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Economic Growth and Inequality in Developing Economies: Theory and Evidence

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***AERC International Conference on Transforming Economic Development: Policies and Strategies
November 22-24, 2016- Karachi***

1. Introduction

- THERE IS broad consensus that the objective of economic development is not only to boost economic growth but also to share prosperity with all segments of society through the equitable distribution of income and wealth.
- In recent decades, policy makers—including multilateral development organizations such as the World Bank Group—have often applied a “**trickle-down**” approach to reduce levels of absolute poverty.
- This approach has resulted in only partial success at the cost of social disequilibrium.
- International organizations such as Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF) and multilateral development institutions including the World Bank Group have repeatedly warned about the dire consequences of the increasing gap between the incomes of the very rich and the very poor.

1. Introduction

- Professor Thomas Piketty's influential 2013 book, *Capital in the Twenty-First Century*, highlighted the inequality in 20 countries during the last three centuries.
- Almost half the world's wealth is now owned by just 1 percent of the population (Working for the Few 2014).
- The richest 10 percent of the population hold 86 percent of the world's wealth, and the top 1 percent alone account for 46 percent of global assets (Credit Suisse 2013).
- In the United States, the wealthiest 1 percent has captured 95 percent of growth since 2009, following the financial crisis, while the bottom 90 percent became poorer (Working for the Few 2014).

1. Introduction

- Rapid and sustained economic growth is a central concern of economists and policy makers. Specifically, assessing growth performance in the presence of high inequalities is an issue of considerable debate and interest. However, neither theoretical nor empirical studies have provided a definite conclusion.
- On the one hand, theoretical studies by Kaldor (1957), Saint-Paul and Verdier (1993) and Galor and Tsiddon (1997a, 1997b) predict a positive growth impact of inequality through incentives, physical capital accumulation, saving rates or investment indivisibility mechanism.
- On the other hand, theoretical studies by Galor and Zeira (1993), Alesina and Rodrik (1994), Persson and Tabellini (1994), and de la Croix and Doepke (2003) predict a negative growth impact of inequality.

2. Introduction (Cont..)

- The negative growth impact of inequality comes about through socio-political instability, imperfections in credit markets, fiscal redistribution and distortion, and fertility differential channels.
- Similarly, on the empirical side, findings on the growth impact of inequality are also mixed, at best. On the one hand, Partridge (1997), Li and Zou (1998), Forbes (2000), and Lundberg and Squire (2003) provide empirical evidence that the growth impact of inequality is positive.
- While, on the other hand, Alesina and Rodrik (1994), Persson and Tabellini (1994), Wan, Lu and Chen (2006), and Sukiassyan (2007) provide empirical evidence that the growth effect of inequality is negative.

Research Questions

- (1) Is inequality harmful for growth?
- (2) Does the effect of inequality on growth vary over the path of development?
- (3) Is the relationship between inequality and growth is perhaps non-linear?

2. Model

In order to estimate the links between inequality and growth in the data, this study follows a standard empirical growth equation:

$$(y_{it} - y_{it-1}) = \delta y_{it-1} + \lambda op_{it} + \omega' x_{it} + \beta g_{it-1} + v_i + u_t + \varepsilon_{it}, \quad (1)$$

Where average growth rate of per capita GDP at 1993 prices & PPP adjusted, y is a measure of inequality in the previous period; x represents a set of control variables other than lagged income, which I shall discuss shortly, op is a measure of openness, v_i is a country specific unobservable effect, and u_t is a time specific factor and ε_{it} is an i.i.d. error term.

2.Model (Cont..)

$$(y_{it} - y_{it-1}) = \delta y_{it-1} + \lambda op_{it} + \omega' x_{it} + \beta_1 g_{it-1} + \beta_2 Edu_{it} + \beta_3 Inv_{it} + \beta_4 Inf_{it} + v_i + u_t + \varepsilon_{it}, \quad (2)$$

Edu is secondary school enrolment rate (in % of the total secondary school aged population). This variable is used as a proxy to human capital; Inv is the share of gross capital formation in GDP; Inf is the annual averages between two survey years, calculated using the IFS's CPI data.

$$(y_{it} - y_{it-1}) = \delta y_{it-1} + \omega' x_{it} + \beta_1 g_{it-1} + \beta_2 Edu_{it} + \beta_3 Inv_{it} + \beta_4 Inf_{it} + \beta_5 g^* ED_{it} + \beta_6 x_{it} + v_i + u_t + \varepsilon_{it}, \dots \dots \dots (3)$$

It is expected that $\lambda < 0$, $\beta_1 < 0$, and $\beta_5 > 0$ meaning that the positive effect of inequality on growth is weaker in countries where economic development is high.

3. Data sources and variable definitions

Variable name	Definitions	Sources
Per Capita Real GDP	GDP per capita at PPP is annual averages between two survey years.	[1] & [4]
Gini Coefficient	It is a measure of income inequality based on the Lorenz Curve, which has a minimum value of zero (reflecting perfect equality) and a maximum value of one (reflecting total inequality).	[3] & [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.	[1]
Inflation	Inflation rates, annual averages between two survey years.	[2] & [4]
Credit as % of GDP	Credit as % of GDP represents claims on the non-financial private sector.	[2] & [4]
Government Expenditures	Government expenditures as share of GDP are averages for the period between two survey years.	[2] & [4]
Population	Population growth rates	[1]
M2 as % of GDP	It represents broad money as percentage of GDP.	[2] & [4]
Trade Openness	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]
FDI	Foreign Direct Investment (FDI) inflows as share of GDP.	[1]

Sources: [1] World Bank, World Development Indicators online data base, 2011; [2] International Financial Statistics online data base, 2011; [3] UNU-WIDER (2011); [4] Iradian (2005).

Table 1: Parameter Estimates for Economic Growth and Income Inequality-OLS

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial Income	-3.850*** (-6.904)	-3.588*** (-6.549)	-4.000*** (-7.227)	-3.588*** (-6.295)	-2.820*** (-6.269)	-2.796*** (-6.410)	-2.645*** (-5.679)	-2.826*** (-6.111)
Inequality	-0.118*** (-3.204)	-0.135*** (-3.732)	-0.0888** (-2.342)	-0.115*** (-3.133)	1.152*** (4.569)	0.978*** (3.928)	1.105*** (4.355)	1.149*** (4.470)
Inequality Square					-0.0126*** (-4.258)	-0.0107*** (-3.681)	-0.0121*** (-4.048)	-0.0126*** (-4.162)
Investment	0.205*** (6.636)	0.200*** (6.631)	0.202*** (6.599)	0.227*** (6.951)	0.365*** (7.168)	0.327*** (6.493)	0.355*** (6.928)	0.365*** (7.112)
Inflation	-0.0338*** (-7.269)	-0.0298*** (-6.381)	-0.0367*** (-7.786)	-0.035*** (-7.510)	-0.0328*** (-5.136)	-0.0312*** (-5.040)	-0.0327*** (-5.145)	-0.0328*** (-5.122)
Education	0.0529*** (4.529)	0.0477*** (4.159)	0.0348*** (2.630)	0.0547*** (4.695)	0.0692*** (3.832)	0.0401** (2.092)	0.0841*** (4.019)	0.0689*** (3.685)
Inequality*ED	0.794*** (4.911)	0.770*** (4.879)	0.784*** (4.911)	0.746*** (4.585)				
Government		-0.0809*** (-3.834)				-0.106*** (-3.692)		
Population			-0.732*** (-2.759)				1.052 (1.399)	
Openness				-0.0107** (-1.984)				0.000759 (0.0633)
Constant	7.227*** (3.604)	8.601*** (4.327)	9.834*** (4.481)	6.682*** (3.320)	-11.05* (-1.774)	-2.641 (-0.409)	-13.72** (-2.111)	-10.97* (-1.723)
Observations	271	271	271	271	271	271	271	271
R-squared	0.426	0.456	0.442	0.435	0.524	0.555	0.529	0.524

Table 3: Growth- inequality: Disaggregation by income levels

Variables	(1)	(2)	(3)
	Low Income Countries	Low middle Income Countries	High Income Countries
Initial Income	-1.232** (-2.187)	-1.232** (-2.187)	-1.784*** (-3.329)
Initial Inequality	-0.0741* (-1.959)	-0.0741* (-1.959)	0.103*** (3.049)
Investment	0.182*** (4.263)	0.182*** (4.263)	0.208*** (3.467)
Education	0.0758*** (4.175)	0.0758*** (4.175)	0.111*** (4.408)
Inflation	-0.0918*** (-8.231)	-0.0918*** (-8.231)	-0.00366 (-0.423)
Constant	8.565** (2.496)	8.565** (2.496)	1.204 (0.213)
Observations	80	80	81
R-squared	0.634	0.634	0.395

Conclusion

- The study finds a negative relationship between inequality and growth in all regressions.
- The positive growth effect of inequality has been explained by the degree of inequality, and the stage of economic development.
- The study finds a non-linear relationship between growth and inequality implying that a lower degree of inequality exerts a positive influence on growth while higher degree of inequality exerts negative effect.
- The inequality-growth nexus is significantly positive for the high-income countries but strongly significantly negative for the low-income one.

Conclusion (Cont..)

- Finding of the study are robust to alternative econometric techniques, specifications, inclusion of additional controls, exclusion of outliers and sub-samples.

Policy Implications

Finding of the study suggests that a redistributive policy that alleviates inequality can increase long-run growth in developing countries.

Thank You!