Xt are both I(1), in such a case it is said that Yt and Xt are cointegrated, and that they share a common trend (Davidson and Mackinnon, 1999).

When this occurs, a special constraint operates on the long-run components of the variables. Consequently, the presence of a co integrating vector in multivariable case can be interpreted as the presence of long term, equilibrium relationship. Economically speaking, two variables will be cointegrated if they have a long-term, or equilibrium, relationship between them. For example, If we take consumption and income as two *I*(1) variables, savings defined as (income − consumption) could be *I*(0). As a result, a regression of consumption on income would be meaningful (i.e., not spurious). In this case, we say that the two variables are cointegrated and have long term or equilibrium relationship.

Consequently, after examining the non stationarity, the existence of long term, equilibrium relationship among the variables of, LNPCHHFC, UR, EDU, PCI, and LNPCGDP was examined by the use of Johanson cointegration tests based on its advantages over others.

Cointegration test

(1) Engle–Granger (EG) or Augmented Engle–Granger (AEG) Test; is the DF or ADF unit root test on the residuals estimated from the co integrating regression. After regressing non-stationary variables each other, it tests if the residual on the cointegration regression is integrated of order zero. The drawback of this procedure is that it is difficult to determine the number of equilibrium relationships if the variables are more than two. In addition to this, it needs priori information that the dependent variables are endogenous and the independent variables are weakly exogenous. In cointegration, relationship estimating a single equation is potentially inefficient since information is lost unless each endogenous and weakly exogenous variable is clearly identified (Harris, 1995).

(2) Co integrating Regression Durbin–Watson (CRDW) Test. An alternative, and quicker, method of finding out whether variables in consideration are cointegrated is the CRDW test, whose critical values were first provided by Sargan and Bhargava. In CRDW we use the Durbin–Watson d obtained from the co integrating regression, with

the null hypothesis is that d = 0 rather than the standard d = 2. Unfortunately, the critical values for this test depend on the process that generated the data

3. Johansen Cointegration Test Approach

Lag length selection criteria

Note that because the cointegration test and the results of Johansen test can be quite sensitive to the lag length included in the VAR model, testing of cointegration and estimation of the VECM requires the determination of the appropriate lag length. Thus, the appropriate lag order (P) of the VAR was determined using standard model selection criteria (data-dependent rule), by the use of a well known information criterion approaches including the Akaike information criteria (AIC),the modified LR statistics test, the Final prediction error (FPE), Shewarz Information criteria (SIC) and Hannan Quinn information criterion (HQ).

Cointegration Test Approach

Unlike the other methods, it is a robust mechanism, by which we can detect the existence of more than one cointegration among the variables. It is a mechanism, which is, more acceptable and widely applicable. In this study, the approach that does not suffer from the drawbacks of the first two methods which was proposed by Johansen (1988), who developed the procedure that also allows one to test for the number of co integrating relationships was implemented.

The VAR model introduced in 3.6 can be reformulated as;

$$\Delta Y_t = A_0 + \pi Y_{t-1} + \sum_{i=1}^{p-1} \gamma i \Delta Y_{t-i} + e_t$$

Where, $\pi = \sum_{i=1}^{p} A_{i-1}$

$$\gamma_i = -\sum_{j=i+1}^{p} A_j$$

The above Granger's representation theorem asserts that if the coefficient matrix π has reduced rank r<k,(k is no of endogenous variables) then there exists kxr matrix α and β each with rank r such that π=αxβ' and β'Yt is I(0). r is the number of co integrating relations (the cointegrating rank) and each column of β is the co integrating vector. As explained below the elements of α are known as the adjustment parameters in the VEC model. Johansen's method is to estimate the π matrix from the unrestricted VAR and to test whether we can reject the restrictions implied by the reduced rank of π.

Johansen suggests two tests;

I, Trace test statistics; is based on testing the k-r smallest eigenvalue are jointly zero. It is given by;

λ trace (r_0)=$-T \sum_{i=r0+1}^{k} \text{Ln}\ (1 - \lambda_i)$, it tests;

H_0; $r \leq r_0$ (at most r_0 co integrating vectors) against the alternative

H_1; $r_0 < r \leq k$ (more than r_0 Cointegrating vectors).

II, Maximal Eigenvalue test statistic; is based on the estimated $(r_0+1)^{th}$ largest eigenvalue given by;

$\lambda \max (r_0) = -Tln(1 - \lambda ro + 1)$, it tests

Ho; $r \leq r_0$ (at most r_o Cointegrating vectors) against

H1; $r = r_o + 1$ (exactly $r_o + 1$ Cointegrating vectors).

4.2.2.2.2 The Vector Error Correction Model (VECM)

From above we have shown that if time series variables y_t and x_t are cointegrated, then there will be a long term, or equilibrium, relationship between the two. It implies, in the short run there may be disequilibrium. Therefore, one can treat the error term in the cointegration regression as the "equilibrium error." In addition, we can use this error term to tie the short-run behavior of the regressand to its long-run value. Hence, the existence of a long-run relationship also has its implications for the short-run behavior of the I(1) variables, because there also has to be some mechanism that derives the variables to their long-run equilibrium relationship. This mechanism is modeled by an *error correction mechanism*, in which the equilibrium error also derives the short-run dynamics of the series. The error correction mechanism (ECM) first used by Sargan and later popularized by Engle and Granger corrects for disequilibrium. It is a means of reconciling the short-run behavior of an economic variable with its long-run behavior.

To take the simplest possible example, consider a two variable system with one cointegrating equation and no lagged difference terms. The cointegrating equation is;

$Y_{2,t} = \beta y_{1,t}$.

The corresponding VEC model is;

$\Delta y_{1,t} = \alpha_1(y_{2,t-1} - \beta y_{1,t-1}) + e_{1,t}$

$\Delta y_{2,t} = \alpha_2(y_{2,t-1} - \beta y_{1,t-1}) + e_{2,t}$

In this simple model, the only right-hand side variable is the error correction term. In the long run equilibrium, this term is zero. However, if y_1 and y_2 deviate from the long run equilibrium, the error correction term will be nonzero and each variable adjusts to partially restore the equilibrium relation. The coefficient α_i measures the speed of adjustment of the i^{th} endogenous variable towards the equilibrium. Using this method the short run behaviour of variables of per capita private consumption expenditure, gross enrollment ratio and political freedom, was analyzed following endogenity test and the vector error correction model.

4.2.2.2.3 Diagnostic Checks

Error Vector Autocorrelation Test

Autocorrelation normally occurs only when using time series data. This occurs when two or more consecutive error terms are correlated, and we say that the error term is subject to autocorrelation or serial correlation , i.e **(**$V\{\varepsilon\} = \sigma^2 i$**)** is violated, It leads OLS though

remains unbiased, it becomes inefficient and its standard errors are estimated in the wrong way. In this study, the existence of autocorrelation up to the specified order was tested by the use of the autocorrelation Lagrange multiplier (LM) Test. The test statistic for lag order h is computed by running an auxiliary regression of the residuals Ut on the original right-hand regressors and the lagged residuals U_{t-h}, where the missing first h values of U_{t-h} are filled with zeros. Under the null hypothesis of no serial correlation of order h, the LM statistic is asymptotically distributed $\chi 2$ with k^2 degrees of freedom. The (LM) technique is used to determine whether the residuals of the model approximate are white noise.

Hetrosckedasticity Test

Hetrosckedasticity of the residuals results for inappropriate standard errors which leads for OLS results in a given model are misleading. A number of alternative tests are available. In this study White's test is used for it detects more general forms of hetrosckedasticity than others. It is designed to test the null hypothesis of homosckedasticity and that there is no problem of misspecification against a variety of alternative hypotheses of hetrosckedasticity.

The test regression is run by regressing each cross product of the residuals on the cross products of the regressors and testing the joint significance of the regression.

Normality Test

It reports the multivariate extensions of the Jarque-Bera residual normality test, which compares the third and fourth moments of the residuals to those from the normal distribution. For the multivariate test, the study selects a Cholesky factorization of the residuals that are orthogonal. The resulting test statistics depend on the ordering of the variables in the VAR.

4.2.2.2.4. VAR and causality

The general VAR (p) model has many parameters, and they may be difficult to interpret due to complex interactions and feedback between the variables in the model. As a result, the dynamic properties of a VAR (p) are often summarized using various types of structural analysis. The three main types of structural analysis summaries are (1) Granger causality tests; (2) impulse response functions; and (3) forecast error variance decompositions. The following sections give brief descriptions of these summary measures.

Granger Causality Test

It is noted that regression analysis deals with the dependence of one variable on other variables or in the reverse way, but it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence.

According to Francis Diebold who prefers the term predictive causality states:

> *The statement "yi causes yj" is just shorthand for the more precise, but longwinded, statement, "yi contains useful information for predicting yj (in the linear least squares sense), over and above the past histories of the other variables in the system." To save space, we simply say that yi causes yj*[12] *(Diebold,2001 pp. 254).*

The Granger representation theorem implies that if two variables, say, Xt and Yt are cointegrated and i.e., each is individually non stationary, then either Xt must Granger-cause Yt or Yt must Granger-cause Xt .

There are three possible cases of causality. Unidirectional (Yt→Xt) or (Xt→Yt) when the causality moves from Yt to Xt or from Xt to Yt only respectively. Bidirectional (Yt↔Xt) when time series Xt and Xt both granger cause each other. The last possible case is when there is no causation.

In our case this means for example, if LNPCGDP and EDU are individually I(1), but are cointegrated, then either PCGDP must Granger-cause EDU or EDU must Granger-cause PCGDP or in a bidirectional way. This means we must first find out if the two variables are I (1) individually and then find out if they are cointegrated. If this is not the case, then the whole question of causality may become moot and this is done by the following system**;**

[12] *Francis X. Diebold, Elements of Forecasting, South Western Publishing, 2d ed., 2001, p. 254.*

In a linear VAR, the equation for Y_t is

$Y_t = a_0 + a_1 Y_{t-1} + \ldots\ldots\ldots\ldots + a_p Y_{t-p} + Z'_{t-1} b_1 + \ldots\ldots\ldots + Z'_{t-p} b_p + e_t$

In this equation Zt does not Granger cause Y_t if and only if

H0; $b_1 = b_2 =$ ---------- $b_p = 0$

This was tested using the appropriate multivariate Wald test.

4.2.2.2.5 Impulse Response Analysis and Variance Decomposition

Impulse Response Analysis

At a specific point of time t_0, an impulse that originates from one equation proceeds through the system: how does a change in the residuals or in the innovations influence the components of the vector Y? In system (3.6), the impulse response function is the path that a variable follows if it is kicked by a single unit shock Ut, i.e., Ut−j = 0, Ut = 1, Ut+j = 0 (Cochrane, 2005). In other words, this approach is designed to determine how each variable responds over time to an earlier shock in that variable and to shocks in the other variables (Shin et al., 2006).

It allows us to start thinking about “causes” and “effects”. For example, in this study, it helps to compute the response of education enrollment, urbanization, political freedom and per capita private consumption expenditure to a shock to economic growth and interpret the result as the “effect” on QOL of economic growth.

Variance Decomposition

The variance decomposition is concerned with decomposing the forecast error variance. It permits in the prediction for each variable in the system that is attributable to its own innovations and to shocks to other variables in the system. It shows the portion of the variance in the forecast error for each variable due to innovations to all variables in the system.

With an increasing time horizon, it is not only the variance of the forecast error but also the variance of the variable itself that can be decomposed into those fractions that are generated by the different innovations. As these fractions are, by construction, orthogonal to each other, they add up to one. Thus, the analysis of the forecast errors leads to a decomposition of the variances of the system's variables.

By analyzing variance decompositions (VDCs) and impulse response functions (IRFs), the relative strength of the impact of economic growth on which component of QOL could easily be determined. For example, if the response of Education due to EG is relatively higher and dissipate at a relatively slower rate than that of political freedom, we could conclude that EG is more effective in influencing Education than political freedom.

CHAPTER FIVE

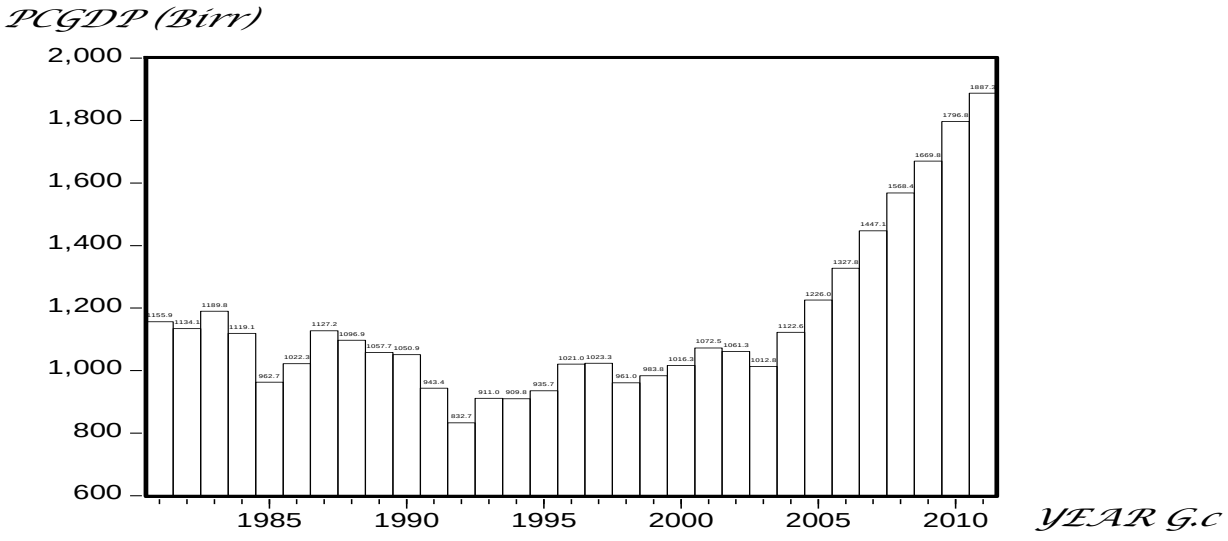
5. RSULTS AND DISCUSSION

5.1 DESCRIPTIVE ANALYSIS

5.1.1 Trend analysis of per capita gross domestic product

The table below shows the trend of per capita gross domestic product (PCGDP) and possible justifications given by sources.

Figure 5.1: Observation Graphing of PCGDP (1981-2011)



Source: World Bank (2011)

At glance, the data collected shows a rising trend. In particular, by the year 1980s and early 1990s PCGDP was in a decreasing trend. But beginning from 1993 it has shown a

sharp rise. According to MOFED (2002EFY), this sharp rise is achieved with economic reforms following the social and political transformations in 1990s and early 2000. The introduction and implementation of the integrated development plan in different rounds beginning from 2002, leads the country to register better economic performance and maintain high growth rates (MoFED 2006).

5.1.2 Correlation analysis

Correlation analysis is done among all the variables to obtain measures of association among them. As shown in table 5.1, all the variables are positively correlated. Particularly, political freedom (PCI) and education enrolment (EDU) are highly correlated with level of urbanization (UR). On the other, political freedom is associated with the level of education. Per capita consumption expenditure (LNPCHHFC) and education enrollment are highly correlated each other and with level of per capita gross domestic product (LNPCGDP), while urbanization and political freedom have positive but low level of association with LNPCGDP.

Table 5.1: Correlation analysis of variables

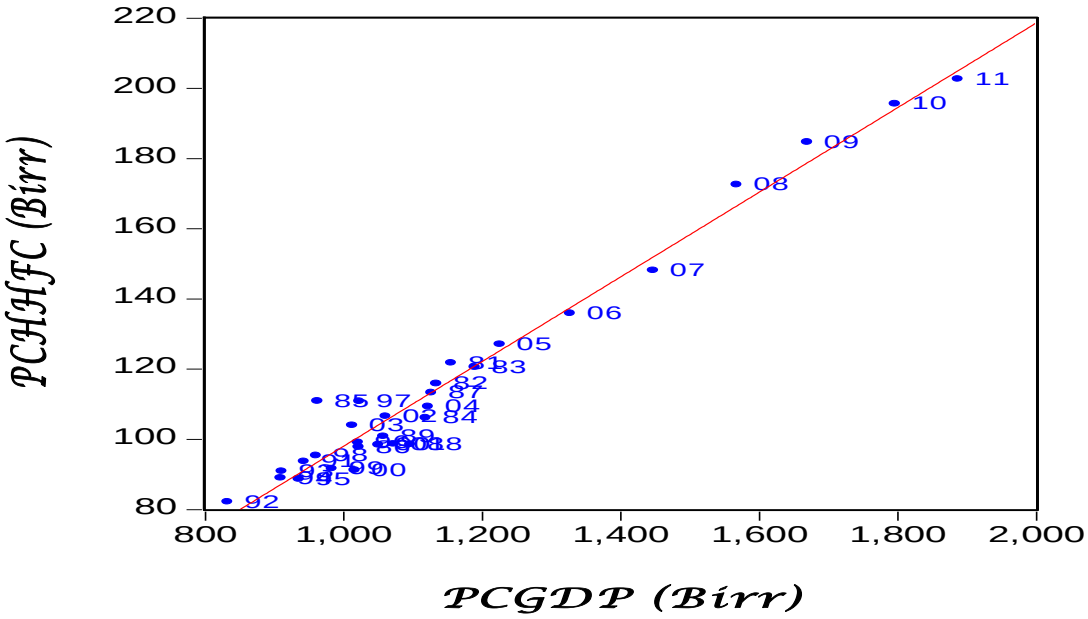
CORRELATION	LNPCHHFC	PCI	EDU	UR	LNPCGDP
LNPCHHFC	1.000000				
PCI	0.157969	1.000000			
EDU	0.870378	0.448888	1.000000		
UR	0.261996	0.728330	0.638753	1.000000	
LNPCGDP	0.975089	0.148619	0.888975	0.275341	1.000000

5.1.3 Trend of objective indicators of QOL and PCGDP

Consumption

Consumption expenditure is a positive function of income, is the agreeable statement and starting point of all consumption theories. Most theories like Keynesian theory of consumption, permanent income hypothesis, the life-cycle hypothesis, Random walk hypothesis and others, though they differ on the elasticity and other assumptions, they agree on the idea behind consumption rises with income. One would expect, therefore, that consumption would be higher in recent periods where PCGDP shows a rising trend.

Figure 5.2: Per capita private consumption expenditure and PCGDP (1981-2011)



Source: World Bank (2011)

For the period studied, associated with the rise in PCGDP, consumption expenditure is also rising. The figure above shows the trend of PCHHFC with PCGDP for the period

considered. Over the period, per capita private consumption expenditure on all types of goods and services including durable products (such as cars, washing machines, and home computers), purchased by households using the year 2000 US$ constant price is increasing on average. Similarly (Figure I and II in appendix I), shows an increment in the trend of PCGDP and PCHHFC both approximately in similar fashion. Looking for the trend of PCHHFC (figure, II), initially up to the early 1990s it was decreasing, but shows a sharp rise after that, which is the same tendency with PCGDP. It may imply with economic growth households expenditure on food, cloth, shelter and other expenditures of nonprofit institutions serving households is raising.

The difference in consumption over time is more pronounced when one moves over the figure showing the percentage of population that have access to improved water sources and sanitation facilities. Figure III, and IV in the Appendix I demonstrate two decades back only 14% of the total population has access to improved water sources with reasonable access against 40% by the year 2010. Similarly, percentage of population that have improved sanitation facilities rise from 3% in 1990 to 21% by 2010[13]. The same trend is observed for electric power consumption (figure V).

The introduction of new products is one of the main characteristics of modern economic growth (Easterlin, 2007). In view of access to internet users and subscription to cellular mobile phone per 100 people, figure VI and VII (appendix I) shows that before the late 1990s the number of people that have access to worldwide network and access to the

[13] *Clarification of improved water source and sanitation facilities is found in the appendix of definitions*

public switched telephone network was negligible. Nevertheless, it shows spontaneous increments since then.

Hence, if quality of life is to be measured as a positive function of the quantity and quality of products consumed Brock (1993), and Esterlin (2007) the data obtained ensures the rise of wellbeing of the people attributed to the rise of consumption of goods.

However, there are cases economic growth can contribute for the deterioration of QOL by increasing the consumption of bad[14]. In line with this, data are collected about the emission of CO_2 associated with consumption of fuel in different areas which can deteriorate QOL through environmental pollution and health problems implying economic growth is not costless. Looking for Figure VIII, IX and X (appendix I), parallel with economic growth the emission of CO_2 from different sources has been increasing over time, which has bad consequences for the environment and health of the people.

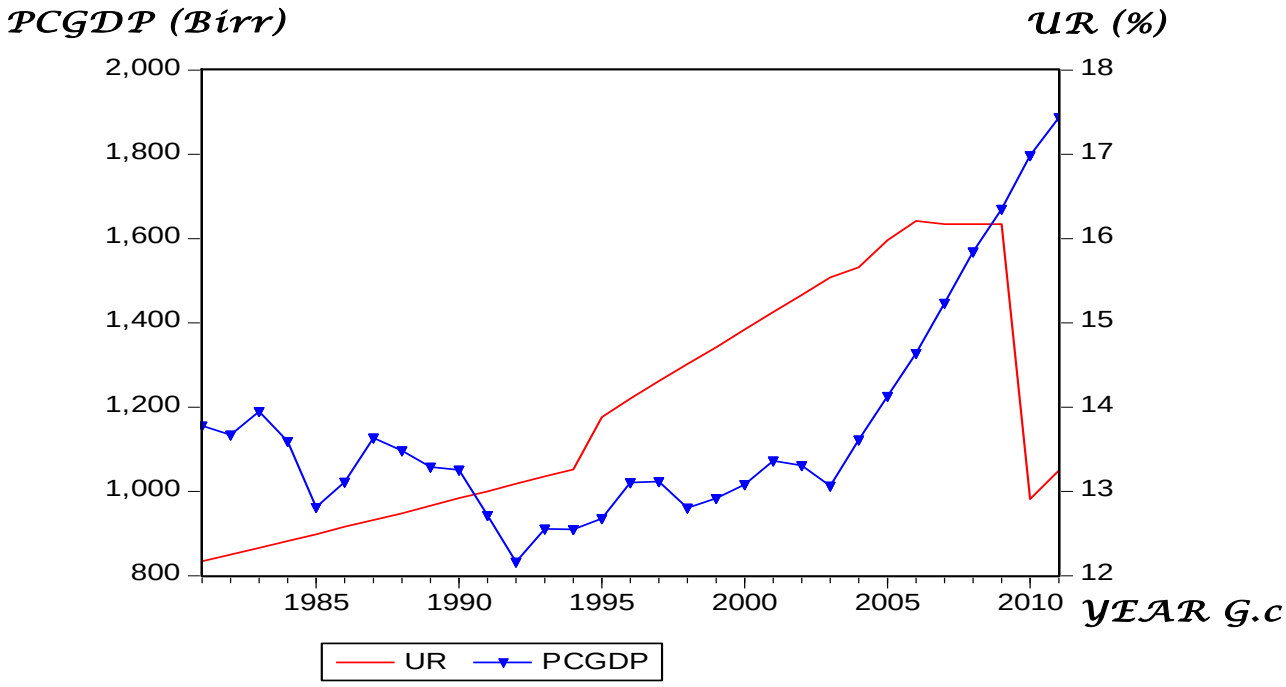
Geographical distribution

Urbanization whether improves QOL or not is a doubtable issue. There are arguments that supports UR improve the QOL, through its capacity to make people to have access for recreational, facilities and different services. Technological advancements like mechanization, factory production, and transportation service, associated with modern economic growth, favored urban areas as a place of residence (Easterlin, 1999).

[14] *This refers to consumption of products results bad consequences for health and quality of life in general*

In this study, given the above arguments and the availability of facilities, public and private services as well as recreational areas as preferences of individuals, urbanization is taken as positive improvement to quality of life, and percentage of population live in the urban areas is presented in the figure below.

Figure 5.3: Real GDP per Capita and Percent of Population in Urban Places



Source; Central Statistics Agency (2011)

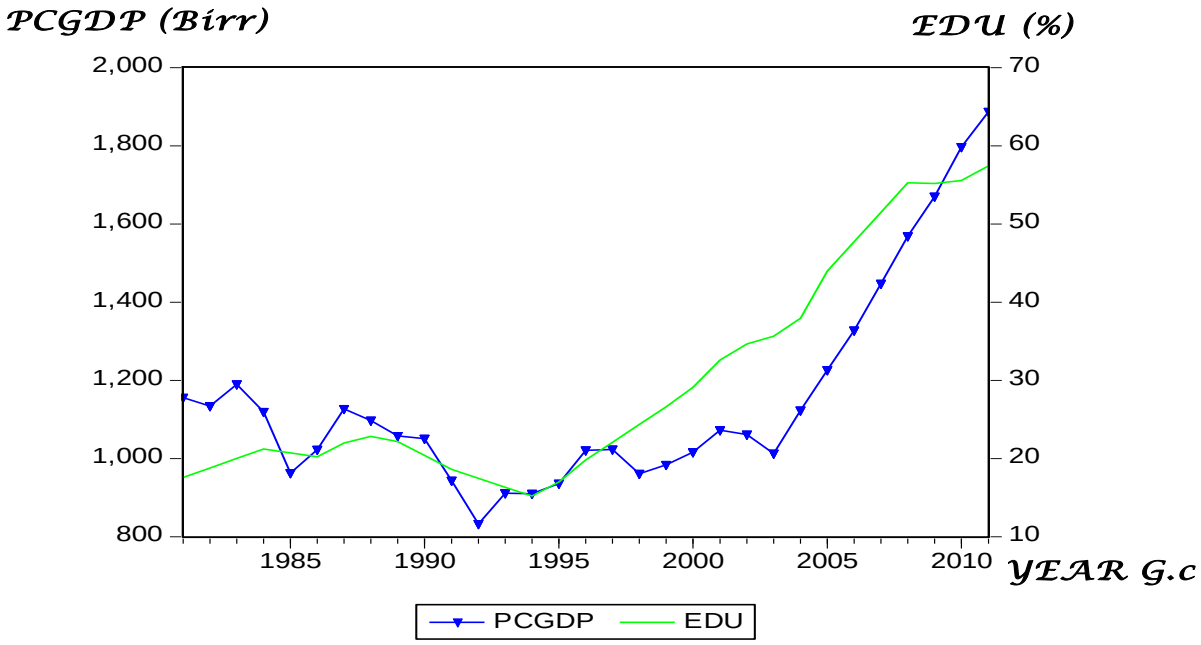
The figure above shows a time series trend of PCGDP and percentage of population live in the urban areas. It displays the rise in urbanization and positive correlation with PCGDP. And it may be associated with the access to services and facilities in the urban areas like health, education, transport, recreational and technological accessibility people desire and search for when their income rises.

Education

Education enrollment at all levels can be taken as social indicator of QOL (Esterlin, 2007). According to ministry of education (MOE), education enrollments have a direct bearing on reducing poverty and improving the welfare of citizens. Given all other things remain constant, it is not difficult to observe and understand the difference in the wellbeing of individuals on average those get education and uneducated, literate and illiterate. Combined gross enrollment ratio against PCGDP is reviewed to show the possible correlation. Accordingly, combined gross enrolment ratio shows an improvement over time with PCGDP. Possibly, it can be justified the rising PCGDP increases the demand and accessibility for education.

Looking for different levels of education, figure VIII, and IX in the appendix I, gross enrolment in primary education followed by gross enrolment in secondary education is highly allied with growth in PCGDP obviously which could be expected and supported by the correlation analysis

Figure 5.4: Combined Gross Enrollment Ratio for Primary, Secondary and Tertiary Schools (%) and GDP per Capita, since 1981 G.c



Source: World Bank (2011)

Political freedom

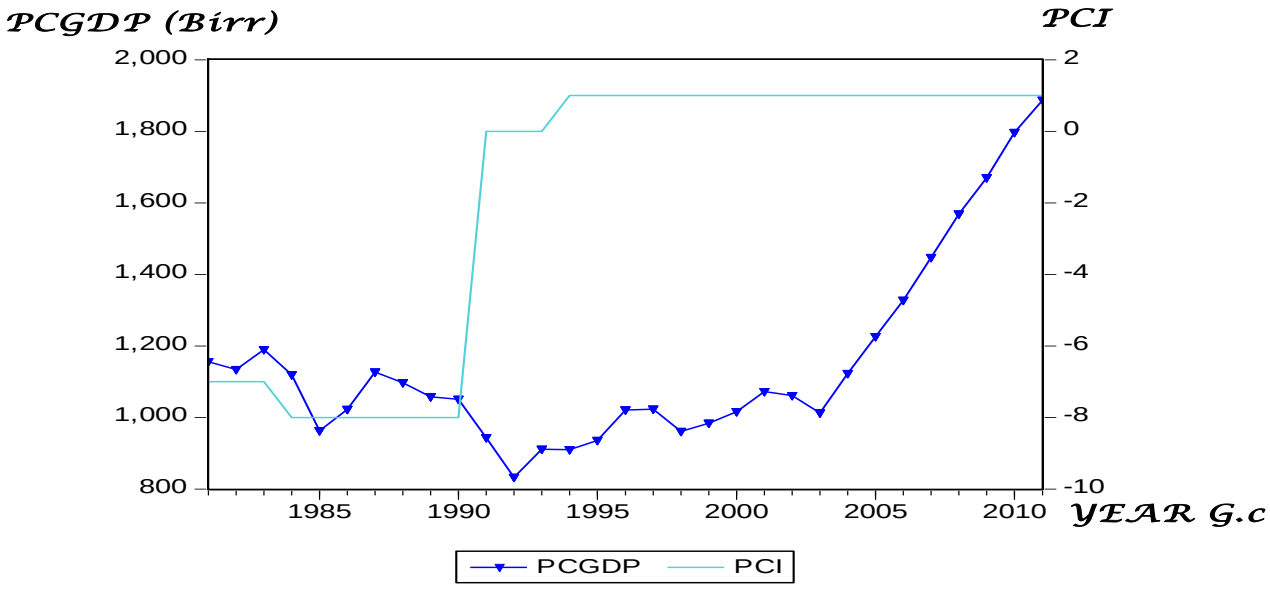
Literatures by haggard & kaufman (1996)[15] point out economic progress leads for the people to stand for their right and ask for political freedom. Their study of political economy of authoritarian withdrawals, shows economic progress is one of the main reasons for the withdrawal of authoritarians in the 1970s and 1980s. They also indicates, in the areas of southern Europe, the east Asian newly industrializing countries, and eastern Europe, economic development resulted in the emergence of more complex,

[15] H*aggard &Kaufman the political economy of democratic transitions 1996 Princeton university press p 25-26*

literate, middle-class societies that demanded increased political participation and demise of authoritarianism.

Using the polity composite index, from the polity IV dataset, prepared by knowledgeable researchers on a systematic evaluation of competitiveness of executive recruitment, openness of executive recruitment, constraints on chief executive, and competitiveness of political participation as a composite indicators of democracy and all the above variables in addition to the regulation of participation as a composite indicators of autocracy and taking polity 2 variable ranges from -10 (fully autocratic) to 10(fully democratic) (obtained as a difference between value of democracy and autocracy) and plotted against the PCGDP for the last three decades, the evidence of insignificant positive association on average is obtained as displayed in the figure below.

Figure 5.5 : Polity Composite Index And GDP Per Capita, (1981 to 2011)



Source: Polity IV project (2011)

5.2 ECONOMETRIC ANALYSIS

5.2.1 Preliminary Data Analysis

Unit root test

To get rid of from the problem of possibility of occurrences of spurious regression, it is necessary to check for stationarity of series and regress accordingly. Given it is explained in the methodology part, augmented dickey-fuller (ADF, 1981) and Phillips-Perron (PP, 1988) are employed to test for unit root and determine the order of integration as displayed below.

The result from both ADF and PP tests demonstrate at level all variables are found non stationary or I(1) at 1% level of significance with all the test statistic assumptions. First differencing all the series results stationarity of the variables with all the test statistic assumptions in both approaches except for urbanization (UR) and education (EDU) in ADF and EDU only in PP approach.

Table 5.2: Augmented Dickey-Fuller Stationarity Test Result

VARIABLE	Test Statistic Under Different Assumptions			Order Of Integration
	Intercept	**Trend and Intercept**	**no trend no intercept**	
LNPCGDP	0.984440	-0.422609	1.029899	I(1)
D(LNPCGDP)	-3.948227	-4.789869	-3.814597*	
LNPCHHFC	0.550591	-0.794663	1.064274	I(1)
D(LNPCHHFC)	-5.722701	-7.388921*	-5.555452*	
UR	-1.518161	-0.732845	0.161031	I(1)
D(UR)	-5.364024*	2.042752	-5.446484*	
EDU	0.410458	-1.643902	1.362417	I(1)
D(EDU)	-2.853999	-3.501137	-2.504240*	
PCI	-1.258004	-1.519822	-1.592705	I(1)
D(PCI)	-5.379131*	-5.338267*	-5.291503*	

N.B.: 1. Lag length are decided based on Schwarz information criterion (SIC)

2. Prefix ‘’ D' stands for first difference operator.

3. Prefix ‘LN’ stands for natural logarithm of the variable

4. Mackinnon (1996) one-sided critical values for rejection of a unit root are used

Here * shows significance at 1%.except for edu which is significant @ 5%,

The phillips-perron test (see appendix II) gives consistent result with ADF test.

Based on ADF test, first differencing of UR results stationarity of the variable with the test statistic assumption of intercept and no trend no intercept. Whereas first differencing

of EDU is stationary with only the assumption of no trend no intercept in both approaches.

When a variable is integrated of order one or more, unrestricted estimation is subject to hazards of regressions involving non-stationary variables and may lead to the so-called spurious regression, in which estimators and test statistics are misleading. Not only these but also the problem of inference is also greatly complicated. To have consistent estimators, appropriate test statistics and inferences, further manipulation of the series is decisive. The presence of non-stationary variables raises the possibility of co integrating relationships and estimation of the VAR following the procedures of;

- Determine the co integrating rank
- Estimate the matrices of co integrating vectors and weighting matrices.
- Estimate the VAR incorporating co integrating relationships.

5.2.2 Long run and short run effect analysis

5.2.2.1 Long run relationship (Cointegration Analysis)

Cointegration test results

Determination of the lag length for endogenous variables

The unit root test examination above shows all variables are found non stationary and integrated of order one I(1) which necessitate differencing of variables and testing for stationarity before estimation of VAR. This results in the removal of long run relationship that may exist and extracted from the variables. However, the exceptional case of spurious regression, i.e. Existence of cointegration digs out the long run relationship that

may exist among the variables through the error correction mechanism. In line with this, testing cointegration using Johansen approach requires determination of the optimal lag length for the endogenous variables. For choosing, too few lags invalidate the test and choosing too many lags entails estimation of additional coefficients and results in loss of degree of freedom. On the other, a large lag length relatively to the number of observations, will typically lead to poor and inefficient estimates of the parameters and too short lag length, will induce spurious significance of the parameters, as unexplained information is left in the disturbance term.

In this study, several information criteria approaches such as sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hanna-Quinn Information Criterion (HQ) were employed to determine the optimal lag length.

Table 5. 3: VAR Optimal Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-153.5877	NA	0.057181	11.32769	11.56559	11.40042
1	-51.69794	160.1125	0.000244	5.835567	7.262929*	6.271926
2	-14.08546	45.67230*	0.000120*	4.934675*	7.551506	5.734667*
3	6.906854	17.99341	0.000278	5.220939	9.027238	6.384562

As revealed in the table above, LR FPE, AIC, and HO helps to select an optimal lag length of 2 at 5% level of significance.

Lag exclusion test

The optimal lag length chosen above may have insignificant contribution for the movement in the endogenous variables. Hence, whether the second lag chosen above is individually and jointly important for cointegration and vector error correction model needs to be examined. The test is carried out by the use of the $\chi 2$ (Wald) statistic for the joint significance of all endogenous variables at the selected lag. The table below shows a lag order of 1 and 2 are significant both jointly and individually for most variables and so it will be employed for cointegration test.

Table 5.4: VAR lag exclusion Wald test

Lag length	Variables					Joint
	EDU	**LNPCGDP**	**LNPCHHFC**	**PCI**	**UR**	
Lag 1	66.59690 [5.22e-13]	30.35193 [1.26e-05]	19.09273 [0.001847]	22.34513 [0.000450]	18.26968 [0.002627]	111.4975 [6.79e-13]
Lag 2	24.49150 [0.000175]	14.90524 [0.010775]	8.188055 [0.146172]	8.630942 [0.124721]	18.57736 [0.002303]	73.51337 [1.14e-06]
df	5	5	5	5	5	25

5.2.2.1.1 The Johansen Cointegration Test Result

ADF and PP found that the series are non-stationary at level and stationary at first difference. To capture the existence of long run relationship among the variables, this study employs the Johansen (1991, 1995) system framework from the given alternatives,

for it can detect the existence of more than one co integrating relationships, by the use of trace and maximum eigenvalue statistic.

This method is sensitive to the deterministic trend assumptions and lag length of variables. Following the rough guide provided by EViews (*EViews 7 User's Guide, II page 687*), case 3 is chosen as appropriate for this study because all trends are stochastic or all the series have a stochastic trend.

Table 5.5: Unrestricted cointegration rank test

Test	Null Hypothesis	Alternative Hypothesis	Eigenvalue	Cointegration Test Statistic	Critical Value (5%)
Trace Statistic	H0: r = 0 *	HA: 0<r≤5	0.759596	95.45541	69.81889
	H0: r ≤ 1*	HA: 1<r≤ 5	0.590360	55.54322	47.85613
	H0: r ≤ 2*	HA: 2<r≤ 5	0.492991	30.55385	29.79707
	H0: r ≤ 3	HA: 3<r≤5	0.253245	11.53553	15.49471
	H0: r ≤ 4	HA: 4<r≤5	0.113048	3.359018	3.841466
Maximum Eigenvalue	H0 : r = 0*	HA: r = 1	0.759596	39.91219	33.87687
	H0: r =1	HA: r = 2	0.590360	24.98936	27.58434
	H0: r = 2	HA: r = 3	0.492991	19.01833	21.13162
	H0: r = 3	HA: r = 4	0.253245	8.176507	14.26460
	H0: r = 4	H0: r = 5	0.113048	3.359018	3.841466

* denotes the rejection of the null hypothesis at the 0.05 level

The summary result of the test is displayed in the table above. Based on trace statistic tests of the null hypothesis of at most r co integrating relationships against the alternative of greater than r co integrating relations and proceeding from r=1 to r=4, 3 cointegration relations are determined. Following maximum eigenvalue test of the null hypothesis of at most r co integrating relationships against r+1 co integrating relationships and proceeding from r=0 to r=4 until we reject the null hypothesis, we have 1 co integrating relationship. The trace statistics identifies 3 cointegration relationships, while, the maximum eigenvalue directs the use of only one cointegration equation both at 5% level of significance. Even though both ensure the existence of long run relationship among the variables, it requires selecting the appropriate number of cointegration equation for the model[16]. As a result, 3 cointegration equation is more sensible and acceptable for the model and objectives specified. Besides, sometimes it is argued the trace test statistics have high power over maximum eigenvalue test.

This result can further be complemented by the fact that the characteristic polynomial of the model has two roots greater than one. Provided the number of variables in the model is five, existence of two roots outside the unit circle indicates that the adjustment coefficients for two potential cointegrating equations are statistically zero, leaving only three potential cointegrating relationships (See Harris, 1995). The roots of the model's characteristic polynomial are given in Appendix (3).

[16] *In case of discrepant results from two above mentioned tests one should analyze the obtained co integrating relationships from their interpretability and sensibility perspective and make final selection based on that. (University of Warsaw Faculty of economic science, 2010)*

Discussion of Econometric results

As explained above, the Johansen test results three cointegration equations. The next step is to test and identify endogenous and exogenous variables based on weak Exogeneity test using Granger Causality/Block Exogeneity Wald Test. This helps us to identify weakly exogenous variables in the system and can enter on the right hand side of VAR. Thus, there is no loss of information by modeling weak exogenous variables (Harris, 1995). Accordingly, the table below indicates LNPCGDP and UR are weakly exogenous variables.

Table 5.6: Weak Exogeneity test

Variable	Chi-sq	Probability	Conclusion
LNPCHHFC	17.39200	0.0263	endogenous
EDU	22.68208	0.0038	endogenous
UR	12.70395	0.1224	weakly exogenous
PCI	14.39086	0.0721	endogenous
LNPCGDP	9.811680	0.2785	Weakly exogenous

After examining weak exogenous test and identifying weakly exogenous variables, the long run models are specified as follows[17].

[17] *Test on the significance of β coefficients for exogenous variables is attached to appendix IV.*

Estimated long run model for per capita consumption expenditure (LNPHHFC)

LNPCHHFC + 0.031677UR* - 1.234594LNPCGDP (-1) ** = 0

(0.00933) (0.09573)

Where; the standard errors are in parenthesis.
* - significance at 5%, ** - significance @ 1 %

As shown from above, the coefficient of urbanization is found negative and statistically significant at 5 percent level. The result suggests in the long run, a unit change in urbanization results per capita consumption expenditure to respond negatively by approximately 3.2 growth rate. It may be associated with higher food budget share in the rural areas than urban areas as per the findings of Delisle (1980). This study shows that, the income elasticity of food expenditure for certain products is higher in rural areas than that of their urban counterparts. A related study by Guush, et al (2011) found Per capita intake of calories is higher in rural Ethiopia than their urban counterpart attributed to disparities in the availability and it may partly cause per capita consumption expenditure to the decrease in the urban areas. On the other hand, it may be associated in the end, more economies of scale adaptation, stability in living conditions, and accessibility of financial institutions with saving facilities and other in urban areas can reduce consumption expenditure.

From the other angle, there are wider disparities in access to food and other resources within the urban population than the rural population. In many ways, the food and nutrition situation of the urban poor may be worse than that of their rural counterparts because, for example, of a lack of in-kind income and dependence on the market

economy, low access to existing services, adverse environmental conditions and the time constraints of women contributes to minimal food expenditure in the urban areas in the long run (Delisle , 1980).

The above long run equation shows economic growth significantly and positively affects private consumption expenditure at 1% level of significance. The empirical estimate reveals a percentage increase in per capita GDP results a 1.23 percentage increase in consumption expenditure in the long run. It indicates that the lion share of income of the people is devoted to consumption purpose. The availability of new and durable products puts pressure for the people to expend more for consumption purpose.

Estimated long run model for Education enrollment (EDU)

EDU - 14.77601UR* -127.3020LNPCGDP (-1)** = 0

(1.25117) (12.8323)

Where; the standard errors are in parenthesis.
* - significance at 5%, ** - significance @ 1 %

From the model, it is shown urbanization has a positive and significant (at 5%) impact on education enrollment in the long run. It discloses, urbanization improves enrollment to education. Empirically, a unit increase (decrease) in urbanization leads an increases (decreases) education enrollment by 14.77 percent respectively. Obviously, it is the availability of more education facilities in the urban areas makes education enrollment high.

On the other, the long run equation shows that, economic growth and gross enrollment ratio are positively and significantly associated[18]. Economic growth has significant positive effect on gross enrollment ratio at 1% level significance. Empirically it shows a percentage increase in per capita GDP helps gross enrollment ratio to increase by 1.27 percent in the long run. It can be justified when income increases it pushes the demand for education up. Because it relaxes the constraints on educational expenditure at micro and macro level. A rise in income helps parents to send their child to the school. On the other way, economic growth leads the government to expend more on education sectors and encourage for enrollment.

[18] *Note that; it is the finding on the reverse impact of growth on human capital accumulation unlike most literatures, which deals on the role of human capital investment on economic growth.*

This result is consistent with the findings of Tadele & Erreygers (2009), in which higher income was found to stimulate investment in human capital. Similarly, the result goes with the study of Khan and Khilji (2011) in their study of the relationship between economic growth and education. Using a time series analysis, their finding confirms education has a long run relationship with economic growth. However, in the short-run education does not have any significant relationship with economic growth. This finding is also in line with the findings of Saiful, Wadud and Islam (2007) indicating education and GDP growth have a bidirectional causality of each other.

Estimated long run model for political freedom (PCI)

PCI - 0.408372UR* - 45.92284LNPCGDP ** = 0

(0.78159) (0.81622)

Where; The standard errors are in parenthesis.
* - significance at 5%, ** - significance @ 1 %

Based on the model, it is shown urbanization influences political freedom positively and significantly at 5%. Empirically, political freedom is measured through a regime scores (the index) ranges from -10(fully autocratic) to 10(fully democratic)[19]. Given this, the result suggests a percentage increase in urbanization improves political freedom by 0.4 polity level[20] in the long run. It is due to the fact; more institutions with the aim of protecting political freedom are available in urban areas relative to their counterpart in rural areas. Further, in the long run more communication associated with more population and technology makes people in the urban areas to stand and ask for their rights.

From the model, it is found that economic growth and political freedom have a positive association in the long run. Economic growth in terms of per capita GDP significantly affects the determination of political system to be competitive enough. The study found that a unit change in LNPCGDP, leads to 0.45 changes in polity score in the long run. Implying more income will lead for more political freedom.

[19] *Detail is found in the appendix of illustration Appendix XII*

[20] *It is the unit of measurement of political freedom.*

The result is consistent with the "Lipset hypothesis" Lipset (1959) within the theory of wealth and democracy. The positive association between growth and freedom also is repeated by others like Jackman (1973), Bollen (1979, 1983), Bollen and Jackman (1985), Brunk, Caldeira and Lewis-Beck (1987), Buckhart and Lewis-Beck (1994), Vanhanen (1997), Barro (1999), and Przeworski, Alvarez, Cheibub and Limongi 2000, among others, as cited by a more recent work of Lipset (1993, 2004).

In summary, for the analysis it is found that, in the long run, urbanization has a negative impact on per capita consumption expenditure and positive impact on education enrollment and political freedom. Economic growth on the other hand is found to have a positive and significant impact on all endogenous variables at 1% level.

5.2.2.2 Short Run Relationships (Vector Error Correction Model (VECM))

Following and supported by a unit root tests and "Johansen Max and Trace" cointegration test, the VECM is ready to tell us about the short run behaviour prevail among the variables by restricting the long run behavior of the endogenous variables to converge to their co integrating relationships while allowing for short-run adjustment dynamics. The existence of cointegration between (selected) variables in VAR model means that it can be represented in a form of error correction mechanism – in that case Vector Error Correction (VEC) containing the long run co integrating coefficients and coefficients on the lagged first difference terms (short run parameters).

Following the optimal lag length determination, the maximum lag length that can be used in the error correction model is one. Starting from the first lag for all variables, the current and lagged observations on variables are excluded from the final parsimonious model based on tests of significance of coefficient[21]. The parsimonious error correction models are given in table below.

Table: 5.7 Parsimonious Error Correction Model for consumption expenditure

Dependent Variable: D(LNPCHHFCt)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**P- Value**
DLNPCHHFC(-1)	-0.748196 ***	0.277934	-2.691995	0.0083
DLNPCGDPT (-1)	0.925131**	0.422655	2.188853	0.0309
ECM1	-0.783322***	0.278475	-2.812895	0.0062

** Significance @ 5% , *** significant @ 1%

The result from the above reveals that both consumption and per capita GDP have significant role in the short run dynamics of consumption expenditure. Besides, the short

[21] The complete Test result for all models is given in Appendix V.

run model tells us other variables have no significant role in determining the short run fluctuation of consumption expenditure.

The short run impact of consumption expenditure on the consumption expenditure itself is found negative at 1% level. That is consumption expenditure at one period before is found to have a negative and significant impact on the current consumption expenditure. Which means that a 10 % increase in consumption at time t-1 leads a decrease in consumption at time t by 7.5%?

On the other hand, economic growth is found to have a positive and significant impact on consumption expenditure in the short run at 5% level. A 10 % rise in economic growth leads for a rise of consumption expenditure by 9.3%. This result is found consistent with the long run impact of economic growth on consumption expenditure.

The coefficients of the error correction terms are interpreted as speed of adjustment to long run equilibrium or the disequilibrium periodically transmitted to consumption expenditure from the endogenous variables.

The coefficient of the error correction term (ECM1) for per capita consumption expenditure possesses the expected negative sign. This guarantees that although the actual per capita consumption expenditure may temporarily deviate from its long-run equilibrium value, it would gradually converge to its equilibrium. The error correction term of -0.783322 shows that 78.33 percent of the deviation of the actual real per capita

consumption expenditure from its equilibrium value is eliminated every year. Hence, full adjustment would require a period of less than one and half year for per capita consumption expenditure to reach its long run value.

Table 5.8: Parsimonious Error Correction Model for education enrollment

Dependent Variable: D (EDUt)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ECM1	37.96374***	10.78613	3.519680	0.0007
ECM2	-0.286714*	0.004037	-1.834038	0.0704
ECM3	-0.801359**	0.365940	-2.189866	0.0309
D(EDU(-1))	0.303127*	0.17257	1.756589	0.0820
D(UR(-1))	-7.138697**	3.377270	-2.113748	0.0370
D(LNPCGDP(-1))	49.12680***	15.57660	3.153885	0.0021
Constant	1.281496*	0.661870	1.936174	0.0557

* Significance @ 10 % ** significance @ 5% , *** significant @ 1%

The result from the above suggests that, the short run dynamics of education enrollment is positively and significantly influenced by the previous year education enrollment and

economic growth at 10 % and 1 % level respectively. This means that, a percentage increase in education enrollment at time t-1 contributes for 0.3 percentage increase in education enrollment at time t. It may be due to the fact more education helps people to recognize the value of education to human wellbeing (Sheffield, 1973). It should also be noted that, school repetition and readmission could also contribute for increasing of education enrollment in the latter periods. Similarly, a percentage increase in GDP per capita results approximately 0.5 percentage increase in education enrollment in the short run. It shows both in the short run as well as long run economic growth has a positive and significant contribution for education enrollment.

On the other, the model shows urbanization has a negative and significant impact on short run fluctuation of education enrollment in spite of its long run sign. According to the result, a 1% increase in urbanization results for approximately 7% decrease in education enrollment in the short run. It can be associate with rapid urbanization in the country through the rural urban migration (Golini , 2007) which indicates the prevalence of a significant number of illiterate persons in the cities. According to Oketch & Ngware (2012), rapid urbanization has led to great urban inequalities that the national education statistics seem to mask. For example, a significant proportion of the residents in urban areas live in the slums where access to public services is of either very deplorable quality or non-existent. Further, huge rural urban migration decreases enrollment in the rural areas and because of negative impact of rapid urbanization on education provisions in the urban areas, the immigrants will left out of school in the short run (Oketch & Ngware, 2012).

However, it should be noted despite the fact in the short run, urbanization has a positive contribution for long run dynamics of education enrollment. It implies in the long run challenges of educational provisions and inequalities are eliminated and positive contributions of urbanization will outweigh in the long run.

The coefficient of error correction term for education enrollment (ECM2) has a negative sign as expected and is statistically significant at 10 percent level. This result ensures that education convergences to its long run equilibrium with more than three years period. The error correction term of -0.286714 shows that approximately 29 percent of the deviation of the actual education enrollment from its equilibrium is eliminated every year.

The coefficient of ECM3 (-0.801359) is the error correction term which is the speed of adjustment to the long run equilibrium of education enrollment periodically transmitted from the disequilibrium in political freedom. It shows that more than 80 percent of the deviation of actual education enrollment from its equilibrium attributed to the disequilibrium in political freedom is eliminated every year, indicating that less than 18 months is required for full adjustment. Given due attention to the definition of political freedom, the result is sensible.

The coefficient of ECM1 (37.96374) implies that any disequilibrium in per capita consumption expenditure making convergence of education to its long run value difficult.

I.e. the disequilibrium in consumption expenditure influences education enrollment by 37 percent per year in the same direction.

Table 5.9: Parsimonious Error Correction Model for political freedom

Dependent Variable: D (PCI)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ECM2	- 0.312775**	0.121005	-2.584807	0.0112
ECM3	-0.457194**	0.182922	-2.499395	0.0141
D(UR(-1))	-3.794023**	1.688193	-2.247387	0.0268
Constant	0.596088*	0.330849	1.801695	0.0746

* Significance @ 10% ** significance @ 5% ,

In the parsimonious model, the short run impact of urbanization on political freedom is found negative and significant at 5 percent. Which means that a one percent increase in urbanization results approximately 3.8 units decrease in political freedom in the short run which is contrary to the long run relationship. The possible justification is associated with the consequences of rapid urbanization. At the times of rapid urbanization, changes occurred hand-in-hand with the arrival of immigrants. Anti-immigration acts, problems that resulted from overcrowded cities, and problems with the civil service commission, are just some of the side effects that urbanization and immigration results. These and

other consequences may expose the people for insecurity in their political freedom in the short run.

Further, it may be associated it takes long for the people to ask for their rights as well as institutions with the aim of protecting political rights and civil liberties to be established and start effective actions. Hence, in the short run, a rise of urbanization may create challenges in administration and protecting political freedom. In contrast to these, in the long run, urbanization has a positive role for political freedom attributed to the elimination of problems that were exist in the short run.

The coefficient of error correction term for political freedom (ECM3) has a negative sign as expected and is statistically significant at 5 percent level. It indicates PCI has the speed of adjustment of more than 45% per year for any disequilibrium originates from itself. Hence, full adjustment needs more than two years.

The coefficient of the error correction terms (ECM2) is interpreted as speed of adjustment to long run equilibrium of political freedom periodically transmitted from disequilibrium in education. The coefficient - 0.312775 tells us that political freedom adjusts to its long run equilibrium with the speed of 31% per year for the disequilibrium originates from education enrollment. Implying full adjustment needs less than three and half years.

In summary, in the short run, economic growth is found to influence per capita consumption expenditure and education enrollment positively and significantly. Whereas, it has no significant impact on political freedom in the short run, unlike its impact in the long run. Urbanization on the other, is found to influence political and social representative variables significantly and negatively in the short run unlike the long run case.

5.2.2.2.1 Post estimation Diagnostics Tests

In the study, different post-estimation diagnostic tests were performed to guarantee that the residuals from the models are Gaussian, that the assumptions are not violated and the estimation results and inferences are trustworthy. The diagnostic test results could also be used as indicators of the validity of employing impulse-response functions and variance decomposition analyses.

VECM Residual Normality Test

Multivariate version of the Jarque Bera tests is used to test the normality of the residuals. It compares the 3^{rd} and 4^{th} moments (skewness and kurtosis) to those from a normal distribution. The test has null hypothesis stating that the error term in the model has skwness and kurtosis corresponding to a normal distribution. The results in Table 5.12 show that we fail to reject the null hypothesis of jointly normally distributed.

VECM Residual serial correlation Test

The table below presents the results of the Residual Vector Serial Correlation LM Lagrange Multiplier test for VEC model. This tests is used to test for the overall significance of the residual autocorrelations up to lag 4. The results suggest that there is no obvious residual autocorrelation problem up to lag4 because all *p*-values are larger than the 0.01 level of significance.

Table 5.10: Diagnostic checks for VECM.

Test	**Statistic**		**P-Value**
Residual Vector Serial Correlation LM 25df	Lag	Chi-sq	
	1	17.69339	0.8551
	2	31.62740	0.1691
	3	22.85114	0.5863
	4	11.17369	0.9921
Residual Vector Normality (Jarque-Bera) 10df	Joint	17.59487	0.0622
Residual Vector Heteroskedasticity 240df	Joint test	240.9426	0.4707

VEC Residual hetrosckedasticity test

Finally, White's hetrosckedasticity test that is the extension of White's (1980) tests to systems of equations, scrutinizes hetrosckedasticity of residuals. Under the null hypothesis of no hetrosckedasticity, the non-constant regressors should not be jointly significant (Johnston and Dinardo, 1997). The joint test (Table 5.12), testifies that we fail to reject (at 10% level of significance) the null hypothesis of the non-constant regressors are not jointly significant thereby proving that there is no heteroskedasticity with the specified VECM.

Model Stability Test

Even though the residual tests indicated that the VECM was specified correctly, we need to pursue more tests to check the appropriateness of the VECM estimated. The inverse roots of the characteristic AR polynomial help test stability (stationarity) of VECM. The estimated VECM is stable (stationary) if all roots have modulus less than one and lie inside the unit circle (Johnston and Dinardo, 1997). As portrayed in Figure 5.6, all the roots lie inside the unit circle. Therefore, the results suggest that the VECM model satisfies the stability condition.

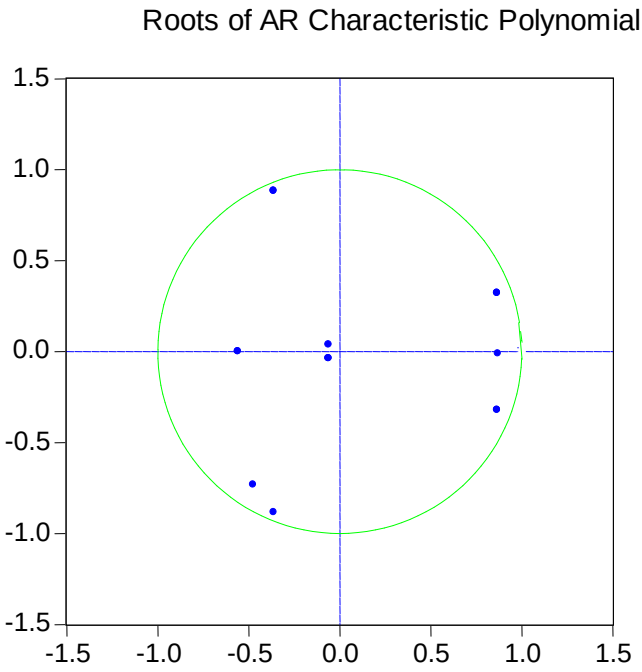


Figure 5.6: Roots of the AR characteristic polynomial

Granger Causality Tests

It carries out pair wise Granger causality test and tests whether an endogenous variable can be treated as exogenous. Moreover, it examines the existence of causation among the variables of interest. A lag length of 3 is picked, expected to correspond to reasonable beliefs about the longest time over which one of the variables could help predict the other. The following table makes obvious the existence of bi-directional causality between UR and EDU, LNPCGDP and EDU, LNPCGDP and UR, and LNPCHHFC and UR.

PCI granger causes EDU, LNPCGDP and LNPCHHFC. On the other LNPCHHFC is Granger caused by all other variables. Note here that LNPCGDP Granger causes all other

variables except PCI. In all the result shows there is much granger causality effect among the variables indicating the appropriateness of use of VAR approach.

Table 5.11: Granger Causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
UR does not Granger Cause EDU	28	3.27235	0.0414*
EDU does not Granger Cause UR		3.43486	0.0355*
PCI does not Granger Cause EDU	28	4.54026	0.0133*
EDU does not Granger Cause PCI		0.50515	0.6829
LNPCGDP does not Granger Cause EDU	28	5.62404	0.0054*
EDU does not Granger Cause LNPCGDP		5.37956	0.0066*
LNPCHHFC does not Granger Cause EDU	28	1.38605	0.2746
EDU does not Granger Cause LNPCHHFC		3.53851	0.0323*
PCI does not Granger Cause UR	28	0.28689	0.8343
UR does not Granger Cause PCI		0.03465	0.9911
LNPCGDP does not Granger Cause UR	28	3.10390	0.0485*
UR does not Granger Cause LNPCGDP		3.88603	0.0235*
LNPCHHFC does not Granger Cause UR	22	3.11466	0.0480*
UR does not Granger Cause LNPCHHFC		3.39331	0.0369*
LNPCGDP does not Granger Cause PCI	22	0.11188	0.9522
PCI does not Granger Cause LNPCGDP		3.90178	0.0232*
LNPCHHFC does not Granger Cause PCI	22	0.30565	0.8210
PCI does not Granger Cause LNPCHHFC		3.17911	0.0452*
LNPCHHFC does not Granger Cause LNPCGDP	22	1.20838	0.3311
LNPCGDP does not Granger Cause LNPCHHFC		4.18647	0.0180*

* Significant at 5% level

5.2.2.2.2 Impulse Responses functions (IRF)

To transform impulses the study uses the generalized impulses option as described by Pesaran and Shin (1998) which constructs an orthogonal set of innovations that does not depend on the VAR ordering. Generating the impulses/innovations and observing responses for all variables in the VAR, the result in appendix VI is obtained by the use of multiple graph.

The result indicates that the response of LPCHHFC significantly attributed to shocks in itself and all other variables except for PCI, which is negative after three periods. The result from appendix VI shows LPCHHFC responds positively and significantly to a one standard deviation shock in all variables except for PCI. Looking for LPCGDP (first row column 5), it reveals a one standard deviation in economic growth will have a positive and significant effect on consumption expenditure. The positive and significant association of GDP with consumption is consistent with many theories of consumption, demonstrating the positive relationship between income and consumption expenditure. It implies, the changing of income highly influences the consumption pattern of individuals. In general, the exogenous shock in per capita consumption expenditure shows a slow transitory pattern in converging to its long run time path.

Looking for the impulse response function of education enrolment, the response of education is significant and positive for shocks in education itself, political freedom and urbanization. Appendix VI second row shows one unit standard deviation in the above variables significantly and positively responded by education enrollment. Besides, the

figure embraces in the initial period education enrolment respond positively to one standard deviation shocks in economic growth and negatively after 4^{th} period.

On the other hand, a one standard deviation shock in LPCHHFC is responded positively by education enrollment for some period. Implying private consumptions expenditure includes expenditures on educational facilities (resources) and these influences enrolment positively.

An attempt was also made to show the response in political freedom to a one standard deviations shocks in other endogenous variables (appendix VI row 3). It is found that political freedom significantly responds to itself, education and urbanization. The function shows significant and negative response of political freedom to a one standard deviation shocks in urbanization and positive and significant response to a one standard deviation in education and itself.

Concerning urbanization, Appendix VI row 4 shows a one standard deviation in consumption expenditure, education enrollment, political freedom and urbanization brings a positive and significant response from urbanization. Pertaining to economic growth, a one standard deviation in this variable brings a negative response from urbanization although it is insignificant initially. It indicates when the income of people rises they prefer to live in the place where their income rises and on the contrary when income of people decreases they will migrate to the urban areas for better income search.

Further, the response of economic growth is assessed against the quality of life indicators. The response in economic growth is significantly credited to shocks in all variables in the VAR except for PCI. Accordingly, economic growth responds positively and significantly for one standard deviation shocks in economic growth itself, consumption expenditure, urbanization[22], and education. All the results are supported with many macroeconomic theories and is consistent with results from VDF of economic growth. The justifications behind are being consumption is the component of economic growth by itself and the positive impact of human capital on economic growth. Moreover, in case of urbanization, in the short run, it may take some form of adjustments for the economy to boost. But in the latter periods urbanization results the economy to boost by making resources available for the economy.

In summary, a one standard deviation in economic growth has a positive and significant impact on economic representative variable-private consumption expenditure and social representative variable-primary education enrollment in the initial period.. But it has insignificant positive impacts on the political representative variable polity composite index unlike its result in the long run. In the reveres impact, economic growth is found to respond positively and significantly for a one standard deviation in economic growth itself, consumption expenditure and education enrollment. And it has insignificant response to political freedom and urbanization in the initial periods

[22] *In the initial periods the response of economic growth to urbanization is found insignificantly negative but in latter periods.*

5.2.2.2.3 Variance Decompositions (VDCS)

Variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR. It indicates the fraction of the variance of an endogenous variable to other variables in the VAR. Thus, the variance decomposition provides information about the relative importance of each random innovation in predicting the variables in the VAR.

In this study, the aim is to decompose the variance of all variables with emphasis on variables of quality of life indicators attributed to the innovations to each of the other variables. And more emphasis is given to the contribution of innovation of economic growth to the representative variables. It answers the question of how much of the variance of each element of $[Y_t]$ is due to the first error term, the second error term, the third error term and so on?

The forecast error variance decomposition in appendix VII show economic growth and urbanization (after the fourth period) best explains the variation in the forecast error of consumption expenditure next to its own innovation. In the first period the variance of per capita consumption expenditure is exclusively generated by its own innovations and it has the dominant share of more than 84 % in all the time horizon. In the latter periods next to its own innovation, per capita GDP and urbanization contribute more in explaining the forecast error variance of consumption expenditure. Looking for other variables, EDU and PCI, have no significance contribution in predicting for future consumption expenditure of the country even though EDU has a rising contribution.

Concerning education, most of the forecast error variance (> 35%) for education is due to its own innovation followed by per capita private consumption expenditure up to the 6th period and UR from 7^{th} to 10^{th} period. Appendix VIII shows in the initial period per capita consumption expenditure and PCI best explains variance of forecast error of EDU next to its own innovation. Pertaining to economic growth and urbanization, their importance in predicting of the movement of education goes increasing beginning from the initial period which is also consistent with IRF result.

Looking at appendix IX for PCI, the variance of the forecast errors is best explained by education up to 5th period and urbanization for 6^{th} and 7^{th} period next to its own innovation. LNPCHHFC takes the dominant share from 8^{th} to 10^{th} period.

Coming to urbanization (appendix X), variance of the forecast error of urbanization is best explained by itself up to the 7^{th} period followed by EDU for the 8^{th} period and LNPCHHFC for the last two periods.

With reference to economic growth (appendix XI), in terms of per capita GDP, variance of forecast error of economic growth is best explained by its owen innovation in the first period. Consumption expenditure best explains the forecast error variance of economic growth beginning from the 2^{nd} period up to the 10^{th} period.

In general, looking for the importance of economic growth in explaining for the variance of forecast error variance of quality of life indicators, in the initial periods it seems insignificant except for economic growth itself and per capita consumption expenditure. However, importance of economic growth in explaining for the forecast error variance of all other variables is rising over time.

CHAPTER SIX

6. CONCLUDING REMARKS AND SUGGESTIONS

6.1 Concluding remarks

Following the rising of the Ethiopian economy from the last two decades onwards, this study aims to look into the change and possible nexus in the quality of life using a time series approach ranges for the period (1981-2011). It tries to investigate the possible nexus that can exist between economic growth and quality of life through its indicators. Even though quality of life indicators can be broadly of classified as objective and subjective indicators, due to the fact mentioned above[23] this study is rather uses only the objective indicators classifying them as economic, social and political representative variable indicators. In addition, it attempts to look for the nexus that possibly may exist within the quality of indicators. The study uses the long run and short run analysis approaches to scrutinize the nexus among economic growth, per capita consumption expenditure, urbanization, political freedom and education enrollment to dig out the econometric analysis output and used descriptive analysis over time.

The trend analysis is done for all the variables included in the descriptive analysis. It shows per capita GDP, per capita consumption expenditure, percentage of population that

[23] *In addition to absence of data, including of subjective indicators makes the study more broad and un manageable.*

have access to improved water source and improved sanitation service, number of people of internet users and mobile subscribers per 100 people, the emission of CO_2 from liquid fuel consumption, from residential and commercial building, and transport service, urban population as a percent of total population, combined gross enrollment ratio[24] and political freedom, have shown a rising trend on average for the period they are studied[25]. In particular, from all the variables considered, per capita consumption expenditure and primary gross enrolment ratio have approximately similar trend with the trend of economic growth. On the other, the number of people with internet users and mobile subscribers, is a recent data beginning from early 2000 and is showing a fast growth trend. Further, the correlation analysis let somebody see per capita consumption expenditure and gross education enrollment are significantly correlated with each other and economic growth. While urbanization and political freedom have positive but low level of association with economic growth.

The econometric analysis examines the nexuses exist among per capita GDP, per capita consumption expenditure, urbanization, gross primary education enrollment ratio and political freedom by the use of long run and short run analysis approaches. The result discloses, in the long run, per capita consumption expenditures political freedom, and gross enrollment ratio has significant and positive relationship with economic growth at 1percent significance level. In the long run, per capita consumption expenditure is found significantly influenced by economic growth which implies much of the income of the

[24] *Refers to the combination of primary secondary and tertiary education enrollment*

[25] *Based on the availability of data period of study differs for some variables*

people is devoted for consumption purpose. Moreover, it is consistent with findings of others and economic theories of consumption.

Similarly, economic growth is found to influence political freedom and education enrollment significantly and positively in the long run. Implying economic growth improves political freedom and it raises the demand for education by relaxing the constraints of education expenditure as well encouraging for expenditure in the education sector.

The short run effects of economic growth on the objective indicators of quality of life as well as the effect on each other of the variables was attempted to be captured by estimating the vector error correction models. In line with this, the role of economic growth in influencing consumption expenditure and education enrollment is found significant and positive the same to its long run impact. On the other hand, unlike to its long run impact, economic growth has no significant role in determining political freedom in the short run.

From the impulse response function, per capita consumption expenditure and economic growth significantly and positively responds for a one standard deviation in economic growth. But others political freedom, urbanization and education enrollment, have shown relatively insignificant response to a shock in economic growth in the initial periods unlike the latter periods. It may be attributed to the requirement of adjustment period for economic growth to transmit to improve these indicators.

The result from VD reveals steady result to impulse response function, consequently, economic growth is found explaining significantly and positively only itself and consumption expenditure in the initial periods. For the other variables even if it has a rising trend to explain, in the initial periods it seems insignificant.

Summarizing all, economic growth in terms of per capita GDP was found that in the short run, its impact on quality of life is relatively insignificant for some variables. But its role in improving the quality of life by influencing the indicators positively and significantly is high in the long run. Hence, economic growth needs long run period for quality of life to flourish in the country.

6.2 Suggestions

Given the ultimate goal of a particular study is proposing of potential solutions for a the studied problem, it is vital to forward some policy suggestions around the area for improvement to flourish.

To realize and strength the role of economic growth in improving quality of life in both long run and short run, economic growth needs to be accelerated. In doing so, it requires to make measures on the components of economic growth including expanding physical infrastructures like road and communication facilities, improve both private and public

investments, flourish export performance, use appropriate monetary, physical, trade, exchange rate and other economic policies,

Further, in the model the role of consumption expenditure /demand/, education enrollment, and urbanization are found significantly and positively influence economic growth[26]. Hence, it also calls for to place much investment on these variables to make better the economy.

From the vector error correction model, urbanization is found to have a negative impact on education and political freedom. And the possible source is found rapid urbanization through rural urban migration. Hence, to enjoy the long run benefits of economic growth and urbanization without paying scarification in the short run, the government of Ethiopia needs to have adjustment mechanisms in the short run which may include;

- Early establishment of institutions with the main objective of protecting political freedom,
- Expand and facilitate educational provisions in the rapidly urbanizing areas and build the awareness and capacity of the society about the benefits investing on human capital (education),and
- Change the rural areas into urban cities by establishments of facilities for urbanization to expand and reduce rural urban migration or use rural industrialization scheme.

[26] *It can be found in the IR functions and VD of economic growth. appendixes below*

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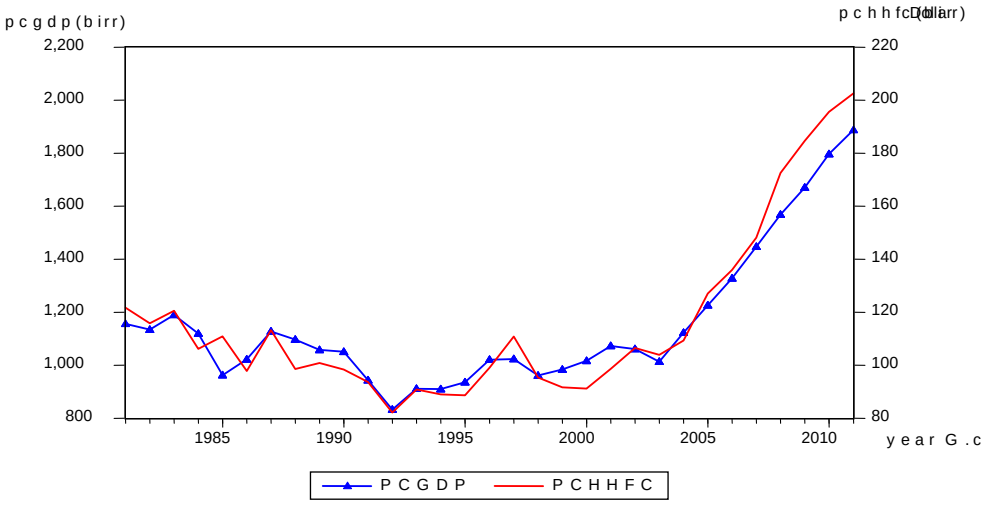
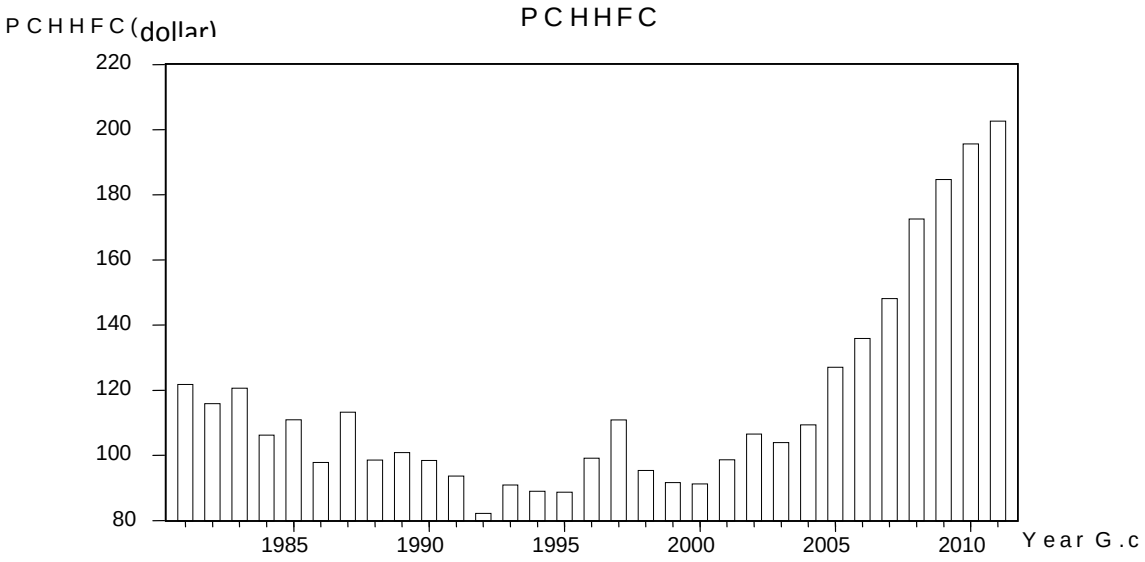
Appendix: I. Graphical representation of variables

Fig I: Trend of PCGDP and PCHHFC for the period 1981-2011 G.c.



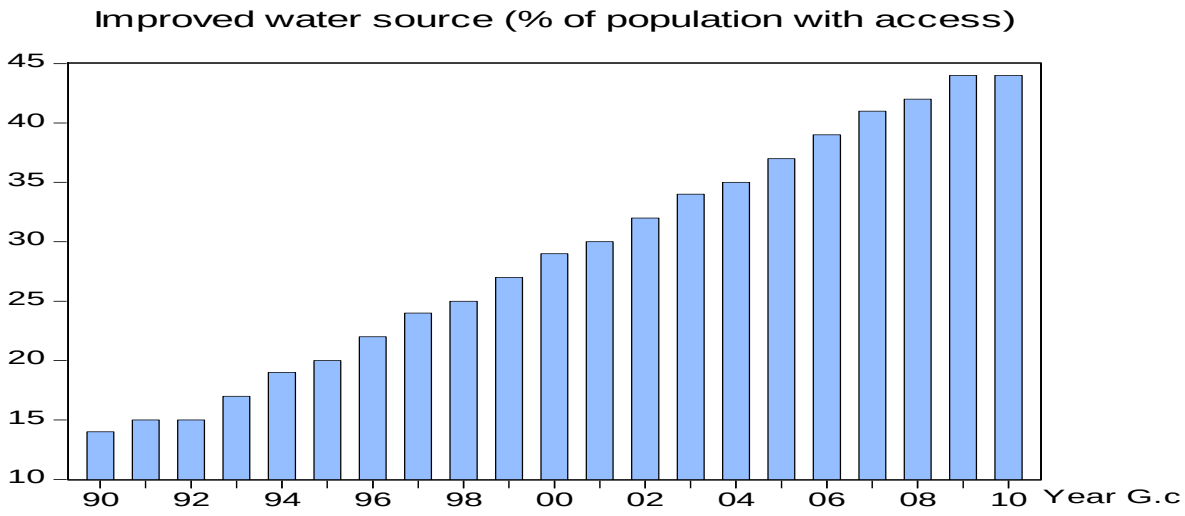
Source: World Bank (2011)

Figure II: Trend of PCHHFC for the period 1981-2011G.c



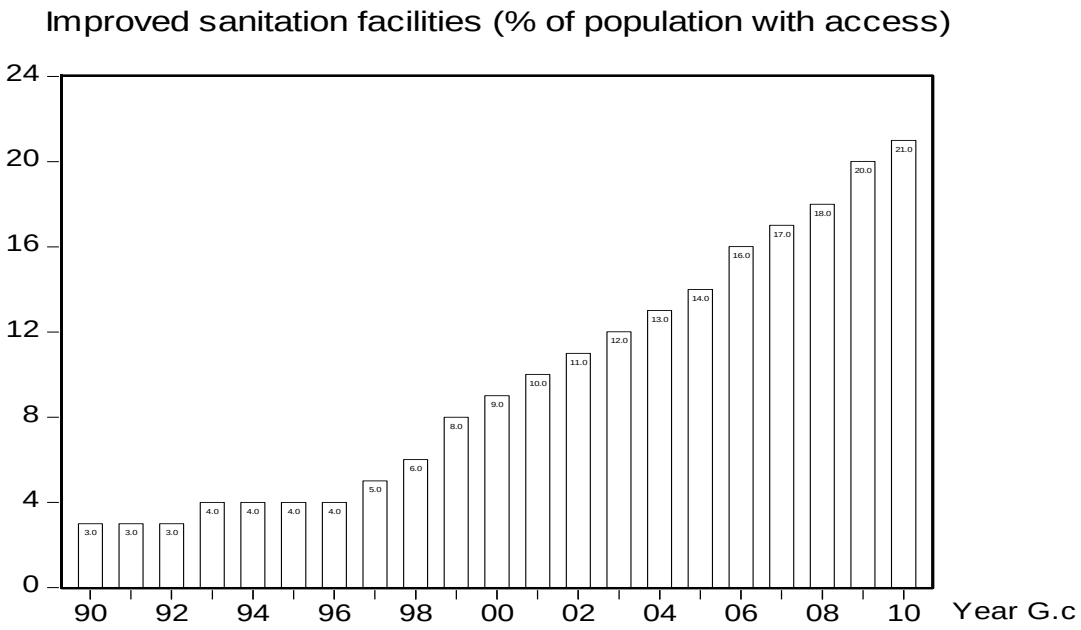
Source: World Bank (2011)

Figure III: Improved water source (% of population with access) (1990-2010)



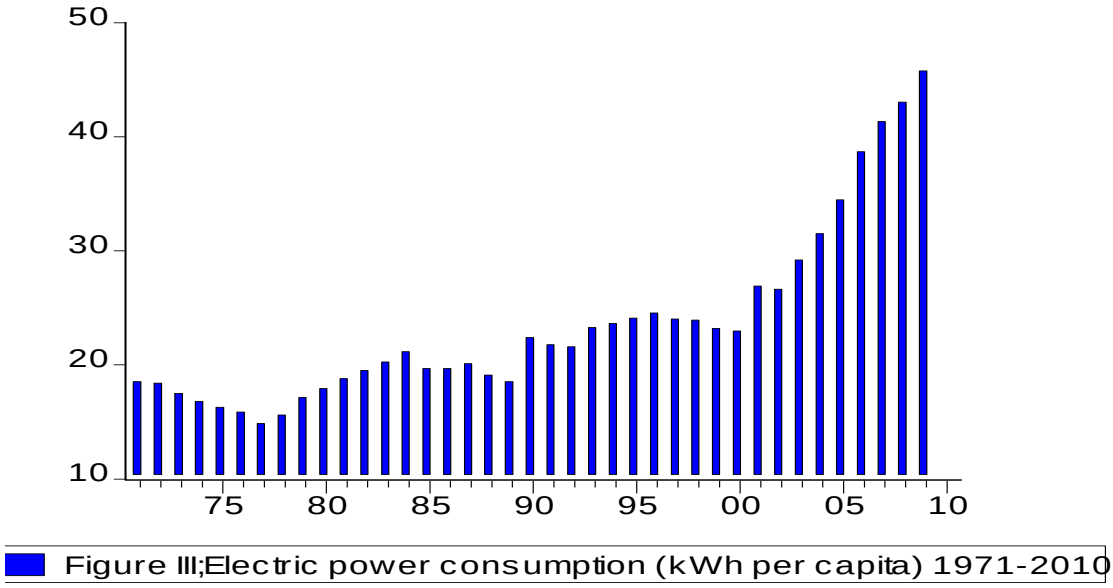
Source: World Bank (2011)

Figure IV: Improved sanitation facilities % of population with access (1990-2010)



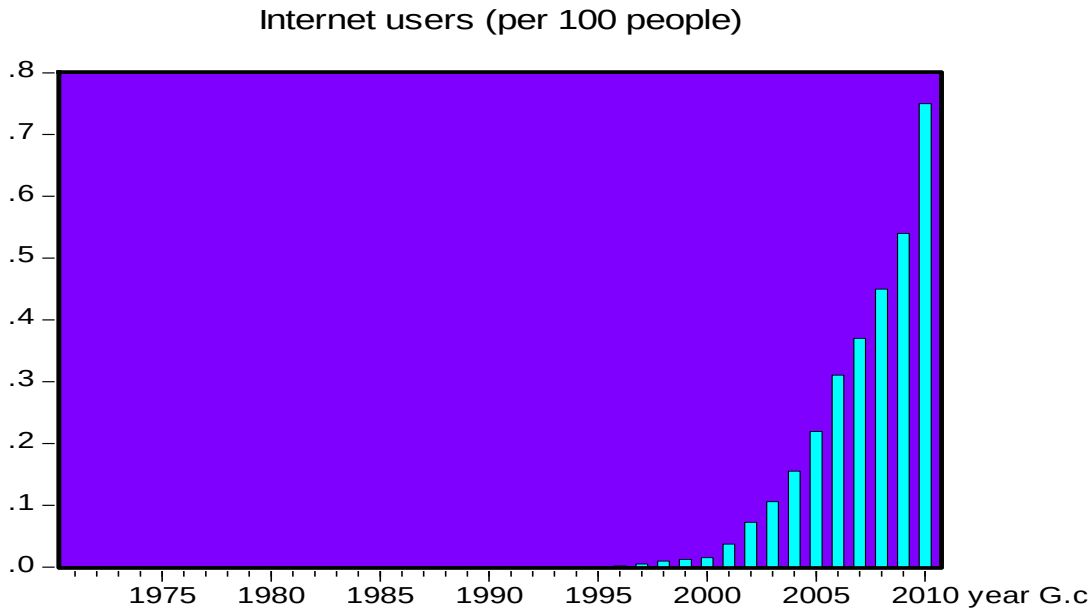
Source : World Bank (2011)

Figure V: Electric power consumption KWh per capita (1971-2010)



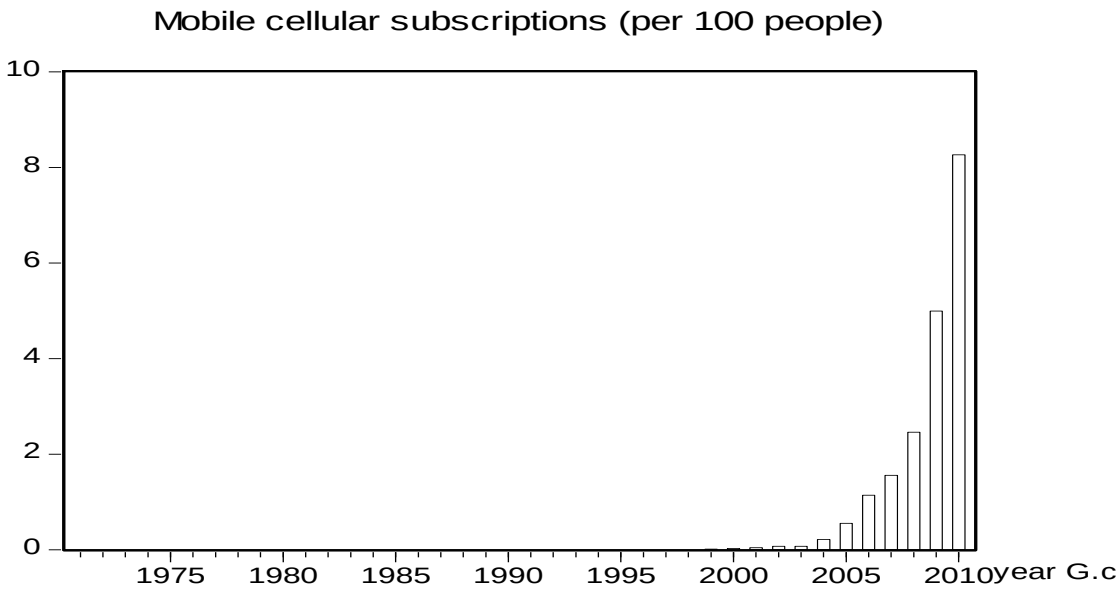
Source: World Bank (2011)

Figure VI: Internet users per 100 people (1971-2010)



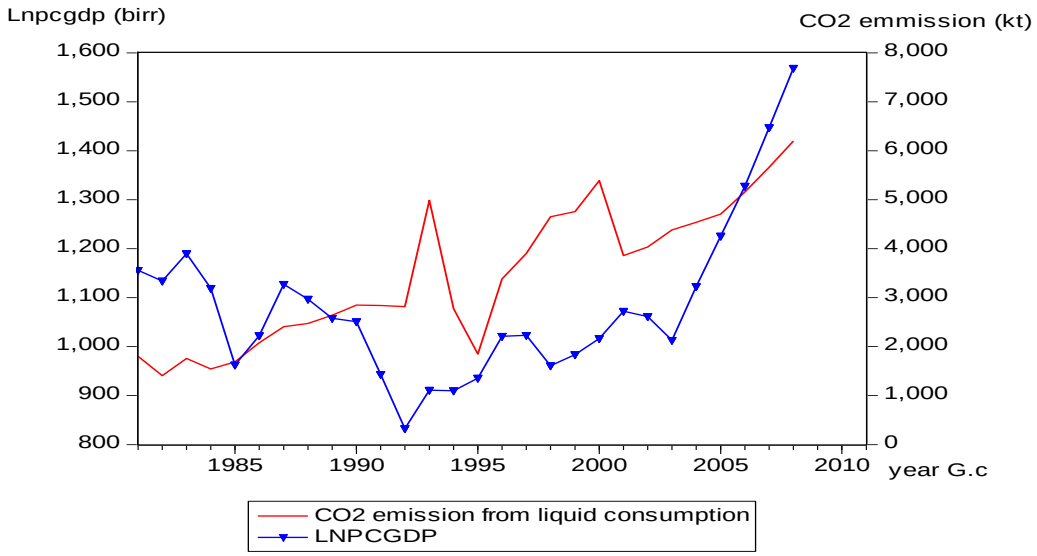
Source: World Bank (2011)

Figure VII: Mobile cellular telephone subscriptions per 100 people (1971-2010)



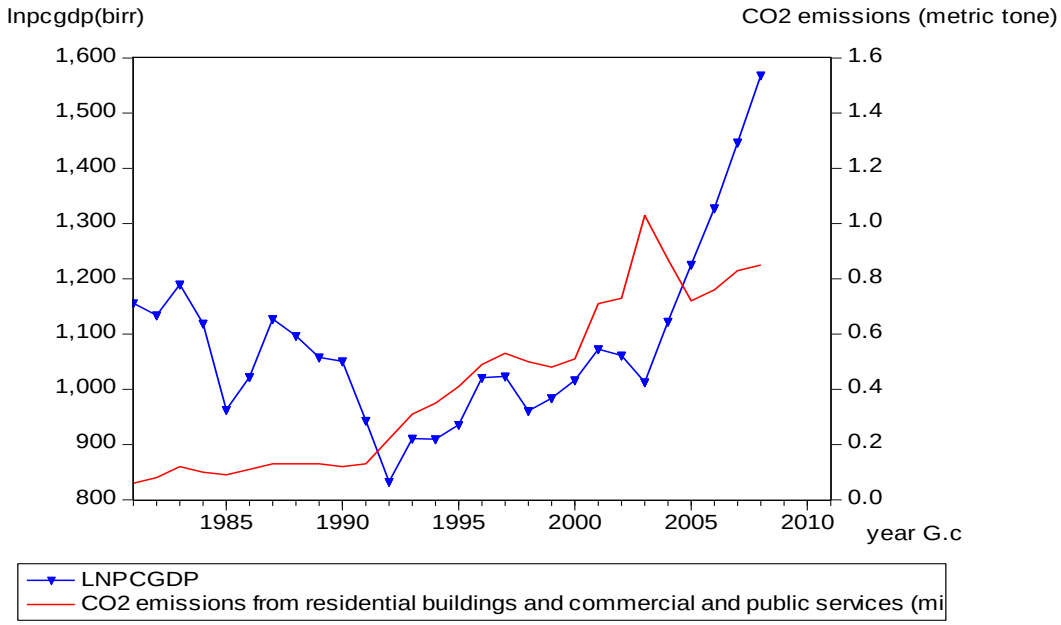
Source: World Bank (2011)

Figure VIII: PCGDP and CO_2 emission from liquid fuel consumption.



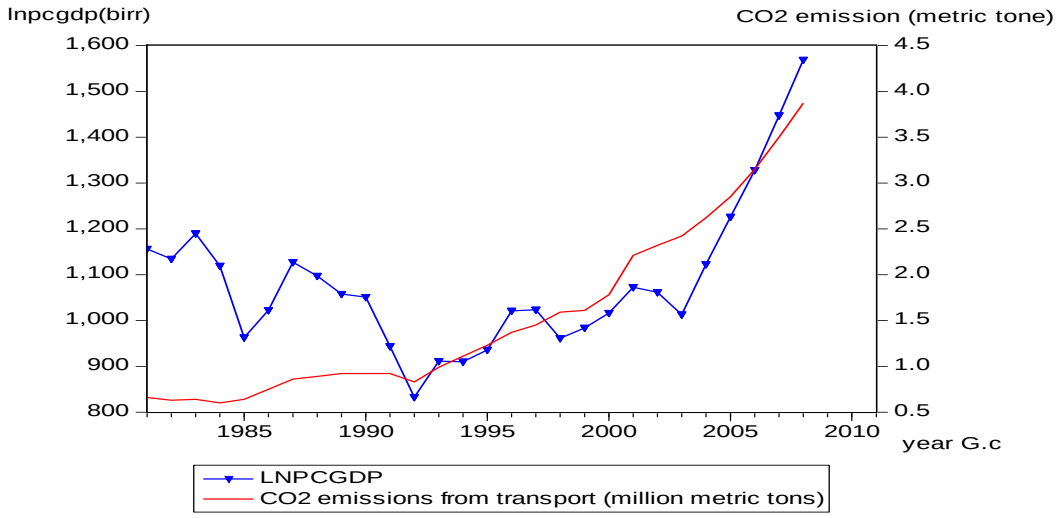
Source: World Bank (2011)

Figure IX: PCGDP and CO_2 emission from residential building and public and private services.



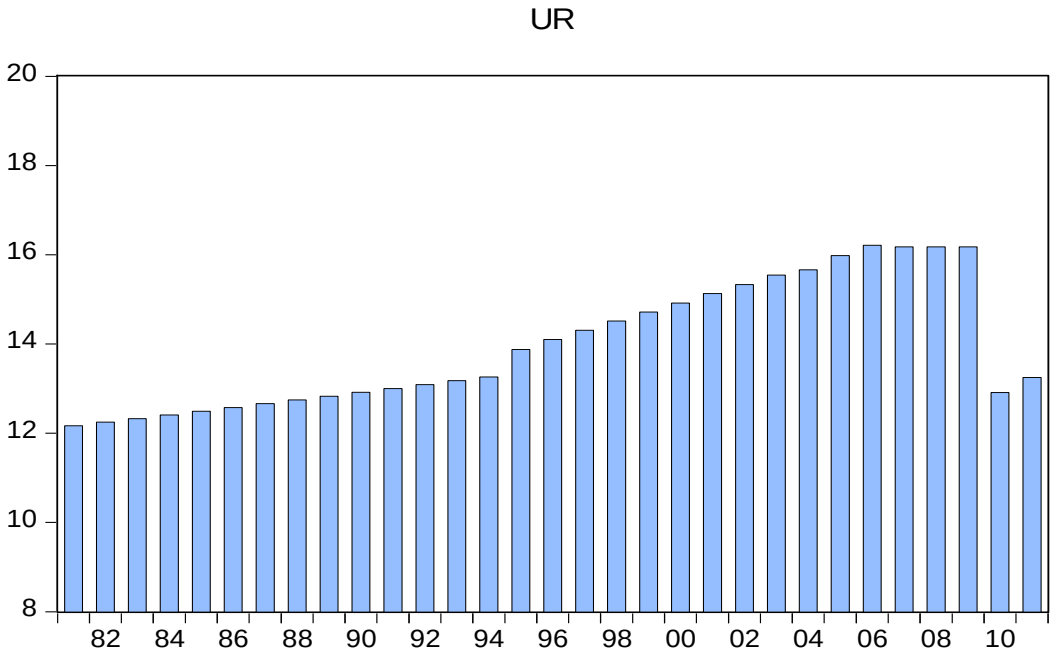
Source: World Bank (2011)

Figure X: PCGDP and CO_2 emission from transport.



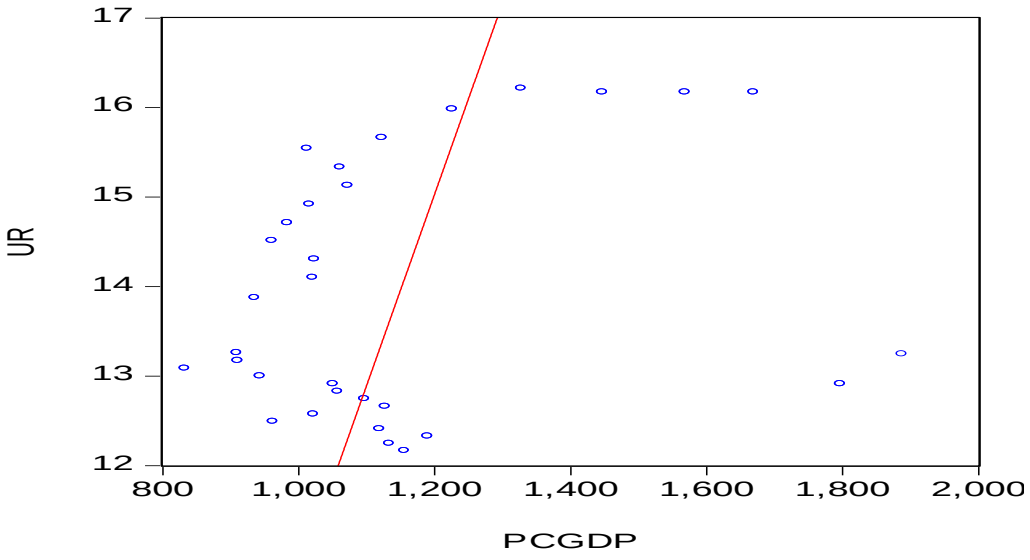
Source: World Bank (2011)

Figure: XI trend of urbanization (% of total population) (1981-2011)



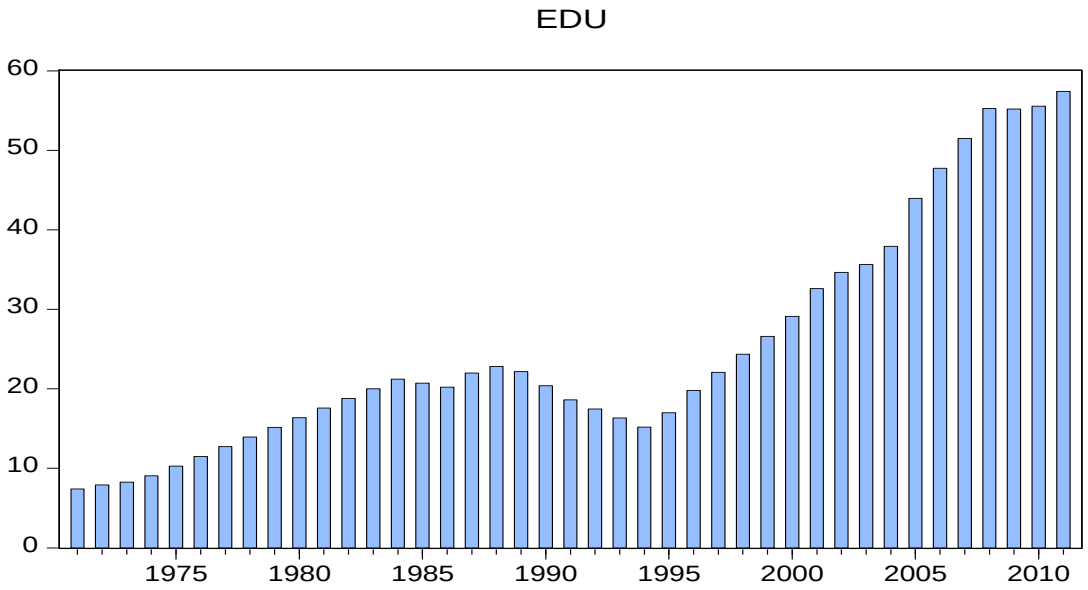
Source: Central statistics Agency (2011)

Figure XII: Percent of Population in Urban Places against Real GDP per Capita (1981-2011) G.c.



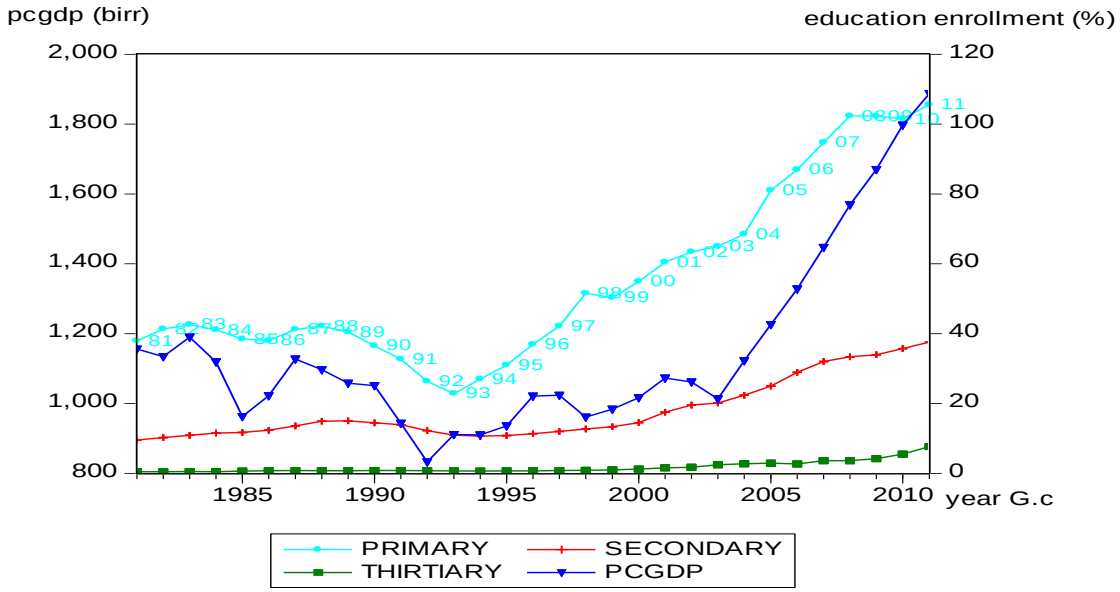
Source: World Bank (2011)

Figure XIII: Trend of Combined Gross Enrollment Ratio for Primary, Secondary and Tertiary Schools since 1971 G.c.



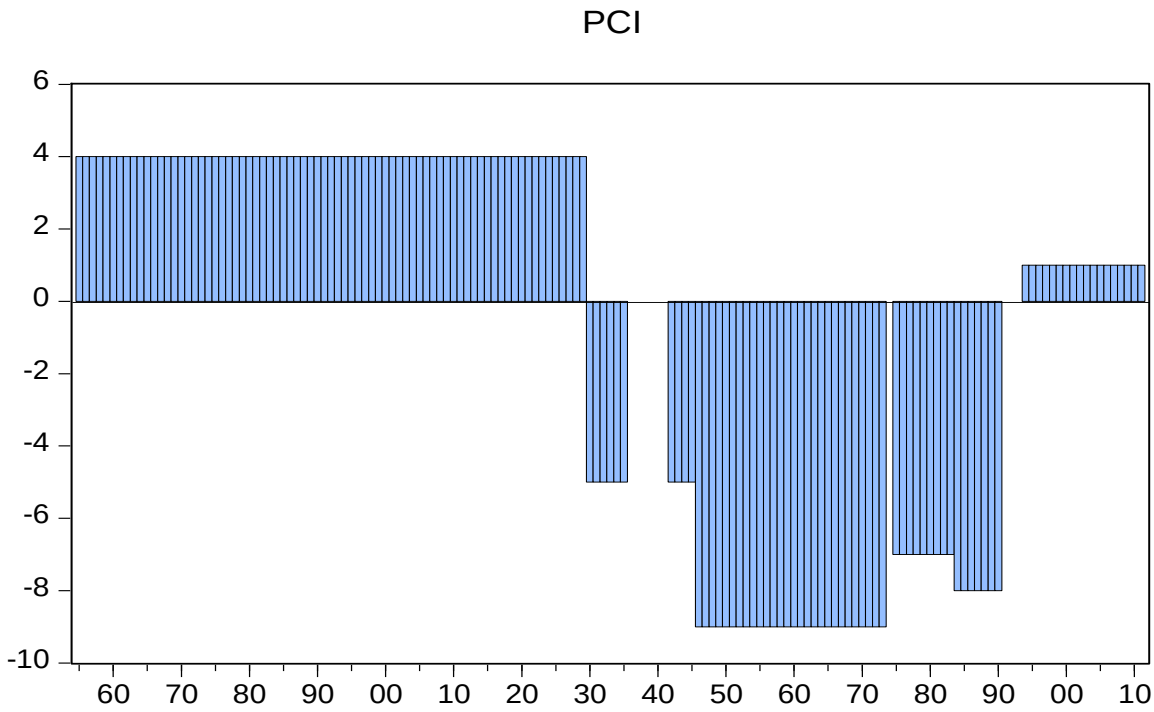
Source: World Bank (2011)

Figure XIV: Gross Enrollment Ratio for Primary, Secondary and Tertiary Schools and PCGDP



Source: World Bank (2011)

Figure XV: Trend of political freedom in Ethiopia beginning from 1955 to 2010



Source: Polity IV project (2011)

Appendix II: Stationary results

PP TEST

variable	Test statistic under different			Order of Integratio
	Intercept	trend and intercept	no trend no intercept	
L(PCGDP)	0.723460	0.078073	1.098594	I(1)
DL(PCGDP)	-3.987820	-5.283271	-3.745157	

L(PCHHFC)	0.773558	-0.280193	1.036090	I(1)
DL(PCHHFC)	-5.717906*	-9.406542	-5.586554	
UR	-1.536683	-0.842483	0.168120	I(1)
D(UR)	-5.365368**	-5.652938*	-5.456644*	
EDU	0.855360	-0.985418	2.278177	I(1)
D(EDU)	-2.843854	-3.517004	-3.517004*	
PCI	-1.255197	-1.599191	-1.593075	I(1)
D(PCI)	-5.379132	-5.338267	-5.291503*	

Note 1. Maximum Bandwidth for PP test is decided based on Newey-West (1994)

2. Prefix ‘’ D' stands for first difference operator

3. Prefix ‘l’ stands for natural logarithm of the variable

4. MacKinnon (1996) one-sided critical values for rejection of a unit root are used here*showssignificanceat1%.

Appendix III Roots of Characteristic Polynomial

Roots of Characteristic Polynomial	
Root	Modulus
1.106843 - 0.202406i	1.125198
1.106843 + 0.202406i	1.125198
-0.601893 - 0.742982i	0.956189
-0.601893 + 0.742982i	0.956189
0.244503 - 0.747998i	0.786945
0.244503 + 0.747998i	0.786945
0.685422	0.685422
0.541726	0.541726
-0.227830 - 0.007396i	0.227950
-0.227830 + 0.007396i	0.227950

Appendix IV: Test on the significance of βcoefficients of Long Run models, Tested simultaneously for all models.

Restrictions: **UR**

b(1,4)=0

b(2,4)=0

b(3,4)=0

Tests of cointegration restrictions:

Hypothesized No. of CE(s)	Restricted Log-likehood	LR Statistic	Degrees of Freedom	Probability
3	-4.470326	11.21884	3	0.010600
4	5.227345	NA	NA	NA

NA indicates restriction not binding.

3 Cointegrating Equation(s): Convergence achieved after 11 iterations.

Restricted cointegrating coefficients (not all coefficients are identified)

LNPCHHFC	EDU	PCI	UR	LNPCGDP
-20.53810	-0.057523	0.239073	0.000000	43.88315
15.10296	0.075129	0.131490	0.000000	-22.82589
-22.31388	0.018697	-0.150037	0.000000	18.40904

Restrictions: **LNPCGDP**

b(1,5)=0

b(2,5)=0

b(3,5)=0

Tests of cointegration restrictions:

Hypothesized No. of CE(s)	Restricted Log-likehood	LR Statistic	Degrees of Freedom	Probability
3	-9.031161	20.34051	3	0.000144
4	5.227345	NA	NA	NA

Appendix V : Tests on the significance of VECM Coefficients

→ **Dependent Variable; D(LNPCHHFC)**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
ECM1	-0.783322	0.278475	-2.812895	0.0062
ECM2	0.001721	0.006568	0.261943	0.7939
ECM3	0.005192	0.009929	0.522856	0.6022
D(LNPCHHFC(-1))	-0.748196	0.277934	-2.691995	0.0083
D(EDU(-1))	-0.000421	0.004682	-0.089976	0.9285
D(PCI(-1))	-0.011522	0.010924	-1.054720	0.2941
D(UR(-1))	0.043868	0.091639	0.478706	0.6332
D(LNPCGDP(-1))	0.925131	0.422655	2.188853	0.0309
C	0.020418	0.017959	1.136939	0.2583

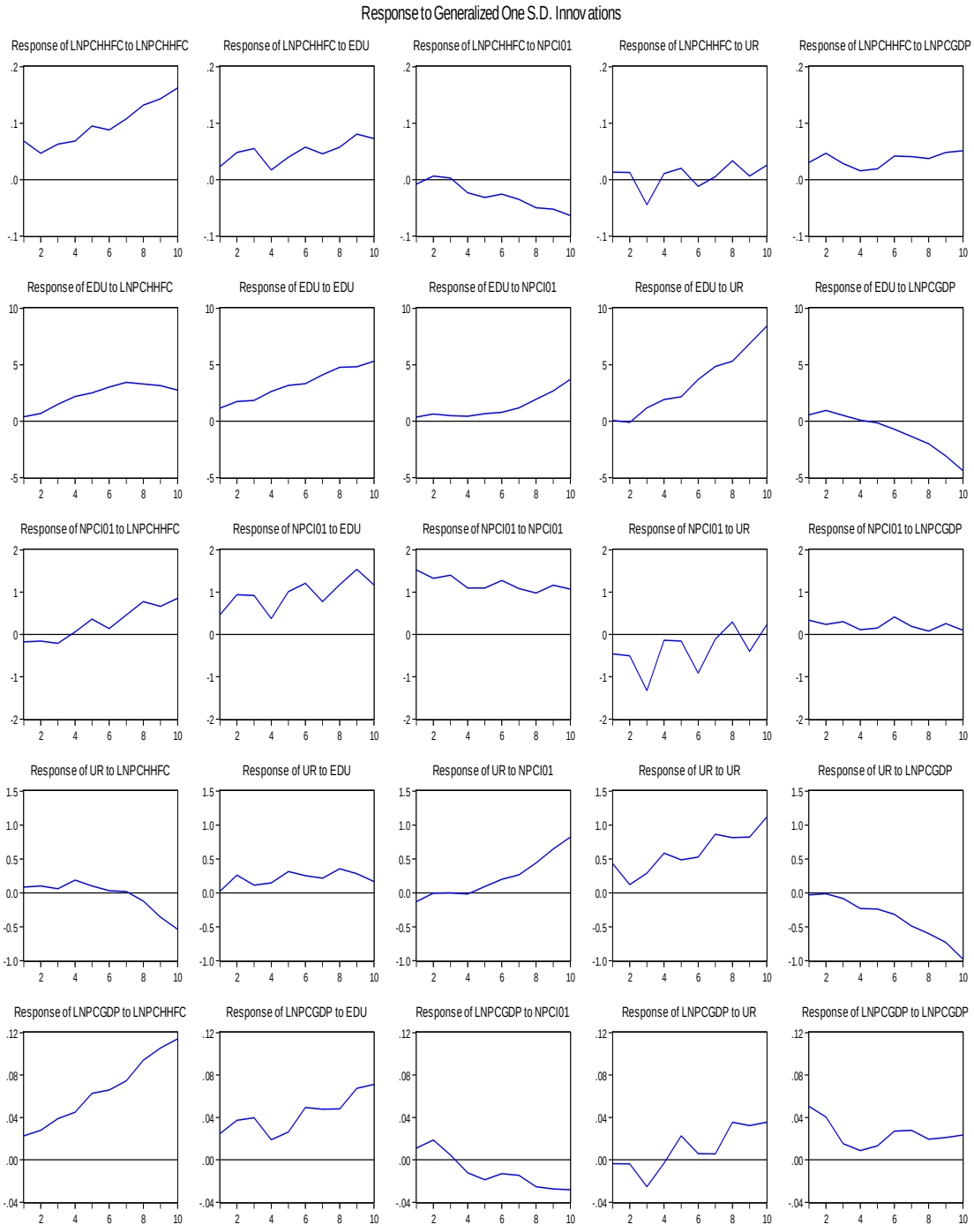
→ **Dependent variable; D(EDU)**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
ECM1	37.96374	10.78613	3.519680	0.0007
ECM2	-0.007404	0.004037	-1.834038	0.0704
ECM3	-0.801359	0.365940	-2.189866	0.0309
D(LNPCHHFC(-1))	-16.93907	10.24301	-1.653720	0.1013
D(EDU(-1))	0.303127	0.172566	1.756589	0.0820
D(PCI(-1))	-0.066460	0.402591	-0.165080	0.8692
D(UR(-1))	-7.138697	3.377270	-2.113748	0.0370
D(LNPCGDP(-1))	49.12680	15.57660	3.153885	0.0021
C	1.281496	0.661870	1.936174	0.0557

→ **Dependent Variable; D(PCI)**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
ECM1	0.317708	5.391656	0.058926	0.9531
ECM2	-0.312775	0.121005	-2.584807	0.0112
ECM3	-0.457194	0.182922	-2.499395	0.0141
D(LNPCHHFC(-1))	-2.172939	5.120165	-0.424388	0.6722
D(EDU(-1))	-0.040960	0.086260	-0.474844	0.6359
D(PCI(-1))	0.052899	0.201243	0.262859	0.7932
D(UR(-1))	-3.794023	1.688193	-2.247387	0.0268
D(LNPCGDP(-1))	-7.401460	7.786262	-0.950579	0.3441
C	0.596088	0.330849	1.801695	0.0746

Appendix VI: Impulse Response function



Appendix VII : Variance decomposition of LNPCHHFC

Period	S.E.	LNPCHHFC	EDU	PCI	UR	LNPCGDP
1	0.078233	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.105915	93.88820	1.566353	0.317476	0.037396	4.190579
3	0.143868	91.12412	4.147975	0.189343	0.282569	4.255994
4	0.172683	92.16517	2.921668	0.327978	0.503902	4.081283
5	0.221014	89.80809	1.785688	0.349471	4.772760	3.283992
6	0.261364	90.33388	2.164782	0.310746	4.234315	2.956278
7	0.303880	91.09063	1.951098	0.256102	4.308270	2.393897
8	0.357348	88.22206	2.301881	0.189070	6.546608	2.740378
9	0.402144	86.85427	2.929381	0.189209	6.422947	3.604188
10	0.452993	84.46073	2.852830	0.232384	8.667122	3.786933

Appendix VIII : Variance decomposition of EDU

Period	S.E.	LNPCHHFC	EDU	PCI	UR	LNPCGDP
1	2.883221	9.713770	90.28623	0.000000	0.000000	0.000000
2	5.226139	28.48507	65.52757	5.442560	0.481992	0.062813
3	8.918757	36.19290	44.60617	3.775613	12.66914	2.756175
4	12.80284	32.98413	42.18097	3.811028	11.41370	9.610173
5	16.59175	31.20169	35.96348	5.368839	16.75833	10.70767
6	22.01973	25.93319	32.31674	4.973109	25.47233	11.30463
7	26.78217	20.44973	35.10346	6.733880	24.73234	12.98059
8	31.98186	15.42880	34.59606	8.970902	27.34865	13.65560
9	38.21876	10.85694	35.21668	10.14592	28.65754	15.12292
10	44.29205	8.734919	35.91894	12.70916	26.71309	15.92389

Appendix IX : Variance decomposition of PCI

Period	S.E.	LNPCHHFC	EDU	PCI	UR	LNPCGDP
1	1.441234	0.211159	16.96680	82.82204	0.000000	0.000000
2	2.096082	0.348132	40.75423	55.06401	0.156653	3.676973
3	3.016143	0.651364	26.62514	42.34644	25.70805	4.669012
4	3.160723	2.408185	24.24949	45.11828	23.41812	4.805922
5	3.367525	5.612189	25.08882	41.05256	21.99001	6.256428
6	3.752265	8.097500	20.37590	36.86895	29.43606	5.221590
7	4.105494	22.66971	17.03799	31.17541	24.71950	4.397382
8	4.625306	32.16150	14.78839	24.65463	24.28313	4.112352
9	5.263122	44.87475	11.80245	19.33641	20.74791	3.238483
10	6.327120	60.48273	8.166718	13.70591	15.32212	2.322525

Appendix X : Variance decomposition of UR

Period	S.E.	LNPCHHFC	EDU	PCI	UR	LNPCGDP
1	0.449468	5.898034	7.271225	5.239422	81.59132	0.000000
2	0.584968	3.874260	36.37651	3.158881	51.63818	4.952168
3	0.724387	2.667559	33.43660	5.740473	53.08105	5.074322
4	1.077738	1.262310	30.67892	3.364074	54.38880	10.30589
5	1.322013	3.699744	35.25340	6.520321	41.39418	13.13235
6	1.647367	5.627056	30.53184	8.848326	43.42047	11.57231
7	2.089013	10.39940	31.72093	9.026631	36.53343	12.31962
8	2.551574	20.76693	29.32020	12.17213	26.58984	11.15091
9	3.105041	28.62623	25.25387	12.87297	23.57705	9.669879
10	3.807110	38.77472	23.02758	12.65004	16.90036	8.647302

Appendix X I : Variance decomposition of LNPCGD

Period	S.E.	LNPCHHFC	EDU	PCI	UR	LNPCGDP
1	0.051884	36.23139	0.782113	0.026545	9.376158	53.58379
2	0.073807	51.22920	10.00436	0.401994	7.713184	30.65127
3	0.097858	53.46842	9.188890	0.552174	14.93617	21.85434
4	0.120770	67.17667	6.699682	0.363411	9.996584	15.76366
5	0.159400	73.86640	3.998332	0.990721	11.58435	9.560191
6	0.189704	79.74150	4.306753	0.712288	8.402973	6.836488
7	0.228473	82.30475	3.806748	0.511073	8.428647	4.948778
8	0.272300	80.35747	4.712226	0.359848	9.062929	5.507531
9	0.309550	79.67751	4.890848	0.420471	9.051178	5.959990
10	0.358907	75.59374	4.831442	0.397071	13.39283	5.784920

Cholesky Ordering: LNPCHHFC EDU PCI UR LNPCGDP

Appendix, XII: Definitions;

Some variables used in the analysis part have a detail definition given below.

- ✓ Access to improved sanitation facilities ; refers to the percentage of the population with at least adequate access to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with a sewerage connection. To be effective, facilities must be correctly constructed and properly maintained

- ✓ Access to improved water sources ; refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unimproved sources include vendors, tanker trucks, and unprotected wells and springs. Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one kilometer of the dwelling.

- ✓ Internet users per 100 people ; are people with access to the worldwide network.

- ✓ Mobile cellular telephone subscriptions per 100 people. ; are subscriptions to a public mobile telephone service using cellular technology, which provide access to the public switched telephone network. Post-paid and prepaid subscriptions are included.

- ✓ Carbon dioxide emissions from liquid fuel consumption refer mainly to emissions from use of petroleum-derived fuels as an energy source.

- ✓ CO2 emissions from residential buildings and commercial and public services contain all emissions from fuel combustion in households. This corresponds to IPCC Source/Sink Category 1 A 4 b. Commercial and public services includes

emissions from all activities of ISIC Divisions 41, 50-52, 55, 63-67, 70-75, 80, 85, 90-93 and 99.

- CO2 emissions from transport contains emissions from the combustion of fuel for all transport activity, regardless of the sector, except for international marine bunkers and international aviation. This includes domestic aviation, domestic navigation, road, rail and pipeline transport, and corresponds to IPCC Source/Sink Category 1 A 3. In addition, the IEA data are not collected in a way that allows the auto producer consumption to be split by specific end-use and therefore, auto producers are shown as a separate item (Unallocated Auto producers).

Political Regime Characteristics and Transitions, 1800-2010

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1, Brief Description:

The Polity IV project continues the Polity research tradition of coding the authority characteristics of states in the world system for purposes of comparative, quantitative analysis. The original Polity conceptual scheme was formulated and the initial Polity I data collected under the direction of Ted Robert Gurr and informed by foundational, collaborative work with Harry Eckstein, *Patterns of Authority: A Structural Basis for Political Inquiry* (New York: John Wiley & Sons, 1975). The Polity project has proven its value to researchers over the years, becoming the most widely used resource for monitoring regime change and studying the effects of regime authority. The Polity project has evolved through three earlier research phases, all under the direction of Ted

Gurr. Through its evolution, the format of the Polity data has been transformed from its original focus on "persistence and change" in the "polity" as the unit of analysis (i.e., polity case format) to its present country-year case format.

The unit of analysis is the "polity." *Webster's New World College Dictionary* defines a "polity" as a "political or governmental organization; a society or institution with an organized government; state; body politic." Eckstein and Gurr (1975, 26) provide a "simple, general definition of all 'polities' (or 'governments') as subsets of the class of 'authority patterns.'" They further point out that "all authority patterns are 'equivalents' of state-organizations." (25) Authority patterns are defined as "a set of asymmetric relations among hierarchically ordered members of a social unit that involves the direction of the unit. They go on to identify three salient norms as bases of regime legitimacy: personal (executive recruitment), substantive (directiveness and responsiveness–executive constraints), and participation (political competition). While authority patterns and polities are inclusive classifications that refer to any social unit's potential for political action, the Polity project focuses specifically on the more or less institutionalized authority patterns that characterize the most formal class of polities, that is, states operating within the world's state system.

2. Indicators of Democracy and Autocracy (Composite Indicators)

In an attempt to facilitate empirical analysis of the historical trend of global landscape of state structures, Polity IV includes constructed annual measures for both institutionalized democracy (DEMOC) and autocracy (AUTOC), as many polities exhibit mixed qualities of both of these distinct authority patterns. The measures are composite indices derived from the coded values of authority characteristic component variables **(variables 3.1- 3.6, see below**) according to the formulas, originally designed by Gurr, provided below. A third indicator, POLITY, is derived simply by subtracting the AUTOC value from the DEMOC value; this procedure provides a single regime score that ranges from +10 (full democracy) to -10 (full autocracy). During periods of central authority interruption,

collapse, or transition, the DEMOC, AUTOC, and POLITY scores will be the assigned Standardized Authority Code.

2.1 DEMOC

Institutionalized Democracy: Democracy is conceived as three essential, interdependent elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Other aspects of plural democracy, such as the rule of law, systems of checks and balances, freedom of the press, and so on are means to, or specific manifestations of, these general principles. We do not include coded data on civil liberties.

The Democracy indicator is an additive eleven-point scale (0-10). The operational indicator of democracy is derived from codings of the competitiveness of political participation the openness and competitiveness of executive recruitment and constraints on the chief executive using the following weights:

Authority Coding	**Scale Weight**
Competitiveness of Executive Recruitment (XRCOMP):	
(3) Election	+2
(2) Transitional	+1
Openness of Executive Recruitment (XROPEN):	
only if XRCOMP is Election (3) or Transitional (2)	
(3) Dual/election	+1
(4) Election	+1
Constraint on Chief Executive (XCONST):	
(7) Executive parity or subordination	+4

(6) Intermediate category	+3
(5) Substantial limitations	+2
(4) Intermediate category	+1
Competitiveness of Political Participation (PARCOMP):	
(5) Competitive	+3
(4) Transitional	+2
(3) Factional	+1

2.2 AUTOC

An eleven-point Autocracy scale is constructed additively. Our operational indicator of autocracy is derived from codings of the competitiveness of political participation, the regulation of participation the openness and competitiveness of executive recruitment and constraints on the chief executive using the following weights:

Authority Coding	**Scale Weight**
Competitiveness of Executive Recruitment (XRCOMP):	
(1) Selection	+2
Openness of Executive Recruitment (XROPEN):	
Only if XRCOMP is coded Selection (1)	
(1) Closed	+1
(2) Dual/designation	+1
Constraints on Chief Executive (XCONST):	
(1) Unlimited authority	+3
(2) Intermediate category	+2
(3) Slight to moderate limitations	+1
Regulation of participation (PARREG):	
(4) Restricted	+2
(3) Sectarian	+1
Competitiveness of Participation (PARCOMP):	
(1) Repressed	+2
(2) Suppressed	+1

2.3 POLITY

Combined Polity Score: The POLITY score is computed by subtracting the AUTOC scores from the DEMOC score; the resulting unified polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic). **Note**: The POLITY score was added to the Polity IV data series in recognition of its common usage by users in quantitative research and in the overriding interest of maintaining uniformity among users in this application. The POLITY variable provides a convenient avenue for examining general regime effects in analyses but researchers should note that the middle of the implied POLITY "spectrum" is somewhat muddled in terms of the original theory, masking various combinations of DEMOC and AUTOC scores with the same POLITY score. Investigations involving hypotheses of varying effects of democracy and/or autocracy should employ the original Polity scheme and test DEMOC and AUTOC separately.

2.4 POLITY2

Revised Combined Polity Score: This variable is a modified version of the POLITY variable added in order to facilitate the use of the POLITY regime measure in time-series analyses. It modifies the combined annual POLITY score by applying a simple treatment, or ""fix," to convert instances of "standardized authority scores" (i.e., -66, -77, and -88) to conventional polity scores (i.e., within the range, -10 to +10). The values have been converted according to the following rule set: First, a brief discussion of standardized codes used to denote periods of central authority interruption, collapse, or transition, that is, during periods when stable authority patterns are volatile or not politically salient is in order.

Interruption Periods (-66): A score of "-66" in the above variables represents a period of "interruption". Operationally, if a country is occupied by foreign powers during war, terminating the old polity, then reestablishes a polity after foreign occupation ends, Polity codes the intervening years as an interruption until an independent polity is reestablished. Cases of foreign "interruption" are treated as "system missing."

Interregnum Periods (-77): A "-77" code for the Polity component variables indicates periods of “interregnum,” during which there is a complete collapse of central political authority. This is most likely to occur during periods of internal war.
Cases of “interregnum,” or anarchy, are converted to a “neutral” Polity score of “0.”

Transition Periods (-88): A score of "-88" indicates a period of transition. Some new polities are preceded by a "transition period" during which new institutions are planned, legally cons tituted, and put into effect. Democratic and quasi-democratic politics are particularly likely to be so established, in a procedure involving constitutional conventions and referenda. During this period of transition, all authority characteristic indicators are scored "-88".
Cases of “transition” are prorated across the span of the transition.

3. Authority Characteristics – Polity Component Variables

The Polity IV project focuses on six operational indicators of political authority patterns, with special attention to the Influence dimensions, the Recruitment of chief executive, and aspects of Conformation, i.e., governmental structure.

Using multiple historical sources for each country, along with reference to a variety of standard sources, the six operational indicators of authority characteristics are elaborated into a series of ordinal scales. These scales are interpreted below..

The six Polity component variables are scored according to the coding rules described below;

Executive Recruitment

According to Eckstein and Gurr, "Executive recruitment involves the ways in which super ordinates come to occupy their positions The Polity IV dataset contains three

indicators of the structural characteristics by which chief executives are recruited: (1) the extent of institutionalization of executive transfers, XRREG; (2) the competitiveness of executive selection, XRCOMP; and (3) the openness of executive recruitment, XROPEN.

3.1 XRREG

Regulation of Chief Executive Recruitment: In considering recruitment, we must first determine whether there are any established modes at all by which chief executives are selected. Regulation refers to the extent to which a polity has institutionalized procedures for transferring executive power. Three categories are used to differentiate the extent of institutionalization:

(1) Unregulated: Changes in chief executive occur through forceful seizures of power. Such caesaristic transfers of power are sometimes legitimized after the fact in noncompetitive elections or by legislative enactment. Despite these "legitimization" techniques, a polity remains unregulated until the de facto leader of the coup has been replaced as head of government either by designative or competitive modes of executive selection. However, unregulated recruitment does not include the occasional forceful ouster of a chief executive if elections are called within a reasonable time and the previous pattern continues.

(2) Designational/Transitional: Chief executives are chosen by designation within the political elite, without formal competition (i.e., one-party systems or "rigged" multiparty elections). Also coded here are transitional arrangements intended to regularize future power transitions after an initial unregulated seizure of power (i.e., after constitutional legitimization of military rule or during periods when the leader of the coup steps down as head of state but retains unrivaled power within the political realm as head of the military). This category also includes polities in transition from designative to elective modes of executive selection (i.e., the period of "guided democracy" often exhibited during the transition from military to civilian rule) or vice versa (i.e., regimes ensuring

electoral victory through the intimidation of oppositional leaders or the promulgation of a "state of emergency" before executive elections).

(3) Regulated: Chief executives are determined by hereditary succession or in competitive elections. Ascriptive/designative and ascriptive/elective selections (i.e., an effective king and premier) are also coded as regulated. The fundamental difference between regulated selection and unregulated recruitment is that regulated structures require the existence of institutionalized modes of executive recruitment, either through constitutional decree or lineage. Moreover, in regulated competitive systems, unlike the designational/transitional mode, the method of future executive selection is not dependent on the particular party or regime currently holding power.

3.2 XRCOMP

Competitiveness of Executive Recruitment: Competitiveness refers to the extent that prevailing modes of advancement give subordinates equal opportunities to become superordinates (Gurr 1974, 1483)." For example, selection of chief executives through popular elections matching two or more viable parties or candidates is regarded as competitive. If power transfers are coded Unregulated ("1") in the Regulation of Executive Recruitment (variable 3.1), or involve a transition to/from unregulated, Competitiveness is coded “0". Three categories are used to measure this concept:

(1) Selection: Chief executives are determined by hereditary succession, designation, or by a combination of both, as in monarchies whose chief minister is chosen by king or court. Examples of pure designative selection are rigged, unopposed elections; repeated replacement of presidents before their terms end; recurrent military selection of civilian executives; selection within an institutionalized single party; recurrent incumbent selection of successors; repeated election boycotts by the major opposition parties, etc.
(2) Dual/Transitional: Dual executives in which one is chosen by hereditary succession, the other by competitive election. Also used for transitional arrangements between selection (ascription and/or designation) and competitive election.

(3) Election: Chief executives are typically chosen in or through competitive elections matching two or more major parties or candidates. (Elections may be popular or by an elected assembly.)

3.3 XROPEN

Openness of Executive Recruitment: Recruitment of the chief executive is "open" to the extent that all the politically active population has an opportunity, in principle, to attain the position through a regularized process. If power transfers are coded Unregulated (1) in the Regulation of Executive Recruitment (variable 3.1), or involve a transition to/from Unregulated, Openness is coded 0. Four categories are used:

(1) Closed: Chief executives are determined by hereditary succession, e.g. kings, emperors, beys, emirs, etc. who assume executive powers by right of descent. An executive selected by other means may proclaim himself a monarch but the polity he governs is not coded "closed" unless a relative actually succeeds him as ruler.

(2) Dual Executive–Designation: Hereditary succession plus executive or court selection of an effective chief minister.

(3) Dual Executive–Election: Hereditary succession plus electoral selection of an effective chief minister.

(4) Open: Chief executives are chosen by elite designation, competitive election, or transitional arrangements between designation and election.

The polities of leaders who seize power by force are coded Unregulated, but there is a recurring impulse among such leaders to regularize the process of succession, usually by relying on some form of selection. A less common variant, as in modern Iran and Nicaragua under the Somozas, is one in which a Caesaristic leader attempts to establish the principle of hereditary succession. Polity codes all such attempts at regularizing succession as Transitional (under Regulation, variable 3.1) until the first chief executive chosen under the new rules takes office.

The Independence of Executive Authority

One of the key characteristics of authority patterns is the extent to which the head of the unit (in states, the chief executive ruler) must take into account the preferences of others when making decisions. According to Eckstein and Gurr: "There is an important qualitative difference in responsiveness that is analogous to the distinction between sufferance and suffrage. In some authority patterns the supers are obliged to incorporate some preferences of subordinates into decisions, in others they need only consider them.

3.4 XCONST

Executive Constraints (Decision Rules): Operationally, this variable refers to the extent of institutionalized constraints on the decision making powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any "accountability groups." In Western democracies these are usually legislatures. Other kinds of accountability groups are the ruling party in a one-party state; councils of nobles or powerful advisors in monarchies; the military in coup-prone polities; and in many states a strong, independent judiciary. The concern is therefore with the checks and balances between the various parts of the decision-making process. A seven-category scale is used.

(1) Unlimited Authority: There are no regular limitations on the executive's actions (as distinct from irregular limitations such as the threat or actuality of coups and assassinations). Examples of evidence:

i. Constitutional restrictions on executive action are ignored.

ii. Constitution is frequently revised or suspended at the executive's initiative.

iii. There is no legislative assembly, or there is one but it is called and dismissed at the executive's pleasure.

Note 3.4: If the executive is given limited or unlimited power by a legislature to cope with an

emergency and relents this power after the emergency has passed, this is not a change to unlimited authority.

(2) Intermediate Category

(3) Slight to Moderate Limitation on Executive Authority: There are some real but limited restraints on the executive. Evidence:

i. The legislature initiates some categories of legislation.

ii. The legislature blocks implementation of executive acts and decrees.

iii. Attempts by the executive to change some constitutional restrictions, such as prohibitions on succeeding himself, or extending his term, fail and are not adopted.

(4) Intermediate Category

(5) Substantial Limitations on Executive Authority: The executive has more effective authority than any accountability group but is subject to substantial constraints by them.

Examples:

i. A legislature or party council often modifies or defeats executive proposals for action.

ii. A council or legislature sometimes refuses funds to the executive.

(6) Intermediate Category

(7) Executive Parity or Subordination: Accountability groups have effective authority equal to or greater than the executive in most areas of activity.

Examples of evidence:

i. A legislature, ruling party, or council of nobles initiates much or most important legislation.

ii. The executive (president, premier, king, cabinet, council) is chosen by the accountability group and is dependent on its continued support to remain in office (as in most parliamentary systems).

iii. In multi-party democracies, there is chronic "cabinet instability."

Political Competition and Opposition

A third general authority trait of polities is participation. The operational question is the extent to which the political system enables non-elites to influence political elites in

regular ways. The Polity IV dataset measures this concept in two ways: (1) by the degree of institutionalization or "regulation" of political participation, and (2) by the extent of government restriction on political competition.

3.5 PARREG

Regulation of Participation: Participation is regulated to the extent that there are binding rules on when, whether, and how political preferences are expressed. A five-category scale is used to code this dimension:

(1) Unregulated: Political participation is fluid; there are no enduring national political organizations and no systematic regime controls on political activity. Political groupings tend to form around particular leaders, regional interests, religious or ethnic or clan groups, etc.; but the number and relative importance of such groups in national political life varies substantially over time.

(2) Multiple Identities: There are relatively stable and enduring political groups which compete for political influence at the national level–parties, regional groups, or ethnic groups, not necessarily elected–but there are few, recognized overlapping (common) interests.

(3) Sectarian: Political demands are characterized by incompatible interests and intransigent posturing among multiple identity groups and oscillate more or less regularly between intense factionalism and government favoritism, that is, when one identity group secures central power it favors group members in central allocations and restricts competing groups' political activities, until it is displaced in turn (i.e., active factionalism). Also coded here are polities in which political groups are based on restricted membership and significant portions of the population historically have been excluded from access to positions of power (latent factionalism, e.g., indigenous peoples in some South American countries).

(4) Restricted: Some organized political participation is permitted without intense factionalism but significant groups, issues, and/or types of conventional participation are regularly excluded from the political process.

(5) Regulated: Relatively stable and enduring political groups regularly compete for political influence and positions with little use of coercion. No significant groups, issues, or types of conventional political action are regularly excluded from the political process.

3.6 PARCOMP

The Competitiveness of Participation: The competitiveness of participation refers to the extent to which alternative preferences for policy and leadership can be pursued in the political arena. Political competition implies a significant degree of civil interaction, so polities which are coded Unregulated (1) on Regulation of Participation (PARREG) are not coded for competitiveness. Competitiveness is coded on a five category scale:

(0) Not Applicable: This is used for polities that are coded as Unregulated, or moving to/from that position, in Regulation of Political Participation

(1) Repressed: No significant oppositional activity is permitted outside the ranks of the regime and ruling party. Totalitarian party systems, authoritarian military dictatorships, and despotic monarchies are typically coded here. However, the mere existence of these structures is not sufficient for a Repressed coding. The regime's institutional structure must also be matched by its demonstrated ability to repress oppositional competition.

(2) Suppressed: Some organized, political competition occurs outside government, without serious factionalism; but the regime systematically and sharply limits its form, extent, or both in ways that exclude substantial groups (20% or more of the adult population) from participation. Suppressed competition is distinguished from Factional competition (below)

by the systematic, persisting nature of the restrictions: large classes of people, groups, or types of peaceful political competition are continuously excluded from the political process. As an operational rule, the banning of a political party which received more than 10% of the vote in a recent national election is sufficient evidence that competition is "suppressed."

However, other information is required to determine whether the appropriate coding is (2) Suppressed or (3) Factional competition. This category is also used to characterize transitions between Factional and Repressed competition. Examples of "suppression" are:

i. Prohibiting some kinds of political organizations, either by type or group of people involved (e.g., no national political parties or no ethnic political organizations).

ii. Prohibiting some kinds of political action (e.g., Communist parties may organize but are prohibited from competing in elections).

iii. Systematic harassment of political opposition (leaders killed, jailed, or sent into exile; candidates regularly ruled off ballots; opposition media banned, etc.). This is evidence for either Factional, Suppressed, or Repressed, depending on the nature of the regime, the opposition, and the persistence of political groups.

Note 3.6: A newly enacted right to engage in political activities is most likely a change from category 1 to 2.

(3) Factional: Polities with parochial or ethnic-based political factions that regularly compete for political influence in order to promote particularist agendas and favor group members to the detriment of common, secular, or cross-cutting agendas.

(4) Transitional: Any transitional arrangement from Restricted or Factional patterns to fully Competitive patterns, or vice versa. Transitional arrangements are accommodative of competing, parochial interests but have not fully linked parochial with broader, general interests. Sectarian and secular interest groups coexist.

(5) Competitive: There are relatively stable and enduring, secular political groups which regularly compete for political influence at the national level; ruling groups and coalitions regularly, voluntarily transfer central power to competing groups. Competition among groups seldom involves coercion or disruption. Small parties or political groups may be

restricted in the Competitive pattern. By combining scores on Regulation of Political Participation (variable 3.5) and the Competitiveness of Participation (variable 3.6), a relatively detailed picture of the extent of political competition and opposition emerges.

In summary, political freedom in this concept is taken from the values of polity II. I.e. The value of polity II that is designed for time series analysis on the authority pattern of nations.

It is obtained as a difference b/n democracy and autocracy measures. Where democracy is measured based on values of four component variables including competitiveness of executive recruitment (XRCOMP), openness of executive recruitment (XROPEN), constraint on chief executive (XCONST), competitiveness of political participation (PARCOMP).each variables have sub classifications and weighs for each sub classifications. Democracy therefore is the sum of weights of each sub classifications attached to democracy. The value of democracy lies within the range of 0 to 10.

On the other autocracy is measured based on the values of five components variables including. Competitiveness of executive recruitment (XRCOMP), openness of executive recruitment (XROPEN), constraints on chief executive (XCONST), regulation of participation (PARREG), competitiveness of participation (PARCOMP). The same to democracy, each variable have sub classifications. Autocracy therefore, is the sum of weights of sub classifications attached to autocracy. The value of autocracy ranges from 0- 10

I, the undersigned, declare that this thesis is my original work and has not been Presented for a degree in any other university, and that all source of materials used for the thesis have been duly acknowledged.

Declared by:

Name: _____

Signature: _____

Date: _____

Confirmed by:

Name: _____

Signature: _____

Date: _____

Place and Date of Submission: _____