Does Institutional Quality Matter for Making Public Spending Effective in Reducing Poverty and Inequality in Developing Countries

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Abstract: While governments across the globe are spending on the social sector, it gives mixed results in reducing poverty and inequality. Poor targeting and inefficient handling of public funds, corruption, quality of public service delivery, and degree of people's participation in the development process, or in a word 'institutional quality', may explain differences in the effectiveness of public spending for poverty and inequality reduction. This study aims to examine the importance of institutional quality for the effectiveness of public spending in reducing poverty and inequality in developing countries in Asia, Africa and South America. Country-level data has been collected from different databases published by international organizations to compile a dataset for the period 1996 - 2007. Due to limited data availability, three different observations are used for each country: one for the periods 1996-1999, 2000-2003, and 2004-2007 each, respectively. Changes in poverty and income inequality between these periods are regressed on institutional quality, public spending, GDP growth rate and several interaction terms. The estimation results indicate that high institutional quality reduce poverty and inequality faster than poorly governed countries and that high institutional quality also makes public spending more effective in reducing poverty and inequality. Hence, improving institutional quality or ensuring good governance and bringing more poor people under the umbrella of social security, education and health care services can be an important way to eradicate poverty and reduce inequality more effectively in developing countries.

Keywords: Poverty Reduction, Public Spending, Institutional Quality, Developing Countries, Inequality.

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1. Introduction

Poverty reduction has become one of the most priority tasks of every government in developing countries and it is also mentioned in the millennium development goals which states to reduce poverty by half by the year 2015. Each government is taking variety of initiatives to eradicate poverty and public spending is one of the most important tools among these initiatives for this goal. According to Fan et al. (2000), government spending have two different effects on poverty; direct and indirect effects. The poor receive directly from direct income payments and expenditures on employment programs. Fan et al. (2000) highlights on government investment in rural infrastructure, agricultural research, health and education for rural people that stimulates agricultural and non-agricultural growth, leading to greater employment and income-earning opportunities for the poor and to cheaper food.

Investment in agricultural research, education and rural infrastructure could be most effective to achieve economic growth and eradicate poverty (Fan, 2008). Besides investment in these sectors, government expenditures in social sector can also reduce poverty significantly (Agrawal, 2008). In rural areas, public spending creates employment and thus, affects rural non-farm wages (Fan, 2008). The 'trickle-down' benefits of government spending could also be significant for the poor (Fan et al., 2000). But public resources are limited, especially in developing countries, and therefore these resources have to be allocated and utilised efficiently (Fan, 2008). On the other hand, inefficient targeting and misuse of funds could hamper the desired outcome. There is also opposition from experts to use public resources for poverty reduction and they argue to use public funds only in crisis situation. Income transfer to the poor becomes relatively costly because it involves other nonwage costs (Fan, 2008).

The performance of public spending in achieving economic growth and poverty reduction is mixed and the same policy yields different outcomes in different regions in the world. Fan and Rao (2006) found that government spending in agriculture and health were more effective in promoting economic growth in Africa. They also found that public spending in agriculture and education were stronger in Asia and public spending in health sector was the stronger way of achieving economic growth in Latin America. There are also drawbacks to solely focus on economic development and target poverty reduction driven by it. Many studies found positive association between economic growth and inequality (Knowles, 2005). So policy makers formulating policies to reduce poverty through growth-oriented policies may end up with higher inequality. If higher growth leads to inequality then the fruit of economic development may not be helpful to provide basic needs of the poorest quintile of the society. To ensure the balanced distribution of growth between rich and poor, benefits of higher

growth should be transferred to the poorest of the poor. Public spending in education and health may increase the productivity of the poor people and help to increase their income level. On the other hand, public spending in social welfare would be helpful for the risks of income fall associated with natural disasters and economic recession.

International donors are funding least developed countries to eradicate poverty. But the outcome is different across different regions in the world (Deaton, 2010). So it might be interesting to check what factors behind the success or failure of government spending to reduce poverty and inequality. It is also important to note that inefficient targeting and misuse of funds make public spending ineffective to reduce poverty (Fan, 2008). Facing the limited funds available to spend in different programmes, governments have to prioritize the spending sectors. As a result, it is important to know which initiative would provide the better result in reducing poverty (Fan, 2008). The institutional quality of a country may play an important role in making public spending and its allocation over sectors effective. Some studies examined the impact of good governance on poverty reduction and found that good governance is very important. Countries with good governance gained faster poverty reduction, and only poverty reducing policy cannot be sustainable (Deolalikar et al., 2002). Institutional quality is important because it affects economic growth (Hasan et al., 2006) and distribution of income (Zhuang et al., 2010). So in this study institutional quality is taken as an important variable to evaluate its effect on poverty reduction and income inequality. Here institutional quality will be understood as 'the traditions and institutions by which authority in a country is exercised'. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them' (quoted from the Worldwide Governance Indicators (WGI) project website).

1.1. Objective and Research Questions

The objective of the study is to examine the importance of institutional quality for the effectiveness of public spending in different sectors in reducing poverty and income inequality in developing countries.

This objective will be reached by answering the following research questions:

a. Does institutional quality affect poverty and inequality?

b. What is the impact of different types of government spending on poverty and inequality?

c. Is the impact of public spending on poverty and inequality stronger in countries with better institutions? If so, which institutions matter most?

d. To what extent do these effects differ between different regions and between countries at different levels of economic development?

1.2. Analytical Framework

Institutional quality or good governance is very important as bad institutions can be responsible for poor targeting and inefficient handling of priority measures (Swaroop and Rajkumar, 2002). Institutional quality also affects the distributional impact in a country (see next paragraph) and thus can help poor people to get out of poverty. Moreover, researchers found that institutional quality promotes economic growth (Gwartney et al. 2004; Butkiewicz and Yanikkaya 2006; Kandil 2009). Thus, it is very important to achieve economic development. In poverty reduction policies these three factors institutional quality, public spending and outcome might be interlinked.

Corruption can be defined as the ‘capture’ of state by elites and the degree of public power which is being exercised for private interest (Kaufmann et al., 2010). Control of Corruption (CC) is one of the important concerns regarding good governance. Corruption sometimes causes the allocation of funds of poverty alleviation programs to powerful group of the society rather than targeted poor people. Corruption may also reduce funding for education which lowers the capability of the poor to increase productivity. It contributes to inequality in the society, because rich are usually able to increase their human capital (Mauro 1998; Tanzi and Davoodi 1997; Gupta, Davoodi, and Alonso-Terme 2002, as cited in Zhuang et al., 2010). Klugman (2002) also states that corruption creates biases in allocating public funds away from pro-poor spending and that corruption costs more for poor people as they spend larger shares of their income in giving bribes.

Government effectiveness (GE) measures the quality of public service delivery, competence of civil service officials, to what extent civil service is free from political pressure, capacity of efficient policy formulation and implementation, and government's commitment to those policies (Kaufmann et al., 2010). Government effectiveness is necessary to formulate and implement good policies. To some extent it ensures efficient division of labour between the public and private sectors which in turn help the better use of resources and better service delivery (Dollar, 2002). So it is expected that countries with better rating in this indicator spend funds more effectively for the poor.

Voice and accountability (VA) indicates the ability of citizens to participate in electing their government, freedom of speech and association, and freedom of media (Kaufmann et al., 2010). Voice and accountability enable people to participate successfully in the decision making process which affect their daily lives (Arimah, 2004). When people are excluded from decision-making process and they cannot take part in the policy-making process, poverty is expected to continue (UNDP, 1997 as cited in Arimah, 2004). Accountability of public officials compels them to inform and to clarify their activities (Ackerman, 2004). People living in countries with better voice and accountability are expected to raise their demand for necessary public goods, and thus it helps the effective prioritization and efficient use of public funds in different sectors, including funds that aim to alleviate poverty and reduce inequality.

Financing human resource development such as spending in education or health sector would help to increase poor peoples' earning potential and productivity over the medium to long term (Paternostro et al., 2005). A healthy person can work efficiently and also can devote more time on productive activities (Baldacci et al., 2005). Thus, an increase in productivity of poor people would reduce the poverty. Safety net programs can ensure poor people to keep the consumption smooth when natural disasters or other shocks hit them. Spending in social welfare, thus, protect them by providing a type of insurance against risks and associated income loss. The existence of safety net programmes in the country would enable poor people to gain from high returns to riskier activities which in turn help to reduce poverty and inequality of the country (Babu, 2003). Social safety nets also help those people who are not able to take advantage of growth and human development opportunities due to physical and mental disabilities, natural disasters, civil conflict and physical isolation (World Development Report, 1990). Thus it helps to reduce the income gaps between advantaged and disadvantaged group in a society.

Many studies found a positive relationship between economic growth and inequality in relatively poor countries (Samanta and Heyse 2006; Angeles-Castro 2006). My hypothesis is that, if economic growth is associated with increased public spending on education, health,

and social welfare, economic growth might be helpful in reducing inequality in the low and lower middle income countries provided these policies are implemented in a good institutional environment.

A country with poor institutions may not be successful in reducing poverty through public spending. A study in different regions in Indonesia, (Sadler and Akhmadi, 2004, as cited in Wilhelm and Fiestas, 2005) found that regions with better institutions experience higher rates of poverty alleviation while this finding is also confirmed in another study for regions in India (Besley et al., 2004, as cited in Wilhelm and Fiestas, 2005).

Chong and Calderón (2000) found the evidence that institutional quality promotes economic growth. They said that policies to reform the state, to make service delivery more efficient, to secure property rights, to reduce corruption and uncertainty are important for economic growth. While institutional quality promotes economic growth, growth can also foster institutional quality (Chong and Calderón, 2000). On the other hand, institutional quality and level of income are correlated and each would affect the other (Acemoglu et al., 2001). Institutional quality can improve level of income of a country and at the same time, a rich country can also afford better institutional quality. As a result, the problem of endogeneity may arise in regression analysis when researchers try to explain poverty with institutional quality because a poor country might not able to afford better institutions. Acemoglu et al., (2001) solved this endogeneity problem in their study by taking mortality rates in colonies as instrument for current institutional quality. Acemoglu et al. (2001) argues that Europeans foster extractive institutions in colonies with high mortality rates like in African countries and good institutions in colonies with low mortality rates like Australia and New Zealand. This trend still persisting as institutional quality does not change much over time. By solving this endogeneity, Acemoglu et al. (2001) estimates the impact of institutional quality on level of income.

1.3. Chapter Overview

After the introduction chapter, chapter two will give a description of the data source, data compilation process, variable definitions and importantly, description of regression models. Chapter three is designed to describe the findings according to regression models which were stated in chapter two. Chapter four provides a brief discussion on important findings and relates findings of this study to findings of other studies in the same field. Finally, chapter 5 concludes with some recommendations.

2. Methodology

The methodology adopted for answering the research questions will be discussed in this chapter. There are sections to describe the data sources, variable definitions, regression models and data processing.

2.1. Data

Secondary data from 1996 to 2007 for low-income countries and lower middle income countries have been used to conduct this cross-country analysis. Low-income countries are defined as countries having per capita income lower or equal to 995 US Dollar according to 2009 GNI calculated using the World Bank Atlas Method while countries having per capita income from 996 to 3945 US Dollar are classified as lower middle income countries (The World Bank, 2010).

This study aims to check the impact of some macro-economic variables on poverty and inequality. As low-income and middle income countries accommodate most poor people of the world, this analysis only includes data of these income-group countries. Reducing the world poverty by half, needs a very good performance of these countries in reducing poverty on their own soil. For these reasons, this study focuses on low-income and lower-middle income countries.

All the data that are required for the analysis have been collected from different databases of recognized organizations like World Bank's Worldwide Governance Indicators (WGI) database, International Monetary Fund's Government Finance Statistics, United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO) etc. Detailed information on the specific sources of all variables can be found in Appendix -1.

2.2. Data Set

The data were collected for 54 countries for the years 1996 to 2007. As a result, the data set can be characterised as a panel data set. Unfortunately, this data set contains many missing values for the variables Headcount ratio and Gini-coefficient. It is usual to have missing values for these variables, because household surveys are not conducted each year in developing countries. Having too many missing values in dependent variables would hamper the estimation accuracy. To overcome the problem of missing values in dependent variables, the years 1996-2007 have been divided into 3 periods: 1996-1999, 2000-2003 and 2004-2007. So each country has data for 3 periods instead of 12 years in this analysis.

It has been found that almost all the countries have data on the Headcount ratio and the Gini coefficient for at least one of the four years in each of these periods. That year is assumed to be representative for the whole period. For example, Bangladesh has data for the Headcount ratio and Gini coefficient only for 1996, 2000 and 2004. So, the 1996 data for the dependent variable have been assumed to be representative for the period 1996-1999, the 2000 data for the period 2000-2003 and the data for 2004 for the period 2004-2007.

On the other hand, data for independent variables are available for many more years, except data on public spending in social welfare. So this study takes average of growth rates, institutional quality and public spending of four years in each period. In some cases, there are data available for independent variables for less than four years. In such cases, the mean of the data for the available years has been taken and is assumed to be representative for the whole period. For example, if institutional quality data are missing for 1997 and 1999 then an average for the two years 1996 and 1998 is taken.

So each country has data for three periods. For dependent variables, it is the absolute value for the available year in that period. And for the independent variables, it is the average for the available years in that period. We are especially interested in changes in poverty and inequality. Percentage changes in the dependent variables between two periods are therefore explained from the values of the independent variables in the starting period. For example, the percentage change of the headcount ratio between the first period (1996-199) and the second period (2000-2003) is explained by the values of the independent variables in the first period (1996-1999).

2.3. Variables

The definitions of the two dependent variables and all the independent are listed in Table 1.

Headcount Ratio (HEAD) as a measure of poverty	Headcount ratio reflects the percentage of population living below 1.25 PPP$ a day at 2005 international prices (World Bank Database, 2011). Headcount ratio has been chosen as a measure of poverty because it is simple and most commonly calculated poverty measure.
Gini Coefficient (INEQ) as a measure of inequality	The Gini Coefficient is a measure of inequality where 0 means complete equality and 1 means complete inequality where one person has all income (The World Bank website, 2011).
Government spending in health (HEALTH)	Government expenditure on health as percentage of GDP
Government spending in education (EDUC)	Government expenditure on education as percentage of GDP
Government spending in social welfare (SW)	Government expenditure on social welfare as percentage of GDP
GDP Growth (GROW)	GDP growth is the percentage change of Gross Domestic Product over the years. Gross Domestic Product is defined as the sum of gross value added by all residents (both native and foreign nationals) in the country plus any product taxes and minus any subsidies not included in the value of the

	products. Gross Domestic Product (GDP) data are in constant 2000 U.S. dollars. Domestic GDP data are converted using 2000 official exchange rate to US Dollar figures (WDI and GDF, 2011).
Dummy for the level of economic development (LOWINC)	Dummy variable for the level of economic development; equals 1 for low income countries and 0 for lower-middle income countries.
Period Dummy (PRD)	Dummy for the second period. So it is 1 for the second period (2000-2003) and 0 for other two periods.
Regional Dummy (AFR)	Regional dummy; equals 1 for all African countries (including Sub-Saharan and North Africa) and 0 otherwise.
Institutional quality (INST)	Institutional quality is defined as the arithmetic mean of the 6 indices published by WGI: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and finally, Control of Corruption.
Government Effectiveness index (GE)	This index is a combination of perceptions of quality of public services and civil services. It also includes the perception of independence of civil service from political pressures, quality of policy formulation and

	implementation and trustworthiness of government's commitment to those policies. This estimate ranging from -2.5 to 2.5 while the higher the index is the better the government effectiveness in the country is (Worldwide Governance Indicators, 2011).
Control of Corruption index (CC)	This index is a perception of the extent of corruption that is, the extent of public power is used for personal gain This estimate ranging from -2.5 to 2.5 while the higher the index is the lower the corruption in the country is (Worldwide Governance Indicators, 2011)..

Table 1: Definition of independent and dependent variables

This study tests the impact of same independent variables on two different dependent variables. Percentage changes in Gini Coefficient (INEQ) and Headcount Ratio (HEAD) are the dependent variables of the analysis.

There will be four regression models for these two different dependent variables. These models aim to estimate different impacts of explanatory variables on poverty reduction and inequality of developing countries.

2.4. Regression Models

Four models are formulated to estimate the impact of institutional quality, public spending and growth on poverty reduction. Three dummies are used namely income dummy, region dummy and period dummy.

Model 1

$$(HEAD_t - HEAD_{t-1})/HEAD_{t-1} = \beta_0 + \beta_1 SS_{t-1} + \beta_2 GROW_{t-1} + \beta_3 IQ_{t-1} + \beta_4 LOWINC + \beta_5 PRD + \beta_6 AFR + e_i$$

Where

SS_{t-1} is $HEALTH_{t-1}$, $EDUC_{t-1}$ and SW_{t-1}, respectively,

IQ_{t-1} is $INST_{t-1}$, GE_{t-1} and CC_{t-1}, respectively,

e_i is the residual of the model, and t is the period. So t-1 is the period prior to the concerned period. That means if t represents period 2 (2000-2003) for a particular observation, then t-1 will represent period 1 (1996-1999).

Government spending in health, education and social welfare is expected to reduce poverty. It is expected that more spending in these sectors results in lower rate of population living below poverty line. Public spending can reduce poverty in two ways – by improving the development pursuit and by enhancing the opportunity for the poor people incorporating them into the growth process. Both of these processes might experience time lags (Wilhelm and Fiestas, 2005). Public spending in health, education and social welfare imply capital formation such as research and building infrastructure for health and education sector which usually have time lags. So it can be expected to have time lags for this kind of indirect effects of public spending. Inefficient handling of public spending also creates a time lag between allocation and implementation in developing countries. Efficient targeting and management often reduce the time lag of direct effects of public spending.

Fan et al. (1999) finds statistically significant estimates for lagged government expenditures but not for current expenditures while examining its impact on irrigation in rural India. So this study takes government expenditures at the start of the period to estimate their impacts on poverty reduction.

Some studies find that there might be a time lag between growth and the improvements of livelihoods (Easterly, 1999). It is reasonable because it would take time to translate the benefits of economic growth in improving the situation of the poor. It requires new technology, new institutions, new investment and availability of new human resources to exploit the

benefits of economic growth which sometimes takes time (WHO, 2002). So economic growth, at the start of the period is incorporated in the model to examine its impact on the change in the poverty rate.

The impact of economic growth on income distribution partly is expected to be dependent on the institutional quality of a country. A country with better institutions would not only let a larger share of its growth trickle down to the poor, but would also translate its economic growth faster (time lag is shorter) to income growth of its poor people. Better institutions are important for better distributional outcomes of economic development. Thus, institutional quality is expected to have a positive influence on the reduction of poverty in a country (Imai et al., 2009). As a result, economic growth is assumed to reduce poverty if good governance exists in a country. On the other hand, improvements in institutional quality are likely to persist, that is, institutional changes maintain their impacts on economic development even periods after they were initiated. It has been found that a time lag of 5-10 years is often required to achieve the full benefits of an institutional change (Gwartney et al., 2004). In this study, institutional quality at the start of the period has been applied in the regression model to examine the impact of institutional quality on the change in poverty between two periods.

The regional dummy is included in the model to examine whether the same policy yields different outcomes in Africa. The dummy for low income countries explores whether the same policy yields different outcomes in countries at different levels of economic development. There is another dummy for the second period (2000-2003) in the model to examine whether the change in poverty went up or down over time.

Model 2

$(HEAD_t - HEAD_{t-1})/HEAD_{t-1} = \beta_0 + \beta_1 SS_{t-1} + \beta_2 GROW_{t-1} + \beta_3 LOWINC + \beta_4 PRD + \beta_5 AFR + \beta_6 IQ_{t-1} * SS_{t-1} + e_i$

Where
SS_{t-1} is $HEALTH_{t-1}$, $EDUC_{t-1}$ and SW_{t-1}, respectively,
IQ_{t-1} is $INST_{t-1}$, GE_{t-1} and CC_{t-1}, respectively,

The main hypothesis of this study is that institutional quality is important for government spending and health, education and social welfare to have a significant negative impact on poverty. So in model 2, an interaction term of institutional quality (aggregate index as well as government effectiveness and control of corruption) with public spending in each of the three

sectors is used to examine whether public spending depends on good institutions to have a larger impact on poverty reduction.

Model 3

$(HEAD_t - HEAD_{t-1})/HEAD_{t-1} = \beta_0 + \beta_1 SS_{t-1} + \beta_2 GROW_{t-1} + \beta_3 LOWINC + \beta_4 PRD + \beta_5 AFR + \beta_6 IQ_{t-1} * SS_{t-1} + \beta_7 GROW_{t-1} * SS_{t-1} + e_i$

Where
SS_{t-1} is $HEALTH_{t-1}$, $EDUC_{t-1}$ and SW_{t-1}, respectively,
IQ_{t-1} is $INST_{t-1}$, GE_{t-1} and CC_{t-1}, respectively,

In model 3, an interaction term between the growth rate and public spending has been added which intends to capture the combined effect of economic growth and government spending in health, education and social welfare. It is expected that higher economic growth results in higher poverty alleviation for given shares of government spending in health, education and social welfare. Likewise, a higher share of GDP spent on health, education and social welfare is expected to result in less poverty at given rates of GDP growth.

Model – 4

$(HEAD_t - HEAD_{t-1})/HEAD_{t-1} = \beta_0 + \beta_1 SS_{t-1} + \beta_2 PRD + \beta_3 AFR + \beta_4 IQ_{t-1} * SS_{t-1} + \beta_5 GROW_{t-1} * SS_{t-1} + \beta_6 AFR * SS_{t-1} + \beta_7 LOWINC * SS_{t-1} + \beta_8 AFR * IQ_{t-1} + \beta_9 LOWINC * IQ_{t-1} + \beta_{10} LOWINC * GROW_{t-1} + e_i$

Where
SS_{t-1} is $HEALTH_{t-1}$, $EDUC_{t-1}$ and SW_{t-1}, respectively,
IQ_{t-1} is $INST_{t-1}$, GE_{t-1} and CC_{t-1}, respectively,

In model 4, the interaction term of the regional dummy and government spending is added to examine whether the impact of government spending differs between African countries and other developing countries. The interaction term of dummy for the level of economic development and government spending examines whether the impact of government spending differs between countries at different levels of economic development. The interaction term of the regional dummy and institutional quality estimates whether the impact

of good governance id different in African countries than in other countries. Furthermore, the interaction term of level of economic development and institutional quality is included to examine whether the impact of good governance on poverty depends on the level of economic development. And, finally, the interaction term of the level of economic development and the GDP growth rate examines whether the impact of economic growth on poverty depends on the level of economic development.

3. Results

3.1. Descriptive Statistics

Table 2 gives the descriptive statistics of the variables used in the regression analysis. Headcount ratio has higher dispersion compared to other variables in the data set. This dispersion arises because of the inclusion of countries from different regions and different income levels where low headcount ratios can be found in North-African countries and high headcount ratios in many Sub-Saharan countries. On average, the headcount ratio decreases by 10 percent between two periods for the developing countries in the sample, but there exists a large spread.

The average Gini coefficient is 42.33, where inequality is higher in some African and Latin American countries. On average, the degree of inequality did not change much between two periods for the countries in the sample (mean change is minus one percent).

The developing countries in the sample spent on average 4.13% of GDP on education, 2.46% of GDP on health and 2.46% of GDP on social welfare. Mali, Malawi, Lesotho and Uzbekistan performed very well in reducing inequality in this sample.

The GDP growth rates also show a high dispersion, ranging from -3.77 to 12.83, where Ethiopia, Cambodia, Armenia etc. experienced double digit growth in the third period (2004-2007).

The share of low-income countries in the sample equals 43 percent, while exactly 50 percent of the observations are for countries from Sub-Saharan Africa.

The average institutional quality is below zero, which is very important to point out here. Even the maximum values of institutional quality are below one. Because this index (see the definition in table 1) is prepared by WGI on a scale from -2.5 to +2.5, the developing countries in our sample have relatively low values for this index. Specific indicators like government effectiveness and control of corruption also show that developing countries are far behind in improving institutions and promoting good governance.

Variables	Mean	Max	Min	Std. Deviation
Headcount Ratio (HEAD)	35.20	86.43	2.00	24.01
Gini Coefficient (INEQ)	42.33	63.16	28.21	8.49
Change in Headcount Ratio ($HEAD_t$ – $HEAD_{t-1}$)/$HEAD_{t-1}$)	-10.28	295.79	-89.95	44.58
Change in Gini Coefficient ($INEQ_t$ – $INEQ_{t-1}$)/$INEQ_{t-1}$)	-1.45	25.56	-28.95	11.31
Government spending in health (HEALTH)	2.46	11.59	0.65	1.49
Government spending in education (EDUC)	4.13	14.06	0.97	2.28
Government spending in social welfare (SW)	2.46	12.43	0.039	3.06
GDP Growth (GROW)	4.60	12.83	-3.77	2.73
Dummy for the level of economic development (LOWINC)	0.43	1.00	0.00	0.50
Period Dummy (PRD)	0.48	1.00	0.00	0.50
Regional Dummy (AFR)	0.50	1.00	0.00	0.50
Institutional quality (INST)	-0.48	0.79	-1.52	0.46
Government Effectiveness index (GE)	-0.63	0.59	-1.74	0.41
Control of Corruption index (CC)	-0.64	0.43	-1.54	0.40

Table 2: Descriptive Statistics of Dependent and Independent Variables

3.2. Regression Results

This chapter presents the regression results for the change in the headcount ratio and gini coefficient. The results are presented according to regression models mentioned in the previous section. There are four regression models for each of the dependent variables. So results are presented in four tables from table 3 to table 6. These four tables present regression results for four models for both dependent variables in which public spending are in health and education sector. Results for public spending in social welfare are reported in appendix 2 (table 7 – table 10). Almost all estimated coefficients in the regression models for social welfare spending are not statistically significant, possibly because of the small number of observations for this variable.

In each model, six regressions have been run for dependent variable headcount ratio and another six regressions have been run for the dependent variable gini coefficient.

In tables with regression results, *** denotes the respective variable is significantly different from zero at 99% level of confidence interval, ** denotes a significance at 95% level of confidence interval and * denotes a significance at 90% level of confidence interval.

3.2.1. Regression Model 1

Results for regression model number 1 are presented in table 3. This table presents estimates for both dependent variable headcount ratio and gini coefficient. There are three different institutional variables and two different indicators of public spending in the social sector, resulting in six different regression results for each dependent variable (for social welfare, please see table 7 in appendix 2).

[Table 3]

R-square for this model with dependent variable headcount ratio varies from 0.13 to 0.18 and R-square with dependent variable gini coefficient varies from 0.06 to 0.19. So, explanatory variables of this model explain 13%-18% variations of the dependent variable headcount ratio. On the other hand, the same variables explain 0.6%-19% variation when the dependent variable is gini coefficient.

Health variable is statistically insignificant and shows mixed results for dependent variable headcount ratio, but it has negative and statistically significant (at 95% level of significance) coefficient for dependent variable gini coefficient. As a result, this estimate suggests that public spending in health can reduce inequality, but it does not reduce poverty. The estimated coefficients for public spending on education and social welfare are not statistically significant.

The GDP growth rate appears in all six equations for both dependent variables. It has negative coefficients in all six equations for dependent variable headcount ratio, but one coefficient is statistically significant at a 90% level of confidence interval. Though not all of them are statistically significant, results suggest that GDP growth may reduce poverty. On the other hand, it has negative (except one) and statistically insignificant results for the dependent variable gini coefficient. Results from the table suggest that the GDP growth rate has a negative but not statistically significant impact on income inequality in developing countries.

In this study, there are three variables for institutional quality – a) a composite institutional quality index made up of six indices of institutional quality which gives us a general variable for good governance, b) an index for government effectiveness which gives us a variable for government's efficiency and effectiveness in policy formulation and implementation, and c) an index for control of corruption which gives us a variable for level of corruption in the country.

Regression results in table 3 provide evidence that institutional quality may reduce poverty in developing countries. The composite institutional quality index is statistically significant at 90% and 95% confidence intervals in two equations and the magnitude of the coefficient is big. Control of corruption and government effectiveness do not have a statistically significant impact in all equations, but coefficients have negative sign. Hence, these results suggest that other aspects of institutional quality, such as voice and accountability, political stability and absence of violence, regulatory quality, rule of law are more important. Regression results for the dependent variable gini coefficient, show that institutional quality does not significantly affect income inequality because it's coefficients are not statistically significant, while government effectiveness and control of corruption significantly increase income inequality (at a 99% confidence level). These findings contradict a priori expectations. But there are few studies which found similar results in their analyses. Zhuang et al. (2010) cited two studies by Chaudhuri and Ravallion (2007) and Easterly (2007) to explain this finding. On the one hand, Zhuang et al. (2010) follow Chaudhuri and Ravallion (2007) by arguing that there are two types of inequality – 'bad' and 'good'. 'Bad inequality' is created by market failures, with poor governance resulting in inequality of opportunities. On the other hand, 'good inequality' results from market-based incentives to foster innovation and entrepreneurship. Improving institutions reduces 'bad' inequality, but it does not have a conclusive relationship with 'good inequality'. On the other hand, Easterly (2007) distinguished between structural and market inequality. Structural inequality caused by some historical events like colonization, land distribution, slavery etc. is similar to 'bad inequality'. Market inequality arises from uneven successes in the free market. Developing countries are now more market oriented than before, so Zhuang et al. (2010) argue that if inequality in some (Asian) developing countries is 'market' or 'good' inequality, then institutional quality would be less correlated with inequality and thus, it does not tend to reduce it. Most non-Asian developing countries have also undertaken market-oriented reforms in recent decades. So it can be assumed that the inequality in lower and lower-middle income countries examined in this study may to a large extent be 'good' or structural inequality. Further study is needed to examine this issue in more detail because this study did not examine it.

Results for the dummy variable for low income countries show that, after controlling for the other variables, the change in poverty was not significantly different for the poorest countries. But results in the table show that inequality increased in developing countries in the same time period though only one coefficient turns out statistically significant at 90% level of significance.

The dummy variable for African countries is not statistically significant in the equations for headcount ratio, and has significant negative coefficients in four equations for the dependent variable gini coefficient. The latter finding suggests that, given the other factors that affect inequality, the increase in inequality between 1996 and 2007 was smaller (or the decline in inequality was larger) in African countries.

The period dummy in table 3 has significant positive coefficients in six equations for the dependent variable headcount ratio. This variable is statistically significant at 95% level of confidence interval in all six equations. This finding means that, given the other explanatory variables, the poverty rate increased between the second (2000-2003) and third period (2004-2007) in developing countries. The reason for this finding may arise from increased availability of data in developing countries. No significant coefficients for this dummy variable were found, however, in the income inequality equations.

3.2.2. Regression Model 2

In regression model 2, most explanatory variables are the same as in model 1. The focus here will be on the newly included variables. Regression results for model 2 are presented in table 4. Results for public spending in social welfare have been shown in table 8 in appendix 2.

[Table 4]

R-square for this model with dependent variable headcount ratio varies from 0.14 to 0.24 and R-square with dependent variable gini coefficient varies from 0.06 to 0.17. So, explanatory variables of this model explain 14%-24% variations of the dependent variable headcount ratio. On the other hand, the same variables explain 6%-17% variation in the dependent variable gini coefficient.

In this regression model, there are interaction terms of different institutional quality and public spending. The interaction term of institutional quality and government expenditures in health gives us significant negative signs, which mean government expenditures in health with good quality of institutions is expected to reduce poverty. If we compare the adjusted R-square of

this model with that of model 1, then it is clear that model 2 fits slightly better. Moreover, the interaction term of institutional quality with public spending in health is statistically significant at a 90% confidence level, while health in model 1 is not significant (table 3). This finding suggests that government expenditures on health under good institutions can be more effective in improving the situation of the poor and thus contribute to reducing poverty. The table also reports results for the interaction terms of government effectiveness with spending in health and control of corruption with spending in health, respectively. The interaction term of government effectiveness and spending in health is statistically significant at 90% level of confidence interval and also has a negative sign. On the other hand, the interaction term for control of corruption and public spending in health is not statistically significant, but has a negative coefficient which suggests it may also reduce poverty.

The interaction term of institutional quality with public spending in education is highly statistically significant with a negative sign. It is significant at a 95% confidence interval. These results suggest that public spending in education in the presence of good governance can be expected to reduce poverty significantly. The education variable in model 1 (table 3), on the other hand, was not statistically significant in the poverty equation. So, our results indicate that institutional quality can be very important for public spending in education to be effective in poverty reduction. There are also interaction terms of public spending in education with government effectiveness and with control of corruption. The interaction term of public spending in education and government effectiveness is highly significant at 99% level of confidence interval and it has a negative coefficient which implies that public spending in education under effective governance may reduce poverty significantly. The interaction term of public spending in education and control of corruption is also significant at 95% level of confidence interval and it has also a negative coefficient which suggests that public spending in education in less corrupt environment can also be expected to reduce poverty significantly. Thus, results suggests that public spending in education may reduce poverty very significantly in the presence of better institutions where public sector is more effective and less corrupt. So, institutional quality turns out very important for the purpose of poverty reduction by making public spending effective and efficient.

The above analysis supports the hypothesis that institutional quality improves public spending effectiveness in poverty reduction.

Regression results from table 4 show that better institutional quality may not cause a decline in income inequality with higher levels of public spending in health and education. Interaction terms of health with control of corruption and government effectiveness are significant at 95% and 99% level of significance respectively with positive signs. This suggests that public

spending in health under less corrupt and more effective government increases inequality. According to the discussion in the previous section, it can be assumed that better institutional quality may contribute to 'good inequality'. But this study did not examine whether the inequality is 'good' or 'bad'. Further study is required to ensure it.

3.2.3. Regression model 3

In regression model 3, interaction terms of GDP growth and public spending in health, education and social welfare have been added to the previous model. Table 5 presents the results of this model with both dependent variables. Results for public spending in social welfare are presented in table 9 in appendix 2.

[Table 5]

R-square for this model with dependent variable headcount ratio varies from 0.15 to 0.33 and R-square with dependent variable gini coefficient varies from 0.09 to 0.17. So, explanatory variables of this model explain 15%-33% variations of the dependent variable headcount ratio. There is a large gain in the value of the adjusted R-square for the three education equations, as compared to model 2. The same variables explain only 9%-17% variation in the dependent variable gini coefficient.

Economic growth is very important for the purpose of reducing poverty. But regression results are mixed for this variable in this model. Coefficients of this variable in the three education equations are statistically significant at either 95% or at 99% level of significance with positive signs. Poor country usually achieve higher growth rate (Dollar and Kraay, 2002). The interaction term of growth and public spending in education is statistically significant at 99% level of confidence interval in all three equations with negative coefficients. So, these results indicate that spending on education by itself does not reduce poverty. But spending on education when there is rapid economic growth may have a significant negative impact on poverty, possibly because public spending on education can promote a redistribution of the outcome of economic development. In this way, it may raise the income of the poor.

Public spending on health and interaction term of growth and public spending in health, on the other hand, do not have a statistically significant impact on poverty reduction in our sample. Likewise, no statistically significant effects are found for public spending on health and education and their interaction terms with economic growth in the equations for the gini coefficient.

3.2.4. Regression Model 4

In regression model 4, several interaction terms have been introduced to examine the impact of growth and institutional quality in low income and African countries. Table 6 shows regression results for dependent variables headcount ratio and gini coefficient. Results for public spending in social welfare are shown in table 10 in appendix 2.

[Table 6]

R-square for this model with dependent variable headcount ratio varies from 0.19 to 0.34 and R-square with dependent variable gini coefficient varies from 0.12 to 0.30. So, explanatory variables of this model explain 19%-34% variations of the dependent variable headcount ratio. On the other hand, the same variables explain 12%-30% variation in the dependent variable gini coefficient.

From the regression results presented in table 6, the interaction term of institutional quality and dummy for low income countries turns out statistically insignificant. The interaction terms of the dummy for lower income countries with government effectiveness and control of corruption are also statistically insignificant. So the finding in Model 1 that better institutional quality reduces poverty seems to be caused by the lower middle-income countries in the sample, not by the lower income countries.

For the regression analyses for inequality with dependent variable change in gini coefficient, results are also statistically insignificant. In other words, also the finding in model 1 that better government effectiveness and control of corruption may contribute to higher income inequality seems to be cause by the lower middle-income countries in the sample.

In the poverty equations, the interaction term of institutional quality and the dummy for countries from African continent also turns out to be statistically insignificant. Moreover, the interaction terms of dummy for African countries with government effectiveness and control of corruption are statistically insignificant. Hence, the findings in model 1 about the impact of institutional quality on poverty reduction seem to be caused by the non-African countries in the sample.

The regression analyses with dependent variable change in gini coefficient show that estimates are statistically insignificant for the interaction term of institutional quality and dummy for African countries. But the interaction term of government effectiveness and dummy for African countries is statistically significant at 90% and 99% level of confidence interval with positive signs, while the interaction term of control of corruption and dummy for African countries is statistically significant at 90% level of confidence interval in one equation

with positive sign. These results indicate that African developing countries are a major cause of the positive impact of better government effectiveness and control of corruption on income inequality that was found in model 1.

Results for the interaction term of the low-income dummy and GDP growth suggest that economic growth in low income countries does not affect poverty, because all estimated coefficients for this interaction term are not statistically significant. On the other hand, economic growth in low income countries may increase income inequality. The estimated coefficient is positive and statistically significant at 95% level of confidence interval in one income inequality equation.

Regression results for the interaction term of public spending and the dummy for low income countries in table 6 show that it is not statistically significant in all poverty and income inequality equations. These results mean that the estimated impact of public spending on education and health on poverty and income inequality does not differ significantly between low-income countries and the other countries in the sample.

The interaction term for public spending and the dummy for Africa in table 6 shows mixed results. It is not significant for health expenditures in all equations, but is negative and significant for education expenditures in one poverty equation and two income inequality equations, these findings suggest that public spending on education in Africa can reduce poverty and inequality more than it does in the other countries in the sample.

4. Discussions

In the regression results, there are three major findings– a) better institutional quality (along with two specific indices – government effectiveness and control of corruption) is expected to reduce poverty and it also can make public spending on health and education more effective in reducing poverty where public spending alone cannot ensure it, b) institutional quality does not reduce inequality in developing countries rather indicates it increases inequality resulted from free market and c) economic growth does not reduce poverty or poor countries achieve higher growth, but a combination of economic growth and increased government spending on education is expected to reduce poverty a bit. So, ensuring good governance and providing education and medical facilities for the poor can be very important to eradicate poverty.

This study did not take into account possible endogeneity between institutional quality and level of income. There are a number of studies found endogeneity and they have solved this problem in their studies which has been discussed in the analytical framework. As a result, findings of this study can be biased. But shorter time period of the analysis of this study (1996-2007) can be one reason why this study did not address endogeneity in the analysis. On the other hand, institutional quality does not change much while poverty rate does over time. As a result, it is expected that endogeneity might not be a problem here for a study of short period of time.

Other studies have examined the impact of institutional quality on poverty alleviation. A cross-country analysis by Azfar (2005) with Dollar and Kraay dataset (2001) finds that better institutional quality is associated with increased level of income for the poorest quintile and this impact is larger than the poorly governed countries. A study by Gaiha and Imai (2005) concludes that poverty reduction does not only depend on growth acceleration but also on institutions which ensure the benefit of the poor. Gaiha and Imai (2005) compiled cross-sectional data on headcount ratio for the year 1998 from World Bank database for this analysis. This study also used the same source to compile the dataset on headcount ratio and gini coefficient. Imai et al. (2009) also found that better institutions are related to a lower level of poverty. A cross-country analysis for more than 100 countries by Rivera (2009) concludes that poverty reduction policy should target not only economic growth but also improving the institutional quality. Poor institutional quality neutralises the impact of economic growth (Rivera, 2009) and thus, may hamper poverty reduction strategies. Rivera (2009) takes sample averages for the period 1972-2005 to prepare his cross-section data set. But he used Human Development Index, life expectancy and literacy rate to define poverty of a country. So, the findings in this study about the importance of institutional quality are in line

with other major studies. They imply that we cannot ignore institutional quality if we want to reduce poverty around the globe.

Azfar (2005) gives some reasons why institutional quality is important for reducing poverty. Institutional quality improves the welfare of the poor by reducing the transaction costs and by ensuring high prices for poor farmers without increasing consumer prices for poor consumers (Azfar, 2005). Institutional quality also provide better infrastructure in remote areas, enhanced educational outcomes, better environment to start businesses and lower rates of crimes affecting the poor. Perhaps most importantly, institutional quality improves the effectiveness of redistribution policies (Azfar, 2005). In fact, institutional quality reduces the influence of a group of people who control the economy and increases the opportunity of the deprived portion of the society to take part in policy matters. In developing countries, the influence of the rent-seeking group is enormous. They deprive the mass people to increase their own wealth, and lack of better institutions hampers the poor to get rid of this interest group.

Acemoglu et al. (2001) points out some reasons behind undeveloped institutions in lower and lower-middle income countries. Their study argues that European settlers adopted different colonisation strategies that were related to the mortality rates of the colony. The study says that Europeans enforced good institutions to provide rule of law and encouraging investment in countries where mortality rates are low like New Zealand, USA and Australia. But they enforced extractive institutions where mortality rates were high like Congo and Gold Coast. Acemoglu et al. (2001) argue that this institutional set-up persists until now, and suggests that some institutional features like property right or rule of law are related to some fundamental institutions like nature of the government (parliamentary or presidential) and it can be changed or reformed.

To change institutional quality or reform institutions, Chong and Calderón (2000) suggest that reforms should reduce the power of the special interest group that control the economy. Ahsan and Oberoi (2002) argue that developing countries should concentrate on a few issues rather than choosing a ‘big menu’. For example, developing countries should make their lawmaking process transparent as well as implement political and fiscal decentralisation. Governments can also intervene in capital and other factor markets for making these markets function in a competitive manner, and also try to weaken the positions of rent-seeking groups (Ahsan and Oberoi, 2002). Rivera (2009), on the other hand, argues that investments in social aspects to improve education levels and healthcare of the poor and participation of all citizens in policy decisions are very important factors.

Second finding of this study is that institutional quality does not reduce inequality if it is ‘good’ or ‘market’ inequality. Easterly (2007) said that inequality arises from market forces because success from market is not equal across regions, cities, farms and individuals. Easterly (2007) gives the example of recent increase of inequality in China which arises from market forces. Third finding of this study is that public spending in health and education can ensure better distribution of economic development among the poor.

5. Conclusion

In short, answers of research questions of this study are as follows: this study finds that institutional quality is expected to be very important for poverty reduction strategies. It may reduce poverty in developing countries. It can also make public spending on health and education more effective and thereby make the poor benefit more from economic development. But there is no conclusive evidence of the impact of public spending itself and this study does not find any different impact of institutional quality in different regions and different level of income. Finding the answers of specific research questions lead to the objective of this study as institutional quality might be helpful to make public spending more effective in reducing poverty but not in reducing inequality.

As a result, besides ensuring good governance, it is necessary to allocate more money in social sector to improve education level and health care of the poor people. Government can also try to bring more people under the umbrella of social security programmes. But government spending in social welfare, education, health etc. are not sufficient, better institutions are necessary to ensure better outcome for the poor. Because better targeting of public funds is likely to benefit the poor people rather profiting the richer groups. So, it is expected that effectiveness of public spending highly depends on adequate formulation and implementation of these policy measures. Corruption in public sectors makes transaction costs of these benefits higher for the poor people. In this regard, it can be assumed that poverty reduction strategies in countries with inadequate institutional quality will need to incorporate institutional reforms such as decentralising political power, ensuring participation of all citizens, improving public service delivery, establishing rule of law, providing property rights, etc. Another important issue is the use of democratic principles which give people the opportunity to decide which institutional reform they want to implement in a country. Without the participation of the people, reform may bring unnecessary costs and thus, lower outcome in poverty reduction.

Further study is necessary to determine the nature of inequality in developing countries. If inequality is ‘good’ which arises from free market, then different strategies should be taken to lessen this. This study did not pay attention to possible endogeneity problem. So findings from this study cannot support to make stronger causal claims. But it can be expected that endogeneity would not be problematic because institutional quality is relatively static and this study has covered a short period of time.

Table 3: Regression results for Model 1

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
Institutional quality (INST)	-23.6* (-1.69)			-35.7** (-2.21)			5.87 (1.64)			2.43 (0.63)		
Government Effectiveness index (GE)		-19.6 (-1.27)			-30.9 (-1.53)			12.4*** (3.28)			9.11* (1.97)	
Control of Corruption index (CC)			-12.0 (-.83)			-19.7 (-1.05)			10.4*** (2.92)			8.95** (2.13)
GDP Growth Rate (GROW)	-3.55* (-1.67)	-2.72 (-1.19)	-3.22 (-1.44)	-2.49 (-1.09)	-1.05 (-0.41)	-1.87 (-0.76)	-.01 (-0.02)	-.54 (-0.96)	-.35 (-0.62)	.20 (0.36)	-.24 (-0.41)	-.12 (-0.22)
Dummy for the level of economic development (LOWINC)	-4.71 (-.39)	-9.80 (-.72)	-4.42 (-.35)	-5.55 (-.36)	-9.48 (-0.55)	-1.64 (-0.10)	1.25 (0.40)	5.48* (1.67)	2.79 (0.92)	2.36 (0.64)	5.51 (1.40)	4.08 (1.14)
Regional Dummy (AFR)	-8.56 (-.71)	-1.71 (-.14)	-1.78 (-.14)	-12.0 (-.85)	-3.22 (-0.21)	-2.66 (-0.16)	-2.88 (-0.94)	-6.30** (-2.10)	-7.18** (-2.26)	-4.67 (-1.40)	-7.02** (-2.04)	-8.46** (-2.31)
Period Dummy (PRD)	23.9** (2.31)	22.3** (2.15)	23.7** (2.23)	27.7** (2.25)	26.4** (2.11)	28.4** (2.18)	-1.85 (-0.68)	-1.64 (-0.64)	-2.80 (-1.06)	-2.18 (-0.73)	-2.45 (-0.85)	-3.55 (-1.20)
Government spending in health (HEALTH)	.43 (.08)	-.67 (-.13)	-.65 (-.12)				-2.73** (-2.04)	-2.79** (-2.24)	-2.95** (-2.31)			
Government spending in Education (EDUC)				3.84 (1.19)	3.88 (1.17)	3.64 (1.08)				-.01 (-0.02)	-.21 (-0.28)	-.24 (-0.31)
Constant	-15.2 (-.68)	-16.8 (-.68)	-13.3 (-.51)	-36.9 (-1.65)	-47.2* (-1.72)	-41.3 (-1.43)	9.78 (1.66)	16.5*** (2.73)	17.2*** (2.66)	1.04 (0.20)	7.74 (1.23)	9.17 (1.41)
Number of observations	79	79	79	64	64	64	76	76	76	62	62	62
R-square	0.1479	0.1336	0.1226	0.1845	0.1499	0.1317	0.1006	0.1916	0.1683	0.0611	0.1168	0.1264
Adjusted R-square	0.0769	0.0614	0.0494	0.0987	0.0604	0.0403	0.0224	0.1213	0.0960	-0.0413	0.0204	0.0311

Table 4: Regression results for Model 2

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	**Reg 2**	**Reg 3**	**Reg 4**	**Reg 5**	**Reg 6**	**Reg 1**	**Reg 2**	**Reg 3**	**Reg 4**	**Reg 5**	**Reg 6**
GDP Growth Rate (GROW)	-3.35 (-1.58)	-2.37 (-1.06)	-2.92 (-1.33)	-1.87 (-.82)	.43 (0.18)	-.83 (-0.34)	-.02 (-0.04)	-.47 (-0.83)	-.26 (-0.45)	.18 (0.31)	-.10 (-0.17)	-.07 (-0.12)
Dummy for the level of economic development (LOWINC)	-6.63 (-.55)	-9.79 (-.77)	-5.06 (-.41)	-6.52 (-.44)	-14.2 (-0.92)	-7.29 (-0.47)	1.23 (0.39)	3.69 (1.18)	1.83 (0.60)	2.17 (0.59)	3.52 (0.93)	3.42 (0.94)
Regional Dummy (AFR)	-9.07 (-.76)	-1.52 (-.13)	-.92 (-.07)	-11.2 (-.81)	2.10 (0.15)	4.86 (0.31)	-3.06 (-0.99)	-5.32* (-1.78)	-5.62* (-1.81)	-4.74 (-1.42)	-6.07* (-1.75)	-7.18* (-1.96)
Period Dummy (PRD)	25.1 ** (2.43)	23.3** (2.26)	24.7** (2.34)	30.8** (2.51)	31.6** (2.62)	34.5** (2.66)	-1.81 (-0.66)	-1.85 (-0.71)	-2.42 (-0.90)	-2.25 (-0.74)	-2.73 (-0.91)	-3.51 (-1.13)
Government spending in health (HEALTH)	-3.18 (-.62)	-7.58 (-1.25)	-5.57 (-.95)				-2.00 (-1.50)	.19 (0.12)	-.57 (-0.39)			
Institutional quality* Government Spending in health (INST* HEALTH)	-10.5* (-1.98)						1.54 (1.11)					
Government spending in Education (EDUC)				.21 (.06)	-.91 (-0.27)	-.48 (-0.13)				.16 (0.20)	.44 (0.54)	.59 (0.70)
Institutional quality* Government spending in Education (INST* EDUC)				-8.82** (-2.61)						.38 (0.46)		
Government effectiveness index* Government Spending in health (GE*HEALTH)		-11.3* (-1.81)						4.50*** (2.93)				
Control of Corruption index* Government Spending in health (CC*HEALTH)			-8.87 (-1.44)						3.62** (2.34)			
Government effectiveness index* Government spending in Education (GE*EDUC)					-11.7*** (-3.03)						1.19 (1.25)	
Control of Corruption index* Government spending in Education (CC*EDUC)						-9.42** (-2.25)						1.46 (1.48)
Constant	-6.60 (-.32)	-6.79 (-.32)	-8.99 (-.42)	-24.6 (-1.18)	-43.1* (-1.99)	-41.2* (-1.80)	6.94 (1.26)	8.57 (1.63)	9.52* (1.73)	.11 (0.02)	2.25 (0.42)	3.11 (0.58)
Number of observations	79	79	79	64	64	64	76	76	76	62	62	62
R-square	0.1599	0.1530	0.1389	0.2093	0.2379	0.1869	0.0821	0.1694	0.1345	0.0580	0.0804	0.0905
Adjusted R-square	0.0899	0.0824	0.0671	0.1261	0.1577	0.1013	0.0023	0.0971	0.0593	-0.0448	-0.0199	-0.0087

Table 5: Regression results for Model 3

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
GDP Growth Rate (GROW)	-.34 (-.08)	.73 (.16)	1.54 (.34)	12.3** (2.32)	13.1** (2.52)	15.0*** (2.87)	-.61 (-0.52)	-.94 (-0.83)	-1.25 (-1.06)	-1.33 (-0.93)	-1.26 (-0.90)	-1.52 (-1.09)
Dummy for the level of economic development (LOWINC)	-6.24 (-.51)	-9.32 (-.73)	-5.07 (-.42)	-12.0 (-.85)	-17.2 (-1.17)	-15.3 (-1.06)	1.19 (0.37)	3.64 (1.15)	1.87 (0.61)	2.86 (0.77)	3.89 (1.02)	4.25 (1.14)
Regional Dummy (AFR)	-8.20 (-.68)	-.81 (-07)	.76 (.06)	-1.44 (.11)	7.73 (0.57)	13.9 (0.95)	-3.20 (-1.02)	-5.40* (-1.80)	-5.93* (-1.90)	-5.73 (-1.66)	-6.57* (-1.87)	-7.99** (-2.14)
Period Dummy (PRD)	25.3 ** (2.44)	23.5 ** (2.27)	25.3 ** (2.41)	25.5 ** (2.19)	26.3** (2.27)	29.3** (2.44)	-1.84 (-0.66)	-1.88 (-0.72)	-2.55 (-0.95)	-1.85 (-0.61)	-2.37 (-0.78)	-3.21 (-1.03)
Government spending in health (HEALTH)	.10 (.01)	-4.07 (-.54)	-1.33 (-.19)				-2.62 (-1.52)	-.33 (-0.18)	-1.50 (-0.86)			
Institutional quality* Government Spending in health (INST* HEALTH)	-10.3* (-1.91)						1.49 (1.07)					
GDP growth rate* Government Spending in health (GROW*HEALTH)	-1.23 (-.78)	-1.28 (-.81)	-1.78 (-1.11)				.24 (0.57)	.19 (0.48)	.39 (0.96)			
Government spending in Education (EDUC)				13.7** (2.45)	12.1** (2.10)	14.1** (2.58)				-1.21 (-0.84)	-.69 (-0.46)	-.69 (-0.49)
Institutional quality* Government spending in Education (INST* EDUC)				- 6.49* (-1.98)						.16 (0.19)		
GDP growth rate* Government spending in Education (GROW*EDUC)				- 4.16*** (-2.92)	- 3.89*** (-2.72)	- 4.61*** (-3.36)				.43 (1.15)	.35 (0.91)	.41 (1.15)
Government effectiveness index* Government Spending in health (GE*HEALTH)		-11.0* (-1.76)						4.45*** (2.88)				
Control of Corruption index* Government Spending in health (CC*HEALTH)			-9.83 (-1.58)						3.81** (2.44)			
Government effectiveness index* Government spending in Education (GE*EDUC)					-8.64** (-2.25)						.93 (0.93)	

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
Control of Corruption index* Government spending in Education (CC*EDUC)						-8.42** (-2.18)						1.38 (1.40)
Constant	-16.8 (-.68)	-17.4 (-.70)	-24.9 (-.96)	-71.2*** (-2.82)	-81.9*** (-3.27)	-91.9*** (-3.54)	8.89 (1.36)	10.1 (1.63)	12.9* (1.97)	5.00 (0.76)	5.73 (0.87)	7.71 (1.15)
Number of observations	79	79	79	64	64	64	76	76	76	62	62	62
R-square	0.1670	0.1607	0.1537	0.3138	0.3266	0.3230	0.0865	0.1721	0.1462	0.0804	0.0944	0.1122
Adjusted R-square	0.0849	0.0779	0.0702	0.2280	0.2424	0.2384	-0.0075	0.0869	0.0583	-0.0388	-0.0230	-0.0029

Table 6: Regression results for Model 4

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
Regional Dummy (AFR)	-4.11 (-.11)	-20.0 (-.56)	-3.18 (-.10)	36.6 (1.26)	37.6 (1.17)	41.8 (1.37)	-4.74 (-0.48)	9.12 (1.05)	-1.53 (-0.18)	-.06 (-0.01)	18.9** (2.56)	11.8 (1.64)
Period Dummy (PRD)	26.1** (2.47)	24.8 ** (2.37)	23.8 ** (2.25)	27.8 ** (2.29)	25.8** (2.11)	26.8** (2.12)	-1.60 (-0.57)	-2.28 (-0.89)	-2.58 (-0.95)	-1.63 (-0.53)	-3.03 (-1.08)	-3.95 (-1.32)
Government spending in health (HEALTH)	2.20 (.39)	-10.9 (-1.30)	-5.88 (-.85)				-1.58 (-1.07)	-.64 (-0.32)	-.90 (-0.52)			
Institutional quality* Government Spending in health (INST* HEALTH)	-14.7** (-2.07)						.62 (0.33)					
GDP growth rate* Government Spending in health (GROW*HEALTH)	-1.52* (-1.79)	-1.44 (-1.62)	-1.74 ** (-2.02)				-.10 (-0.45)	-.22 (-1.01)	-.12 (-0.55)			
Government spending in Education (EDUC)				9.42** (2.04)	4.85 (0.81)	7.33 (1.32)				1.14 (0.97)	1.56 (1.13)	1.85 (1.42)
Institutional quality* Government spending in Education (INST* EDUC)				-10.2** (-2.51)						.22 (0.21)		
GDP growth rate* Government spending in Education (GROW*EDUC)				-1.60** (-2.45)	-1.15 (-1.58)	-1.59** (-2.32)				-.03 (-0.19)	-.12 (-0.75)	-.10 (-0.59)
Dummy for the level of economic development*GDP growth rate (LOWINC*GROW)	2.68 (-79)	3.09 (.92)	3.00 (.91)	5.06 (1.54)	4.24 (1.31)	5.14 (1.57)	1.41 (1.60)	.98 (1.21)	1.04 (1.25)	1.77** (2.14)	.97 (1.31)	1.00 (1.30)
Dummy for the level of economic development*Institutional quality (LOWINC*INST)	28.7 (-98)			31.3 (1.11)			4.54 (0.60)			10.6 (1.52)		
Regional Dummy*Institutional quality (AFR*INST)	-8.14 (-.23)			-1.89 (-.06)			-.85 (-0.09)			-10.0 (-1.22)		
Government effectiveness index* Government Spending in health (GE*HEALTH)		-16.1* (-1.95)						1.28 (0.64)				
Control of Corruption index* Government Spending in health (CC*HEALTH)			-14.1* (-1.86)						1.56 (0.81)			
Dummy for the level of economic development* Government Spending in health (LOWINC*HEALTH)	-2.77 (-.25)	-2.58 (-.22)	.46 (.04)				-1.97 (-0.68)	1.57 (0.56)	-1.15 (-0.41)			

Name of Independent Variables	Dependent variable: Headcount Ratio						Dependent variable: Gini Coefficient					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
Regional Dummy* Government Spending in health (AFR*HEALTH)	-1.97 (-.12)	9.75 (.60)	1.74 (.11)				1.57 (0.37)	-3.42 (-0.88)	.72 (0.19)			
Government effectiveness index* Government spending in Education (GE*EDUC)					-11.5** (-2.10)						-.39 (-0.31)	
Control of Corruption index* Government spending in Education (CC*EDUC)						-9.78* (-1.86)						.38 (0.31)
Dummy for the level of economic development* Government spending in Education (LOWINC*EDUC)				-5.63 (-1.03)	-5.06 (-0.87)	-5.38 (-0.92)				-.82 (-0.60)	-.15 (-0.11)	-.17 (-0.12)
Regional Dummy* Government spending in Education (AFR*EDUC)				-9.54* (-1.75)	-5.75 (-0.95)	-6.76 (-1.13)				-1.58 (-1.17)	-3.17** (-2.29)	-2.76* (-1.98)
Dummy for the level of economic development* Government effectiveness (LOWINC*GE)		36.6 (1.65)			22.4 (0.92)			2.81 (0.53)			-3.41 (-0.62)	
Regional Dummy* Government effectiveness (AFR*GE)		-7.17 (-.27)			12.3 (0.38)			12.16* (1.91)			21.0*** (2.82)	
Dummy for the level of economic development*Control of Corruption index (LOWINC*CC)			31.8 (1.47)			21.7 (0.92)			1.07 (0.20)			-2.33 (-0.42)
Regional Dummy* Control of Corruption index (AFR*CC)			-1.35 (-.06)			8.73 (0.27)			7.22 (1.18)			15.2* (1.98)
Constant	-25.2 (-1.37)	-3.08 (-.17)	-13.0 (-.69)	-46.2** (-2.43)	-46.0** (-2.29)	-50.9** (-2.48)	5.60 (1.12)	5.40 (1.17)	6.65 (1.34)	-2.84 (-0.59)	-5.27 (-1.14)	-4.16 (-0.85)
Number of observations	79	79	79	64	64	64	76	76	76	62	62	62
R-square	0.1885	0.1978	0.1858	0.3443	0.3184	0.3055	0.1218	0.2553	0.1771	0.1823	0.2974	0.2416
Adjusted R-square	0.0691	0.0799	0.0661	0.2206	0.1898	0.1745	-0.0133	0.1407	0.0505	0.0220	0.1596	0.0929

References

Acemoglu, D., Johnson, S. and Robinson, J.A. (2001). The Colonial Origins of Comparative Development: An Empirical Investigation. *The American Economic Review, 91*(5), 1369-1401

Ackerman, J. (2004). Co-Governance for Accountability: Beyond "Exit" and "Voice". *World Development, 32*(3), 447-463,

Agrawal, P. (2008). Economic growth and poverty reduction: evidence from Kazakhstan., *Asian Development Review, 24*(2), 90–115.

Ahsan, S.M. and Oberoi, J. (2002). Inequality, Well-Being and Institutions in Latin America and the Caribbean. Presented in CESifo Conference Centre, Munich. 8-9 November 2002. . Retrieved June 11, 2011, from http://www.cesifogroup.de/portal/page/portal/ifoContent/N/neucesifo/CONFERENCES/SC_CONF_1999-2006/GIW02/PAPERS/GIW02-AHSAN2.PDF.

Angeles-Castro, G. (2006). *The Relationship Between Economic Growth and Inequality: Evidence from the Age of Market Liberalism* (Studies in Economics 0601). United Kingdom: Department of Economics, University of Kent. Retrieved July 09, 2011, from http://www.degit.ifw-kiel.de/papers/degit_11/C011_009.pdf

Arimah, B. C. (2004). Poverty Reduction and Human Development in Africa. *Journal of Human Development, 5*(3), 399-415.

Azfar, O. (2005). *Institutions and poverty reduction*. IRIS, University of Maryland. Retrieved June 11, 2011, from http://siteresources.worldbank.org/INTPGI/Resources/342674115051862644/Institutions8.pdf).

Babu, S. (2003). Social Safety Nets for Poverty Reduction in South Asia - Global Experiences. *Sri Lankan Journal of Agricultural Economics, 5*(1), 1-8.

Baldacci, E., Clements, B., Cui, Q. and Gupta, S. (2005). What Does It Take to Help the Poor. *Finance and Development, 42*(2), 20-31.

Butkiewicz, J.L. and Yanikkaya, H. (2006). Institutional quality and economic growth: maintenance of the rule of law or democratic institutions, or both? *Economic Modelling, 23*(4), 648-661.

Chong, A. and Calderón, C. (2000). Institutional quality and poverty measures in a cross-section of countries. *Economics of Governance*, *1*(2), 123-135.

_____. (2000). Causality and Feedback Between Institutional Measures and Economic Growth. *Economics & Politics*, 12: 69–81. doi: 10.1111/1468-0343.00069

Deaton, A. (2010). Price Indexes, Inequality and the Measurement of World Poverty. *American Economic Review, 100*(1), 5-34,

Deolalikar, A. B., Brillantes, A. B. Jr., Gaiha, R., Pernia, E. M. and Racelis, M. (2002*). Poverty Reduction and the Role of Institutions in Developing Asia* (ERD Working Paper Series No. 10). Manila: Economics and Research Department, Asian Development Bank.

Dollar, D. (2002). *Reform, Growth, and Poverty in Vietnam* (World Bank Policy Research Working Paper No. 2837).. Washington, DC: World Bank.

Dollar, D. and Kraay, A. (2002). Institutions, trade, and growth. *Journal of Monetary Economics*. Volume 50, Issue 1, January 2003, Pages 133-162.

Easterly, W. (1999). Life During Growth. *Journal of Economic Growth, 4*(3), 239-275.

_____. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics*. 84(2), 755-776.

Fan, S. (2008). *Public Expenditures, Growth and Poverty in Developing Countries: Lessons from Developing Countries (*.Issue Briefs 51). Washington, DC: International Food Policy Research Institute (IFPRI).

Fan, S. and Rao, N. (2006). *Public Spending in developing Countries: Trends, Determination, and Impact*,(Environment, Production and Technology Division Discussion Paper 99). International Food Policy Research Institute, Washington, D.C: International Food Policy Research Institute.

Fan, S., Hazell, P. and Thorat, S. (2000). Government spending, Agricultural Growth and Poverty in Rural India. *American Journal of Agricultural Economics, 82*(4), 1038-1051.

Fan, S., Hazell, P. and Thorat, S. (1999*). Linkages between government spending, growth, and poverty in rural India* (RESEARCH REPORT 110). Washington, D.C: International Food Policy Research Institute.

Gaiha, R. and Imai, K. (2005). *Do Institutions Matter in Poverty Reduction? Prospects of Achieving the MDG of Poverty Reduction in Asia* (Economics Discussion Paper EDP-0506). Manchester: The University of Manchester.

Gwartney, J. D., Holcombe, R. G. and Lawson, R. A. (2004). Economic freedom, institutional quality, and cross-country differences in income and growth. *Cato Journal, 24*(3), 205-233.

Hasan, R., Mitra, D. and Ulubasoglu, M. (2006). *Institutions and policies for growth and poverty reduction: the role of private sector development* (ERD Working Paper Series No. 82)..Manila: Asian Development Bank.

Imai, K., Gaiha, R. and Thapahas, G. (2009). *Poverty Reduction Slowed Down in the Developing World? Evidence Based on New Poverty Estimates* (The School of Economics Discussion Paper Series 0902). Manchester: The University of Manchester.

Kandil, M. (2009). Determinants of institutional quality and their impact on economic growth in the MENA region. *International Journal of Development Issues, 8*(2), 134 – 167.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010). *The Worldwide Governance Indicators: Methodology and Analytical Issues (*World Bank Policy Research Working Paper No. 5430). Washington, DC: World Bank.

Klugman, J. (2002). A Sourcebook for Poverty Reduction Strategies Volume 1: Core Techniques and Cross-Cutting Issues, the World Bank, Washington, D.C.

Knowles, S. (2005). Inequality and Economic Growth: The Empirical Relationship Reconsidered in the Light of Comparable Data. *Journal of Development Studies, 41*(1), 135 – 159.

PATERNOSTRO, S., RAJARAM, A. and TIONGSON, E. R. (2005). *How does the Composition of Public Spending Matter?* (World Bank Policy Research Working Paper No. 3555).Washington DC: The World Bank.

Rivera, H. D. (2009). Poverty and Institutional Quality in a Cross-Section of Countries. Andrew Young School of Policy Studies, summer 2009 Internship Program, Georgia State University. Retrieved June 11, 2011) from http://aysps.gsu.edu/econ/files/Econ_09_SummerIntern_HDRivera_Paper.pdf.

Samanta, S.K. and Heyse, A. (2006). Income inequality and economic growth in developing countries: an empirical analysis. *Indian Journal of Economics and Business, 5(*2). Retrieved July 10, 2011 from

http://findarticles.com/p/articles/mi_m1TSD/is_2_5/ai_n25012649/

Swaroop, V. and Rajkumar, A. S. (2002). *Public Spending and Outcomes: Does Governance Matter?* (World Bank Policy Research Working Paper No. 2840). Washington, DC: World Bank

The World Bank website. (2011). *Measuring Inequality.* Retrieved February 12, 2011, from http://go.worldbank.org/3SLYUTVY00.

The World Bank website. (2010). *How we Classify Countries* . Retrieved September 7, 2010, from
http://data.worldbank.org/about/country-classifications.

The World Bank website. (2010). *The Worldwide Governance Indicators (WGI) project.* Retrieved September 7, 2010, from
http://info.worldbank.org/governance/wgi/index.asp.

WHO. (2002). Health, *Economic Growth, and Poverty Reduction* (The Report of Working Group I of the Commission on Macroeconomics and Health). Geneva: World Health Organization.

Wilhelm, V. and Fiestas, I. (2005). *Exploring the Link Between Public Spending and Poverty Reduction: Lessons from the 90s* (WBI Working Paper). Washington DC: World Bank Institute. Retrieved June 11, 2011 from
http://siteresources.worldbank.org/WBI/Resources/ExploringtheLink_FINAL_with_cover.pdf.

World Bank Database. (2011). *Poverty headcount ratio at $1.25 a day (PPP) (% of population).* Retrieved February 12, 2011, from
http://data.worldbank.org/indicator/SI.POV.DDAY.

The World Bank Database. (2011). *World Development Indicators (WDI) and Global Development Finance (GDF)*. Retrieved February 11, 2011, from http://databank.worldbank.org/ddp/home.do?Step=1andid=4.

The World Bank. (2010). *World Development Report 1990: Poverty*. (Vol. 1 of 1), Washington DC: The World Bank.

Zhuang, J., Dios, E. D. and Lagman-Martin, A. (2010). *Governance and Institutional Quality and the Links with Economic Growth and Income Inequality: With Special Reference to Developing Asia* (ADB Economics Working Paper Series, No. 193). Manila: Asian Development Bank.

Appendices

Appendix 1: Data Source

No.	Name of Variables	Source
1	Government Effectiveness index (GE)	Worldwide Governance Indicators, The World Bank[1]
2	Control of Corruption index (CC)	Worldwide Governance Indicators, The World Bank[2]
3	GDP (GDP)	World Bank Database[3]
4	Dummy for the level of economic development (LOWINC)	World Bank Country and Lending Group[4]
5	Institutional quality (INST)	Worldwide Governance Indicators, The World Bank[5]
6	Regional Dummy (AFR)	World Bank Country and Lending Group[6]
7	Government spending in social welfare (SW)	Government Finance Statistics, International Monetary Fund (IMF)[7]
8	Government spending in health (HEALTH)	World Health Organization (WHO)[8]
9	Government spending in education (EDUC)	United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics[9]
10	Gini Coefficient (INEQ)	PovcalNet, The World Bank[10]
11	Headcount Ratio (HEAD)	PovcalNet, The World Bank[11]

[1] http://info.worldbank.org/governance/wgi/index.asp

[2] http://info.worldbank.org/governance/wgi/index.asp

[3] http://databank.worldbank.org/ddp/home.do?Step=12andid=4andCNO=2

[4] http://data.worldbank.org/about/country-classifications/country-and-lending-groups

[5] http://info.worldbank.org/governance/wgi/index.asp

[6] http://data.worldbank.org/about/country-classifications/country-and-lending-groups

[7] http://www2.imfstatistics.org/GFS/

[8] http://www.who.int/research/en/

[9] http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx

[10] http://iresearch.worldbank.org/PovcalNet/povcalSvy.html

[11] http://iresearch.worldbank.org/PovcalNet/povcalSvy.html

Appendix 2: Regression Results for public spending in social welfare

In the following tables, *** denotes the respective variable is significantly different from zero at 99% level of confidence interval, ** denotes a significance at 95% level of confidence interval and * denotes a significance at 90% level of confidence interval.

Table 7: Regression results for model 1 (public spending in social welfare)

Name of Independent Variables	**Dependent variable: Headcount Ratio**			**Dependent variable: Gini Coefficient**		
	Reg 1	**Reg 2**	**Reg 3**	**Reg 1**	**Reg 2**	**Reg 3**
Institutional quality (INST)	-15.3 (-1.05)			6.21 (1.34)		
Government Effectiveness index (GE)		3.91 (0.22)			5.11 (0.91)	
Control of Corruption index (CC)			-18.0 (-1.41)			7.11* (1.79)
GDP Growth Rate (GROW)	-1.59 (-.84)	-1.55 (-0.77)	-.99 (-0.53)	-.05 (-0.08)	-.15 (-0.22)	-.14 (-0.22)
Dummy for the level of economic development (LOWINC)	-7.94 (-.70)	-4.74 (-0.3)	-11.3 (-0.9)	3.37 (0.95)	4.11 (1.03)	4.45 (1.24)
Regional Dummy (AFR)	2.05 (.15)	8.92 (0.74)	9.01 (0.78)	.06 (0.01)	-3.13 (-0.82)	-3.17 (-0.87)
Period Dummy (PRD)	12.6 (1.17)	10.3 (0.95)	13.4 (1.26)	-3.00 (-0.85)	-2.33 (-0.66)	-3.01 (-0.88)
Government spending in social protection (SW)	.30 (.16)	.47 (0.23)	.51 (0.27)	-.42 (-0.67)	-.74 (-1.14)	-.57 (-0.95)
Constant	-19.4 (-1.37)	-14.1 (-0.76)	-29.9* (-1.80)	4.96 (1.11)	7.14 (1.23)	8.91* (1.73)
Number of observations	35	35	35	33	33	33
R-square	0.1388	0.1062	0.1639	0.1348	0.1032	0.1764
Adjusted R-square	-0.0457	-0.0854	-0.0152	-0.0649	-0.1037	-0.0137

Table 8: Regression results for model 2 (public spending in social welfare)

Name of Independent Variables	Dependent variable: Headcount Ratio			Dependent variable: Gini Coefficient		
	Reg 1	**Reg 2**	**Reg 3**	**Reg 1**	**Reg 2**	**Reg 3**
GDP Growth Rate (GROW)	-1.18 (-.63)	-1.97 (-1.06)	-1.37 (-0.71)	-.01 (-0.02)	-.07 (-0.10)	-.03 (-0.04)
Dummy for the level of economic development (LOWINC)	-1.43 (-.12)	-2.78 (-0.25)	-5.92 (-0.52)	3.58 (0.96)	2.67 (0.73)	2.51 (0.69)
Regional Dummy (AFR)	11.6 (.99)	7.69 (0.67)	9.08 (0.76)	-2.26 (-0.58)	-3.04 (-0.78)	-2.93 (-0.75)
Period Dummy (PRD)	6.17 (.56)	7.35 (0.70)	10.0 (0.91)	-3.16 (-0.85)	-2.22 (-0.61)	-2.15 (-0.59)
Government spending in social protection (SW)	3.90 (1.28)	3.96 (1.46)	2.06 (0.33)	.21 (0.21)	.37 (-0.40)	-.23 (-0.12)
Institutional quality* Government Spending in social protection (INST* SW)	9.58 (1.39)			2.21 (1.00)		
Government effectiveness index* Government Spending in social protection (GE*SW)		10.5* (1.71)			.62 (0.30)	
Control of Corruption index* Government Spending in social protection (CC*SW)			1.99 (0.25)			.45 (0.18)
Constant	-18.4 (-1.33)	-11.1 (-0.80)	-17.1 (-1.20)	3.45 (0.77)	4.10 (0.88)	3.69 (0.81)
Number of observations	35	35	35	33	33	33
R-square	0.1627	0.1889	0.1067	0.1088	0.0780	0.0759
Adjusted R-square	-0.0167	0.0151	-0.0848	-0.0969	-0.1348	-0.1374

Table 9: Regression results for model 3 (public spending in social welfare)

Name of Independent Variables	Dependent variable: Headcount Ratio			Dependent variable: Gini Coefficient		
	Reg 1	**Reg 2**	**Reg 3**	**Reg 1**	**Reg 2**	**Reg 3**
GDP Growth Rate (GROW)	-1.45 (-.54)	-2.08 (-0.77)	-1.08 (-0.39)	-.02 (-0.02)	.16 (0.14)	.21 (0.19)
Dummy for the level of economic development (LOWINC)	-1.61 (-.14)	-2.88 (-0.26)	-5.60 (-0.48)	3.58 (0.94)	2.78 (0.74)	2.64 (0.71)
Regional Dummy (AFR)	11.8 (.98)	7.71 (0.66)	8.98 (0.73)	-2.26 (-0.56)	-3.18 (-0.80)	-3.11 (-0.78)
Period Dummy (PRD)	6.02 (.54)	7.32 (0.69)	10.2 (0.90)	-3.16 (-0.82)	-2.09 (-0.56)	-1.98 (-0.52)
Government spending in social protection (SW)	3.52 (.86)	3.79 (0.95)	2.32 (0.36)	.21 (0.16)	-.11 (-0.08)	-.08 (-0.04)
Institutional quality* Government Spending in social protection (INST* SW)	9.86 (1.36)			2.22 (0.92)		
GDP growth rate* Government Spending in social protection (GROW*SW)	.13 (.14)	.05 (0.06)	-.14 (-0.15)	.00 (0.01)	-.09 (-0.27)	-.09 (-0.28)
Government effectiveness index* Government Spending in social protection (GE*SW)		10.6 (1.66)			.51 (0.24)	
Control of Corruption index* Government Spending in social protection (CC*SW)			1.64 (0.20)			.22 (0.08)
Constant	-17.2 (-1.05)	-10.6 (-0.63)	-18.3 (-1.09)	3.47 (0.62)	3.18 (0.54)	2.80 (0.50)
Number of observations	35	35	35	33	33	33
R-square	0.1633	0.1890	0.1074	0.1088	0.0806	0.0787
Adjusted R-square	-0.0536	-0.0213	-0.1240	-0.1407	-0.1769	-0.1793

Table 10: Regression results for model 4 (public spending in social welfare)

Name of Independent Variables	Dependent variable: Headcount Ratio			Dependent variable: Gini Coefficient		
	Reg 1	**Reg 2**	**Reg 3**	**Reg 1**	**Reg 2**	**Reg 3**
Regional Dummy (AFR)	12.5 (.47)	5.49 (0.22)	-.91 (-0.04)	-6.36 (-0.72)	3.31 (0.40)	3.54 (0.45)
Period Dummy (PRD)	11.1 (.85)	12.8 (1.06)	14.9 (1.19)	-3.16 (-0.71)	-3.19 (-0.78)	-3.48 (-0.90)
Government spending in social protection (SW)	3.85 (1.03)	4.49 (1.22)	5.13 (0.73)	.01 (0.01)	-.21 (-0.17)	.09 (0.04)
Institutional quality* Government Spending in social protection (INST* SW)	6.45 (.71)			1.99 (0.66)		
GDP growth rate* Government Spending in social protection (GROW*SW)	-.07 (-.10)	-.22 (-0.32)	.01 (0.02)	.01 (0.03)	-.02 (-0.11)	-.02 (-0.08)
Dummy for the level of economic development*GDP growth rate (LOWINC*GROW)	.34 (.11)	1.14 (0.35)	.67 (0.20)	.11 (0.11)	-.35 (-0.33)	
Dummy for the level of economic development*Institutional quality (LOWINC*INST)	-7.61 (-.32)			.25 (0.03)		
Regional Dummy*Institutional quality (AFR*INST)	9.14 (.27)			-6.07 (-0.55)		
Government effectiveness index* Government Spending in social protection (GE*SW)		7.32 (1.07)			.35 (0.16)	
Control of Corruption index* Government Spending in social protection (CC*SW)			4.42 (0.48)			.63 (0.22)
Dummy for the level of economic development* Government Spending in social protection (LOWINC*SW)	-5.01 (-.83)	-4.93 (-0.94)	-7.44 (-1.43)	.21 (0.10)	-.36 (-0.21)	-.57 (-0.36)
Regional Dummy* Government Spending in social protection (AFR*SW)	3.14 (.21)	5.49 (0.37)	3.96 (0.25)	.62 (0.12)	-.79 (-0.16)	-1.09 (-0.22)
Dummy for the level of economic development* Government effectiveness (LOWINC*GE)		3.94 (0.23)			-5.49 (-0.95)	
Regional Dummy* Government effectiveness (AFR*GE)		1.95 (0.07)			8.67 (0.94)	
Dummy for the level of economic development*Control of Corruption index (LOWINC*CC)			-3.01 (-0.18)			-2.67 (-0.59)
Regional Dummy* Control of Corruption index (AFR*CC)			-9.64 (-0.44)			7.69 (1.09)
Constant	-25.5** (-2.40)	-22.9** (-2.09)	-27.6** (-2.53)	4.47 (1.20)	3.84 (0.99)	4.13 (1.14)
Number of observations	35	35	35	33	33	33
R-square	0.1830	0.2073	0.1784	0.0963	0.1220	0.1128
Adjusted R-square	-0.1574	-0.1230	-0.1639	-0.3145	-0.2770	-0.2343