INCOME DISTRIBUTION, GROWTH AND FINANCIAL DEVELOPMENT
A Cross Countries Analysis

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Abstract. Income inequality is an important economic issue faced by most of the developed and developing countries. Many attempts have been made to identify a link between economic growth and income inequality in the past. However, the literature is not conclusive about the relationship between economic development and income inequality. This study attempts to analyze the factors responsible for income inequality among the different groups of countries at different stages of economic growth and test the Kuznet's hypothesis by breaking panel of countries into four sub-panels; low income, lower middle income, upper income and higher income countries. In this study a larger set of variables are utilized for investigating the cross country differences in income inequality. The results of the study find the evidence of the existence of inverted U-shaped hypothesis for income growth. Financial development reduces the inequalities in income distribution irrespective of stage of development, and hence negates the inverted U-shaped relationship between inequality and financial development.

I. INTRODUCTION

The concern about inequality goes back to Kuznet's (1955) a seminal study, which argues that there is an inverted U-shaped relationship between income inequality and economic development; it means inequality first increases with economic development and then decreases. According to him, as

industrial sector expands people engaged in industrial sector move from low income to high income. However, as agriculture sector shrinks and wages increase, it results into lower income inequality. Many attempts have been made to identify a link between growth and income inequality since then. However, the literature is not conclusive about the relationship between economic development and income inequality. Although, several early studies find support for Kuznet's hypothesis (*e.g.*, Pauker, 1973; Ahluwalia, 1976), but later research fails to find economic development affecting the income distribution (*e.g.*, Anand and Kanbur, 1993; Deininger and Squire, 1998; Ravallion, 1995).

It is argued that at given level of income, more equal income distribution would be associated with a low rate of poverty. Moreover, income distribution might itself be detrimental to long run growth (Alesina and Rodrik, 1999; Birdsall *et al.*, 1994; Deininger and Squire, 1998; Perrosson and Tabellini, 1994; Slyuester, 2000; Easterly, 2001). The most common argument is that an unequal distribution of income creates pressure for redistribution policies and therefore, distorts incentives for work and investment. It leads to abuse of power and thus harms investment environment and finally in the presence of imperfect markets, it also reduces opportunities for accumulating human capital and physical assets. So in order to tackle income inequality, policy makers must have knowledge of factors responsible for inequality.

There is a vast amount of literature available on determinants of income inequality both considering individual as well as at macro level factors affecting income inequality (Li, Squire and Zou, 1998; Li, Xu and Zou, 1999; Lundberg and Squire, 2003; Foster and Szekely, 2001; Clark *et al.*, 2003; Beck *et al.*, 2004). The most important factors responsible for income inequality, figured out by literature, are economic development, financial market development, government expenditures (size of public sector), education, inflation, population growth and openness.

This study is an attempt to bring out factors responsible for income inequality among the countries, test the Kuznet's hypothesis by breaking our panel into four sub-panels, *i.e.* (*i*) low income, (*ii*) lower middle income, (*iii*) upper income and (*iv*) higher income countries. Ordinary least square method is used for estimation for whole panel of countries and for different groups of countries using pooled data.

This study is divided into five sections. Section I gives us the introduction and brief review of the literature on the issue. Section II presents the determinants of income inequality on theoretical basis. Section III covers

the model specification and data description. Section IV presents empirical results, while section V concludes the discussion.

II. DETERMINANTS OF INCOME INEQUALITY

This section explains the affect of different factors like economic development, government involvement in the economy, structural changes and political as well as social factors on the distribution of income. The main factors responsible for income inequality are explained below:

1.   Economic Growth

The main factor affecting income inequality is the economic growth. The relationship between income inequality and economic growth has received a lot of attention from the researchers. The impact of economic growth on the income inequality is ambiguous. For example, Kuznet suggested a U-shaped relationship between economic growth and income inequality, while Paukerit (1973) and Ahluwalia (1976) support the Kuznet's point of view. But some later studies (Deininger and Squire, 1998; Ravallian, 1995) do not find economic growth affecting income distribution. The literature has taken the issue in reverse direction also which means causality may run in reverse direction from inequality to economic growth. It is argued that on one hand income inequality is good for economic growth as it reduces the cost of mobilizing capital but, on the other hand, it is bad for economic growth due to constraints on the poor in financial markets. It also reduces demand for financial institutions, which are considered to be necessary for economic development in the long run. Golar and Zeira (1993), Benabou *et al.* (1996), Durlauf (1994), and Banerjee and Newman (1993) analyzed the effect of income inequality on long run growth through human capital accumulation theoretically. While Persson and Tabellini (1994) and Perotti (1996) establish a negative relationship between inequality and growth. Their findings have also revisited by Barro (2000). However, Banerjee and Duflo (2000) and Iyigun and Owen (2004) found inverted U-shaped function of changes in inequality.

2.   Financial Development

Financial market has also an effect on income inequality. Theory provides different hypothesis concerning the financial development and income inequality. Some theories (Banerjee and Newman, 1993; Galor and Zeira, 1993; Aghion and Bolton, 1997) claim that financial intermediary development is pro-poor. Lamoreaux (1986), Haber (1991), Maurer and Haber (2003), on the other hand, argued that at early stage of financial

deepening access to financial services is limited to incumbents and will thus raise their income relevant to income of poor. Other model (Greenwood and Jovnovie, 1990), posit a non-linear inverted U-shaped relationship and income distribution.

3.   Inflation

Inflation may have a strong redistribution effect which could be positive (through its effects on individual income wealth) or negative (through a progressive tax system). It is also argued that higher rate of inflation hurts the poor and middle class, relatively more than rich, because later have better excess to financial markets that allow them to hedge their exposure to inflation.

4.   Government Consumption

Government Consumption is also one of the factors affecting income inequality. Income inequality may increase or decrease with government consumption. If most of redistribution through tax and transfer system is toward poor, government consumption might result into greater inequality. However, it could have opposite effects if government consumption is not developmental (it means not pro-poor). Cross countries studies (Stock, 1978; Boyd, 1988), found the size of public sector to be significant in reducing the income inequality. Higher unemployment also results into higher income inequality. Higher income inequality hurts the workers.

5.   Population Growth

Difference in population growth is another factor explaining inter-country variation in income inequality. Although population growth generally declines as per capita income rises, there is considerable variation in population growth rate among the countries at similar income level. 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.

6.   Education

One of the most important factors underlying the income inequality is level of access to education. There is two-way link; on the one hand an unequal educational opportunity leads to greater inequality in income distribution by widening the skilled and productivity gap in the working population. On the other hand unequal income distribution tends to prevent the poor investing in education and acquiring skill.

7. Openness of the Country for Foreign Trade

A number of studies have attempted to relate trade policy variables to economic growth (Dollar, 1992; Sachs and Warner, 1995; Edwards, 1992). These studies found that trade openness is associated with more rapid growth. Dollar and Kraay (2004) found evidence in support of the view that globalization leads to faster economic growth and a reduction in income inequality.

III. MODEL SPECIFICATION AND ESTIMATION

In the light of previous discussion our base model specification is

$$GINI_{(it)} = \alpha_{(i)} + \beta_0 PGDP_{(it)} + \beta_1 FIN_{(it)} + \beta_2 INF + \beta_3 UNEMP_{(it)}$$
$$+ \beta_4 CG_{(it)} + \beta_5 Edu_{(it)} + \beta_6 POPG_{(it)} + \beta_7 OPP_{(it)} + \varepsilon_{(it)}$$

GINI is Gini coefficient of income inequality, PGDP is per capita income growth, FIN is financial development,[1] INF is rate of inflation, UNEMP is unemployment rate, CG is government consumption, EDU is literacy rate of adults, POPG is population growth and OPP is openness,[2] and $\varepsilon_{(it)}$ is error term such that $\varepsilon_{it} \sim$ IID $(0, \sigma^2$ for all i and t) that is for a given country observations are serially uncorrelated and across the country and time the errors are homoscedastic.

Many studies tried to test U-shaped relationship between income inequality and other variables by using either cross sectional or time series data; however, as pointed out by Deininger and Squire (1998), the longitudinal data are needed to see whether income inequality changes with its potential determinants. The early study in this regard used square of variables to account for quadratic relationship (Kuznet's hypothesis) between income inequality and other variables. It is appropriate to check whether income inequality increases with increase in the variables mentioned in the above model and then decrease afterwards. But it is not appropriate to test whether inequality increases at early stage (*e.g.* economic or financial development) and decrease at later stage. We divide the panel of countries into four sub panels to check the inverted U-shaped relationship between variables mentioned in the model.

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[1]FIN is calculated as: M2/GDP.

[2]OPP is defined as: (Exports + Imports) / GDP.

DATA DESCRIPTION

The data are taken from World Development Indicators (WDI) and International Financial Statistics (IFS) CD ROM 2005. Since data on Gini coefficient are survey data, collected in different years for different countries, we take average of the other variables to year for which Gini coefficient is available for specific countries. In this study, data are taken for the period 1975 to 2002 on fifty-one countries. We get one to three observations (one for some countries, two and three for others) for each country and use this pooled data for analysis.[3] This gives us how different variables on average effect income distribution over a period.

IV. EMPIRICAL RESULTS

We estimate our model for all countries included in this study using ordinary least square method as well as by dividing these countries in four groups, *i.e.* low income countries (LIC), lower middle income countries (LMIC), upper middle countries (UMIC) and high income countries (HIC).[4] In this section the empirical results for each group as well as for all countries are presented and discussed. The model is estimated for each group separately to test the inverted U hypothesis by including all the variables in model and excluding variables which are statistically insignificant (*t* values less than 1), except per capita growth and financial development (our main variables) one by one. Tables 1 to 6 represent the empirical results when all the insignificant variables are excluded.

Table 1 shows that after excluding the insignificant variables one by one, per capita growth and population growth become significant besides the government consumption and financial development. Both government consumption and financial development carry negative sign, which implies that both of these variables reduce income inequality. Per capita income growth and population growth have positive sign showing that any increase in these variables will results in high-income inequality.

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[3]Table of countries with number of observations is given in Appendix.

[4]The countries are divided into groups on the basis of World Bank estimates of per capita GNI during 2000, *i.e.* low income if per capita GNI ≤ 755 US $, lower middle income if 756 $ ≤ per capita GNI ≤ 2955 $, upper middle if 2996 $ ≤ per capita GNI ≤ 9265 $ and high income if per capita GNI ≥ 9266 $.

TABLE 1

Determinants of Income Inequality in Low Income Countries

Variable	Coefficient	Std. Error	t-Statistic
C	54.24206	8.781059	6.177167
CG	–21.84433	9.118678	–2.395558
FIN	–64.01283	23.58934	–2.713635
PGDP	1.220781	1.170007	1.043396
POPG	3.948892	1.633935	2.416798

R-squared = 0.738735; F-statistic = 5.655072

After the exclusion of statistically insignificant variables, the results for lower middle-income countries are presented in Table 2. The results indicate that the openness and financial development reduce income inequality as they carry negative sign. The sign of unemployment rate is positive which indicates that higher unemployment will result into higher income inequality. While the sign of per capita income growth is positive but statistically insignificant which means that this variable has no significant impact on income inequality.

TABLE 2

Determinants of Income Inequality in Lower Middle Income Countries

Variable	Coefficient	Std. Error	t-Statistic
C	47.38522	4.561439	10.38822
FIN	–5.313076	5.171368	–1.027403
OPP	–13.19634	5.019388	–2.629073
PGDP	0.354076	0.637057	0.555800
UNEMP	0.356663	0.316652	1.126355

R-squared = 0.621778; F-statistic = 5.208601

Table 3 provides the results for upper-middle income countries. Financial developments, government consumptions and literacy rate carry negative sign which indicates that these variables reduce income inequality. Population growth carries positive sign which is statistically significant. It indicates that population growth increases the income inequality in the

upper-middle income countries. Per capita income growth has a positive sign which is statistically insignificant, indicates that this variable has no significant impact on the income inequality.

TABLE 3

Determinants of Income Inequality in Upper Middle Income Countries

Variable	Coefficient	Std. Error	t-Statistic
C	80.11728	23.40678	3.422824
FIN	–27.38087	8.585770	–3.189100
CG	–5.685175	5.365235	–1.059632
EDU	–0.362736	0.236809	–1.531767
PGDP	0.155950	0.660577	0.236082
POPG	6.158690	1.397179	4.407947

R-squared = 0.653724; F-statistic = 9.061788

Table 4 shows the results for high-income countries after the insignificant variables are dropped. Government consumption, inflation, literacy rate reduces income inequality. Population growth and unemployment increase income inequality in high income countries. The sign of financial development is negative but statistically insignificant, while the negative sign of per capita growth indicates that any increase in per capita growth is good for income to be distributed equally.

TABLE 4

Determinants of Income Inequality in High Income Countries

Variable	Coefficient	Std. Error	t-Statistic
C	70.55923	24.89303	2.834497
INF	–0.000181	0.000154	–1.176006
CG	–57.57043	22.46519	–2.562650
FIN	–0.158824	0.397172	–0.399888
EDU	–0.308798	0.232200	–1.329879
PGDP	–0.841554	0.681645	–1.234593
POPG	2.244908	1.803155	1.244989
UNEMP	0.379794	0.267399	1.420323

R-squared = 0.582959; F-statistic = 5.668804

From the above discussion, it can be observed that the sign of per capita income growth is positive for LICs (low income countries), LMICs (lower middle income countries) and UMICs (Upper middle income countries), while negative for HIC (high income countries), which provides evidence, though weak, for the existence of inverted U-shaped relationship between income inequality and per capita income growth. However, the sign of coefficient of financial development is negative for all the four groups, which indicates that financial development is good for even distribution of income irrespective of stage of development.

We estimate our model for all countries included in this study. The results are presented in Table 5. Our results show that both per capita income growth and financial development have negative sign which are statistically insignificant. Openness has negative and correct sign. The literacy rate has positive sign implying that as literacy rate increases, income inequality also increases. Population growth also has positive relation with income inequality, while unemployment rate with negative coefficient indicates that higher unemployment will result in to lower income inequality.

TABLE 5

Determinants of Income Inequality in Case of All Countries

Variable	Coefficient	Std. Error	t-Statistic
C	32.65391	4.024090	8.114608
FIN	−0.166838	0.618200	−0.269877
EDU	0.058911	0.037715	1.562017
OPP	−4.263600	1.933144	−2.205526
PGDP	−0.117380	0.356428	−0.329323
POPG	4.539327	0.822334	5.520051
UNEMP	−0.134839	0.103588	−1.301687

R-squared = 0.510573; F-statistic = 5.873302

We also include the inverse of squares of per capita income growth and financial development to test the inverted U-shaped hypothesis for both of variables. These results are presented in Table 6. The inverse of squares of

financial development is positive but insignificant which indicates the non-existence of inverted U-shaped relationship between financial development and income inequality. The inverse of square of per capita growth is significant and negative. It confirms the evidence of existence of inverted U-shaped relationship between income inequality and per capita income growth, while same does not hold for financial development.

TABLE 6

Determinants of Income Inequality in Case of All Countries
and Testing of the Inverted U-Shape Hypothesis

Variable	Coefficient	Std. Error	t-Statistic
C	26.62326	4.055774	6.564286
FINSI	1.79E-07	1.55E-07	1.149016
INF	0.000194	0.000160	1.215155
EdU	0.100665	0.040020	2.515331
OPP	−3.401081	1.824124	−1.864500
PGDPSI	−0.001050	0.000355	−2.956228
POPG	5.188951	0.838536	6.188107

R-squared = 0.508238; F-statistic = 7.905118

V. CONCLUSIONS

This study attempts to analyze factors responsible for the differences in income distribution among the different groups of countries at different stages of economic development. It also tests the Kuznet's hypothesis that income inequality increases first with increase in income growth but after a certain level it decreases. We also test this hypothesis for financial development, i.e. the inequality first increases with financial development but then decreases.

Per capita growth raises income inequality in all the countries except in higher income countries. The results show that there is a weak evidence for the existence of inverted U-shaped hypothesis for income growth. The negative sign of the coefficient of financial development for all the countries

shows the negative relationship between financial development and income inequality irrespective of stage of economic development. This negates the inverted U-shaped relationship between income inequality and financial development. The results of the model which include inverse of squares of per capita income growth and financial development confirm the existence of inverted U-shaped relationship between per capita income growth and income inequality but no such relationship exists between financial development and income inequality.

Keeping in view the results of all models, it can be concluded that government consumptions, openness and literacy rate are the main variables which can be helpful in reducing income inequality in low income, lower middle income and upper middle income countries. It is, therefore, suggested in order to reduce the income inequality, the government of these countries should pay much emphasis to increase the literacy rate and devise policies for raising the openness and government consumptions.

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APPENDIX

Country List

LICs	No. of Obs.	LMICs	No. of Obs.	UMICs	No. of Obs.	HICs	No. of Obs.
Bangladesh	3	Belarus	2	Argentina	1	Australia	1
Cot de love	3	Belovia	2	Brazil	3	Canada	2
India	3	Bulgaria	2	Chile	3	Denmark	2
Niger	1	China	2	Costa Rica	3	Ireland	2
Pakistan	3	Columbia	3	Czech Rb	1	Italy	2
		Ecovador	2	Estonia	2	Japan	1
		Egypt	3	Hungry	2	Korea	3
		El Salvador	3	Jamaica	3	Netherlands	2
		Indonesia	2	Lithuania	2	New Zealand	1
		Macedonia	1	Malaysia	2	Portugal	2
		Morocco	2	Mexico	3	Singapore	2
		Peru	3	Poland	2	Slovenia	1
		Philippine	3	Slovak Rb	1	Sweden	2
		Sri Lanka	3	Trinidad	1	Switzerland	1
		Thailand	3	Venezuela	1	UK	2
						US	2
Total	13		36		30		28