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# **Economic Growth and Human Development; A Link Mechanism: An Empirical Approach**

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**ECONOMIC GROWTH AND HUMAN DEVELOPMENT; A LINK  
MECHANISM: AN EMPIRICAL APPROACH**

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## Abstract

*The aim of the study was to determine the relationship mechanisms between the economic growth and human development. The research used cross country survey research design. The research covers 40 countries, 10 countries from each of human development ranks. Multivariate multiple regression model is used to analyse data. The research found that there is a strong relationship between economic growth and human development. But the relationship is not perfect it starts after a country attained a certain level of human development. It is recommended that a country should concentrate on both improving human development and the economic growth since are strongly related, the human development is an important input to growth economic and in turns, the economic growth activates the human development. The political policies and technology invested have a positive influence on the human development and economic growth in a particular country.*

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## **ABBREVIATIONS**

AIDS	Acquired Immunodeficiency Syndrome
Cp	Country Population
EI	Expected Index
EYS	Expected Years Schooling
GII	Gender Inequality Index
GNI	Gross National Income
HDI	Human Development Index
HDF	Human Development Foundation
HDR	Human Development Report
HIV	Human Immune Virus
II	Income Index
IHDI	Inequality-Adjusted Human Development Index
LBE	Life Birth expected
LEI	Life Expectancy Index
MYS	Means Years schooling
NGOs	Non-Government Organisations
NSGRP	National Strategy for Growth and Reduction of Poverty
PPP	Purchasing Power Parity
UNDP	United Nations Development Programme
URT	United Republic of Tanzania





## CHAPTER ONE

### **1.0 Introduction and background of the study**

Examination of the economic growth and human development relationship mechanisms help the policy and decision makers to formulate and implement relevant poverty eradication strategies. The research found out how economic growth influences the human development and it is vice versa.

The research used the broaden definition of human development, to encompass the human development index, inequality-adjusted human development index and gender inequality index. The research aimed to explore the link mechanisms between economic growth and human development with view to identifying significant policies and prioritizing sequences of policies. Can we aim for growth and expect human development to occur automatically or it is vice versa or for both? Are there conflicts, which is most important? Decision makers now are able to answer these decisional questions.

A study on economic growth and human development is a hitting issue to researchers that should be adheres to. To understand the key determinants of human development or economic growth helps decision makers on setting the proper poverty eradication strategies in the developing countries. Researchers try to investigate the connection of an economic growth and human development. One of the debatable question for economists and researchers is that of, is there any relationships between economic growth and human development? The aim of this question was to know if the economic growth influences the human development and if it is vice versa. Human development has broadened its definition to cover various human needs, economically, socially and politically. The broadening of this concept makes hard to prove empirically the relationship mechanisms between economic growth and the human development.

The research aimed to test empirically the relationship mechanism between economic growth and human development in its broadening view. The research conducted in two ways chain relations examinations to make a thorough investigation. The first way chain relation examination was to determine how the economic growth influences the human development by examining the relationship between growth national income (GNI) per capita and indices of human development. The second way chain relation examination was to determine how the human development influences the economic growth.

Knowing the key determinants of human development or economic growth fosters the implementation of the National Strategy for Growth and Reduction of Poverty (NSGRP) for any developing countries in the world. The research found out how the economic growth influences the human development and how the human development influences the economic growth.

Most recent researches on the economic growth and development found that the most developed countries are those with the highest GNI per capita. Clearly, though GNI per capita doesn't tell the whole profile of human development. GNI per capita is calculated by dividing GNI by the population. It says nothing about how incomes are distributed or spent. Growth in GNI per capita could result from growth in the incomes of richer groups in society, with incomes of poorer groups remaining largely unchanged.

It coincides with spending patterns that are skewed towards the rich and which exclude the needs of the poor. It doesn't necessarily follow that growth in per capita GNI will lead to a reduction in poverty or to broader social and economic development. Indeed, there are those who argue, rightly or wrongly, that in many countries economic growth is associated with increasing levels of poverty, rather than the reverse. Economic growth is a necessary (but not sufficient) condition for sustainable poverty reduction (URT, 2002).

The relationship between economic growth and human development is a hotly debated topic, about which people are much divided. Some people highlight the negative effect of growth on low income groups, stressing the need for new approaches to economic development that will allow the poor to benefit more from economic growth than they do at present.

Much of the debate in this area revolves around the values and ideals of those engaged in it, as well as the different theories on the subject. It also hinges upon interpretations of the empirical evidence. Poverty and income distribution are hard to measure, especially in developing countries where the capacity to gather and analyze data is often very weak. Consequently, the strength of the statistical relationship between growth and human development remains the subject of debate. There is also controversy about the mechanisms by which economic growth may reduce poverty, the timing of these and the policy implications.

### **1.1 Statement and significance of the research problem**

Determination of the economic growth and human development relationship help the policy and decision makers to formulate and implement relevant poverty eradication strategy. The research found out how economic growth influences the human development and what nations need to improve the economic growth and human development. The need for determination of the relationship mechanism of the economic growth and human development was based on the fact that most of decision makers face difficulties in setting poverty eradication strategies in their countries. The most frequently questions asked are of that, how the economic growth affects human development, is it possible a country to concentrate on economic growth and human development comes automatically or vice versa. If, not, what should be preferred. This research provides answers to these decisional questions.

The research used the broadened definition of human development, to encompass the human development index, inequality-adjusted human development index and gender inequality index. The research aimed to explore the links between human development and economic growth with view to identifying significant policies and prioritizing sequences of policies.

## **1.2 Research Objective**

The research guided with the following objectives:-

### **1.2.1 General Objective**

The general objective of the research was to examine the relationship mechanisms between economic growth and the human development.

### **1.2.2 Specific Objectives**

The research was guided with the following specific objectives:-

- (1) To examine the influence of the GNI per capita on human development indices and their components and, how the human development indices and their components influence the GNI per capita.
- (2) To identify the needs of nation to improve both the economic growth and human development.

## **1.3 Research questions**

Questions guided the research were:-

- (1) How the GNI per capita influences human development indices and their components and, how human development indices and their components influence the GNI per capita?
- (2) What nation needs to improve both the economic growth and human development?

#### **1.4: Research hypotheses**

This study tested the following set of hypotheses on relationship between the economic growth and human development.

H0<sub>1</sub>: There is no significant relationship between gross national income per capita and human development index, life expectancy at birth, mean years of schooling and expected years of schooling.

H1<sub>1</sub>: There is a significant relationship between gross national income per capita and human development index, life expectancy at birth, mean years of schooling and expected years of schooling.

H0<sub>2</sub>: There is no significant relationship between gross national income per capita and inequality –adjusted human development index, inequality-adjusted life expectancy index inequality-adjusted education index and inequality-adjusted income index.

H1<sub>2</sub>: There is a significant relationship between gross national income per capita and inequality –adjusted human development index, inequality-adjusted life expectancy index inequality-adjusted education index and inequality-adjusted income index.

H0<sub>3</sub>: There is no significant relationship between gross national income per capita and gender inequality index and its components,

H1<sub>3</sub>: There is a significant relationship between gross national income per capita and gender inequality index.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Theoretical background

The human development approach arose in part as a result of growing criticism to the leading development approach of the 1980s, which presumed a close link between national economic growth and the expansion of individual human choices.

Many, such as Dr. Mahbub ul Haq, the Pakistani economist who played a key role in formulating the human development paradigm, came to recognize the need for an alternative development model due to many factors, including, growing evidence that did not support the then prevailing belief in the “trickle down” power of market forces to spread economic benefits and end poverty, the human costs of Structural Adjustment Programmes became more apparent and Social ills (crime, weakening of social fabric, HIV/AIDS, pollution, etc.) were still spreading even in cases of strong and consistent economic growth; and a wave of democratization in the early 90’s raised hopes for people-centred models.

As of 1990, the human development concept was applied to a systematic study of global themes, as published in the yearly global human development reports under the auspice of the UNDP. Sen (1992) provided the conceptual foundation for an alternative and broader human development approach defined as a process of enlarging people’s choices and enhancing human capabilities (the range of things people can be and do) and freedoms, enabling them to live a long and healthy life, have access to knowledge and a decent standard of living, and participate in the life of their community and decisions affecting their lives.

Human development is an international and economic development paradigm that is about much more than the rise or fall of national incomes. People are the real wealth of nations (UNDP, 1990). Development is thus about expanding the choices people have, to lead lives that they value and improving the human condition so that people will get the chance to lead full lives, (Streeten, 1994). And it is thus about much more than economic growth, which is only a means, if a very important one of enlarging people's choices (UNDP, 2009). Fundamental to enlarging these choices is building human capabilities, the range of things that people can do or be in life.

Human development disperses the concentration of the distribution of goods and services that underprivileged people need and center its ideas on human decisions (Srinivasan, 1994). By investing in people, we enable growth and empower people thus developing human capabilities. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources and social services, needed for a decent standard of living and to be able to participate in the life of the community. Without these, many choices are simply not available, and many opportunities in life remain inaccessible (UNDP, 2009).

There are four basic pillars of human development which are equity, sustainability, production and empowerment. Equity is the idea of fairness for every person; we each have the right to an education and health care. Secondly, sustainability is the view that we all have the right to earn a living that can sustain us and have access to a more even distribution of goods amongst populations. In addition, production is used to show how the government needs more efficient social programs for its people. Lastly, empowerment is an effect of general well-being (HDF, 2009).

The two ways chain relationship between economic growth and human development suggests that nations may enter either into a virtuous cycle of high growth and large



gains in human development, or a vicious cycle of low growth and low rates of human development improvement (Ranis, 2004).

Countries may also find themselves in a lop-sided state, at least temporarily, with relatively good growth and relatively poor human development, or vice versa. There may be various reasons for “economic growth lopsided” nations, i.e. those which have high rates of GNI growth relative to the improvement in human development indicators, including government corruption, low social expenditures, or inequitably.

Dependency theorists argue that poor countries have sometimes experienced economic growth with little or no economic development initiatives; for instance, in cases where they have functioned mainly as resource-providers to wealthy industrialized countries. There is an opposing argument, however, that growth causes development because some of the increase in income gets spent on human development such as education and health.

## **2.2 Empirical Literature**

According to Ranis, *et al.* (2000) economic growth and human development is a two-ways relationship. Moreover, the first chain consists of economic growth benefiting human development with GNI. Specifically, GNI increases human development by expenditure from families, government and organizations such as NGOs. With the rise in economic growth, families and individuals will likely increase expenditures with heightened incomes, which, in turn leads to growth in human development. Further, with the increased consumption, health and education grow, also contributing to economic growth (Streeten, 1994).

Recent development experience has underlined the need for paying a close attention to the link between economic growth and human development because many fast-growing and developing countries having high GNI growth rates have failed to reduce the socio-economic deprivation of substantial sections of their population. At the same time some

low-income countries have achieved high levels of human development by skillfully using the available means to expand basic human capabilities.

Countries like Viet Nam, Georgia, Indonesia and Jamaica having relatively very low per capita GNI (PPP US \$ 2,805, 4,780, 3,716 and 6,487) could achieve medium levels of human development (0.593, 0.733, 0.617 and 0.727) whereas Botswana and South Africa in spite of having very high per Capita GNI (PPP US \$ 13,049 and 9,469) achieved relatively lower level of human development 0.633 and 0.619 (UNDP, 2011). This indicates that there a need to go further in research to prove empirically the relationship mechanisms between economic growth and human development.

The research done on investigating the link mechanism between economic growth and human development such as, Ranis (2004) explained that the extent that greater freedom and capabilities increase economic performance, human development will have an important effect on growth. Similarly, the extent that increased incomes will increase the range of choices and capabilities enjoyed by households and governments, economic growth will enhance human development.

Ranis and Steward (2005) empirically confirm the significance of various links in each of the two ways chain overtime, from economic growth to human development including human development along with the investment ratio. The economic growth which is an important input into human development improvement is either prior or simultaneous. Therefore, traditional policy advice, which argues that human development improvements must wait until economic expansion makes it affordable, is likely to be in error.

Ramirez *at el.* (1998) explore the link between economic growth and human development, identifying two chains, one from economic growth to human development, and the other, conversely, from human development to economic growth, they found that there are exist a strong positive relationship in both directions and that

public expenditures on social services and female education are especially important links determining the strength of the relationship between economic growth and human development, while the investment rate and income distribution are significant links in determining the strength of the relationship between human development and economic growth.

Boozer *et al.* (2003) developed new empirical strategies to estimate the strength of the two ways chain connecting human development and economic growth. They concluded that human development must be given priority for the achievement of both higher economic growth as well as human development.

Chakraborty and Mukherjee (2010) confirm that there is need for further investigation to determine the underlying factors (other than per capita income) which influence human development achievements of a state.

A broaden human development measures; encompass the broad of human choices. The *Human Development Report (2011)*, presents the human development index values and ranks for 187 countries and UN-recognized territories, along with the inequality-adjusted HDI for 134 countries and the gender inequality index for 146 countries.

### **2.2.1 Human Development Index (HDI)**

The HDI is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. As in the 2010 human development report a long and healthy life is measured by life expectancy, access to knowledge is measured by: mean years of adult education, which is the average number of years of education received in a lifetime by people aged 25 years and older; and expected years of schooling for children of school-entrance age, which is the total number of years of schooling a child of school-entrance age can expect to receive if prevailing patterns of age-specific enrolment rates

stay the same throughout the child's life. Standard of living is measured by gross national income (GNI) per capita expressed in constant PPP\$.

### **2.2.2 Inequality-adjusted HDI (IHDI)**

The inequality-adjusted human development index (IHDI) adjusts the human development index (HDI) for inequality in the distribution of each dimension across the population. It is based on a distribution-sensitive class of composite indices proposed by Foster, Lopez-Calva, and Szekely (2005), which draws on the Atkinson (1970) family of inequality measures.

The HDI is an average measure of basic human development achievements in a country. Like all averages, the HDI masks inequality in the distribution of human development across the population at the country level. The 2010 human development report introduced the 'inequality adjusted HDI (IHDI)', which takes into account inequality in all three dimensions of the HDI by 'discounting' each dimension's average value according to its level of inequality.

The HDI can be viewed as an index of 'potential' human development and IHDI as an index of actual human development. The 'loss' in potential human development due to inequality is given by the difference between the HDI and the IHDI, and can be expressed as a percentage (UNDP, 2011).

### **2.2.3 Gender Inequality Index (GII)**

The gender inequality index (GII) reflects gender-based inequalities in three dimensions – reproductive health, empowerment, and economic activity. Reproductive health is measured by maternal mortality and adolescent fertility rates; empowerment is measured by the share of parliamentary seats held by each gender and attainment at secondary and higher education by each gender; and economic activity is measured by the labour market participation rate for each gender. The GII replaced the previous gender related

development index and gender empowerment index. The GII shows the loss in human development due to inequality between female and male achievements in the three GII dimensions (UNDP, 2011).

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1. Research design

The research design is a logical sequence that connects the empirical data to a study's initial research questions and ultimately to its conclusions. The study based on descriptive approach (quantitative) that led to a description of the determinants as found from practice in the existing situation. A description of practices allowed an analysis to be performed based on the practical reality so as to arrive at conclusions that address the reality.

A description of practices is also critical for gaining insight into practices, provides a sound basis for judging their relationships – a central issue in this study, and forms a reliable basis for providing recommendations for further improvements. The research based on the cross country survey strategy.

##### 3.1.1 Area of study

The study focused on the testing the relationship between the Economic growth and Human development. The study covers 40 countries in the world, ten countries from each of very high human development countries, high human development, medium development and low development countries.

##### 3.1.2 Population of the study

A population is a group of individuals' persons, objects, or items from which samples are taken for measurement. For this study, population has been defined as all the countries involved in the Human Development Report, 2011 that is, 187 countries form all continents. The main reason to select that population is to reflect the real profile of the relationship.

### **3.1.3 Sampling procedures**

Sampling procedures are classified under two general categories namely probability sampling and non-probability sampling. In the former, the researcher knows the exact possibility of selecting each member of the population; in the latter, the chance of being included in the sample is not known. This study used Probability sampling; the stratified-sampling. Reasons to use stratified –sampling technique is not only the nature of data and their availability but also for accuracy and generalization of the findings of the study.

### **3.1.4 Sample size**

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole. When dealing with people, it can be defined as a set of respondents (people) selected from a larger population for the purpose of a survey. This study took a total of 40 countries sampling from each of the category of human development classification, 10 countries in the rank of low human development, and 10 countries in the rank of medium human development and 10 countries in the high human development, and 10 countries in the rank of very high human development as per human development report, 2011.

### **3.1.5 Data sources**

The study used secondary data. The main source of data is human development reports of the United Nations Development Programme, as per 2011. The reason to select secondary data is due to fact that secondary data was available and reduced the cost of conducting this research. Also it saved time for researcher, and maintains the reliability of the research.

### 3.1.6 Data Collection Tools

This study used document analysis technique to collect data. Documents and reports such as human development reports and other publicly available information used to provide information about the economic growth and human development of the selected countries. Website or online surveys used to collect data. These strategies saved time, cost, and do not need a team of people (no field staff is required.)

### 3.1.7 Data Analysis

The data set used in the analysis was constructed by merging countries' human development indices; gross national income per capita of the selected countries will be used. The data relate to the year of 2011 on human development report. The data used relate to the 40 countries reported on the human development report of 2011. The sample includes both human developmentally sound countries and countries in low human development position to avoid bias. Data was analysed in regression model. Before running the regression, investigation into the multicollinearity problems was carried out. The Minitab 16 English software used to analyse data.

### 3.1.8 Model Specification

Following multiple regression models was used to test the relationship between the economic growth and human development.

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 \dots\dots\dots (1)$$

Where

$X_1$  = Human development index

$X_2$  = Inequality- adjusted human development index

$X_3$  = Gender inequality index

a = Constant term of the model



b's = Coefficients of the model

### 3.1.9 Definition of variables

#### 3.1.10 Dependent Variable (Y)

It is defined as the ratio of gross national income to population of a particular country. It is given by:

$$Y = \text{GNI}/\text{Cp} \dots \dots \dots (2)$$

Where,

Y = Gross national income per capita

GNI = Gross national income

Cp = Country population

#### 3.1.11 Independent Variables

**Human development index (X<sub>1</sub>):** It is defined as the arithmetic mean of life expectancy index (LEI), Education index and income index (II). It is given by:

$$X_1 = (\text{LEI} \times \text{EI} \times \text{II})^{1/3} \dots \dots \dots (3)$$

**Inequality- adjusted human development index (X<sub>2</sub>):** It is

The IHDI is the geometric mean of the three dimension indices adjusted for inequality. It is calculated as:-

$$X_2 = ((\text{I}-\text{A}_{\text{Life}}) \cdot \text{I}_{\text{Life}} \cdot (\text{I}-\text{A}_{\text{Education}}) \cdot \text{I}_{\text{Education}} \cdot (\text{I}-\text{A}_{\text{Income}}) \cdot \text{I}_{\text{Income}})^{1/3} \dots \dots \dots (4)$$

Inequality measure is  $A = 1 - g/\mu$ , where g is the geometric

Mean and  $\mu$  is the arithmetic mean of the distribution.

That is  $A_x = 1 - (X_1 \dots X_n)^{1/3} / \bar{x}$ , I is Index value of a particular indicator.

**Gender inequality index (X<sub>3</sub>):** It is given by:

$$X_3 = 1 - \frac{HARM(G_F, G_M)}{G_{\bar{F}, \bar{M}}} \dots \dots \dots (5)$$

Where,

HARM (G<sub>F</sub>, G<sub>M</sub>) is the harmonic means of female and male indices, and  $G_{\bar{F}, \bar{M}}$  is the geometric means of female and male indices.

## CHAPTER FOUR

### FINDINGS AND DISCUSSIONS

#### 4.1 Introduction

The study aimed to investigate the link or relationship mechanisms between economic growth and human development. The study covered 40 countries from all continents in the world. The main source of data is the human development report of 2011. The multiple regression models used to investigate the relationship. The Minitab 15 English software used to analyse data.

The economic growth measured in gross national income per capita and human development measured by using three human development indices, namely human development index, inequality-adjusted human development index and gender inequality index. The investigation of the relations done in two ways chain, first the gross national income per capita related with each of the named human development indices and each of their components, this is termed as the first way chain relations examination, and the second way chain relations examination was done, the human development indices and each of their components were kept constant (dependent variables) and the GNI per capita income was treated as independent variable. This is done in order to investigate keenly the effect of the coefficients in their regression models.

The descriptive statistics were computed to profile the general characteristics of the sampled countries. The targeted statistical measures are means, standard deviation and range (Table 1). The country with maximum GNI per capital is 45 times the country with the minimum GNI per capita. This is a huge difference. The standard deviations profile on how these values of GNI per capita vary from country to country. The standard deviation (14,884) is higher than minimum value of the GNI per capita (1123), this implies that the dispersion of the GNI per capita value is extremely large.

**Table 4.1: Descriptive statistics for GNI per capita, human development index, and inequality-adjusted HDI and gender inequality index**

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Variable	N	N*	Mean	StDev	Minimum	Maximum
GNI per capita	40	0	13,832	14,884	1123	50,557
Human development index	40	0	0.6928	0.1639	0.4000	0.9430
Inequality-adjusted HDI	40	0	0.5714	0.1940	0.2460	0.8900
Gender inequality index (GII)	40	0	0.3892	0.1823	0.0490	0.6550

---

*Source: Field data (2012)*

The table 4.1 above shows the descriptive statistics of the gross national income and human development indices of the 40 sampled countries.

The country with the smallest human development index (0.4000) is 2 times as the country with the highest human development index. The country with the smallest inequality-adjusted human development index (0.2460) is 4 time as the country with the highest inequality-adjusted human development Index (0.8900).

The gender inequality index profiles relevantly the variation of GNI per capita of the sampled countries. The country with smallest Gender inequality index (0.0490) is 13 time as the country with the highest gender inequality index (0.6550). These figures profile that the countries sampled have high range in gender inequality indices.

The Pearson correlation was computed to diagnose multicollinearity problem of independent variables, the independent variables tend to relate each other. The values of Pearson correction range from 0.910 to 0.986 which indicate strong relationship of these variables (Table 4.2).

**Table 4.2: Pearson correlations human development index, inequality-adjusted HDI and gender inequality index**

<b>Variable</b>	<b>X<sub>1</sub></b>	<b>X<sub>2</sub></b>	<b>X<sub>3</sub></b>
Human development index (X <sub>1</sub> )	1.000		
Inequality-adjusted HDI (X <sub>2</sub> )	0.986	1.000	
Gender inequality index (X <sub>3</sub> )	-0.910	-0.943	1.000

*Source: Field Data (2012)*

Table 4.2 above shows Pearson correlations of the independent variables, variables are strongly related each other due to fact that are computed from the similar feature of the human development factors.

#### **4.2 The relationship mechanisms between the economic growth and human development**

The stepwise regression was run to determine how human development indices influence the GNI per capita. The inequality-adjusted human development index is the first best determinant of economic growth. The gender inequality index and the human development index are the best alternative determinants of economic growth (Table4. 3).

**Table4. 3: Stepwise Regression for GNI per capita versus human development index, inequality-adjusted HDI and gender inequality index**

Alpha-to-Enter: 0.05 Alpha-to-Removes: 0.05

Response is GNI per capita on 3 predictors, with N = 40

<b>Step</b>	<b>1</b>
Constant	-23700
<b>Inequality-adjusted HDI</b>	65680
T-Value	10.22
P-Value	0.000
<hr/>	
S	7789
R-Sq	73.32
R-Sq (adj)	72.61
Mallows Cp	2.2
<hr/>	
<b>Best alternatives:</b>	
<b>Factor</b>	<b>Gender inequality index (GII)</b>
T-Value	-9.87
P-Value	0.000
<b>Factor</b>	<b>Human development index (HDI)</b>
T-Value	9.56
P-Value	0.000

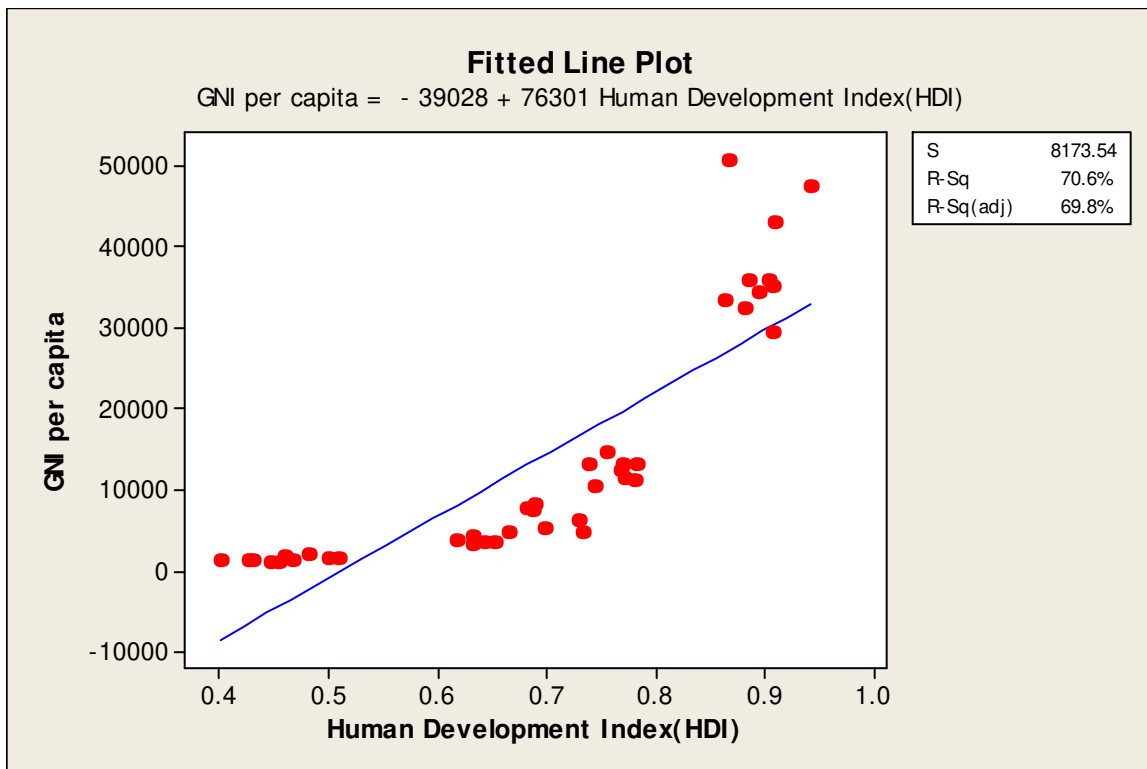
Source: Field Data (2012)

The table 4.3 above shows factors that indicate the economic growth. The stepwise regression was run at 5 per cent level of significant.

#### 4.2.1 The GNI per capita and human development index, inequality-adjusted HDI and gender inequality index

The study carried out on how to investigate the relationship mechanism between economic growth and human development. The GNI per capita regressed with each of the human development indices and their components. The GNI per capita is plotted against to human development index to profile the relationship between them.

Figure4. 1: The regression line between GNI per capita and human development index

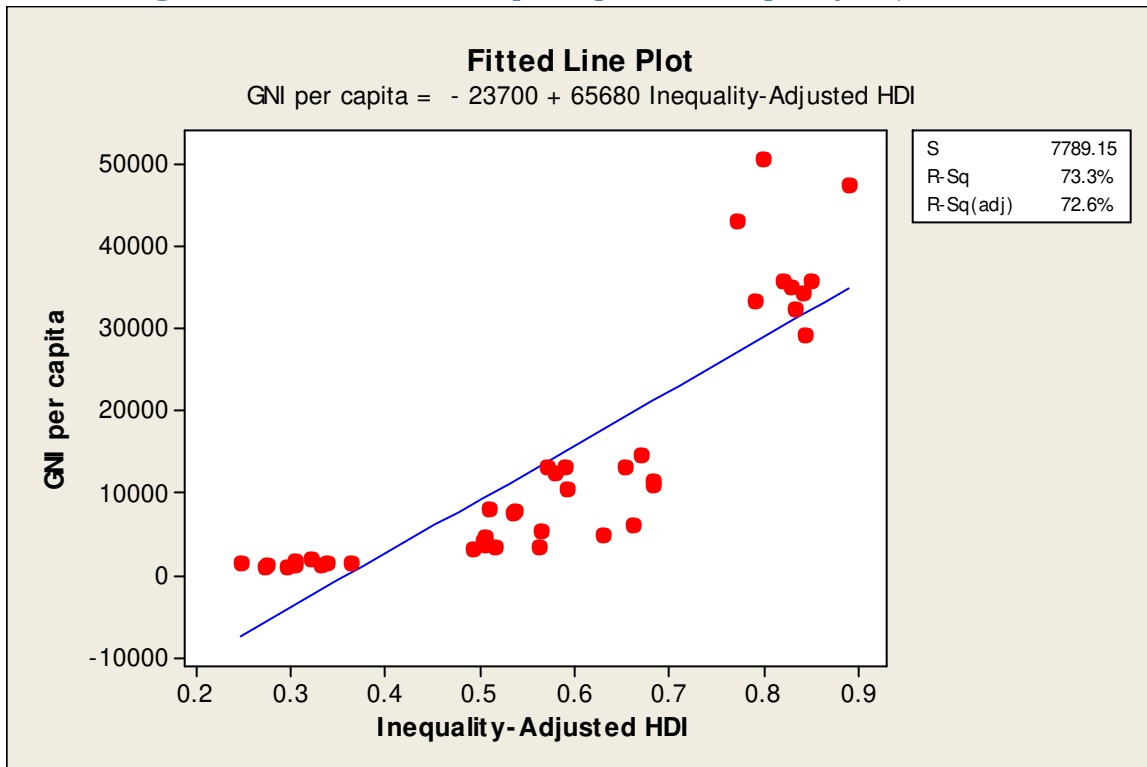


Source: Field Data (2012)

The figure 4.1 above shows the relationship between GNI per capita and human development index. The GNI per capita varies positively with the human development index. The regression line is determined at 70.6 percent which is a strong relationship.

The GNI per capita was plotted against inequality –adjusted human development (Figure 4.2). The figure portrays the positive relations. This implies that the higher the GNI per capita the higher the inequality –adjusted human development index and it is vice versa.

**Figure4. 2: The regression line between GNI per capita and Inequality-Adjusted HDI**



*Source: Field Data (2012)*

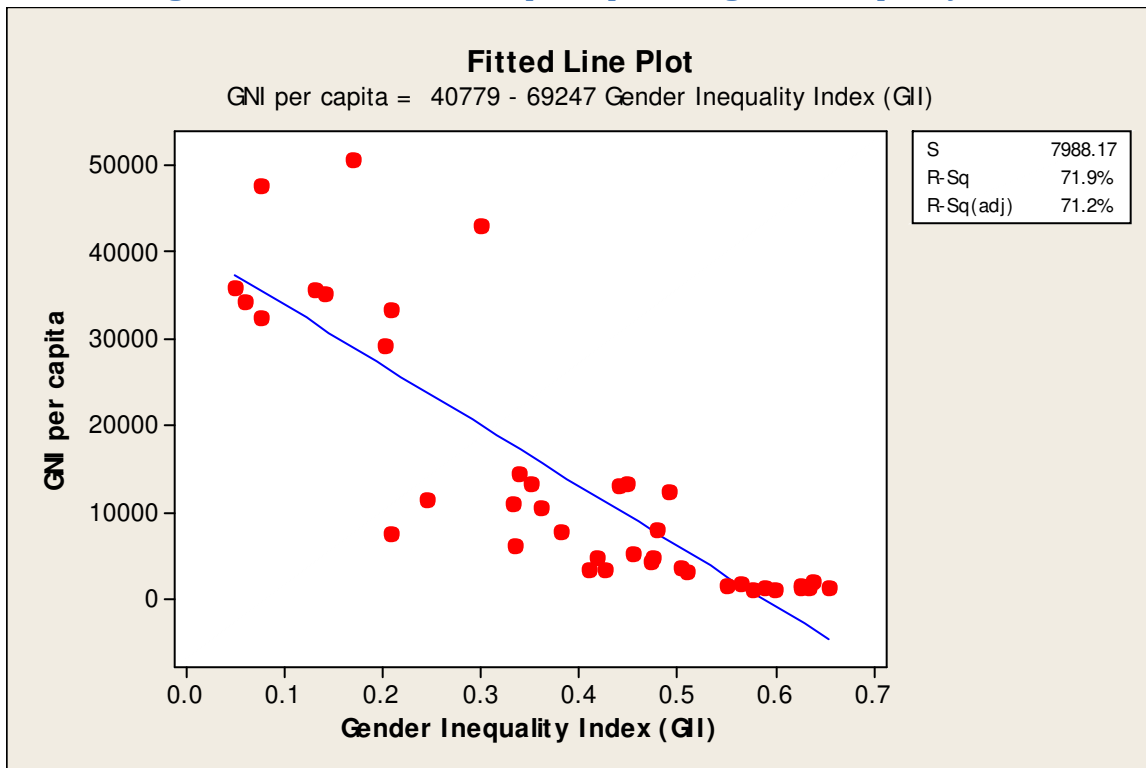
The figure 4.2 above shows the relationship between GNI per capita and inequality –adjusted human development index. The line of best fit is determined at 73.3percent. This shows the strong relations.

The GNI per capita and gender inequality index were plotted, the graph portrays that the GNI per capita varies negatively with the increase of the gender inequality index (Figure



4.3). The increase of GNI per capita causes the decrease of gender inequality index and it is vice versa.

**Figure4. 3: The regression line between GNI per capita and gender inequality index**



*Source: Field Data (2012)*

The figure 4.3 above shows the relationship between GNI per capita and gender inequality index. The line of best fit is determined at 71.9 percent. The two variables relate negatively.

#### **4.2.2 The GNI per capita and life expectancy at birth, mean years of schooling and expected years of schooling values**

The GNI per capita and the components of human development index were related to each other. Description statistics of the GNI per capita and life expectancy at birth, mean years of schooling and expected years of schooling were computed to scrutiny the

general characteristics of the countries sampled. The targeted statistical measures were mean, range, and standard deviation (Table 4.4).

**Table 4.4: Descriptive statistics of GNI per capita, life expectancy at birth, mean years of schooling and expected years of schooling**

Variable	N	N*	Mean	StDev	Minimum	maximum
GNI per capita (PPP \$)	40	0	13832	14884	1123	50557
Life expectancy at birth	40	0	70.85	9.23	49.00	81.40
Mean years of schooling	40	0	8.335	2.650	3.300	12.600
Expected years of schooling	40	0	12.785	2.959	6.300	18.000

*Source: Field Data (2012)*

The table 4.4 above shows the descriptive statistics of the components of the human development index, namely life expectancy at birth, mean years of schooling and expected years of schooling.

The person correlation was computed to diagnose the multicollinearity problem of the independent variables (components of human development Index) the figures show that they correlate at strong level (Table 4.5).

**Table 4.5: Correlations of life expectancy at birth, mean years of schooling and expected years of schooling**

Components of HDI	Life expectancy at birth	Mean years of schooling	Expected years of schooling
Life expectancy at birth	1.000		
Mean years of			

schooling	0.745	1.000	
Expected years of schooling	0.798	0.871	1.000

Source: Field Data (2012)

The table 4.5 above shows the Pearson Correlation of the components of human development index. The figure shows that these components are strongly related. After determination of the Pearson correlation, the step wise regression model was run (Table 4.6).

**Table 4.6: Stepwise regression of GNI per capita versus life expectancy at birth, mean years of schooling and expected years of schooling**

Alpha-to-Enter: 0.05 Alpha-to-Removes: 0.05

Response is GNI per capita on 3 predictors, with N = 40

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<b>Step</b>	1
Constant	-33646
<b>Expected years of schooling</b>	3714
T-Value	6.75
P-Value	0.000

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S	10170
R-Sq	54.51
R-Sq (adj)	53.31
Mallows Cp	5.6

---

**Best alternatives:**

<b>Component</b>	<b>Mean years of schooling</b>
T-Value	6.61
P-Value	0.000

<b>Component</b>	<b>Life expectancy at birth</b>
T-Value	6.20
P-Value	0.000

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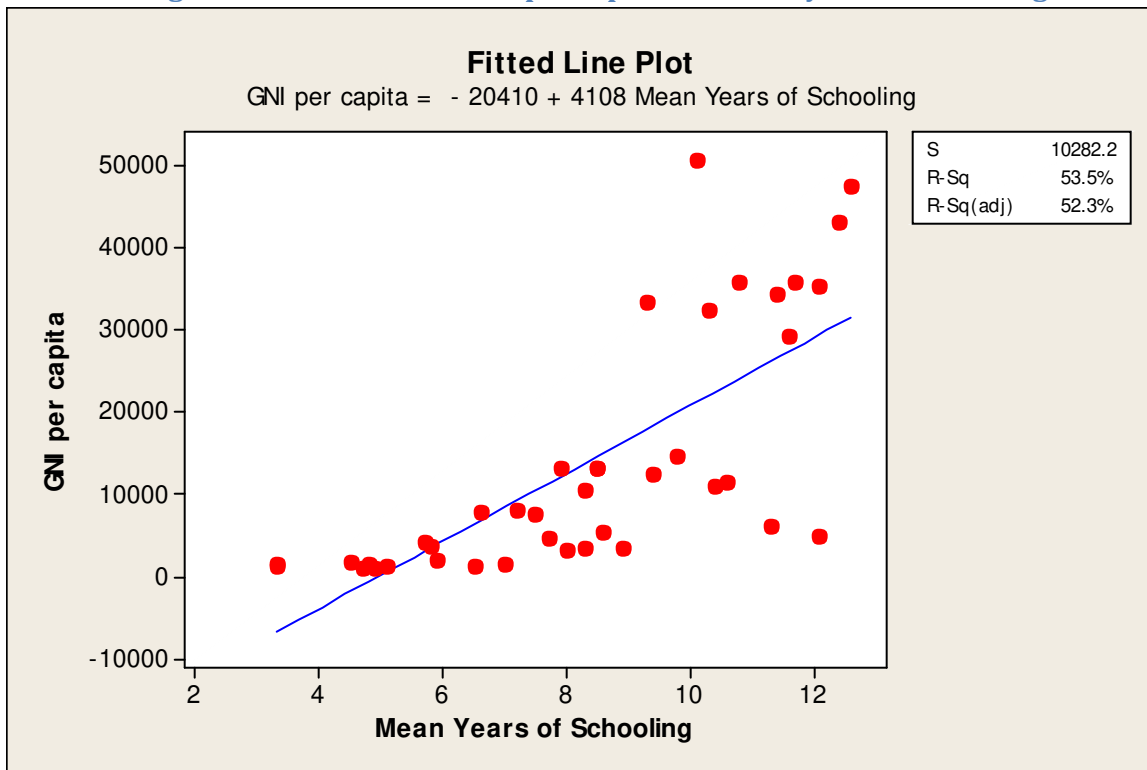
*Source: Field Data (2012)*

The table 4.6 above shows the stepwise regression results, the most component relates to GNI per capita is expected years of schooling, mean years of schooling and life expectancy at birth are best alternative variables.

#### **4.2.3 The GNI per capita and the life expectancy at birth, mean years of schooling and expected years of schooling values**

The GNI per capita with mean years of schooling were related together. The relationship is portrays that the higher the GNI per capita indicates the higher the mean years of schooling (Figure 4.4).

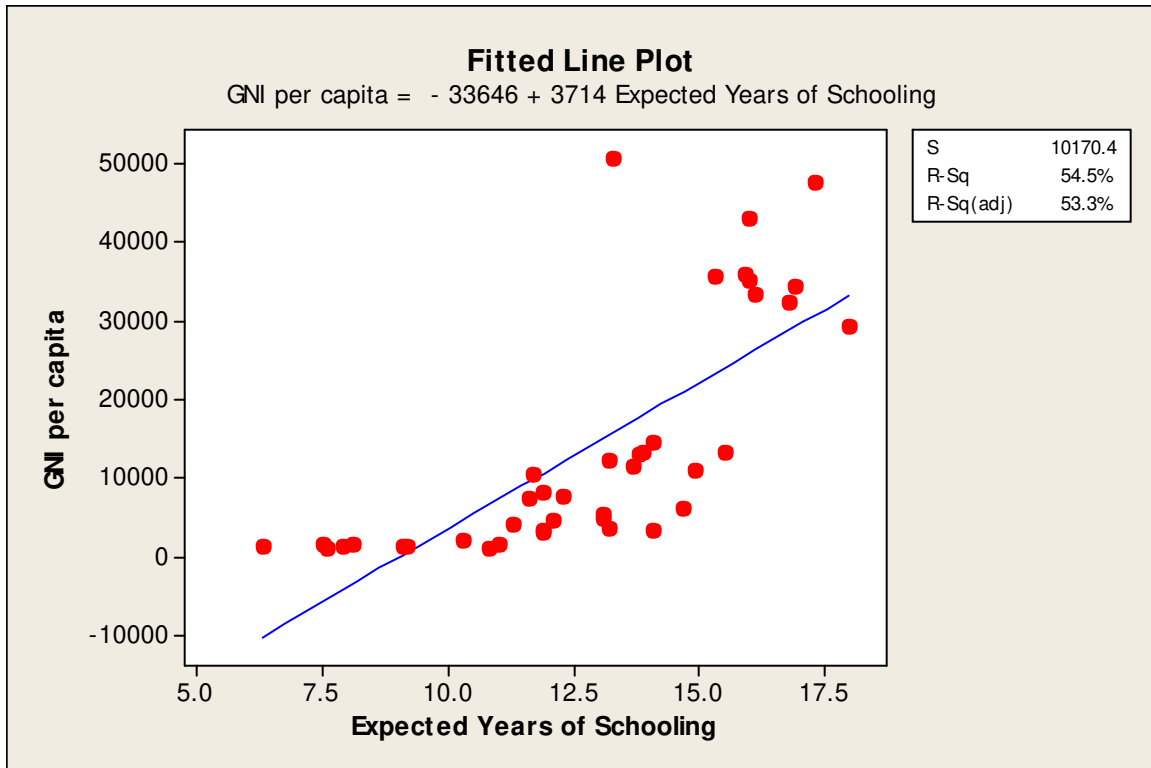
Figure 4.4: The regression line between GNI per capita and mean years of schooling



Source: Field Data (2012)

The figure 4.4 above shows the line of best fit determined at 53.5 per cent. The graph portrays positive relationship between GNI per capita and the mean years of schooling.

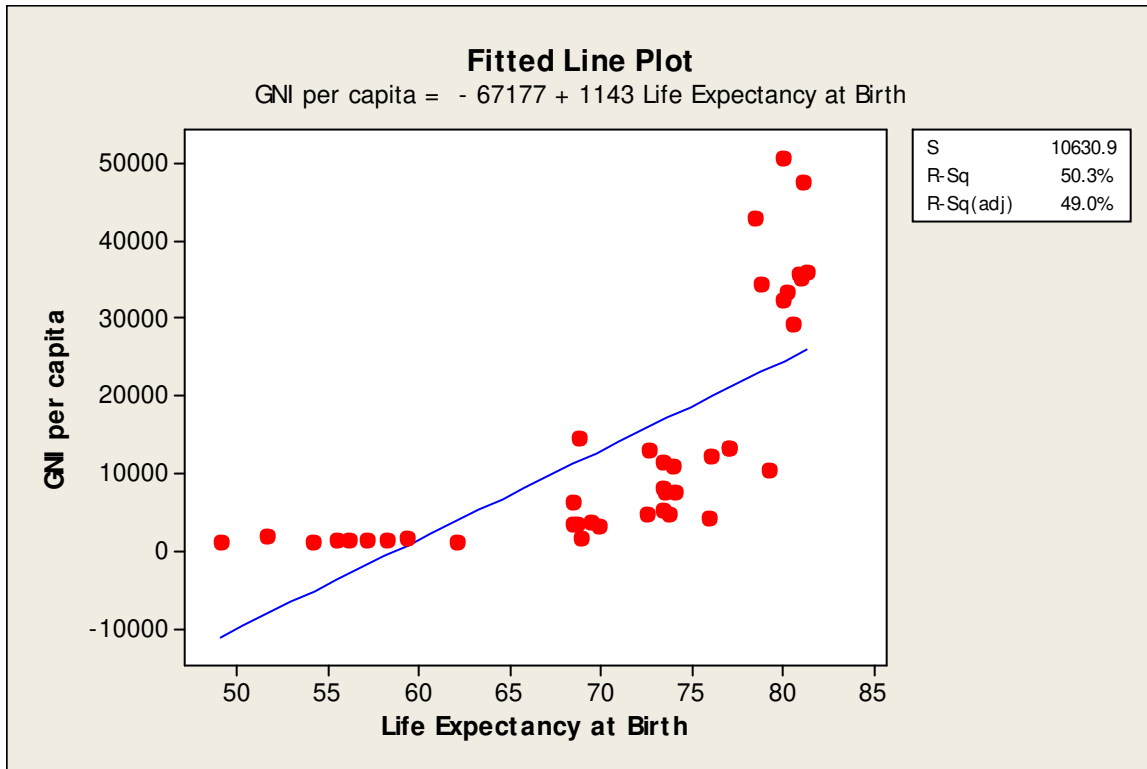
Figure 4. 5: The regression line between GNI per capita and expected years of schooling



Source: Field Data (2012)

The figure 4.5 above shows the graphical relationship between GNI per capita and expected years of schooling. The line of best fit is positive determined at 54.5 per cent.

**Figure4. 6: The regression line between GNI per capita and life expectancy at birth**



*Source: Field Data (2012)*

The figure 4.6 above shows the line of best fit between GNI per capita and life expectancy at birth. The figure portrays the positive relations determined at 50.3 percent.

**4.2.4 GNI per capita and inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index**

In order to make a thorough investigation on the relationship between the economic growth and the human development, the components of the inequality –adjusted human development index were examined. The descriptive statistics were of the components were computed to preview the statistical characteristics of those components (Table 4.7).

**Table 4.7: Descriptive statistics for GNI per capita, inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index**

<b>Variable</b>	<b>N</b>	<b>N*</b>	<b>Mean</b>	<b>StDev</b>	<b>Minimum</b>	<b>Maximum</b>
GNI per capita	40	0	13832	14884	1123	50557
Inequality-adjusted LEI	40	0	0.6872	0.2036	0.2660	0.9370
Inequality-adjusted EI	40	0	0.5863	0.2335	0.1730	0.9640
Inequality-adjusted II	40	0	0.4739	0.1713	0.1800	0.7890

*Source: Field data (2012)*

The table 4.7 above shows the descriptive statistics of the GNI per capita and the components of inequality –adjusted human development index.

The figures above show that there is a little variation of these components in the samples countries. This is contrary to the variation of the GNI per capita. The Pearson correlations of components of inequality –adjusted human development index were computed to profile the multicollinearity problem. The components shows that are strongly correlated (Table 4.8).

**Table 4.8: Pearson correlations inequality-adjusted life expectancy index, inequality-adjusted education index, and inequality-adjusted income index**

<b>Components of inequality-adjusted HDI</b>	Inequality-adjusted life expectancy index	Inequality-adjusted education index	Inequality-adjusted income index
Inequality-adjusted life expectancy index	1.000		
Inequality-adjusted education index	0.823	1.000	
Inequality-adjusted income index	0.850	0.878	1.000

*Source: Field data (2012)*



The table 4.8 above shows the values of Pearson correlation of the IHDI's components.

The stepwise regression was run to investigate the indicators of the economic growth among the indices of the IHDI's components. The inequality –adjusted income index is the most indicator of the economic growth, the inequality-adjusted education index and inequality-adjusted life expectancy index are alternative indicators (Table4.9).

**Table 4.9: Stepwise regression of GNI per capita versus inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index**

Alpha-to-Enter: 0.05 Alpha-to-Removes: 0.05

Response is GNI per capita on 3 predictors, with N = 40

<b>Step</b>	<b>1</b>
Constant	-23486
<b>Inequality-adjusted II</b>	78750
T-Value	13.23
P-Value	0.000
<hr/>	
S	6366
R-Sq	82.17
R-Sq(adj)	81.70
Mallows Cp	0.5

Best alternatives:

<b>Component</b>	<b>Inequality-adjusted education index</b>
T-Value	7.54
P-Value	0.000

<b>Component index</b>	<b>Inequality-adjusted life expectancy</b>
T-Value	7.04
P-Value	0.000

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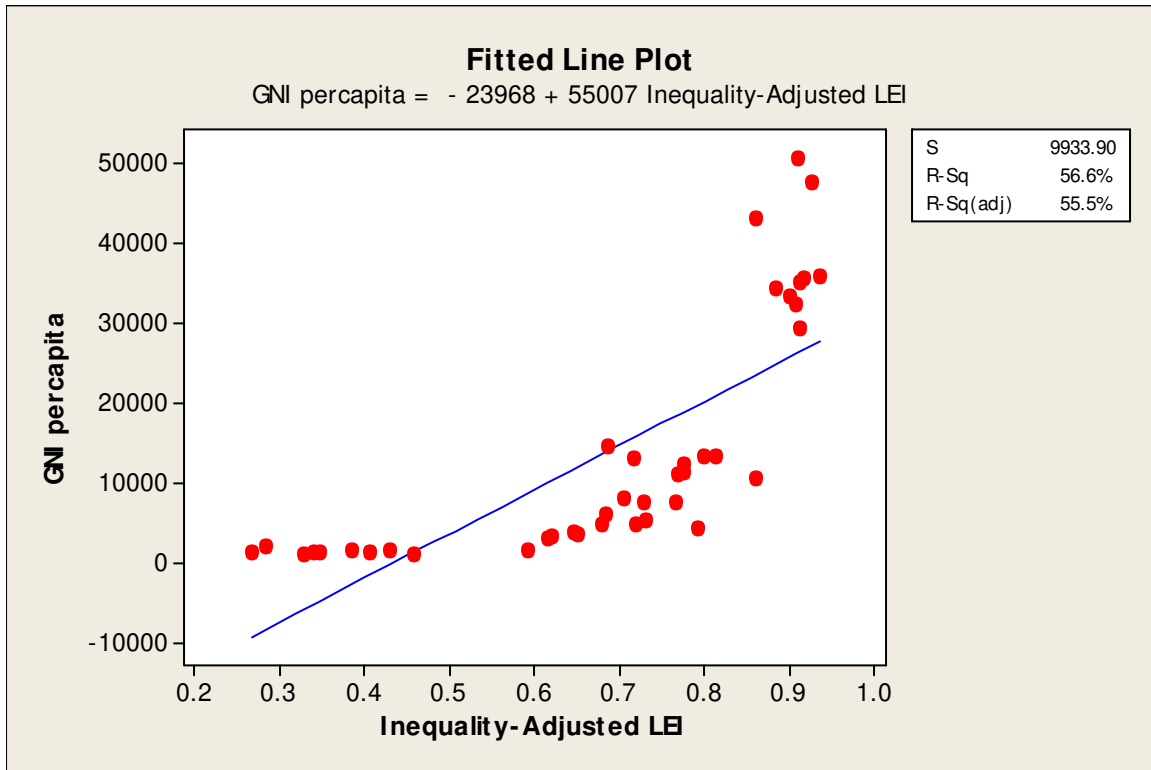
*Source: Field Data (2012)*

The table 4.9 above shows the results on the stepwise regression on the components of IHDI. The most effective component of indicator to influence the economic growth is inequality-adjusted income index, and the inequality-adjusted education index and inequality-adjusted life expectancy index are the best alternative components of indicators.

#### **4.2.5 The GNI per capita and inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index**

To profile on how these components relates to GNI per capita each component were graphed to determine the line of best fits. The GNI per capita and inequality-adjusted life expectancy index was regressed. The line of best fit is determined at 50.3 percent positive related. The higher inequality-adjusted life expectancy index indicates the higher GNI per capita that is the higher economic growth (Figure 4.7)

**Figure4. 7: the regression line between GNI per capita and inequality -adjusted life expectancy index**

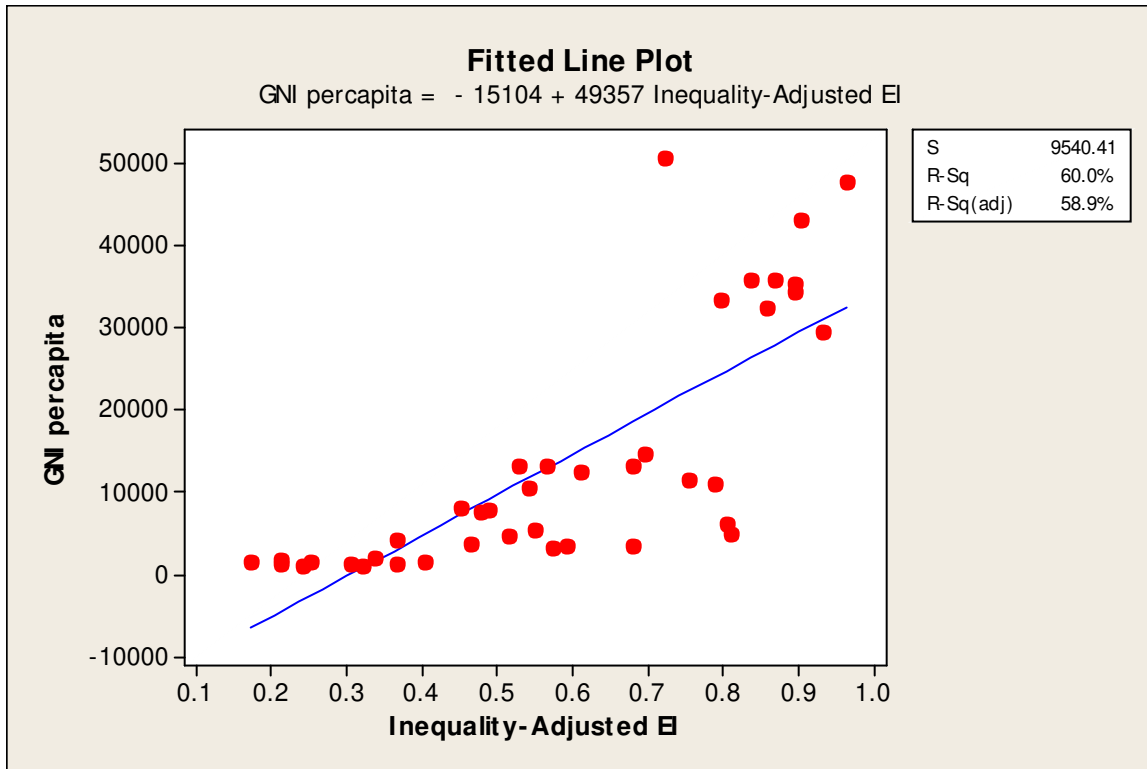


*Source: Field Data (2012)*

The figure 4.7 above shows the relationship between GNI per capita and inequality-adjusted life expectancy index.

The graph of the GNI per capita and inequality-adjusted education index portrays the negative relation, determined at 53.5 per cent (Figure 4.8).

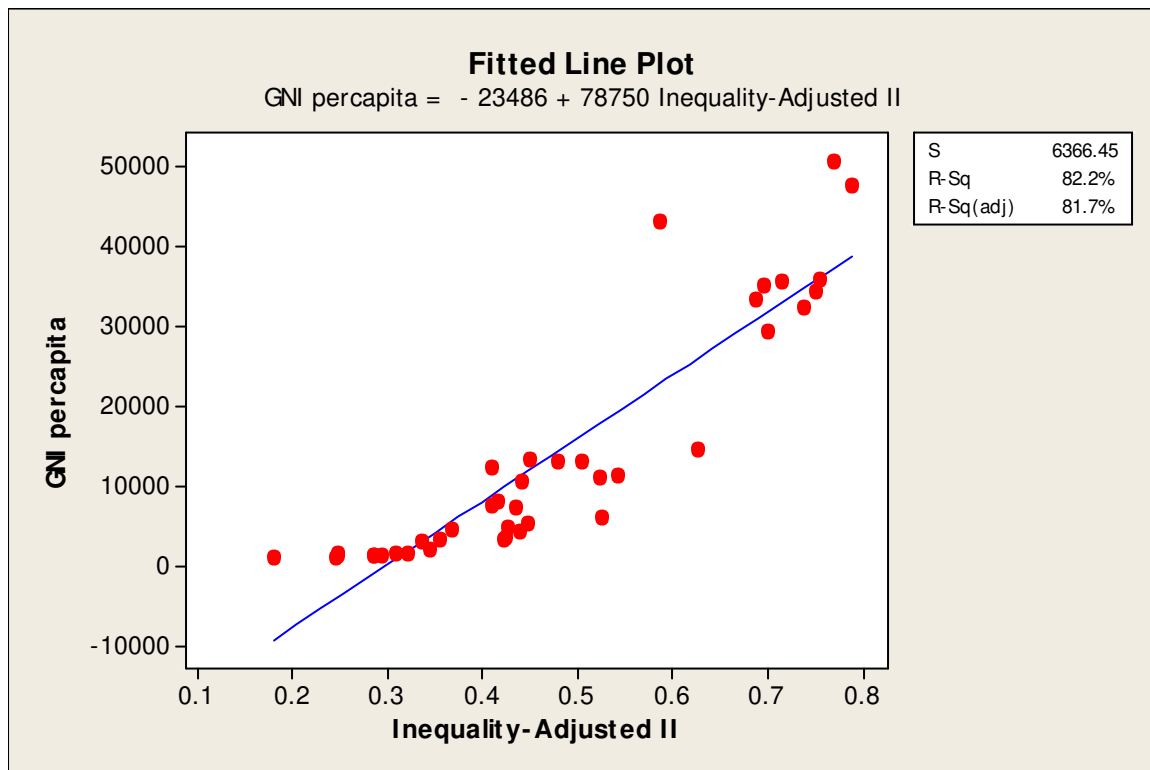
Figure4. 8: The regression line between GNI per capita and inequality-adjusted education index



Source: Field data (2012)

The graph 4.8 above shows the line of best fit of the GNI per capita and inequality-adjusted education index. The line of best fit is determined at 60.0 per cent. The GNI per capita is positive related to inequality-adjusted education index. The increase of GNI per capita cause increase in the value of inequality-adjusted education index and it is vice versa.

**Figure 4.9: The regression line between GNI per capita and inequality-adjusted income index**



*Source: Field Data (2012)*

The figure 4.9 above shows the relationship between GNI per capita and inequality-adjusted income. The line of best fit is determined at 82.2 percent, this is a strong relations. The regression is not determined at 17.8 percent. This implies that GNI per capita is highly influenced with inequality-adjusted income index.

### **4.3 The nation needs to improve economic growth and human development**

In increases of social and economic consumptions of the individuals particularly but not limited on health services, education services, income per capita, gender equity and freedom of individuals improve both economic growth and human development in a country. The increases of consumptions on social services caused by the proper political policies and technology and increase of income per capita improves the economic growth in turn. The nation needs to strategies to improve health, education services, income per capita, gender equity and freedom of individuals. The improvement

strategies will be integrated to improve both economic growth and human development of any particular nation. The improvement of those social services must be facilitated by good governance (political policies) and appropriate technology at a time. The investment of good political policies and technology, there returns must both of improved economic growth and human development.

#### **4.4 Tests of hypotheses**

The study aimed to investigate the relationship between economic growth, measured in GNI per capita and human development, measured in three indices, human development index, inequality-adjusted human development index and gender inequality index.

Three set of hypotheses were tested at 5 per cent level of significant or 95percent of confidence level. The human development index has a coefficient of 76,301, R-sq 70.6 percent, p-value of 0.000 and t-value of 9.56. The coefficient of expected years of schooling is 3714 with R-sq of 54.5 percent, p-value of 0.000 and t-value of 6.75. The mean years of schooling has a coefficient of 4108, R-sq 53.5percent, p-value of 0.000 and t-value of 6.61. The life expectancy at birth has a coefficient of 1143 with R-sq of 50.3 percent, p-value of 0.000 and t-value of 6.20.

In testing the first set of the hypothesis at 5 percent level of significant, all values of P, are less that the level of significant tested, that is  $0.000 < 0.05$ . From this fact the alternative hypothesis in the first set of hypotheses is accepted. That is, there is a statistical significant relationship between growth national income per capita and human development index, life expectancy at birth, Mean years of schooling and expected years of schooling.

The second set of hypotheses was tested at 5 percent level of significant. The inequality-adjusted human development index has a coefficient of 65,680 with R-sq of 73.3 percent, t-value of 10.22 and p-value of 0.000. The inequality-adjusted life expectancy index has a coefficient of 55,007 with R-sq 56.6 percent, t-value of 7.04 and p-value of

0.000. Inequality-adjusted education index has 49,357 with R-sq 60.0 percent, t-value 7.54 and p-value of 0.000 and inequality-adjusted income index has a coefficient of 78,750 with R-sq of 82.2 per cent, t-value of 13.23 and p-value of 0.000.

In testing this set of hypotheses at 5 percent level of significant, all p-values of the tested are less than 5 percent, that all values of P are 0.000. From this fact, the alternative hypothesis of the second set of hypotheses was accepted at 5 percent level of significant. That is, there is a significant relationship between gross national income per capita and inequality –adjusted human development index, inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index.

The third set of hypotheses was tested at 5 percent level of significant. The gender inequality index has a coefficient of -69,247 with R-sq 71.9 percent, t-value of -9.87 and p-value of 0.000. The value of p-value of 0.000 is less than 0.05. From this fact there is no strong statistical evidence to accept the null hypothesis of the third set of the hypotheses. Therefore, the alternative hypothesis is accepted at 5 percent level of significant. That is, there is a significant relationship between gross national income per capita and gender inequality index.

#### **4.5 Two ways chain – relations analysis**

In order to make a thorough investigation on the relationship of these two variables, the two ways chain relations examination was done. The first way chain is that, what happens on human development, if the GNI per capita income changes and the second way chain is that, what happens on the GNI per capita if the human development changes? In other words how the GNI per capita influences the human development and on other side how the human development influences the increase or decrease of GNI per capita in a particular country.

The investigation done by coefficients analysis, coefficients of the regression models used in the data analysis. The values of coefficients of correlation do not change at all.

The first way chain relations examination shows high figures of coefficients of human development index with high negative constant. The coefficients show that the GNI per capita highly depends on the human development. The human development is required to improve the GNI per capita.

Analyses of the equation of figure 1, the coefficient of this regression equation profiles that at the maximum human development index value, that is 1, the GNI per capita is 37,273 PPP (US\$ 1). But, at zero human development index, the GNI per capita is -39028, extremely low and impractical; the *break even index* is 0.5115. This means that by using this regression model must have at least 0.5115 values of HDI to have at least GNI per capita of PPP (US\$0). This is a confusion of mind. From this fact human development may exist automatically up a certain level (constant value) and slightly will be reinforced by the increase of GNI per capita. What come first? Is it the increase of GNI per capita or the human development? From this examination, the human development come first, and then forces the economic growth. The first way chain relations examination shows that economic growth comes after the country reaches a certain level of human development, and it is not vice versa.

In analyzing the coefficient of the equation, human development index =  $0.565 + 0.0000009$  GNI per capita (reverse equation of the regression model figure 1), the coefficient of the profiles that, even at the GNI per capita of PPP (US\$1) the value of human development index will be exist at *reasonable value*, the value which acquired by other countries with high GNI per capita. This fact, portray the same meaning with the first way chain-relations examination. The GNI per capita is necessary but not enough to improve human development of a particular country.

The first way chain relations examination of the GNI per capita and inequality –adjusted human development was done. Analyzing the coefficient of regression equation of figure 2, portrays the same facts as the first scenario. The break even index is 0.3608.



The value required to cause at least zero value of GNI per capita. The facts do not confirm the reality of the operation; the negative value does not make sense in logical reasoning. It is not expected to get negative value of GNI per capita, but mathematically plays to have a significant meaning.

Analysing the second way chain relations examination, the regression equation becomes, Inequality-adjusted human development index =  $0.417 + 0.000011\text{GNI per capita}$ . The equation still describes the same facts profiled by the human development index reverse or second way chain relations examination. The only difference of this analysis is the slight decreasing of value of IHDI at the GNI per capita at PPP (US\$1). This equation describes that even at zero value of GNI per capita, the human development will be exist at the reasonable value. This finding pose a question that, is it true, human development index is a proper measure of human development or GNI per capita true measure of economic growth? Another aspect to be considered is, if the GNI per capita not initiate the growth of human development, what are the *initiators* of the human development? And how influence the human development of a particular country?

The analysing of the first way chain relations examination of the regression of GNI per capita and gender inequality index, confirms the reality of the practical application. The regression has a positive constant, with a negative coefficient of gender inequality index (figure 4.3). The regression has a break even index of 0.588.

#### **4.6 Discussion of the results**

The study covered various testable variables, including human development indices and their components. The components of the gender inequality index were not tested due to fact that data were not available for some of the sampled countries.

The general characteristics of sampled counties profiled by descriptive statistics show that countries highly vary in GNI per capita. The human development indices slightly vary among the countries. This poses a question on how this measure reflects or

determines the economic growth and human development in a particular country because figures fail to show coincidence of variations.

The indices components were keenly scrutinized, expected years of schooling as a component of HDI relates to GNI per capita, determined at 54.5 percent. The mean years of schooling determined at 53.5 percent and the life expectancy at birth determined at 50.3 percent. In its composition, the line of best fit of the HDI and GNI per capita is determined at 70.6 percent. The figure shows that all the components of HDI positively related to GNI per capita at marginal level.

It is not strong enough to conclude that, the gross national income per capita influenced by components of HDI. The relations of GNI per capita and EYS, MYS, and LBE are determined at 54.5 percent, 53.5percent and 50.3 percent respectively. Figures are too slight to say that they are above the half of a percent; they are almost all equal to the half percent. What does it means? It is indifferently to judge their influences since both the answers are right, no influence on each other is a right answer and at the same time influences each other is a right answer.

Inequality-adjusted life expectancy index the component of IHDI is the least variable that relates to GNI per capita determined at 56.6 percent, with t-value of 7.04. The inequality-adjusted education index relates to GNI per capita at 60.0 percent and the inequality-adjusted income index highly relates to GNI per capita, it is determined at 82.2 percent. This is strong enough to conclude that the GNI per capita relates to inequality-adjusted income index. In its composition, the line of best fit between IHDI and GNI per capita is determined at 73.3 percent. This value is strong enough to conclude that the GNI per capita relates to IHDI.

The gender inequality index relates negatively to the GNI per capita, determined at 71.9 percent. The higher gender inequality decreases the GNI per capita. The country with less gender inequality index promotes the higher GNI per capita. The gender equity

promotes the growth of economy in a country. The components of the gender inequality index were not considered in this research due to lack of relevant data. The negative relations means that a country which does not consider gender equality narrowing the chances of female or ignore female opportunity in decision making, getting education, high maternity rate (poor health services for female), workforce participation of female and any kind of female ignorance will lead to have a burden of poverty. Most of the females will be low earners income and not involved fully in the decision making and production. The result of this is a country to produce less due to fact that males are the only healthier, educated and able to produce. They produce for the both male and female. In this situation female treated as *spectators of the economy builders –males*. This is quite wrong! Obviously the GNI per capita will be low, produced by few, consumed or shared by many.

The human development index found statistically significant at 5 percent with positive coefficient or slope. This means that the higher GNI per capita leads to higher human development index. From this fact, the human development index is the indicator of economic growth.

The findings confirm that economic growth and human development strongly relates. This finding confirms to Ramirez, *at el.* (1998), Boozer, *at el.* (2003), Ranis, *at el.* (2000) and others that there is a strong relationship between economic growth and human development. The economic growth depends on the human development and human development depends on the economic growth. As suggested by Boozer, *at el.* (2003) the priority should pay to human development to raise economic growth and human development at the same time. The increase of income of the individuals in a country (high GNI per capita) increases the range and capabilities of choice enjoyed by household, government and other organisation, including NGOs. The increase of this enjoyment or consumption increases the human development in a particular country. The increase of consumption on health and education forces the economic to grow. This

relationship is termed two ways chain relations, which depends on the *activating factor on each side*.

#### **4.7 Findings of the research**

The research aimed to determine the relationship between economic growth and human development. This research sought to answer the questions that, how the GNI per capita influences human development indices and their components and, how human development indices and their components influence the GNI per capita? And what are the nation needs to improve both of economic growth and of human development?

Human development indices namely human development index, inequality-adjusted human development index and gender inequality index were used in the study. Further investigation was done to scrutiny on how components of human development indices relate to economic growth. This is done to test the strengths of the components to compose a strong measure of human development. Indices show that these components are moderate fairly to compose accurate measure of human development.

This research found that the economic growth and human development relates. All the components of human development indices relate to economic growth and are moderate components to compose a measure of human development. The strengths of these components were examined in the sense that each of the components composes the human development indices correlate in the same way and at more than 0.80. These components correlate positively for human development index and inequity-adjusted human development index. The nation needs to improve both of economic growth and human development are *previewed in high expenditures on enjoying a broad choice of social services, including setting strategies to improve education, health, gender equity, democracy and other social needs*. The indicators of human development are presence of good and standard social services such as education, health, gender equality and active democracy of the people.

From this fact, although it is not necessary a country having a high economic growth must have high human development, but it is more likely to have high human development keeping no influence of *operative political policies and technology* invested in a particular country.

The findings of this study is that the human development can exist at even zero income, this implies that the relationship of economic growth and human development is not perfect, it starts after a certain level of human development. First, human development must exist to improve the economic growth, and economic growth improves human development. This is why not a country having high GNI per capital must have high human development, the initiators of human development are *operative* political policies and technology invested, and the GNI per capita is the activator of human development.

## CHAPTER FIVE

### CONCLUSION, RECOMMENDATION AND POLICY IMPLICATION

#### 5.1 Conclusion

The research sought to find out the relationship mechanisms of economic growth and human development. The considerable factors to improve the economic growth and human development were identified by this research. In general both the economic growth and human development were strongly related. The human development is the input of the economic growth, but in turns, the economic growth activates the human development. The political policies and technology invested in a country have a positive impact on both human development and economic growth. The country may have high GNI per capita but fail to improve its human development status, due to imperfection of political policies and technology invested in a country.

The research found that improving social services (increasing consumptions) on health services, education service, enhancing gender equity and freedom of individuals are considerable factors to improve the human development and economic in turns. The key determinants on improving of the named social services are political policies and technology invested in a country. The GNI per capita is a secondary determinants or input to human development. From these facts, a country may achieve a high human development with low GNI per capita income. The *sustainable human development* should be should achieved through both economic growth and political policies and technology invested in a country.

The situation of a country to be economic growth lopsided may be caused by the poor political policies and technology invested on human development, the country may run into vicious cycle. It is hard to transform the economic growth to human development, since the economic growth is the secondary determinant of the human development. The economic growth lopsided countries have never run to virtuous cycle, instead run to

vicious cycle. Countries having human development lopsided situation may run to virtuous cycle. The two chain analyses proved this situation.

## **5.2 Recommendations**

In adhering to the findings of this research, a country struggling for improving social and economic welfare of her people, should concentrate on both human development and economic growth. The political policies and technology to invest in a country should *be weighted* to the human development improvement. These factors may hinder both the economic growth and human development in a country if are not weighted to the human development improvement. A country should have *integrated strategy* on both to improve the human development and economic growth.

## **5.3 Policy implications**

Posing implications on these findings is a crucial aspect in the sense that, findings are not free of challenges. How these findings being a challenge to be implemented, is a matter to be discussed. The findings of this research recommend that both economic growth and human development should be executed. The human development is an input of economic growth, and the economic growth in a secondary input of human development. To achieve a sustainable human development a country must have to improve its economic growth. The economic growth is a key input for sustainable human development.

From this fact, there is a strong relationship between human development and economic growth, so it is required to establish an integrated strategy to improve both of them. The single sided strategy (human development sided strategy or economic growth sided strategy) will not improve the social and economic welfare of the people in a country.

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