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# Inequality, Financial Development and Government: Evidence from Low-Income Developing Countries

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# **Inequality, Financial Development and Government: Evidence from Low-Income Developing Countries**

**Dr M Tariq Majeed\***

## **Abstract**

The purpose of this study is to examine the impact of financial and economic development on cross-country income inequality using a panel data set from 50 low-income developing countries over a long period 1970-2008. The results show that financial development helps in reducing inequalities, however a non-monotonic relationship between financial development and inequality does not hold. The study finds a non-monotonic relationship between inequality and level of economic development, thus this study supports Kuznets inverted-U hypothesis. The government emerges as a major player in reducing income inequalities as its role is significant in all models. Policy makers should primarily focus on achieving the higher levels of economic development to reduce increasing inequalities. Since financial development, reduces inequalities irrespective of its level, policy makers need to focus more on improvements in financial reforms.

**JEL Classification: C23, D31, H10 and E51**

**Key Words: Inequality; Financial Development; Government; Developing Countries**

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## **1. Introduction**

An extant literature has shown a strong link from financial development to economic growth (Levine, 2005). More recently, a small body of literature explores whether financial development contributes to less income inequality. However, theory does not provide definite answer to this question.

On the one hand, some of theories predict that financial development increases growth and reduces inequality. The argument is that poor may face financing constraints in the presence of imperfect financial markets as they lack collateral and credit histories. While a relaxation of the financing constraints disproportionately benefit the poor. It implies that not only efficiency of capital allocation increases but also income inequality decreases because the poor are facilitated

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with funding and productive investments (Galor and Zeira, 1993; Aghion and Bolton, 1997; Galor and Moav, 2004; Majeed, 2010a).

On the other hand, theoretical models imply that financial development initially helps the rich. The argument is that poor seek finances through informal sector of the economy such as family relations while rich rely on formal financial sector. Thus, financial devolvement inordinately benefits the rich. Greenwood and Jovanovic (1990) develop a model that predicts non-montonic relation between financial development and income inequality. According to their model, at early stages of development rich benefit from financial development because they can easily afford access to better financial markets as they have collaterals and credit histories. Later on, at higher levels of development, many people have access to financial markets.

Although theoretical studies predict conflicting impact of the financial development on income distribution but empirical studies fairly show that financial development improves income distribution. Beck et al. (2007) find that financial intermediary development decreases income inequality. (Clarke et al., 2006) also find that financial intermediary development and income inequalities are inversely related. Thus, a larger proportion of society benefits from improved financial sector.

According to the Kuznets (1955) inverted-U hypothesis, income inequality increases during the early stages of economic development and decreases at higher levels of economic development. Although, Kuznets curve predicts favourable effects at higher levels of economic development but poverty is still a long standing problem of developing countries, particularly in low income countries, despite many of these countries have experienced growth episodes. Does Kuznets curve hold in low income countries? It is not yet empirically tested, to the best of my knowledge.

Since theoretical models predict conflicting effects, estimating the actual impact of economic and financial development on inequality remains largely an empirical issue. To best of my knowledge, no previous effort has been made to quantify the relative contributions of the financial and economic development and other fundamental variables to inequality in low-income countries. This study, therefore, attempts to fill the gaps in the existing literature and lends a fresh perspective to the financial development, inequality debate by addressing five key concerns. (1) Does economic development benefit different economic actors equally or it comes at the cost of increased inequality leaving poor actors behind? (2) Is the effect perhaps different

over the path of development in the long run? (3) Does high financial intermediation reduce inequality? (4) Does the relationship vary with the level of financial development? (5) What is the role of government in all this; does government spending reduce potentially existing inequalities?

Rest of the discussion is structured as follow. Section 2 provides a review of the related literature and theory on the predictors of inequality. Section 3 presents an analytical frame work for the study and section 4 provides a discussion on data and estimation procedure. Section 5 puts forward results derived from the research questions and discussion on these results. Finally, section 6 provides conclusion.

## **2. Inequality, finance and other control variables**

The role and importance of financial development in reducing income inequality can be traced to the earlier theoretical papers of Galor and Zeira (1993) and Banerjee and Newman (1993). These papers demonstrate an inverse relationship between financial development and income inequality. Nevertheless, Greenwood and Jovnovie, (1990) predict a non-linear inverted U-shaped relationship between financial development and income distribution. They show that initially financial development favours rich but over time it helps poor as well when more people have access to financial system.

Kuznets Curve suggest an inverse U-shaped relationship between economic growth and income inequality that implies at early stage of economic development income inequality increases and eventually decreases at the later stage of development due to trickle down effects of economic growth. However, this relation is not stable in the literature and it varies with a change in methodology, sample size and conditioning variables. Ahluwalia (1976), Macdonald and Majeed (2010) and Majeed (2010b) support the Kuznet's point of view.

Inflation may have a strong redistributive effect which could be positive (through its effects on individual income wealth) or negative (through a progressive tax system). The negative effects of inflation on poor are intensified when wages fail to chase increasing price levels. In developing countries trade unions are weak and minimum wage laws are not working properly due to weak institutions and workers are left with less or no rise in wages, while firms enjoy the benefits of rising prices and get further rich (MacDonald and Majeed, 2010).

Government spending is also one of the factors that affect income inequality. Income inequality may increase or decrease with government consumption. If most of redistribution through taxes and transfer system is toward poor, government spending might result into lower inequality. Papanek and Kyn (1986) test the impact of government intervention on inequality and results of their study do not support the contention that government spending reduces inequality. They argue that government intervention often benefits the elite such as the political, bureaucratic and military leadership rather than poor<sup>1</sup>. However, some cross-country studies (Boyd, 1998; MacDonald and Majeed, 2010), find the size of public sector to be significant in reducing income inequality.

Generally, it is believed that faster population growth is associated with higher income inequality. One of the reasons is that dependency burden may be higher for poor group. Investment in human capital can be expected to reduce income gaps as higher education improves skills, productivity and labour income.

In the literature, studies by Papanek and Kyn (1986), Jha (1996), Jalilian and Kirkpatrick (2002), and Clarke et al. (2006) are closely related to the work in this study. Papanek and Kyn (1986) investigate the impact of economic development on inequality for 83 countries and find some evidence in the favour of Kuznets curve, however these evidence are not strong. Their study does not find any systemic effect of the government intervention and growth on inequality. The results of this study are constrained by the availability of data series as more than fifty percent of the countries in this study include only one observation. The problem of endogeneity is not addressed in this study. Furthermore, the study also does not incorporate the role of financial development in determining inequality

In a successive study, Jha (1996) revisits the Kuznets curve and finds evidence in the favour of Kuznets curve. The sample used in this study contains both developed and developing countries over the period 1960-1992. The author notes the issue of reverse causality but leave it on future research. Furthermore, the role of government and financial development is not incorporated in the study that can cause omitted variables bias. The present study differs from Jha (1996) by exclusively studying cross-country inequality variation in low-income developing countries, taking note of the omitted variable bias and endogeneity issues.

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<sup>1</sup> For a detailed discussion on government spending, elites and corruption see Majeed and MacDonald, 2010; Mjeed and Majeed, 2011.

Jalilian and Kirkpatrick (2002) address the effect of financial development on poverty using a sample of low-income developing countries. The results of their study show that financial development helps in reducing poverty. The present study differs in terms of dependent variable as this study uses inequality as dependent variable while Jalilian and Kirkpatrick (2002) use poverty as dependent variable. Their study does not take account of Kuznets curve and non-linearity in the relationship of finance and poverty. The results of their study are constrained by the availability of data series as their study represents the relationship between finance and poverty only for 18 developing countries.

Recently, Clarke et al. (2006) examine the relationship between finance and inequality for 83 countries over the period 1960-1996 and their results support the inequality-narrowing hypothesis of finance. This study finds some evidences in the favour of inequality-widening hypothesis but these evidences are not robust. The analysis in their study is based on a pooled sample of both developed and developing countries.

The present study fills the gaps in the above mentioned studies by studying the finance inequality relationship, the role of government and Kuznets hypothesis exclusively for low-income developing countries. The present study differs in many ways from above noted studies. First, this study uses a more comparable statistic for inequality by averaging the household survey years. Second, this study addresses the problem of omitted variable bias. Third, it carefully controls the problem of endogeneity. Fourth, it exploits both within countries inequality variation and across countries inequality variation for a large set of low-income developing countries over a long period. Fifth, and finally, it provides a fresh understanding of cross-country inequality variation using the most recent panel data set.

### 3. Methodology

In this section, this study introduces a methodological frame work for inequality. Following conventional approach of the literature on inequality, initially Kuznets curve has been modelled followed by some key variables of interest and later on some additional control variables to assess the sensitivity of results and control for omitted variables bias.

#### 3.1: Inequality Model

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y^2_{it} + \varepsilon_{it} \quad (I)$$

$$(i = 1, \dots, N; t = 1, \dots, T)$$

$\log Gini_{it}$  = it refers to the natural logarithm of the Gini Index.

$\log Y_{it}$  = it refers to the natural logarithm of income per capita, adjusted with PPP.

$\log Y_{it}^2$  = square term controls nonlinear conditional convergence across the countries.

$\varepsilon_{it}$  = it is a disturbance term

Equation (I) is conventionally used to test for Kuznets hypotheses. The expected signs for  $\gamma_1$  and  $\gamma_2$  are positive and negative respectively.

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y_{it}^2 + \gamma_3 \log FI_{it} + \varepsilon_{it}$$

(II)

$FI_{it}$  = It is natural log of financial intermediation as proxy for financial development

Cross-country inequality variation depends on other factors like government size, education and population growth. Higher targeted government spending could reduce inequalities given that rent-seeking activities are avoided and government spending enhances the possibilities and opportunities for the poor. A rise in human capital can be expected to narrow down the gap between poor and rich as people with high investment in HK have less chances to fall in poverty trap. Equation (I) can be rewritten as

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y_{it}^2 + \gamma_3 \log FI_{it} + \gamma_4 \log G_{it} + \gamma_5 \log HK_{it} + \gamma_6 \Delta Pop_{it} + \varepsilon_{it} \quad (III)$$

$G_{it}$  = It is natural log of government spending as proxy for government spending on social sector

$HK_{it}$  = It is measured as secondary school enrolment rate.

$\Delta Pop_{it}$  = It is percentage change in total population.

$\varepsilon_{it}$  = It is a disturbance term

Finally, this study tests for Greenwood and Jovanovic's inverted U-shaped by including a square term for the financial development.

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y_{it}^2 + \gamma_3 \log FI_{it} + \gamma_4 \log G_{it} + \gamma_5 \log HK_{it} + \gamma_6 \Delta Pop_{it} + \gamma_7 \Delta FI_{it}^2 + \varepsilon_{it} \quad (IV)$$

According to Greenwood and Jovanovic (1990) at lower levels of financial development only rich have access to private credit, thereby, initially, income inequality increases while at higher levels of the financial development poor also have the access to private credit thereby, later on, income inequality decreases.

#### **4. Data**

The Income inequality data may not be comparable across countries due to differences in definitions and methodologies. I use Gini coefficient to measure income inequality, which is one of the most popular representations of income inequality. It is based on Lorenz Curve, which plots the share of population against the share of income received and has a minimum value of 0 (case of perfect equality) and maximum value of 1 (perfect inequality). The level of financial development is measured with two variables namely credit to private sector and broad money supply. There are some other variables such as number of banks (private and state owned) that also represent financial development. However, in this study the main focus is on above mentioned two variables for following reasons. First, these variables are highly correlated with other measure of financial development. Second, data series are manageable for these two series while others measures are constrained with the availability of data series particularly for low-income developing countries. Third, these two variables have been widely used in the literature on financial development (see, for example, Clarke et al., 2006).

To make the data more comparable, this study takes data on variables in the form of averages between two survey years. A panel data for 50 low-income countries for the period 1970-2008 have been assembled with the data averaged over periods of three to nine years, depending on the availability of inequality data. The minimum number of observations for each country is three and the maximum, nine. That is, only countries with observations for at least three consecutive periods are included. Following King and Levine (1993), financial market development and credit market imperfections are represented by taking the summation of the share of broad money (M2) in GDP, and the share of credit to the economy in GDP. M2 as a percentage of GDP shows broad money and is taken from line 34 plus 35 of the IFS. Credit as percentage of GDP represents the claims on the non-private sector and is taken from line 32d line of the IFS. Description of other control variables is given in Table 4.1. Description of basic



statistics is given in Table 4.2. This Table shows that average inequality, 40.34, is rather high in low-income developing countries.

The classification of low-income countries in this study follows the World Bank's classification of countries at different income levels. This study mainly focuses a sample of low-income developing countries by including only low-income and middle low-income developing countries. This is quite possible that a sample of countries from a specific region such as Africa produces different results. However, present study mainly focuses the development level similarity rather than a regional similarity.

In order to control the possible problem of reverse causality, this study uses both internal and external instrument. Where internal instruments are defined as own lag variables while external instruments are some other exogenous factors. Following financial development literature, this study uses legal origin as instruments (La Porta et al., 1997 and Clarke et al., 2006). The legal original of a country is measured as a dummy variable. The legal origin for a country can be British, French German, Socialist or Scandinavian.

**Table 4.1** <insert here >

**Table 4.2** <insert here >

## **5. Results and Discussion**

Estimation procedure for this study proceeds in four steps. First, following conventional approach of cross sectional and panel data studies, parameter estimates have been obtained using OLS econometrics method. Second, initially, study tests the hypothesis of Kuznets curve and later on the effect of financial development followed by some other determinants of income inequality borrowed from the literature. To test the inverted U-shaped relationship between financial development and income inequality, the study introduces a square term. Third, Table 5.2 reports the benchmark results using own lag variables as instruments to control for the possible problem of endogeneity. Fourth, finally, Table 5.3 replicates the results of Table 5.1 using exogenous instruments for financial development.

**Table 5.1** <insert here >

Table (5.1) reports the results of causes of income distribution in low-income countries. Column 2 of Table 5.1 indicates that the relationship between economic development and income distribution is non-linear implying that at lower levels of economic development income inequality tends to increase while at higher levels of the economic development it tends to fall. This finding suggests that poor are deprived from benefits of economic development when pace of the economic development remains behind a threshold level of the economic development. However, the poor also benefit from the economic development when economic development surpasses a threshold level. In other words, results of this study support validity of Kuznets curve in low-income developing countries. Column (3) shows a negative relationship between financial development and inequality, however, the effect is insignificant. This negative effects turn out to be significant when additional control variables are incorporated.

The role of government spending is consistently negative and significant in all the regressions while the effect of inflation is positive. It implies that in low-income countries government can play an important role in reducing income inequalities while inflation hurts poor hard, it may be controlled to reduce sufferings of the poor. A study Papanek and Kyn (1986) does not support the contention that government spending reduces inequality. The present study finds strong support to the contention that government spending increases equality in low-income countries. Thus results of this study imply that more recently the benefits of government spending have reached the poor.

Column (6) introduces a non-linear term for financial development to test for the Greenwood and Jovanovic's hypothesis of inverted U-shaped relationship between financial development and income distribution. Empirical results do not support the inverted U-shaped relationship, predicted by Greenwood and Jovanovic (1990), as both variables ( $FI_{it}$  and  $FI_{it}^2$ ) turn out to be insignificant. Thus, this finding indicates that inequality-widening hypothesis is not valid in low-income developing countries. Clarke et al. (2006) find some support for inequality widening hypothesis, however results in this study do not support this hypothesis. One possible reason could be intra group differences between high income developing and low-income developing countries. Since present study only focuses low-income developing countries, it does not find a support for inequality widening hypothesis.

**Table 5.2**

<insert here >

Table 5.2 represents the benchmark results using alternative econometrics techniques and internal instruments to control for the possible problem of endogeneity. Column (2) reports results without controlling square term and using 2SLS while column (3) introduces square term. Columns (4-8) represent the results using LIML and GMM econometrics techniques, respectively. The estimated coefficient for  $Y_{it}$  and  $Y_{it}^2$  are of expected signs and consistently significant. The coefficient on  $Y_{it}$  is about 1.1 while coefficient on  $Y_{it}^2$  is consistently 0.06. It implies that a 1% increase in economic development leads to a 1.1% decrease in income inequality at lower level of the economic development while at higher levels of the economic development a 1% increase in economic development leads to only 0.06% decrease in income distribution. It is noteworthy that alone high development is not sufficient to pull all the poor from poverty traps; there must be some other pro-poor reforms such as financial development. The financial development is consistently negative and significant in all regressions implying that higher level of financial development could bridge the gap between rich and poor. This finding supports inequality-narrowing hypothesis.

However, columns (3, 5 and 7) indicate that the effect of financial development turns out to be insignificant when  $FI_{it}^2$  term is introduced. Thus, this study does not find support for inequality-widening hypothesis. In other words, an inverted U-shaped relationship between financial development and inequality does not hold in low-income countries. Overall results improve in terms of level of significance and size of coefficients, however, inflation drops its level of significance.

Financial development is robustly negatively associated with income inequalities. The coefficient on financial liberalization fluctuates around 0.06 that implies a one standard deviation increase in financial liberalization explains 1.8% of income inequalities. The government plays an important role in reducing income inequalities as estimated coefficients on government spending in all regressions are robustly significant.

**Table 5.3**

<insert here >

Table 5.3 replicates the benchmark results including exogenous instruments for financial development that are dummies for legal origin of the countries. The quality of results is highest

in this table while main findings of the study remain robust. In all columns human capital turns out to be significant. It means human capital can play an important role in low-income countries to reduce the gap between rich and poor because investment in human capital is the potential source of income of individuals. Chi2, Sargan, Basman and Hansen J stat support the validity of exogenous instrument.

With reference to the research questions posted for this study following are the major findings. First, a non-monotonic relationship (Kuznets curve) holds in low-income developing countries that necessitate the importance of policies that could help in building a threshold level of economic development that is necessary to pull the poor out of poverty traps. Second, financial development plays an important role in reducing income inequality that necessitates the importance of domestic financial reform in low-income countries. Third government can play an important role in reducing inequality in low-income developing countries. This study does not support inverse U-shaped relations between financial development and inequality implying that financial reforms are helpful for the poor of low-income developing countries at all levels of the economic development.

## **6. Conclusion**

The purpose of this study has been to assess the effect of financial development for developing countries over a long period 1970 to 2008. This study is unique in the way that it examines inequality and financial development relationship for low-income developing countries and uses a more comparable statistics on inequality. Furthermore it applies alternative econometrics techniques.

This study confirms a non-monotonic relationship (Kuznets curve) in low-income developing countries and this necessitates the importance of policies that could help in building a threshold level of economic development that is necessary to pull the poor out of poverty traps. The study also finds that financial development plays an important role in reducing income inequality that necessitates the importance of domestic financial reform in low-income developing countries. Results show that government can play an important role in reducing inequality in low-income countries. However, this study does not support inverse U-shaped relationship between financial development and inequality implying that financial reforms are helpful for the poor of low-income countries at all levels of financial development.

**Table 4.1: Data sources and variable definitions**

Variable name	Definitions	Sources
Per capita real GDP	GNP per capita at PPP is annual averages between two survey years.	[1]
Gini coefficient	It is a measure of income inequality based on Lorenz curve, which plots the share of population against the share of income received and has a minimum value of zero (reflecting perfect equality) and a maximum value of one (reflecting total inequality).	[3]
Secondary school enrolment	The secondary school enrolment as % of age group is at the beginning of the period. It is used as a proxy of investment in human capital and derived from.	[1]
Inflation	Inflation rates, annual averages between two survey years.	[2]
Credit as % of GDP	Credit as % of GDP represents claims on the non-financial private sector/GDP.	[2]
Government expenditures	Government expenditures as share of GDP are averages for the period between two survey years.	[2]
Population	Population growth rates	[1]
M2 as % of GDP	It represents broad money/GDP.	[2]
Trade Liberalization	It is the sum of exports and imports as a share of real GDP. Data on exports, imports and real GDP are in the form of annual averages between survey years.	[1]
Financial Intermediation (FI)	The level of Financial Intermediation is determined by adding M2 as a % of GDP and credit to private sector as % of GDP.	
Legal Origin	It is a dummy variable. The legal origin of a country can be British, French German, Socialist or Scandinavian	[4]

Sources: [1] World Bank, World Development Indicators online data base, 2009; [2] International Financial Statistics online data base, 2009; [3] UNDP; [4] La Porta et al. (1997).

**Table 4.2: Descriptive Statistics in low income developing countries**

Variable	Observation	Mean	Std. Dev.	Min	Max
Income Inequality	241	40.34	8.69	23.3	62.3
GDP Per Capita	241	3475.9	2667.1	260	15832
Financial Intermediation	223	59.74	37.03	10	211.33
Human Capital	191	54.79	23.04	16	101.69
Government Spending	191	20.54	8.46	5.18	45.9
Population	191	1.57	1.16	-1	4.2
Inflation	191	20.97	38.08	.1383	310
Trade Openness	240	69.67	31.94	13.05	172.90

**Table 5.1: Inequality in low-income developing countries**

Independent Variables	Dependent Variable: Income Distribution					
	Per Capita GDP	1.03 (3.90)*	0.94 (3.54)*	0.71 (2.38)*	0.66 (2.24)**	0.65 (2.12)**
Per Capita GDP squared	-0.04 (-3.89)*	-0.059 (-3.41)*	-0.037 (-2.00)**	-0.03 (-1.85)***	-0.03 (-1.74)***	-0.04 (-1.95)**
Financial Intermediation (FI)		-0.01 (-0.37)	-0.06 (-2.90)*	-0.05 (-2.36)*	-0.11 (-0.60)	-0.05 (-2.34)*
Human Capital			-0.031 (-0.73)	-0.03 (-0.75)	-0.03 (-0.73)	-0.04 (-0.97)
Population			0.098 (6.03)*	0.10 (6.35)*	0.10 (6.25)*	0.11 (6.37)*
Government Expenditure			-0.12 (-3.65)*	-0.13 (-3.86)*	-0.13 (-3.79)*	-0.14 (-4.16)*
Inflation				.001 (1.99)**	0.001 (1.97)**	.001 (1.92)**
FI square					0.007 (0.31)	
Trade						0.001 (2.08)**
Constant	-0.287 (-0.28)	0.007 (0.01)	1.00 (0.87)	1.14 (1.01)	1.29 (1.02)	1.13 (1.01)
F Stat	7.63 (0.000)	5.55 (0.005)	17.61 (0.000)	15.80 (0.000)	13.84 (0.000)	14.56 (0.000)
R square	0.06	0.07	0.33	0.34	0.43	0.36
Observations	241	223	187	187	187	187

F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The t-statistics are given in parentheses (\*), (\*\*), and (\*\*\*) indicate statistical significance at 1%, 5% and 10% levels respectively

**Table 5.2: Inequality in low-income developing countries (robustness analysis I)**

Independent Variables	Dependent Variable: Income Distribution						
	2SLS	2SLS	LIML	LIML	GMM	GMM	GMM
Per Capita GDP	1.13 (2.77)*	1.11 (2.68)*	1.13 (2.41)*	1.13 (2.34)*	1.06 (2.62)*	1.04 (2.52)*	1.05 (2.62)*
Per Capita GDP squared	-0.06 (-2.42)*	-0.06 (-2.33)*	-0.06 (-2.07)**	-0.06 (-2.01)**	-0.06 (-2.26)*	-0.06 (-2.16)**	-0.06 (-2.28)**
Human Capital	-0.06 (-1.18)	-0.06 (-1.13)	-0.06 (-1.19)	-0.06 (-1.18)	-0.06 (-1.19)	-0.06 (-1.12)	-0.07 (-1.29)
FI	-0.06 (-2.14)**	-0.09 (-0.31)	-0.06 (-1.80)**	-0.09 (-0.28)	-0.06 (-2.05)**	-0.11 (-0.38)	-0.05 (-1.98)**
Population	0.11 (5.57)*	.11 (5.23)*	.11 (5.22)*	.11 (5.10)*	0.11 (5.57)*	0.11 (5.23)*	0.11 (5.51)*
Government Expenditure	-0.11 (-3.15)*	-0.11 (-3.19)*	-0.11 (3.20)*	-0.11 (3.20)*	-0.12 (-3.41)*	-0.12 (-3.45)*	-0.13 (-3.65)*
Inflation	.001 (0.760)	0.001 (0.76)	.001 (0.85)	.001 (0.86)	.001 (0.94)	.001 (0.95)	.001 (0.85)
FI Square		.004 (0.11)		.004 (0.09)		0.01 (0.19)	
Trade							0.001 (1.01)
Constant	-0.79 (-0.50)	-0.69 (-0.39)	-0.82 (-0.46)	-0.73 (-0.36)	-0.49 (-0.31)	-0.34 (-0.19)	-0.45 (-0.29)
Wald	85.92 (0.000)	86.34 (0.000)	64.65 (0.000)	64.75 (0.000)	88.33 (0.000)	88.43 (0.000)	88.18 (0.000)
Over id. Chi2	1.90 (0.17)	1.90 (0.17)					
Sargan			2.36 (0.13)	2.36 (0.12)			
Basman			2.22 (0.14)	2.20 (0.14)			
Hansen J					1.91 (0.17)	1.90 (0.17)	2.57 (0.11)
R Square	0.28	0.28	0.28	0.28	0.28	0.28	0.29
Countries	51	51	51	51	51	51	51

F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The t-statistics are given in parentheses (\*), (\*\*), and (\*\*\*) indicate statistical significance at 1%, 5% and 10% levels respectively

**Table 5.3: Inequality in low-income developing countries (robustness analysis II)**

Independent Variables	Dependent Variable: Income Distribution						
	2SLS	2SLS	LIML	LIML	GMM	GMM	GMM
Per Capita GDP	0.84 (2.74)*	0.91 (2.87)*	0.85 (2.33)*	0.91 (2.45)*	1.01 (3.47)*	1.05 (3.51)*	1.02 (3.46)*
Per Capita GDP squared	-0.04 (-2.20)**	-0.05 (-2.34)*	-0.04 (-1.86)***	-0.05 (-2.00)**	-0.05 (-2.88)*	-0.06 (-2.94)**	-0.05 (-2.90)**
Human Capital	-0.07 (-1.78)***	-0.08 (-1.84)***	-0.07 (-1.77)***	-0.08 (-1.83)***	-0.09 (-2.08)**	-0.09 (-2.24)**	-0.09 (-2.17)**
FI	-0.06 (-2.41)*	-0.13 (-0.64)	-0.06 (-2.09)**	0.14 (0.59)	-0.05 (-2.22)**	0.06 (0.30)	-0.05 (-2.13)**
Population	0.10 (6.05)*	0.10 (5.85)*	0.10 (5.68)*	0.10 (5.49)*	0.10 (6.09)*	0.10 (5.84)*	0.10 (6.07)*
Government Expenditure	-0.12 (-3.60)*	-0.12 (-3.60)*	-0.12 (-3.75)*	-0.12 (-3.74)*	-0.13 (-3.95)*	-0.14 (-4.15)*	-0.14 (-4.29)*
Inflation	.001 (1.38)	0.001 (1.35)	.001 (1.36)	.001 (1.33)	.001 (1.72)***	.001 (1.68)***	.001 (1.53)
FI Square		-0.023 (-0.90)		-0.024 (-0.84)		-0.51 (-0.42)	-0.22 (-0.20)
Trade							0.001 (1.39)
Constant	0.42 (0.36)	-0.16 (-0.12)	0.39 (0.29)	0.22 (0.14)	-0.22 (-0.19)	-0.34 (-0.19)	-0.34 (-0.19)
Wald	138.31 (0.000)	136.83 (0.000)	88.80 (0.000)	89.00 (0.000)	162.79 (0.000)	165.07 (0.000)	159.96 (0.000)
Over id. Chi2	5.65 (0.13)	5.26 (0.15)					
Sargan		6.98 (0.07)		6.24 (0.10)			
Basmann		2.19 (0.10)		1.95 (0.13)			
Hansen J					5.64 (0.13)	5.26 (0.15)	7.5 (0.06)
R Square	0.31	0.31	0.31	0.31	0.31	0.30	0.32
Observations	172	172	172	172	172	172	172
Countries	51	51	51	51	51	51	51

F-statistics and associated p-values are reported for the test of all slope parameters jointly equal to zero. The t-statistics are given in parentheses (\*), (\*\*), and (\*\*\*) indicate statistical significance at 1%, 5% and 10% levels respectively



## Appendix

### List of Countries

1	Algeria	18	Honduras	35	Nigeria
2	Armenia	19	India	36	Pakistan
3	Azerbaijan	20	Indonesia	37	Paraguay
4	Bangladesh	21	Iran	38	Peru
5	Belarus	22	Ivory Coast	39	Philippines
6	Bulgaria	23	Jamaica	40	Romania
7	Cameroon	24	Jordan	41	Russia
8	China	25	Kazakistan	42	Senegal
9	Colombia	26	Kyrgyz Rep.	43	Sri lanka
10	Costa Rica	27	Latvia	44	Tajikistan
11	Dominican Rep	28	Lesotho	45	Thailand
12	Ecuador	29	Lithuania	46	Tunisia
13	Egypt	30	Madagascar	47	Uganda
14	El Salvador	31	Mali	48	Ukraine
15	Ethiopia	32	Mauritania	49	Vietnam
16	Georgia	33	Morocco	50	Zambia
17	Ghana	34	Nepal		

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