

The 3rd IPAR Annual Research Conference

Assessing the relationship between Economic Growth and HDI in Rwanda

Research Paper Undertaken and presented by

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Outline

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Introduction

In 2000, the international community set MDGs to be achieved by 2015 and by that period the government of Rwanda also embarked on long term **Vision of 20** years which set out the economic image of the country in 2020s, the decisive of the vision was to change Rwanda into middle income country in 2020. Currently we are reaching time bound of MDGs and Less than 7 years remain to reach vision 2020, and it is an opportune time to look the economic growth and the livelihood transformation measured through Human Development Index (HDI) in order to fast track the dvpt.

Problem

Ideally, Economic Growth should help the nation to change people's life in all aspects: Education, Increased in income per capita, changes in consumption patterns, access to infrastructure, access to health facility, etc... However, the current reports on Rwanda and official statistics (EICV 1,2,3), UNDP Reports, World Bank Data 2012) reveal that, constant Economic Growth (DGP) that the country experienced over last 12 years did not much more translate into significant reduction on income Inequality, which finally constrained the substantive improvement in the Human Development Index (HDI). Income plays big role in HDI computation, lack of bell shaped distribution among population, ultimately affect its improvement despite the good indication of Economic Growth.

Research questions, objectives and Hypothesis

Research questions:

- Is the stable real growth that the country experienced over 12 years shared equally among the Rwandan citizens?
- Is there a relationship between the Economic Growth and Human Development Index (HDI)
- What are the appropriate measures to be put in place in order to heighten the HDI

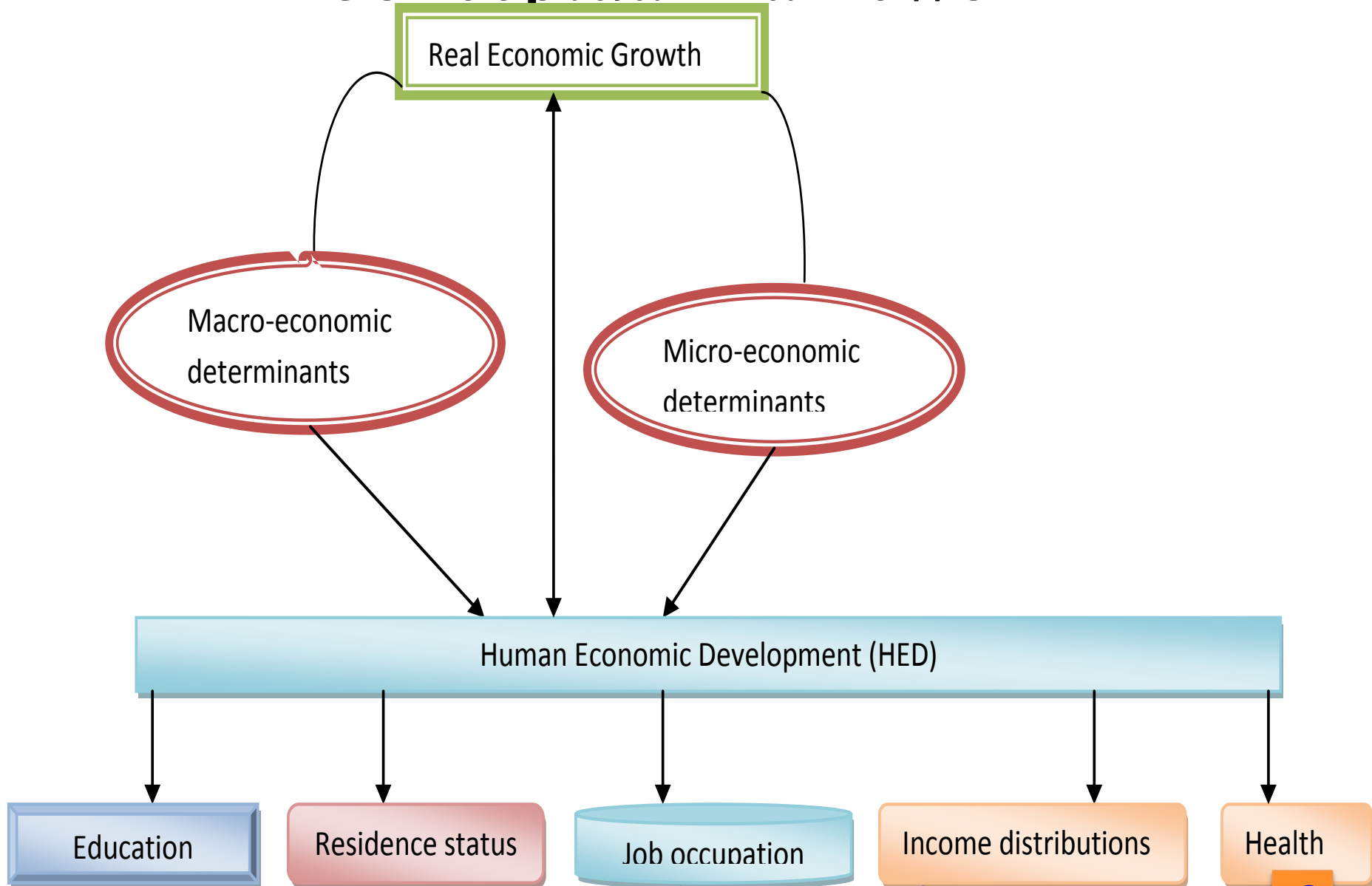
Research Objective:

The main objective of the study is to assess with empirics the link between Economic Growth and Human Development Index (HDI) of Rwanda in Last decade:2000-2012

Hypothesis: H0: There is no linear Relationship between Economic Growth (GDP) and Human Development Index (HDI)

H1: Significant Linear Relationship exists between the GDP and HDI

Conceptual framework



Literature

Economic growth is the increase in the market value of the goods and services produced by a given economy over a specified time period usually a year . GDP is corrected with inflation on the price of goods and services produced in economy (Lucas:1988, Mankiw:2001). Different models of grow dominated mainly by Classical and Neoclassical theories or models. The basis of the classical theory was subsistence real wage rate and population dynamics in production process. And neoclassical theory/model (Endogenous growth theory) of Growth which was dominated by Solow-Swan Growth Model (1950s and 1960s) involving series of equation depicting the relationship between labor-time, capital goods, output, and investment to the economy output over time (Mankiw:2001).

Literature

Traditional analysis used to indistinctly analyze poverty and growth (Ianchovichina, Lundstrom and Garrido:2011). The requirement for rapidity in growth is of crucial importance for poverty reduction and the sustainability of growth condition to be met need to be broad-based across sectors (Kraay 2004 , Berg and Ostry 2011a, Ali and Son: 2007), such character may lead to substantive increase in Human development Index which commonly used in comparing and measuring countries people's development. The macro-economic determinants represent the basic indicator of economic activity in any country (Keynes: 1936, Mankiw: 2001, Vladimir: 2011) are:

$$Y = C + I + G + X - M \text{ and}$$

HDI aggregates the development in Health, Education and Income of a country for a certain period of time (UNDP:2012).

Data and methodology

Various source of data were used: NISR, UNDP, and mainly World Bank Development indicator data.

The data used were quantitative and cover 2000 to 2012 period. For some indicators, the reliable data covered 2005-to 2012.

The methodology used to analyze the data is linear regression with OLS Methods, with

The following models was tested and constitute helped to decide on the research objective

$$\mathbf{HDI} = \boldsymbol{\lambda} + \boldsymbol{\beta} \mathbf{GDP}_{\text{capita}} + \boldsymbol{\varepsilon}$$

And models used were subsidiary in order to test the trend particularly on education index as well as health index(HI)

Analysis and interpretation of the findings

Health Index improvement

Health Index (HI) = - 3.53 - 0.00208 Mort_rate_under_5 + 0.0708
Preval_of_HIV_15-49 + 0.167 Improved_water_source_rural - 0.0769
Improved_water_source_urban - 0.0078 Improved_sanitation_facilities

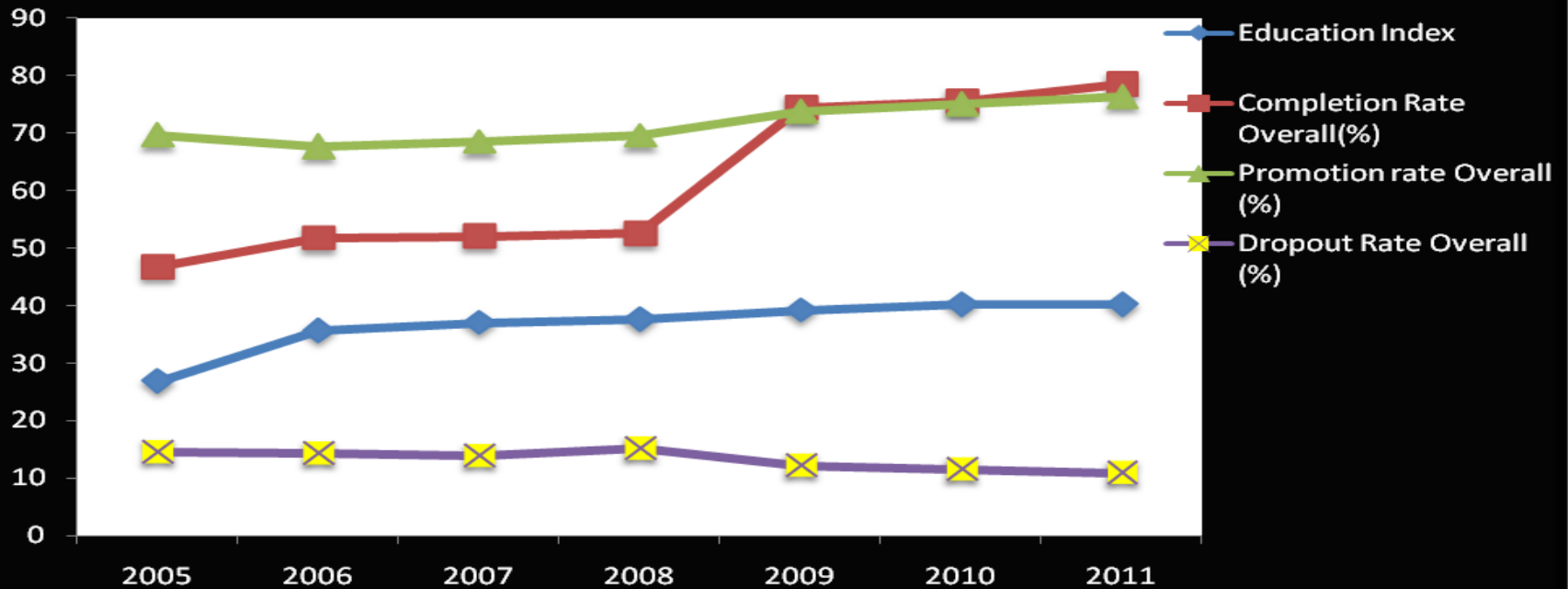
Predictor	Coef	SE Coef	T	P	VIF
Constant	-3.527	2.520	-1.40	0.211	
Mort_rate_under_5	-0.0020823	0.0006324	-3.29	0.017	521.615
Preval_of_HIV_15-49	0.07078	0.03693	1.92	0.104	238.571
Improved_water_source_rural	0.16671	0.03679	4.53	0.004	1268.052
Improved_water_source_urban	-0.07689	0.03932	-1.96	0.098	4633.339
Improved_sanitation_facilities	-0.00776	0.01635	-0.47	0.652	4108.588

S = 0.00386253 R-Sq = 99.7% R-Sq(adj) = 99.5%

Durbin-Watson statistic = 2.02298

Health index = 0.4172 + 0.0130*t Where t is time values

Analysis and interpretation of the findings



Y_t (Education Index Improvement) = $0.2933 + 0.0185 * t$ where t is time value

And the regression results

Education Index = $2.41 + 0.0023$ Completion Rate Overall + 0.00242 Transition percentage - 0.0266 Promotion rate Overall - 0.035 Dropout Rate Overall

Predictor	Coef	SE Coef	T	P
Constant	2.406	3.774	0.64	0.589
Completion Rate Overall (%)	0.00234	0.01664	0.14	0.901
Transition percentage (%)	0.002418	0.005862	0.41	0.720
Promotion rate Overall (%)	-0.02659	0.02378	-1.12	0.380
Dropout Rate Overall (%)	-0.0353	0.1302	-0.27	0.812

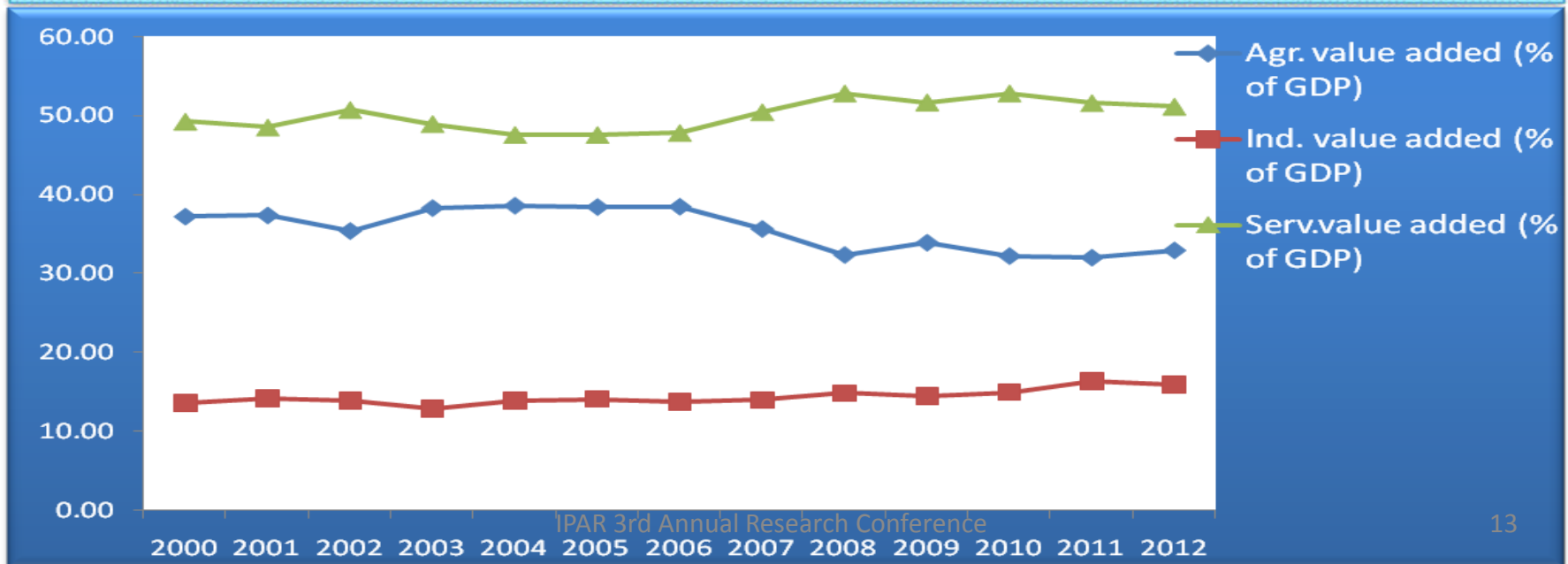
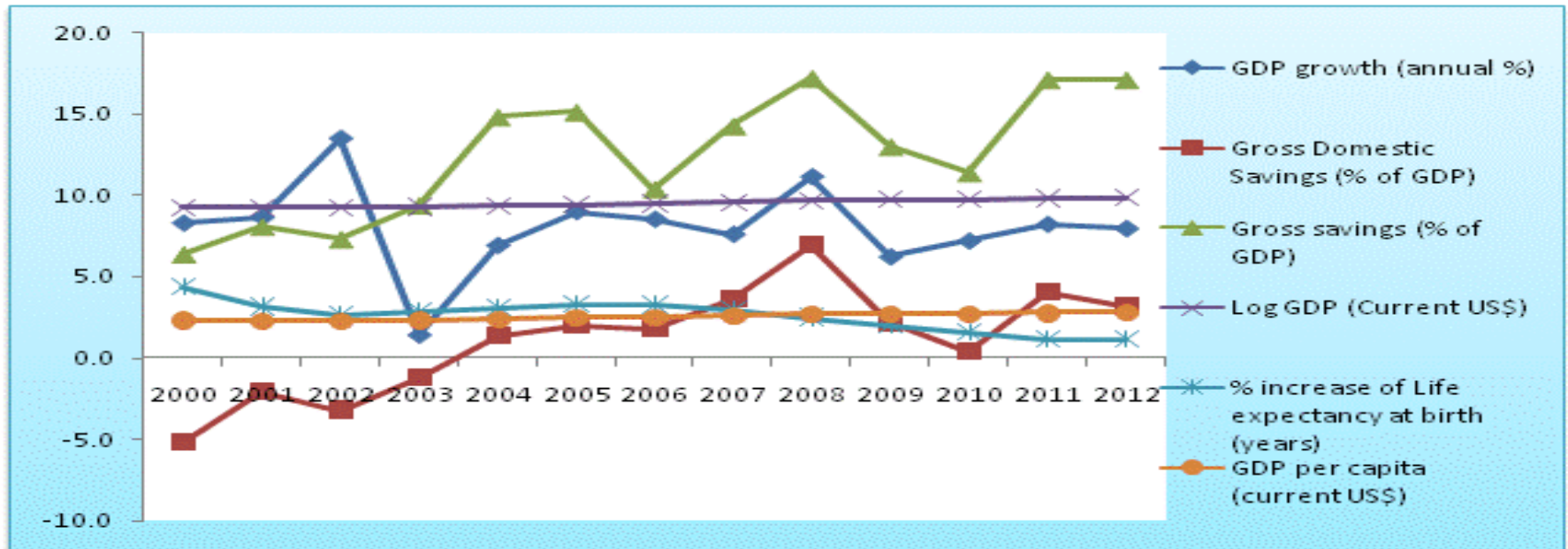
R-Sq = 81.3%

Analysis and interpretation of the findings

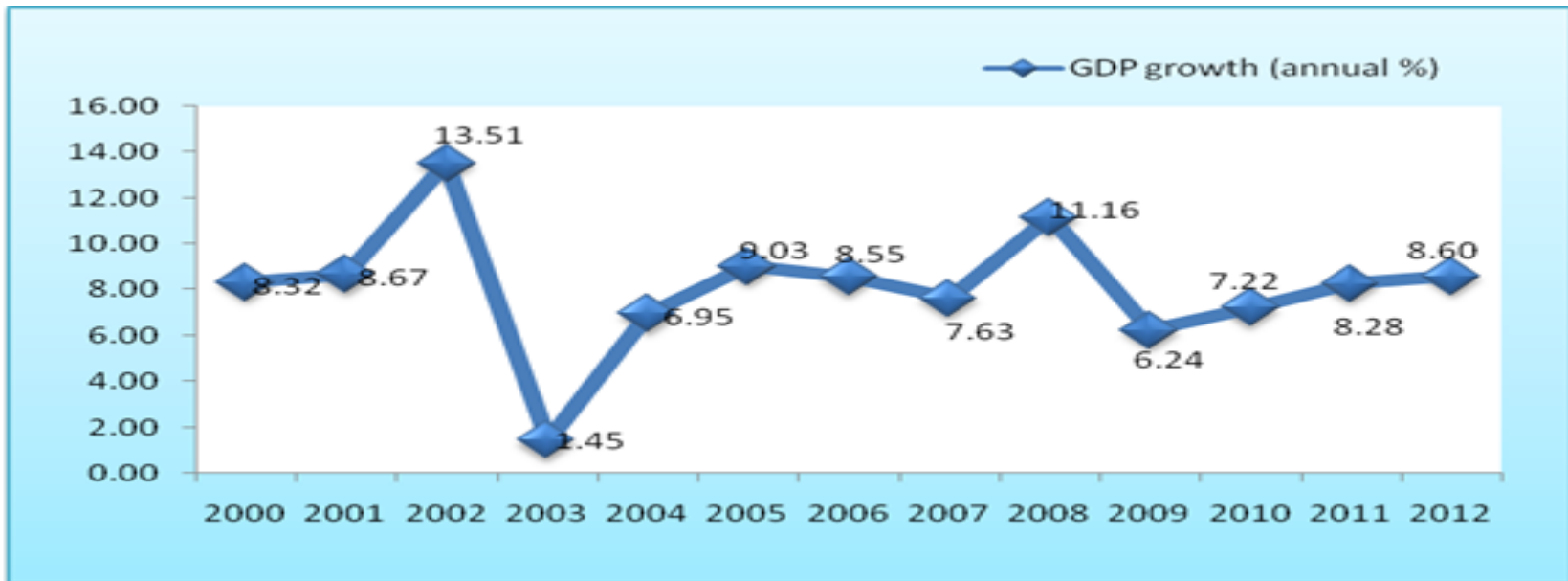


Indicators\Years	2000	2006	2011
Income share held by highest 20%	57.16	58.61	56.84
Income share held by lowest 20%	4.78	4.6	5.16
Income share held by highest 10%	43.42	45.15	43.22
Income share held by lowest 10%	1.88	1.81	2.13

Analysis and interpretation of the findings



Analysis and interpretation of the findings



Average growth for 12 years was **8.12%**

Linking the GDP with the HDI

$$\text{HDI} = \lambda + \beta \text{GDPc} + \varepsilon$$

Results

$$\text{HDI Value in \%} = 29.0 + 0.0251 \text{ GDP capita}$$

Predictor	Coef	SE Coef	T	P	VIF
Constant	28.958	1.033	28.04	0.000	
GDPc	0.025091	0.002607	9.63	0.000	1.000

S = 1.43408 R-Sq = 89.4% R-Sq(adj) = 88.4%

PRESS = 30.9651 R-Sq(pred) = 85.48%

Conclusion and Policy Recommendation

1. High growth rate contributed to the improvement of HDI in Rwanda for 12 years back, and a moderate positive relationship was observed,
 2. GDP has a scale up effect on the improvement of other components of HDI (Health, and Education),
 3. Inequality persistence helped the highest income holder group to gain much more to the economic growth than the lowest income holders, (**Strong effort for resources allocation and inequality reduction**), cater for the lowest income holders who are much more excluded from income
 4. Health Index was principally improved by the access to sanitation facilities and water access, as well as the reduction of the maternal and infant Mortality, HIV Prevalence did not contribute to the improvement of HDI significantly (**Policy to increase access to health, health facilities, and maternal and < 5 years death**)
 5. Education Index was highly induced by the primary school completion rate, and the data indicated a negative relationship with drop out (**Policy to reduce primary school drop out**)
- “Well educated, Healthier with high income holders people will be certainly be self reliant”**

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