Inequality, Finance and Development: Evidence from Low-Income Developing Economies

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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 counties. The empirical analysis is based on fixed effects 2SLS model. The results show that a non-monotonic relationship between financial development and inequality, predicted by Greenwood and Jovanovic (1990), does hold. The study, also, finds a non-monotonic relationship between inequality and the level of economic development, which supports Kuznets's inverted-U hypothesis. The government emerges as a major player in reducing income inequalities as its role is significant in all models. The study suggests that the policy makers must focus primarily on economic development to reduce inequalities. Since financial development, at higher levels, also reduces inequalities, policy makers also need to encourage financial reforms.

عدم المساواة والتمويل والتنمية : أدلة من الاقتصادات النامية ذات الدخل المنخفض

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ملخص

تهدف هذه الدراسة إلى تحليل أثر التنميةالاقتصادية والمالية على عدالة توزيع الدخل في خمسين دولة من الدول منخفضة الدخل بالاعتماد على الأثر الثابت في نموذج الإنحدار ذو المرحلتين 2SLS)). وتشير نتيجة الدراسة إلى أن العلاقة بين التنمية المالية والاقتصادية وعدم العدالة في التوزيع ليست مستقرة وتصاعدية وتخالف توقع دراسة (Greenwood & Jovanovic) وبينت الدراسة أن هذه العلاقة ليست تصاعدية وإنما تتفق مع فرضية كوزنت (Kuznets's hypothesis) والتي تدل على أن هذه العلاقة تأخذ شكل حرف U المقلوب . وتبين الدراسة أن الحكومة هي اللاعب الرئيسي في إشكالية عدم العدالة في توزيع الدخل في جميع النماذج التي تم دراستها . وتشير الدراسة أن السياسات الاقتصادية يجب أن تركز على التنمية الاقتصادية بهدف تقليل عدم العدالة في التوزيع كما ثبت أن التنمية المالية بالمستويات المتقدمة تقلل من عدم العدالة في التوزيع لذلك لا بد من تشجيع عمليات الاصلاح المالي .

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1. Introduction

An extant literature has shown a strong linkage between financial development and economic growth (e.g. Levine, 2005). More recently, a small body of literature explores whether financial development contributes towards less income inequality. A definite answer to the question still eludes us.

On one hand, some theories support that financial development increases growth and reduces inequality. The argument is that the poor may face financing constraints in the presence of imperfect financial markets as they lack collateral and credit histories. Hence, any relaxation of the financing constraints disproportionally benefits the poor. With financial development, not only does the efficiency of capital allocation increase but also income inequality decreases as the poor are facilitated by funding and productive investments (Galor and Zeira, 1993; Aghion and Bolton, 1997; Galor and Moav, 2004; Majeed, 2010).

On the other hand, theoretical models imply that financial development initially helps the rich. The argument is that the poor seek finances through the informal sector of the economy, such as through family relations, while the rich rely on the formal financial sector. Thus, financial devolvement inordinately benefits the rich. Greenwood and Jovanovic (1990) develop a model that predicts a non-monotonic relationship between financial development and income inequality. According to the model, at early stages of development, the rich benefit from financial development because they can easily afford access to better financial markets, being in possession of collaterals and credit histories. Later on, at higher levels of development, more people, and not just the rich, get access to financial markets.

Although theoretical studies predict a conflicting impact of financial development on income distribution, empirical studies clearly show that financial development improves the 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, and that a larger proportion of society benefits from an improved financial sector.

According to Kuznets〈1955〉, and his inverted–U hypothesis, income inequality increases during the early stages of economic development and decreases at higher levels of economic development. Kuznets Curve predicts favourable effects at higher levels of economic development but the fact is that poverty is still a long standing problem of developing countries, particularly in low income countries, despite many of these countries having experienced growth episodes. Does Kuznets Curve hold in low income countries? To answer this question, an empirical test for low–income countries is required.

Since theoretical models predict conflicting effects, estimating the actual impact of economic and financial development on inequality remains largely an empirical issue. No previous effort has been made to quantify the relative contributions of financial and economic development and other fundamental variables to inequality in low–income countries. This study, therefore, attempts to fill the gaps in existing literature and lends a fresh perspective to the financial development–inequality debate by addressing the following five key concerns.

〈1〉Does economic development benefit different economic actors equally or does it promote increased inequality leaving poor actors behind?
〈2〉Is the effect in〈1〉different for development path in the long run?
〈3〉Does high financial intermediation reduce inequality?
〈4〉Does the relationship in〈3〉vary with the level of financial intermediation?
〈5〉Does government spending reduce potentially existing inequalities?

Rest of the discussion is structured as follows. Section 2 provides a review of the related literature and theory on the predictors of inequality. Section 3 presents an analytical framework for the study. Section 4 provides a discussion on data and estimation procedures, while Section 5 discusses the results. Finally, Section 6 concludes the study by stating answers to the above–mentioned research questions.

2. Inequality, finance and other control variables

The role and importance of financial development in reducing income inequality can be traced to the theoretical papers by Galor and Zeira〈1993〉and Banerjee and Newman〈1993〉which demonstrate an inverse relationship between financial development and income inequality. Haber〈1991〉, on the other hand, argues that at

the early stage of financial deepening access to financial services is limited to incumbents and will thus raise their incomes relative to the incomes of the poor. 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 the rich but the poor also benefit over time as more people get access to the financial system.

The Kuznets Curve suggests an inverse U-shaped relationship between economic growth and income inequality. This implies that income inequality increases at the early stage of economic development but eventually decreases at the later stage due to trickle down effects of economic growth. However, development literature has established that the relationship varies depending on the choice of methodology, sample size and conditioning variables. Paukerit (1973), Ahluwalia (1976) and Macdonald and Majeed (2010) support the Kuznets Curve. However, some later studies (see for example, Deininger and Squire, 1998) do not find evidence in support of an inverse U-shaped relationship between economic growth and income inequality. One of the reasons is that inflation accompanying growth 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 generally weak and minimum wage laws do not work properly due to weak institutions. Hence, workers enjoy little or no rise in wages, while firms do avail the benefits of rising prices and get richer (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 redistribution through taxes and transfer system is towards the 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 the poor. 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

poorer groups. Investment in human capital can be expected to reduce income gaps as higher education improves skills, productivity and labour income. Deaton and Paxon ⟨1997⟩ argue that population growth increases the size of families in the poor stratum, thereby increasing poverty. Becker, Glaeser and Murphy ⟨1999⟩ argue that population growth does not increase labour force and high income in poor agricultural economies, or in economies characterised by limited human capital oroutdated technology.

The present study is closely related to the studies by Papanek and Kyn ⟨1986⟩, Jha ⟨1996⟩, Jalilian and Kirkpatrick ⟨2002⟩, and Clarke et al. ⟨2006⟩. Papanek and Kyn ⟨1986⟩ investigate the impact of economic development on inequality for 83 countries and find some weak evidence in favour of the Kuznets Curve. Their study does not, however, find any systemic effect of the government intervention and economic growth on inequality. The results of this study are constrained by the availability of data series with above fifty percent of the countries in the sample having a single observation. The problem of endogeneity is not addressed by the study which also does not consider the impact of financial development on inequality,

In a successive study, Jha ⟨1996⟩ revisits the Kuznets Curve relationship and finds evidence in its favour. The sample used by the study includes both developed and developing countries over the time period 1960–1992. The study notes the issue of reverse causality but chooses to leave it for future research. Furthermore, the role of government spending and financial development is not incorporated in the study possibly causing an "omitted variable 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.

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. While Jalilian and Kirkpatrick ⟨2002⟩ use poverty as dependent variable, the present study differs by using inequality as the dependent variable. Their study also does not take account of Kuznets Curve and the non–linear nature of the relationship between finance and poverty. The results of the study are further constrained by the data series which is available for only 18 developing countries.

Recently, Clarke et al. ⟨2006⟩ examine the relationship between finance and inequality for a pooled sample of 83 developed and developing countries over the period

1960–1996, and their results support the inequality–narrowing hypothesis of finance. The study also finds some evidence in the favour of the inequality–widening hypothesis but the evidence is not robust.

The present study attempts to fill the gaps in the above mentioned studies by studying the finance–inequality relationship, the role of government and Kuznet's hypothesis exclusively for low–income developing countries. The study is distinct in a number of ways. First, the study uses a more comparable statistic for inequality by averaging the household survey years. Second, it addresses the problem of omitted variable bias. Third, it carefully controls the problem of endogeneity. Fourth, the study utilises 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

The study introduces a methodological framework for inequality. Following the conventional approach to inequality, Kuznets Curve has been initially modelled followed by some key variables of interest. Some additional control variables have been added later to assess the sensitivity of results and to control for omitted variable bias.

3.1: Inequality Model

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y^2_{it} + \varepsilon_{it} \qquad (1)$$
$$(i = 1, \ldots \ldots \ldots N; t = 1, \ldots \ldots \ldots T)$$

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^2_{it} = square term controls nonlinear conditional convergence across the countries.
ε_{it} = it is a disturbance term

Equation (1) is conventionally used to test for Kuznet's hypotheses (Garbis, 2005; Majeed and Macdonald, 2010). The expected signs for $\gamma 1$ and $\gamma 2$ are positive and negative respectively.

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y^2_{it} + \gamma_3 \log FI_{it} + \varepsilon_{it} \qquad (2)$$

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 inhuman capital have less chances to fall intothe poverty trap. Equation $\langle 1 \rangle$ can be rewritten as

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y^2_{it} + \gamma_3 \log FI_{it} + \gamma_4 \log G_{it} + \gamma_5 \log HK_{it} + \gamma_6 \Delta Pop_{it} + \varepsilon_{it} \qquad \langle 3 \rangle$$

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.

ΔPop_{it} =It is percentage change in total population.

ε_{it} =It is a disturbance term

Finally, this study tests for Greenwood and Jovanovic'sinverted U–shapedrelationship by including a square term for the financial development.

$$\log Gini_{it} = \alpha_{it} + \gamma_1 \log Y_{it} + \gamma_2 \log Y^2_{it} + \gamma_3 \log FI_{it} + \gamma_4 \log G_{it} + \gamma_5 \log HK_{it} + \gamma_6 \Delta Pop_{it} + \gamma_7 \Delta FI^2_{it} + \varepsilon_{it} \qquad \langle 4 \rangle$$

According to Greenwood and Jovanovic $\langle 1990 \rangle$, at lower levels of financial development, only rich have access to private credit, thereby, initially, income inequality increases. However, at higher levels of financial development, poor also have access to private credit thereby, later on, income inequality decreases.

This study also controls for inflation and trade liberalization variables to assess the robustness of results. The inflation is likely to increase inequalities as it hits the poor hard. The likely impact of trade liberalization on inequalities is negative as predicted by the Hecksher–Ohlin $\langle HO \rangle$ model. The inflation rate is measured with consumer price index while trade liberalization is measured as sum of exports and imports as % of GDP.

4. Data

The income inequality data may not be comparable across countries due to differences in definitions and methodologies. The study uses the Gini coefficient $\langle$one of the most popular representations of income inequality$\rangle$ to measure income inequality. It is based on the Lorenz Curve, which plots the share of population against the share of income received and has a minimum value of 0 $\langle$case of perfect equality$\rangle$ and maximum value of 1

(perfect inequality). Garbis (2005) introduces the idea of a comparable cross country data series and this study closely follows his approach by extending the data set for different variables and for a longer period. The level of financial development is measured by two variables – credit to private sector and broad money supply. Some other variables, such as the number of banks (private and state owned), also indicate financial development. However, the study focuses on the above-mentioned two variables for the following reasons. First, these variables are highly correlated with other measures of financial development. Second, sufficient data series are available for the two variables. Most other measures of financial development are constrained by the non-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, the study averages the data for the two variables for two survey years. Panel data for 50 low-income countries for the period 1970–2008 has been assembled by averaging over periods of three to nine years, depending on the availability of inequality data. Only countries with observations for at least three consecutive periods are included. Hence, the minimum number of observations for each country is three and the maximum is nine. 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 provided in Table 4.1, while the description of basic statistics is listed in Table 4.2. Table 4.2shows that average inequality (40.34) for low-income developing countries is rather high.

The classification of low-income countries in this study follows the World Bank's classification of countries according to income level. This study comprises a sample of low-income and middle low-income developing countries with focus on development level rather than regional similarity.

4.1: Endogeneity

In order to control for possible reverse causality, both internal and external instruments are used. Internal instruments are defined as "own lag variables" while external instruments are "other exogenous factors". Following financial development literature, this study uses "legal origin" as an instrument (La Porta et al., 1997 and Clarke et al., 2006). The legal origin of a country is measured as a dummy variable. The

legal origin for a country can be British, French German, Socialist or Scandinavian. The dummy variable takes value 1 when it belongs to a specific origin and zero otherwise.

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] and [4]
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] and [4]
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] and [4]
Credit as % of GDP	Credit as % of GDP represents claims on the non-financial private sector/GDP.	[2] and [4]
Government expenditures	Government expenditures as share of GDP are averages for the period between two survey years.	[2] and [4]
Population	Population growth rates	[1]
M2 as % of GDP	It represents Broad money/GDP.	[2] and [4]
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)	Following Garbis (2005), the level of Financial Intermediation is determined by adding M2 as a % of GDP and credit to private sector as % of GDP. The high level of financial intermediation represents development of financial sector.	
Legal Origin	It is a dummy variable. The legal origin of a country can be British, French German, Socialist or Scandinavian	[5]

Sources: [1] World Bank, World Development Indicators online data base, 2009; [2] International Financial Statistics online data base, 2009; [3] UNDP; [4] Garbis (2005); [5] La Porta et al. (1997).

5. Results and Discussion

The estimation procedure consists of three steps. First, following the conventional approach of cross sectional and panel data studies, parameter estimates have been obtained using OLS method. Second, the study initially tests the hypothesis of Kuznets Curve and then 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, the results are obtained using fixed effects 2SLS model to control

for heterogeneity of the cross sectional units and endogeneity of financial development.

Table ⟨5.1⟩: Inequality in low–income developing countries

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Per Capita GDP	0.709**	0.620**	0.592**	0.646**	1.371***	1.560***
	(2.384)	(2.153)	(2.272)	(2.122)	(5.803)	(5.900)
Per Capita GDP	-0.0373**	-0.0330*	-0.0304*	-0.0331*	-0.0814***	-0.0901***
Squared	(-2.001)	(-1.825)	(-1.849)	(-1.736)	(-5.684)	(-5.587)
Human Capital	-0.0316	-0.0417	-0.0429	-0.0321	-0.0339	-0.0311
	(-0.733)	(-1.019)	(-1.033)	(-0.729)	(-0.874)	(-0.760)
Financial Intermediation	-0.0601***	-0.0932	-0.118	-0.103	0.00885	-0.0371
(FI)	(-2.904)	(-0.526)	(-0.621)	(-0.594)	(0.0508)	(-0.219)
FI Square		0.00464	0.00854	0.00678	-0.00865	-0.00398
		(0.203)	(0.356)	(0.307)	(-0.397)	(-0.189)
Population	0.0975***	0.0998***	0.104***	0.104***	0.114***	0.121***
	(6.035)	(6.025)	(6.186)	(6.248)	(7.682)	(7.868)
Government	-0.119***	-0.136***	-0.0985***	-0.128***	-0.103***	-0.0866***
Expenditure	(-3.654)	(-4.120)	(-2.986)	(-3.789)	(-3.627)	(-2.862)
Trade		0.103***				
		(3.285)				
FDI			0.0320***			
			(4.636)			
Inflation				0.000577*		
				(1.968)		
Dummy for low-income					-0.111***	
Countries					(-3.290)	
Dummy for middle low-						-0.00678
income countries						(-0.265)
Constant	0.998	1.151	1.548	1.298	-1.591	-2.536**
	(0.872)	(0.975)	(1.439)	(1.024)	(-1.554)	(-2.367)
Observations	187	187	183	187	267	267
Adj. R-squared	0.325	0.374	0.399	0.335	0.430	0.409

Note: t–values are given in parentheses
⋆ denotes statistically significant at the 10% level.
⋆⋆ denotes statistically significant at the 5% level.
⋆⋆⋆ denotes statistically significant at the 1% level.

Table 5.1 reports the results for factors determining income distribution in low–income countries. Column 1 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 economic development it tends to fall. This finding suggests that poor are deprived of benefits of economic development till the pace of development is below threshold level. However,

the poor do benefit from economic development once its pace surpasses the threshold level. In other words, results of this study bear out the validity of Kuznets Curve for low-income developing countries. Column 2 shows a negative relationship between financial development and inequality. However, the effect is insignificant.

The impact of government spending is consistently negative and significant in all regressions, while the effect of inflation is positive. Evidently, in low-income countries the government can play an important role in reducing income inequalities through its spending, and also by controlling inflation to reduce sufferings of the poor. Papanek and Kyn (1986) do 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. It appears that in low-income countries benefits of government spending have reached the poor in recent years.

Columns (2-6) introduce a non-linear term for financial development to test for 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^2_{it}) are found to be insignificant. The inequality-widening hypothesis does not appear to be valid for low-income developing countries. Clarke et al. (2006) did find some support for the inequality-widening hypothesis, however results in this study differ. One possible reason could be the intra group differences between high-income developing and low-income developing countries. As already mentioned, the present study focuses solely on low-income developing countries. In columns 5 and 6, we control development stage of low income developing economies by using two dummies one for low income developing economies and other for low-middle income economies. It is evident from the results reported in both columns that baseline findings remain intact.

Since there is a significant heterogeneity in the sample of 50 low income and middle low income countries from 1970 to 2008. The estimation of such sample requires testing for fixed effect, and most likely to estimate the regressions using fixed effects model. Moreover, the likely problem of endogeneity can yield biased results. To address these both issues, we replicate the benchmark results applying fixed effects model with 2SLS. The results are reported in Table 5.2. It is clear from the results that the Kuznets Curve holds in this sample of countries. In addition, the non-monotonic relationship between financial development and inequality turns out to be significant when fixed effects are controlled. Thus financial development is important to reduce inequality in developing economies. The role of government is reducing

inequality is important as parameter estimates on government expenditure are negative and significant in all regressions.

Table (5.2): Inequality in low-income developing countries- Fixed Effects Model with 2SLS

Variables	(1)	(2)	(3)	(4)	(5)
	FE-2SLS	FE-2SLS	FE-2SLS	FE-2SLS	FE-2SLS
Per Capita GDP	0.633**	0.797**	0.812**	0.791**	0.928***
	(2.126)	(2.337)	(2.315)	(2.455)	(2.721)
Per Capita GDP	-0.0395**	-0.0481**	-0.0488**	-0.0479**	-0.0552***
Squared	(-2.114)	(-2.267)	(-2.232)	(-2.387)	(-2.656)
Human Capital	-0.0493	-0.0610	-0.0562	-0.0600	-0.0395
	(-1.345)	(-1.476)	(-1.385)	(-1.536)	(-1.031)
Population	0.00582	-0.000302	-0.00456	0.00287	0.0151
	(0.169)	(-0.00774)	(-0.111)	(0.0776)	(0.416)
FI	0.160**	0.846**	0.821**	0.800**	0.814**
	(2.280)	(2.551)	(2.442)	(2.517)	(2.521)
FI Square		-0.0818**	-0.0783*	-0.0799**	-0.0809**
		(-2.053)	(-1.860)	(-2.116)	(-2.103)
Government	-0.0615**	-0.0508*	-0.0521*	-0.0468*	-0.0363
Expenditures	(-2.531)	(-1.831)	(-1.883)	(-1.783)	(-1.392)
Trade			-0.0287		
			(-0.477)		
Remittances				0.0205*	
				(1.653)	
FDI					0.00128
					(0.140)
Sargan Test	.028	1.47	1.81	1.24	2.68
	(0.86)	(0.22)	(0.17)	(0.26)	(0.10)
Basmann Test	.015	.83	1.01	0.69	1.48
	(0.89)	(0.36)	(0.31)	(0.41)	(0.22)
Constant	0.814	-1.359	-1.293	-1.217	-2.018
	(0.636)	(-0.784)	(-0.749)	(-0.739)	(-1.117)
Observations	122	122	122	122	120
Adj-R-squared	0.919	0.897	0.897	0.908	0.911

Note: t-values are given in parentheses
For Saran and Basan tests p-values are given in parentheses.
★ denotes statistically significant at the 10% level.
★★ denotes statistically significant at the 5% level.
★★★ denotes statistically significant at the 1% level.

The estimated coefficients for Y_{it} and Y^2_{it} have expected signs and are consistently significant. The coefficient of Y_{it} is about 1.1, while the coefficient of Y^2_{it} is consistently 0.06. It implies that a 1% increase in economic development leads to a 0.8% decrease in income inequality at a lower level of economic development, while at higher levels of development a 1% increase in economic development leads to only 0.04% decrease in income distribution. It is noteworthy that economic development alone is not sufficient to pull all the poor from poverty traps; the process must be accompanied by other pro–poor reforms such as financial development.

The financial development is consistently positive and significant in all regressions implying that financial development widens the gap between rich and poor. This finding supports the inequality–widening hypothesis. However, the effect of financial development square is negative and significant. Thus, this study does find support for the inequality–narrowing hypothesis. In other words, an inverted U–shaped relationship between financial development and inequality does hold in low–income countries. The government plays an important role in reducing income inequalities as estimated coefficients of government spending in all regressions are robustly significant. Chi2, Sargan, Basmann and Hansen J stat support the validity of exogenous instruments.

6. Conclusion

The purpose of the study is to assess the effect of financial development on inequality for a large set of developing countries over a long period ⟨1970 to 2008⟩. The study has employed a unique methodology to examine the inequality–financial development nexus for low–income developing countries, while using a more comparable time series of inequality. Furthermore, it applies alternative econometrics techniques.

The major findings of the study relevant to the research questions posed are as below. First, a non–monotonic relationship ⟨Kuznets Curve⟩ holds for low–income developing countries that necessitates policies which may help build a threshold level of economic development to pull the poor out of poverty traps. Second, financial development plays an important role in reducing income inequality underlining the importance of domestic financial reform in low–income countries. Third, the government can play an important role in reducing inequality in low–income developing countries. This study does support an inverse U–shaped relationship between financial development and inequality implying that financial reforms are helpful for the poor of low–income developing countries at higher levels of financial development.

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Appendix

Table A1: List of Low–Income Developing Countries

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