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Abstract

This paper analyzes the role of good governance in fostering pro-poor and inclusive growth. Using a sample of 112 countries over the period 1975-2012, the main results show that growth is in general pro-poor. However, growth has not been inclusive – as illustrated by a decline in the bottom quintile share of the income distribution. While all features of good governance support income growth and reduce poverty, only government effectiveness and the rule of law are found to enhance inclusive growth. Investigating the determinants of pro-poor and inclusive growth highlights that education strategies, infrastructure improvement and financial development are the key factors for poverty reduction and inclusive growth. Relying on the Panel Smooth Transition Regression (PSTR) model following Gonzalez et al. (2005), the paper identifies a nonlinear relationship between governance and pro-poor growth while the impact of governance on inclusive growth appears to be linear.

Keywords: pro-poor growth, inclusive growth, governance, PSTR.

JEL Classification: C23, G28, H5, O11, O15, O57.

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I. Introduction

Poverty remains widespread, particularly in developing countries, notwithstanding recent progress. While the aggregate worldwide poverty rate was reduced by about half between 1990 and 2010 mainly thanks to robust growth, the World Bank estimated that more than 1.22 billion people lived with less than $1.25 a day in 2010. To contrast the encouraging dynamic in poverty reduction, income inequality has risen across the world over the last two decades. How do these two divergent dynamics impact the income opportunities of the less fortunate, namely the poorest 20 percent of the population? This is an important policy question that has led to the development of new concepts for pro-poor growth and increased focus on income distribution with new studies on inclusive growth.

Numerous empirical and statistical studies have identified economic growth as one of the main factors affecting poverty reduction (Dollar and Kraay, 2002; Dollar, Kleineberg and Kraay, 2013). Moreover, there is a growing understanding that economic, political, legal and social institutions are critical for economic prosperity. Since the 1990s the concept of "good governance" has become central in the discussion and design of development policies. Since both governance and pro-poor growth are important in development policies agenda, the question arises as to whether and how they are related to each other.

This paper provides a cross-country analysis investigating the role of economic growth in poverty reduction and adds two main contributions to the existing literature. First, it contributes to the recent and growing literature on inclusive growth by assessing how pro-poor and inclusive growth has been. It also investigates the main structural factors that impact inclusive growth with a particular attention to an important channel that has received little attention so far: the quality of governance. Second, focusing on governance, the paper investigates the potential non-linearities in the impact of growth on the poor depending on the quality of governance.

The analysis therefore sheds some light on the role of governance in making growth more pro-poor and inclusive. Following Ravallion and Chen (2003), this paper defines growth as pro-poor simply if it reduces poverty or increases the income of the poor while inclusive growth refers to growth which is not associated with an increase in inequality (Rauniyar and Kanbur, 2010).

The paper relies on panel fixed effect estimations and the Generalized Method of Moments in System (SYS-GMM) following Arrellano and Bover (1995). This method attempts to address endogeneity issues related to potentially endogenous explanatory variables. A second empirical method used in the study is the Panel Smooth Transition Regression (PSTR), following Gonzalez et al. (2005). The PSTR models a non-linear relationship and captures the speed of transition from one regime to the other, with the transition between the two regimes assumed to be gradual.

The main findings are that *(i)* in general growth is pro-poor: the income of the poorest 20 percent increases with per capita income growth; *(ii)* globally growth has not been inclusive; *(iii)* all features of good governance especially control of corruption are pro-poor but only

two features – government effectiveness and rule of law promote inclusive growth; *(iv)* the impact of growth on the income of the poor is non-linear and declines with the level of corruption. However, the impact of growth on the income share of the poorest 20 percent is linear; and *(v)* structural factors such as education spending, infrastructure improvement, and financial development are key factors for promoting both poverty reduction and inclusive growth.

The rest of the paper is structured as follows. Section II briefly reviews the literature on pro-poor growth and income distribution as well as the relationship between governance and pro-poor growth. Section III explains the econometric methodology. Section IV describes the data and sections V and VI present empirical results. Section VII provides concluding remarks.

II. Literature Review

Growth, Poverty, and Income Distribution

This section discusses the cross-country empirical literature analyzing the relationship between growth, poverty and income distribution.

In his seminal paper, Kuznets (1955) found evidence of an inverted-U relationship between the level of development and income inequality. As economies develop, inequality increases initially because growth tends to benefit a small segment of the population. Overtime, inequality declines subsequently as a larger part of the population finds employment in the high-income sector. However, existing empirical evidence of the Kuznets curve is at best mixed. Deininger and Squire (1998) found no evidence of an inverted-U relationship between per capita income and inequality. The authors show that high growth was associated with declining inequality as often as it was related to increasing inequality, or no changes at all. Ravallion and Chen (1997) highlighted that changes in inequality and polarization were uncorrelated using household surveys for 67 developing and transnational economies over the period 1981-1994. The authors showed that income distribution improved as often as it worsened in growing economies, and negative growth was often more unfavorable to distribution than positive growth. Goudie and Ladd (1999) also found little evidence that growth systematically changes income distribution.

Empirical evidence on the reverse link, which is the impact of inequality on growth, is similarly mixed. For instance, Forbes (2000) showed that an increase in income inequality has a significant positive effect on economic growth in short and medium term. Alesina and Rodrik (1994) illustrated in a political economy context that when inequality is high, the poor have less voice and accountability. In such a context, the median voter will push for distortionary taxes, which will have discouraging effects on savings and hamper growth. Berg and Ostry (2011) found that lower income inequality is associated with sustained growth spells.

Few other studies have analyzed the impact of inequality on poverty. Deininger and Squire (1998) examined how initial inequality and concomitant changes in inequality impact

poverty. They found that the poorest 20 percent suffer the most from growth decreasing effects of inequality. Initial inequality also hurts the poor via credit rationing and powerlessness to invest. Ravallion (2001) also shows that the poor might gain more from redistribution but suffer more than the rich from economic shrinkage.

Governance and Pro-poor Growth

A large number of studies have investigated the role of good governance for economic development and poverty reduction. Kaufmann and Aart (2002) identified a strong positive correlation between per capita income and the quality of governance across countries. The authors also highlighted a strong positive causal effect running from better governance to higher per capita income. However, they found a weak, even negative, causal effect running from per capita income to governance, not supporting a possible "virtuous circle", in which higher income leads to further improvement in governance.

Dollar and Kraay (2002) found that a greater rule of law is associated with a larger share of growth dividend accruing to the poorest 20 percent of the population. Kraay (2004) found similar results. Resnick and Regina (2006) developed a conceptual framework specifying the relationship between different aspects of governance and pro-poor growth. Using this framework, the paper reviewed a range of quantitative cross-country studies analysing pro-poor growth and including indicators of governance as independent variables. The review indicated that governance indicators, such as political stability and rule of law are associated with higher growth but provided mixed results regarding poverty reduction. However, governance indicators related to transparency, such as civil liberties and political freedom, tend to conduce to poverty reduction but the evidence is rather mixed when it comes to the relationship between these variables and growth. Providing a different perspective, Lopez (2004) assessed whether policies that are pro-growth are also pro-poor. He found that policies tend to be poverty reducing in the long run rather than the short run. The author also argues that political economy constraints could prevent these policies from staying in place long enough to be able to reduce poverty. Kraay (2004) found that better rule of law and enhanced accountability are both positively correlated with higher growth. White and Anderson (2001) argued that civil liberties and political freedom are pro-poor, with political freedom having a much larger impact.

III. Econometric Methodology

This section describes the main empirical framework underlying our analysis. The analysis covers 112 developed and developing countries.[2] Following various empirical studies on economic growth, the paper relies on 10 non-overlapping 4-year periods to control for business cycle fluctuations during the sample period (1975-2012).[3]

The following equation forms the basis of our empirical strategy:

[2] Table A1 in the Appendix presents the list of countries.
[3] The latter period is the mean of the two last years.

$$\ln Y_{it} = \beta \ln y_{it} + \gamma \ln GINI_{it} + \beta_{Gov} Gov_{it} + \beta_x X_{it} + \alpha_i + \eta_t + \varepsilon_{it} \quad (1)$$

where Y_{it} is a vector of our three distinct dependent variables capturing poverty and inclusiveness for each country *i* during period *t*: *(i)* the income of the poorest 20 percent in the income distribution (yp_{it}); *(ii)* the poverty headcount ratio at $2 a day PPP ($P_{it}$); and *(iii)* the income share of the poorest 20 percent (Q_{it}). lny_{it} is the logarithm of GDP per capita. Following Ravallion and Chen (1997), the paper also controls for the logarithm of the Gini index ($lnGINI_{it}$) to control for the potential impact of income distribution on poverty.[4] Gov_{it} denotes a set of the six governance indicators plus our aggregated indicator of governance, which we obtained using the Principal Component Analysis (PCA). X_{it} represents the set of control variables. This set includes variables related to health, human capital, infrastructure, openness to trade, employment and financial variables. These control variables reflect the state of the empirical literature on the determinants of economic growth and poverty reduction. Table A2 in the Appendix summarizes the description and source of the variables and Table A3 presents statistical summaries of the main variables. α_i indicates country-specific effects, μ_t time-specific effects, and ε_{it} is the time-varying error term.

In additional to fixed effects estimations, the paper also relies on the Generalized Method of Moments in System (SYS-GMM) to address potential endogeneity due to reverse causality as well as allowing for a dynamic process, which may be more appropriate when analyzing persistent phenomenon overtime such as poverty and inclusiveness.

IV. Data

Measuring Poverty and Inequality

The paper uses two main datasets to capture poverty and inclusiveness. The income of the bottom 20 percent and the income share of the first quintile are from the Kleineberg-Kraay's (DKK)[5] dataset. This dataset builds on a larger dataset of 963 country-year observations for which household surveys are available. It emerges from the fusion of the Luxembourg Income Study (LIS) database, covering mostly developed countries, and the World Bank's POVCALNET database, covering essentially developing countries. The survey means in LIS are converted to constant 2005 USD in order to be consistent with POVCALNET data. DKK's dataset covers a total of 151 countries between 1967 and 2011.

The poverty headcount ratio at $2 a day in purchasing power parity is from the World Development Indicators (WDI) dataset. This measure is based on the percentage of the population living on less than $2 a day at 2005 international prices. In addition, the paper measures mean income – per capita income – as real per capita GDP[6] at purchasing power parity in constant 2005 international dollars. The logarithm of the Gini index is our measure

[4] Growth in average income can shift the income distribution while variations in inequality can also change the shape of income distribution. Both of these effects can impact the income of the poor and poverty headcount ratios.

[5] See https://www.econstor.eu/bitstream/10419/95564/1/767021142.pdf

[6] In the paper, per capita income and per capita GDP are equivalent.

of inequality. The Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. The Gini index measures the area between the Lorenz[7] curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

Defining and Measuring Governance

The concept of Governance is widely discussed among scholars and policymakers. It means different things to different people and there is as yet no consensus around its definition. Consequently, there are varying definitions of Governance. Theoretically, governance can be defined as "the rule of the rulers", typically within a given set of rules. In the context of economic growth and poverty reduction, governance refers to essential parts of the wide-ranging cluster of institutions. The United Nations Development Program (UNDP, 1997) defines governance as "the exercise of economic, political, and administrative authority to manage a country's affairs at all levels. It comprises mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences."

According to the World Bank (1993), governance is the process through which power is exercised in the management of a country's political, social and economic institutions for development. Kaufmann, Kraay and Zoido-Lobaton (1999) explain that "the fundamental aspects of governance" are graft, rule of law, and government effectiveness. Other dimensions are: voice and accountability, political instability and violence, and regulatory burden". Within this notion of governance, the evident interrogation is: what is good governance? This paper associates the quality of governance with democracy and transparency, with the rule of law and good civil rights, and with efficient public services. Also, the quality of governance is determined by the impact of this exercise of power on the quality of life enjoyed by the citizens.

In order to measure the concept of good governance, we use the Worldwide Governance Indicators (WGI). The WGI – developed by Kaufmann et al. (2005) have been proposed by the World Bank to estimate good governance. There exist three dimensions of governance: political, economic and institutional dimensions. The six governance indicators[8] can be classified into three groups with two indicators in each cluster. First, the political feature of governance is proposed to capture the process by which government is nominated, supervised and replaced. The political feature encompasses two indicators – *voice and accountability* and *political stability*. The second dimension is the economic governance, which includes *government effectiveness* and *regulatory quality*. The third dimension represents the institutional feature of governance. It involves *rule of law* and *control of corruption* indicators.

[7] A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household.
[8] The point estimates range from -2.5 (weak governance) to 2.5 (strong governance).

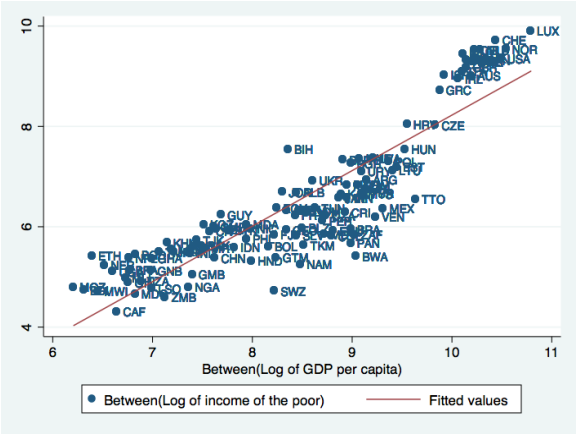
V. Pro-poor Growth: Empirical Evidence

Has growth been pro-poor?

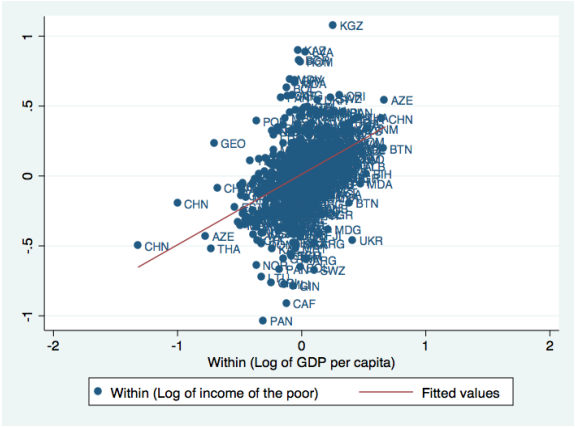
Before analyzing our regressions, a simple plotting illustrates the tight link between poverty reduction and per capita income growth. For both transformed between and within variables, income growth is associated with higher income of the poor (Figure 1).

Figure 1. Growth and the income of the poor.

(a) Between transformed variables



(b) Within transformed variables



As a starting point, the paper examines the impact of economic growth on the income of the poorest 20 percent and poverty headcount at $2 a day, in order to examine how pro-poor growth is. The coefficient of interest is β, which gives the impact of economic growth on poverty reduction as the equation is in logarithm terms. γ measures the effect of a change in the Gini index on poverty reduction.

As the paper defines growth as pro-poor if it reduces poverty (following Ravallion and Chen, 1997), the results suggest that growth is in general pro-poor using our two indicators. A one percent increase in real GDP per capita leads to about a 1.42 percent increase in the income of the poor (Table 1, column 5). A similar 1 percent increase in real GDP per capita leads to a decrease of about 2.25 percent in the poverty headcount (Table 2, Column 3). The results also show that inequality increases poverty.

Table 1. Pro-poor Growth Regressions- Income of the poorest 20 percent.

Variables	(1) lnyp	(2) lnyp	(3) lnyp	(4) lnyp	(5) lnyp	(6) lnyp
Log of GDP per capita	0.60***	0.66***	1.11***	0.98***	1.42***	1.02***
	(0.05)	(0.05)	(0.05)	(0.03)	(0.14)	(0.08)
Log of Gini Index		-1.37***		-2.01***		-1.64***
		(0.13)		(0.2)		(0.26)
Constant	1.47***	5.79***	-2.87***	5.6***	-5.53***	3.82**
	(0.49)	(0.67)	(0.44)	(0.89)	(1.27)	(1.29)
Observations	517	426	517	426	517	426
R-squared	0.21	0.4	0.8	0.9		
AR(1) test					0.66	0.51
AR(2) test					0.3	0.23
P-Value Hansen test					0.11	0.2
Number of countries	112	109	112	109	112	109
Model	FE	FE	BE	BE	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses: *** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by by the SYS-GMM estimator.

Table 2. Pro-poor Growth Regressions- Poverty Headcount ratio at $2.

Variables	(1) lnP	(2) lnP	(3) lnP	(4) lnP
Log of GDP per capita	-1.024***	1.15***	-2.25***	-1.66***
	(0.13)	(0.12)	(0.44)	(0.21)
Log of Gini Index		2.53***		3.93***
		(0.33)		(0.66)
Constant	11.17***	2.84*	21.29***	1.88
	(1.13)	(1.52)	(3.64)	(3.01)
Observations	424	421	424	421
R-squared	0.14	0.27		
AR(1) test			0.9	0.81
AR(2) test			0.57	0.1
P-Value Hansen test			0.13	0.2
Number of countries	92	92	92	92
Model	FE	FE	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses: *** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Governance and pro-poor growth

As a second step we add indicators of governance in the estimating equation to capture the impact of good governance on poverty reduction. All indicators of governance, except political stability and absence of violence, seem to have an impact on poverty. A one percent increase of the aggregated governance index, which combines political, economic and institutional features of good governance, increases the income of the poor by 14 percent.[9] Because corrupt governments can distort decision-making in favor of projects that profit the few rather than the many, reforms for good governance positively impact poverty reduction by providing better opportunities to the poor. This is most likely to happen through better rule of law (including property rights), which improve economic prospects and better ensure access to pro-poor public goods such health and education. Indeed, zooming on institutional governance, which is represented by rule of law, control of corruption and accountability, the results suggest that a better rule of law and control of corruption significantly increases the income of the poor. A government accountable to its people is also more prone to implement pro-poor policies than otherwise. Our results (columns 3 and 5) show that an improvement in government effectiveness or regulatory quality positively impacts the income of the poor. A one point increase in government effectiveness or regulatory quality improves the income of the poor by respectively 35 and 42 percent. A one-point increase in the control of corruption leads to an increase of about 39 percent in the income of the poor. These results are consistent with previous empirical findings and robust when poverty headcount ratio is used as an alternative poverty indicator (Table A5 in Appendix).

In this line, Acemoğlu and Robinson, in *"Why Nations Fail"*, argue that less developed countries such as Egypt are poor because "It [Egypt] has been ruled by a narrow elite that have organized society for their own benefit at the expense of the vast mass of people. Political power has been narrowly concentrated, and has been used to create great wealth for those who possess it." They defend that developed countries such as the United Kingdom and the United States grew successful because they created inclusive institutional and political arrangements that benefit society as a whole.

[9] The index is constructed through the principal component analysis.

Table 3. Governance indicators and Pro-poor Growth Regressions.

Variables	(1) lnyp	(2) lnyp	(3) lnyp	(4) lnyp	(5) lnyp	(6) lnyp	(7) lnyp
Log of GDP per capita	0.94***	0.75***	0.87***	0.9***	0.85***	0.88***	0.83***
	(0.15)	(0.14)	(0.13)	(0.08)	(0.12)	(0.1)	(0.7)
Log of Gini Index	-1.21***	-1.65***	-1.4***	-1.41***	-1.33***	-1.38***	-1.67***
	(0.42)	(0.33)	(0.37)	(0.31)	(0.38)	(0.3)	(0.29)
Governance	0.14**						
	(0.07)						
Control of corrup		0.39***					
		(0.13)					
Gov. Effectiveness			0.35**				
			(0.15)				
Political Stability				0.08			
				(0.08)			
Regulatory quality					0.42***		
					(0.12)		
Rule of law						0.24*	
						(0.13)	
Voice and Account.							0.25***
							(0.08)
Constant	2.94	6.22***	4.26**	3.46**	4.06**	4.08**	5.52***
	(2.45)	(2.14)	(2.2)	(1.51)	(1.96)	(1.53)	(1.43)
Observations	286	286	286	286	286	286	286
AR(1) test	0.43	0.45	0.49	0.24	0.41	0.41	0.21
AR(2) test	0.49	0.07	0.33	0.18	0.89	0.33	0.05
P-Value Hansen test	0.05	0.01	0.14	0.05	0.04	0.15	0.07
Number of countries	107	107	107	107	90	107	107
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses:*** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Other Determinants of Pro-poor Growth

In this section, we assess the robustness of our results after controlling for other determinants of poverty as identified in the empirical literature. The results (Table 5) confirm our main results: growth has been pro-poor as higher per capita income has positively and significantly impacted the income of the poor. Controlling for other potential determinants of poverty also show that better health services (captured by health expenditure, lower infant mortality or lower prevalence of HIV), better access to education (captured by spending in education or secondary school enrolment) are individually associated with higher income of the poor. In

addition, improvement in sanitation infrastructure and financial openness increase the income of the poor.[10] Combining these different factors into a single estimation could raise the issue of multicollinearity. Selectively introducing few variables together confirms the role of education, financial development, and financial openness in increasing the income of the poor.

[10] The paper does not find a significant effect of trade openness on the income of the poor. Results in the empirical literature are mixed on this. For instance, Lopez (2004) suggested that the impact of trade openness on the poor might vary according to the sectors in which the poor are concentrated. Measuring trade openness as the volume of trade adjusted by a country's size and population, he found that while trade openness appears to increase poverty in the short run, it is negatively correlated with poverty in the long run.

Table 5. Structural determinants of Pro-poor Growth.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Variables	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp	lnyp
Log of GDP per capita	0.65***	0.40**	0.55***	0.91***	0.59***	0.46***	0.73***	0.72***	0.88***	0.55***	0.45***
	(0.1)	(0.18)	(0.07)	(0.15)	(0.16)	(0.18)	(0.1)	(0.1)	(0.09)	(0.11)	(0.14)
Log of Gini Index	-1.73***		-1.61***		-1.08***	-0.92**	-1.43***	-1.54***	-1.89***	-1.87***	-1.7***
	(0.25)		(0.09)		(0.34)	(0.53)	(0.3)	(0.31)	(0.37)	(0.26)	(0.4)
Control of Corrup	0.35***	0.62***	0.012	0.33**	0.43***	0.5***	0.42***	0.39***	0.22**	0.4***	0.26*
	(0.12)	(0.14)	(0.13)	(0.14)	(0.13)	(0.16)	(0.11)	(0.13)	(0.11)	(0.12)	(0.1)
Hegdp	0.06*										0.03
	(0.03)										(0.04)
Mortality5		-0.006**									
		(0.003)									
pVIH			-0.02*								
			(0.01)								
SpendingEdu				0.17***							0.06*
				(0.06)							(0.03)
SchoolSec					0.007**						
					(0.004)						
Sanitation						0.013**					0.005
						(0.007)					(0.004)
Inflation							0.00*				0.02
							(0.0006)				(0.001)
M2								0.001			0.006**
								(0.002)			(0.002)
Openness									-0.002		-0.002
									(0.002)		(0.002)
FinOpenness										0.09	0.09*
										(0.06)	(0.05)
Constant	7.1***	3.53**	7.56***	-1.94***	4.88***	5.02**	5.57***	5.95***	6.14***	8.65***	7.92***
	(1.29)	(1.71)	(1.11)	(1.34)	(1.78)	(2.61)	(1.75)	(1.97)	(1.69)	(1.54)	(1.66)
Observations	286	328	202	287	251	284	276	284	286	283	236
AR(1) test	0.3	0.9	0.23	0.42	0.85	0.47	0.4	0.43	0.33	0.53	0.13
AR(2) test	0.17	0.6	0.04	0.9	0.13	0.15	0.12	0.11	0.08	0.04	0.56
P-value Hansen test	0.09	0.102	0.51	0.2	0.104	0.096	0.109	0.09	0.13	0.108	0.27
Number of countries	107	110	70	103	102	106	104	107	107	105	95
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Diagnostic tests (Hansen and 1st and 2nd-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Is there any non-linear effect?

This section discusses a possible evidence of linearity or non-linearity from two perspectives: *(i)* a differentiation by the level of development and *(ii)* a differentiation by the quality of governance. A simple test consists of exogenously splitting the sample according to the median level of the variables of interest (level of development or governance) as a threshold point.

We first examine the impact of good governance[11] on the income of the poor as a function of the level of development. Results reported in the first column of Table 6 illustrate interesting heterogeneity. Higher growth has a larger impact on the income of the poor in more developed countries; growth increases income per capita more than proportionally in these countries. While better control of corruption increases the income of the poor in countries with per income above the median level (5227 PPP constant 2005 international dollar), its impact is not significantly in less developed countries (countries with per capita income below the median level). This differentiation is robust to the introduction of additional control variables (education, health, trade openness, financial development, etc.) discussed in the previous section. The finding suggests that, in opposite to higher income countries, less developed countries may not be successful in controlling corruption in such a way that it could influence the income of the less fortunate.

The second step consists in investigating the effect of growth and governance on the income of the poor as a function of the quality of governance[12]. As in the previous section, we split the sample in two groups of countries according to the median level of governance indicators. Countries that are below the median are those who have lower governance quality while those above the median have greater governance quality.

The results showed in the second and third columns of Table 6 do not provide any evidence of a differentiated impact of growth on the income of the poor depending on the quality of governance. For the variable control of corruption for instance, the effect of a 1 percent increase in income per capita on the income of the poor goes from 0.82 to 0.81. However, the quality of governance seems to matter for the income of the poor only in countries with relatively adequate level of governance. These findings are also robust to the introduction of additional control variables as in the previous section.

[11] We retain control of corruption as our proxy for good governance in pro-poor growth regressions.
[12] Quality of governance is measured by the aggregated governance and control of corruption indicators.

Table 6. Pro-poor growth and governance: non-linearity.

	(1) Level of Development		(2) Control of Corruption		(3) Governance	
	Below	Above	Below	Above	Below	Above
Log of GDP per capita	0.6***	1.25***	0.82***	0.81***	0.74***	0.67***
	(0.17)	(0.14)	(0.11)	(0.13)	(0.12)	(0.21)
Log of Gini Index	-1.63***	-1.68***	-1.4***	-1.34***	-1.79***	-0.88***
	(0.34)	(0.26)	(0.34)	(0.35)	(0.45)	(0.3)
Control of Corrup	-0.02	0.21**	0.05	0.61***		
	(0.15)	(0.08)	(0.18)	(0.17)		
Governance					-0.005	0.43***
					(0.09)	(0.13)
Constant	7.09***	1.58*	4.57**	4.3**	6.6***	3.68*
	(2.04)	(1.9)	(1.74)	(1.79)	(2.27)	(2.19)
Observations	146	140	154	132	156	127
AR(1) test	0.25	0.23	0.63	0.47	0.83	0.35
AR(2) test	0.61	0.08	0.07	0.14	0.05	0.05
P-Value Hansen test	0.32	0.13	0.13	0.58	0.42	0.25
Number of Countries	58	59	66	65	63	64
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Panel Smooth Transition Regression

In this section, we further analyze the non-linear relationship between pro-poor growth and governance. We introduce and estimate the Panel Smooth Transition Regression (PSTR) model to accommodate other issues that have arisen in the literature on the relationship between poverty reduction, economic growth and good governance, and to test the robustness of our results. The section (i) examines the impact of good governance on the income of the poor as a function of development level and (ii) investigates the impact of growth on the income of the poor as a function of the level of governance quality.

The PSTR developed by González et al. (2005), is a generalization of the Hansen (1999) Panel Threshold Regression (PTR) model. The PSTR considers the speed of transition from one regime to the other with the passage from a regime to another being gradual. Hence, this method may be more accurate than the one used in the previous sub-section.

Estimation of Model (i)

For the first step (i), the PSTR model is defined as follow:

$$\ln yp_{it} = \beta_0 Gov_{it} + \beta_1 Gov_{it} g(\ln y_{it}, \gamma, \delta) + u_i + \varepsilon_{it} \quad (2)$$

Where $lnyp_{it}$ denotes the logarithm of income of the 20 percent poorest, Gov_{it} represents a vector of governance indicators; lny_{it} is the logarithm of the GDP per capita, u_i is an individual fixed effect, and ε_{it} stands for the idiosyncratic error. Moreover, the transition function is given by a logistic function:

$$g(\ln y_{it}, \gamma, \delta) = \frac{1}{\left[1 + \exp(-\gamma(\ln y_{it} - \delta))\right]}, \ \gamma > 0 \quad (3)$$

Where $g(lny_{it}, \gamma, \delta)$ is a continuous function and it is bounded between [0,1]. It depends on the transition function i.e. the logarithm of GDP per capita (lny_{it}), a smooth parameter γ, and a threshold parameter δ.

The advantage of this method compared to SYS-GMM is the fact that it incorporates the change effect of individual heterogeneity in the same country over time. This approach introduces the concept of heterogeneity in time and space. Besides, the PSTR allows the effect of good governance on poverty reduction to vary with the level of economic development.

Accordingly, the marginal impact of the governance indicator depending on economic development is given by:

$$e_{it} = \frac{\partial \ln yp_{it}}{\partial Gov_{it}} = \beta_0 + \beta_1 g(\ln y_{it}, \gamma, \delta) \quad (4)$$

The properties of the transition function involve:

$$\beta_0 \leq e_{it} \leq \beta_0 + \beta_1 \text{ if } \beta_1 > 0 \text{ or } \beta_0 + \beta_1 \leq e_{it} \leq \beta_0 \text{ if } \beta_1 < 0$$

When estimating the parameters of the PSTR model, the individual effects u_i are removed by eliminating individual-specific means and thus it is a transformed model by nonlinear least squares that one estimates (González et al., 2005). The testing procedure of González et al. (2005) consists of: first testing the linearity against the PSTR model, and second determining the number r of transition function. Considering equation (2), the linearity check consists in testing:

$H_0 : \gamma = 0$ or $H_0 : \beta_0 = \beta_1$. Then three standard tests can be applied using these statistics: Lagrange Multiplier of Fisher (LM_F), Wald test (LM), and Pseudo Likelihood-ratio (LRT).

The results presented in Table 7 suggest no evidence of non-linearity regarding the effects of governance on the income of the poor as a function of the level of development. These findings contrast with our previous results, which show that the impact of good governance on the income of the poor is greater in countries with high development levels.

Table 7. Parameter estimates for the PSTR model *(i)*.

Threshold variable: Level of Development	
N° of transition function (r*)	1
(H_0: r=0 *vs* H_1: r=1)	
LRT Test of linearity	0.056 (0.945)
Wald Test (LM)	0.056 (0.972)
Fisher Test	0.018 (0.982)
(H_0: r=1 *vs* H_1: r=2)	
LRT Test of no remaining nonlinearity	1.249 (0.536
Wald Test	1.246 (0.536
Fisher Test	0.402 (0.670)
Number of observations	1120
Number of Countries	112

Note: The test of linearity has an asymptotic distribution F(1,TN-N-1) under the null hypothesis and F(1,TN-N-2) for the no remaining nonlinearity test with N the number of individuals and T the number of periods. For statistics, the p-values are in parentheses.

Estimation of Model (ii)

For the second step (ii), the PSTR model is written as follow:

$$\ln yp_{it} = \beta_0 \ln y_{it} + \beta_1 \ln y_{it} g(Gov_{it}, \gamma, \delta) + \alpha_0 X_{it} + \alpha_1 X_{it} g(Gov_{it}, \gamma, \delta) + u_i + \varepsilon_{it} \quad (5)$$

where the logistic transition function is:

$$g(Gov_{it}, \gamma, \delta) = \frac{1}{\left[1 + \exp(-\gamma(Gov_{it} - \delta))\right]}, \ \gamma > 0 \quad (6)$$

X_{it} is a vector of the following control variables – spending in education, inflation, health expenditure as a percentage of GDP and money and quasi-money as a percentage of GDP (M2).

Additionally, equation (5) allows the marginal effect of income growth to depend on governance quality and is given by:

$$e_{it} = \frac{\partial \ln yp_{it}}{\partial \ln y_{it}} = \beta_0 + \beta_1 g(Gov_{it}, \gamma, \delta) \quad (7)$$

The properties of equation (7) remain the same as in the first step.

Table 8 below presents the results of the second step using equation (5). Depending on the transition function[13], the effects of income growth on the income of the poor are positive and significant. Tests [14] of linearity also show evidence of non-linearity. For the four specifications, the effect of growth on the income of the poorest 20 percent increases with the control of corruption. Figure 2 illustrates these findings.

Control of corruption is good for pro-poor growth, especially after reaching a threshold. For countries where the control of corruption is stronger (index greater than zero), it leads to much larger impacts of per capita income growth on the income of the poor than in countries where corruption is more prevalent (lower levels of control of corruption).

Table 8. Parameter estimates for the PSTR model *(ii)*.

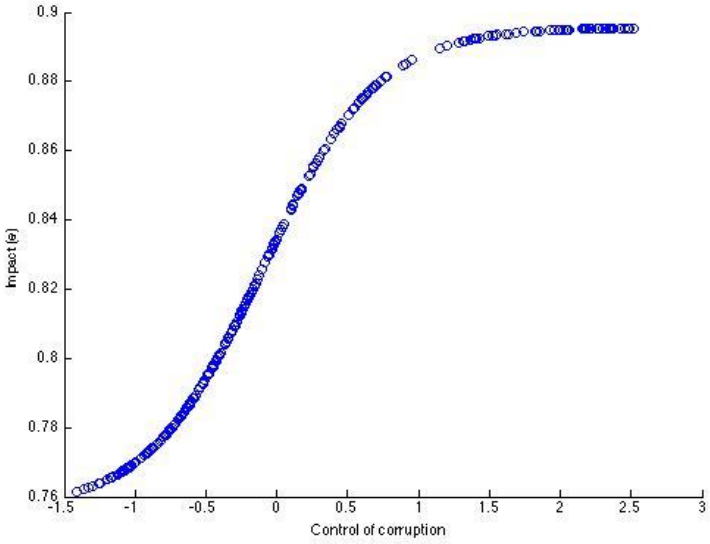
Threshold variable: Control of corruption				
Control variables	Spending in Education	Inflation	Health/GDP	M2
N° of transition function (r*)	1	1	1	1
(H_0: r=0 *vs* H_1: r=1)				
LRT Test of linearity	9.292 (0.000)	2.782 (0.066)	3.012 (0.053)	3.588 (0.031)
Wald Test	3.361 (0.037)	1.035 (0.358)	1.122 (0.329)	1.338 (0.266)
Fisher Test	9.101 (0.011)	2.760 (0.252)	2.987 (0.225)	3.550 (0.169)
(H_0: r=1 *vs* H_1: r=2)				
LRT Test of no remaining nonlinearity	0.190 (0.909)	0.125 (0.939)	1.1339 (0.512)	1.018 (0.601)
Wald Test	0.066 (0.936)	0.045 (0.956)	0.481 (0.619)	0.365 (0.695)
Fisher Test	0.190 (0.909)	0.125 (0.939)	1.334 (0.513)	1.15 (0.602)
Parameter β_0	0.7562 (0.053)	0.8282 (0.08)	0.7553 (0.071)	0.7071 (0.092)
Parameter β_1	0.1395 (0.028)	0.0004 (0.0003)	0.0581 (0.0411)	0.003 (0.0015)
Parameter a_0	0.020 (0.030)	-0.0443 (0.009)	-0.0211 (0.036)	-0.0188 (0.019)
Parameter a_1	-0.132 (0.048)	0.0059 (0.005)	-0.044 (0.065)	-0.0035 (0.0018)
Location parameter δ	-0.1025	0.3941	0.4088	0.2730
Smooth parameter γ	2.4781	4.2151	3.0167	2.8196
AIC	-4.976	-4.719	-4.746	-4.7119
BIC	-4.934	-4.662	-4.690	-4.6542
Number of Observations	630	430	440	420
Number of Countries	63	43	44	42

Note: The test of linearity has an asymptotic distribution F(1, TN - N - 1) under the null hypothesis and F(1, TN - N - 2) for the no remaining nonlinearity test with N the number of individuals and T the number of periods. For statistics, the p-values are in parentheses. For paremeters, the standard errors are in parentheses and are corrected for heteroskedasticity.

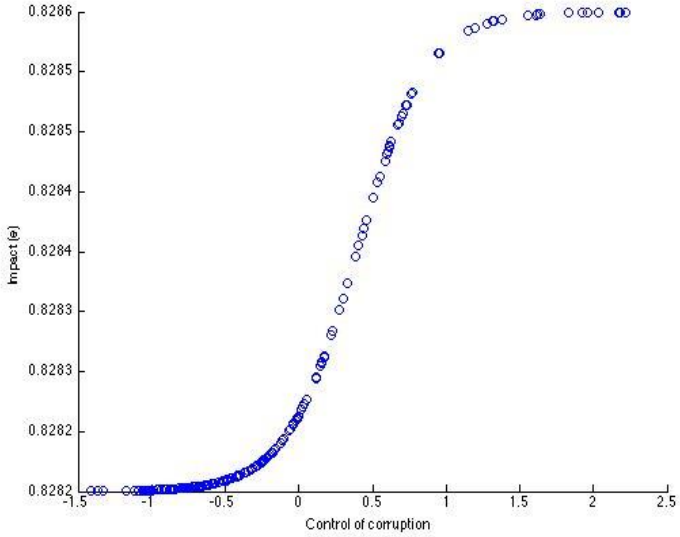
[13] The transition function depends upon the governance indicator: control of corruption.
[14] For all the specifications, LRT test of linearity rejects the null hypothesis of linearity.

Figure 2. Marginal impact of income growth on the income of the poor.

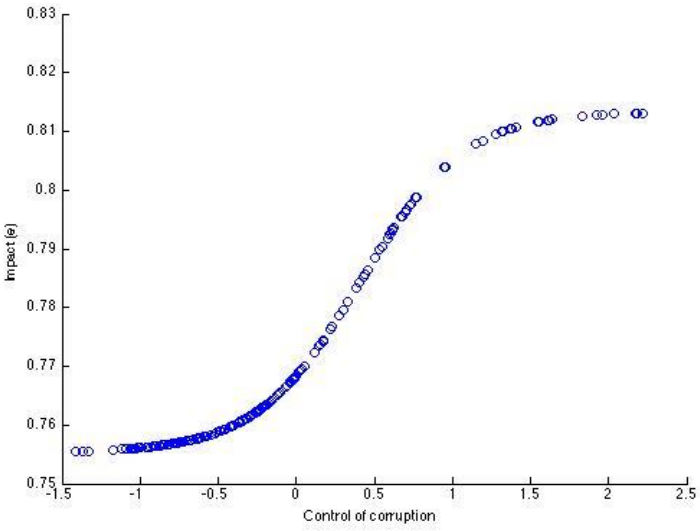
Control: Spending in education



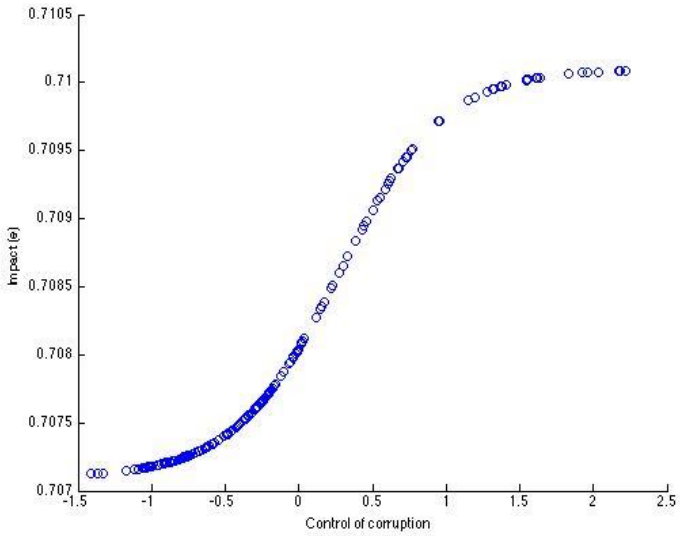
Control: Inflation



Control: Health/GDP



M2



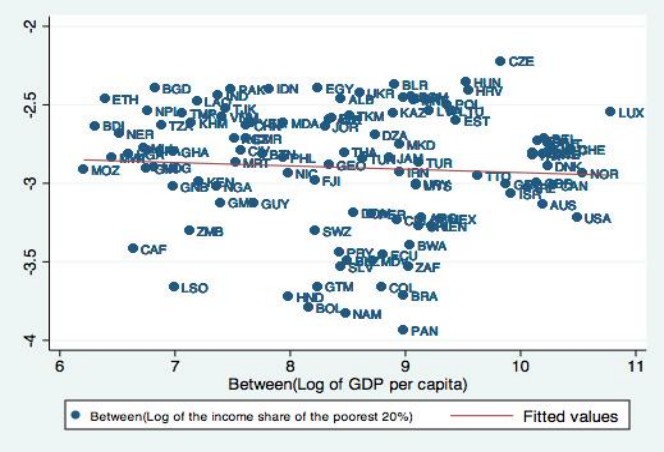
VI. Inclusive Growth: Empirical Evidence

Governance and Inclusive Growth

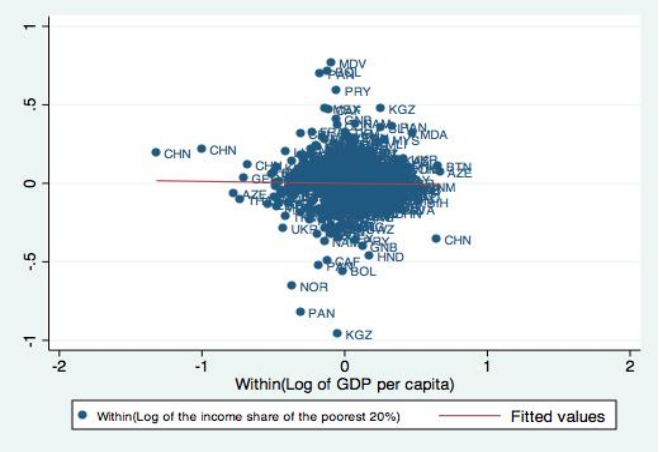
Following Dollar and Kraay (2002), this section first examines the relationship between per capita income and a broad definition of inclusiveness – the bottom quintile share of the income distribution (Figure 3). Debates on inclusiveness usually focus on the incidence of poverty and the income distribution among individuals and households in the society. Thus, income shares are conventional metrics for gauging the distributive impact of policies.

Figure 3. Inclusiveness of Growth.

(a) Between transformed variables



(b) Within transformed variables



As in the section on pro-poor growth, we follow a two steps approach by first assessing the impact of income growth on the bottom quintile income share and second by analyzing the impact of governance. Since, the paper considers growth as inclusive when income growth is associated with an increase in the bottom quintile share of the income distribution, growth is inclusive if β is greater than zero.

The results reported in Table 9 show no evidence of inclusive growth (column 1) – the coefficient is positive but not significant. Inclusiveness goes beyond poverty and income distribution. It involves other dimensions such as governance, which in itself impact income distribution. Building effective institutions could therefore be important to make growth inclusive. This raises the question about which key governance factors and mechanisms could facilitate growth and promote inclusiveness.

To this end, we estimate our baseline model using the income share of the poor as dependent variable and governance indicators as explanatory variables. Results are shown in the six last columns of Table 9. Our inclusiveness coefficient is not significant for any of the specifications – illustrating that growth has not been inclusive.

Our results show that government effectiveness (economic governance) and rule of law (institutional governance) are key in increasing the income share of the poorest 20 percent. Government effectiveness has greater impact than rule of law – a one-point increase in the government effectiveness index increases the income share of the poorest 20 percent by 84 percent while a similar one-point increase in the rule of law index leads to an increase of 58 percent in the income share of the poorest 20 percent. Other indicators of governance are not significantly associated with the income share of the poorest 20 percent.

The results illustrate that economic growth should be complemented with liable and transparent public administration, effective government policies, and confidence in the rules of society, which could lead to a nondiscriminatory redistribution of the gains of growth.

Table 9. Governance and Inclusive Growth Regressions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	lnQ	lnQ	lnQ	lnQ	lnQ	lnQ	lnQ
Log of GDP per capita	0.11	0.08	-0.77	-0.03	0.37	-0.25	-0.15
	(0.08)	(0.25)	(0.67)	(0.08)	(0.51)	(0.43)	(0.26)
Control of Corrup		0.04					
		(0.24)					
Gov. Effectiveness			0.84*				
			(0.46)				
Political Stability				-0.006			
				(0.10)			
Regulatory quality					0.35		
					(0.44)		
Rule of law						0.58*	
						(0.33)	
Voice and Account							-0.01
							(0.13)
Constant	-3.85***	-3.63	3.76	-2.62***	-6.16	-0.65	-1.58
	(0.74)	(2.24)	(5.80)	(0.75)	(4.38)	(3.78)	(2.31)
Observations	522	330	330	330	330	330	330
AR(1) test	0.32	0.48	0.15	0.44	0.09	0.45	0.57
AR(2) test	0.17	0.59	0.87	0.32	0.71	0.66	0.26
P-Value Hansen test	0.002	0.69	0.37	0.77	0.86	0.41	0.77
Number of countries	112	110	110	110	110	110	110
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses: *** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Robustness Checks

Additional control variables

This section analyzes the determinants of inclusive growth. We add control variables to our baseline specification. Table 10 shows important results. Findings confirm that growth has not been inclusive since growth in per capita income leads to a decrease in the income share of the poor. A-one point increase in government effectiveness increases the income share of the poorest 20 percent by 23 percent (Column 1). Sound policies that promote equity and equality could promote inclusive growth. Also, inflation has a slightly positive effect on the income share of the bottom quintile. Trade openness and sanitation improvement have positive impacts – a 1 percent increase in trade openness increases the income share of the poor by 0.3 percent while a similar increase in sanitation improvement increases the income share of the bottom quintile by 1 percent (Column 3). Unemployment and financial openness negatively impact the poor even though the coefficient is not significant. Besides, secondary school enrollment benefits the poor (Column 4). Estimates from the fifth specification show that financial development (M2) increases the income share of the poorest 20 percent by 0.1 percent.

To summarize these results, government effectiveness, infrastructure improvement, trade openness, human capital and financial development are pro-inclusive policies.

Regressions of shared prosperity i.e. considering the share of the bottom 40 percent of the income distribution broadly confirm these results (Table A6 in Appendix).

Table 10. Inclusive Growth and Structural Variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	lnQ	lnQ	lnQ	lnQ	lnQ	lnQ
Log of GDP per capita	-0.12	-0.23**	-0.34**	-0.27***	-0.44***	-0.51***
	(0.11)	(0.11)	(0.13)	(0.10)	(0.15)	(0.14)
Gov. Effectiveness	0.23**	0.15	0.28**	0.03	0.21*	0.24**
	(0.12)	(0.11)	(0.11)	(0.08)	(0.10)	(0.11)
SpendingEdu	0.02	0.01	-0.01			
	(0.05)	(0.03)	(0.04)			
SchoolSec				0.01***	0.005	0.002
				(0.002)	(0.004)	(0.004)
FinOpenness	-0.08	-0.06	-0.06	-0.02	-0.10	-0.03
	(0.06)	(0.04)	(0.04)	(0.04)	(0.08)	(0.04)
Openness	0.003	0.001	0.003*	0.001	0.001	0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Inflation	0.001**	0.00	0.00	0.00	0.003	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.002)	(0.00)
M2	-0.00	-0.00	-0.00	0.00	0.001*	0.00
	(0.00)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sanitation		0.009***	0.01**		0.009**	0.012**
		(0.003)	(0.00)		(0.004)	(0.005)
Unemployment			-0.01			-0.006
			(0.01)			(0.01)
Hegdp			-0.001			0.02
			(0.03)			(0.03)
Constant	-2.17**	-1.7**	-0.67	-1.44*	-0.47	0.24
	(0.92)	(0.83)	(0.98)	(0.75)	(1.14)	(1.05)
Observations	231	269	226	277	272	231
AR(1) test	0.16	0.95	0.68	0.42	0.4	0.84
AR(2) test	0.61	0.16	0.12	0.28	0.73	0.14
P-Value Hansen test	0.55	0.43	0.81	0.45	0.08	0.91
Number of countries	89	98	88	100	99	88
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses: *** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Panel Smooth Transition Regression

This section tests the non-linear relationship between: *(i)* growth and the income share of the poorest 20 percent depending on the level of government effectiveness (equation 8) and *(ii)* the link between government effectiveness and the income share of the poorest 20 percent depending on the level of development (equation 9).

$$\ln Q_{it} = \beta_0 \ln Gov_{it} + \beta_1 \ln Gov_{it} g(\ln y_{it}, \gamma, c) + u_i + \varepsilon_{it} \quad (8)$$

$$\ln Q_{it} = \beta_0 \ln y_{it} + \beta_1 \ln y_{it} g(Gov_{it}, \gamma, c) + u_i + \varepsilon_{it} \quad (9)$$

Where lnQ_{it} denotes the logarithm of income share of the 20 percent poorest, Gov_{it} represents the governance indicator[15]; lny_{it} is the logarithm of the GDP per capita, u_i is an individual fixed effect, and ε_{it} stands for the idiosyncratic error.

Considering equations 8 and 9, the linearity check consists in testing:

$H_0 : \gamma = 0$ or $H_0 : \beta_0 = \beta_1$. Then three standard tests can be applied using these statistics: Lagrange Multiplier of Fisher (LM_F), Wald test (LM), and Pseudo Likelihood-ratio (LRT).

Results are reported in Table 11. Tests[16] show no evidence for linearity considering neither the impact of growth on the income share of the poorest 20 percent when government effectiveness is considered as transition variable nor the effect of government effectiveness on the income share of the poorest 20 percent depending on the level of development.

[15] We retain government effectiveness, which is the main significant variable in our inclusive growth regressions.

[16] Considering the level of development as transition variable, only the Fisher test show no evidence of linearity.

Table 11. Parameter estimates for the PSTR models.

Threshold variables	Level of Development	Government Effectiveness
N° of transition function (r^*)	1	1
(H_0: r=0 *vs* H_1: r=1)		
LRT Test of linearity	3.127 (0.078)	0.820 (0.367)
Wald Test	3.127 (0.077)	0.818 (0.336)
Fisher Test	2.263 (0.134)	0.589 (0.444)
(H_0: r=1 *vs* H_1: r=2)		
LRT Test of no remaining nonlinearity	-1.083 (1.000)	0.003 (0.956)
Wald Test	-1.085 (1.000)	0.003 (0.956)
Fisher Test	-0.764 (1.000)	0.002 (0.963)
Number of observations	720	650
Number of Countries	72	65

Note: The test of linearity has an asymptotic F(1,TN-N-1) distribution under the null hypothesis and F(1, TN-N-2) for the no remaining nonlinearity test with N the number of individuals and T the number of periods. For statistics, the p-values are in parentheses.

VII. Conclusion and Discussion

This paper examines first how pro-poor and inclusive growth has been by assessing respectively the impacts of income growth on poverty reduction and on the bottom share of the income distribution. Second, it investigates the effects of good governance in reducing poverty and attaining inclusive growth and assesses what factors have been driving these outcomes. Finally, the paper tests the non-linear impacts of growth on poverty and inclusion.

Using a sample of 112 countries over the period 1975-2012, it comes not surprisingly that growth is in general pro-poor. Incomes of the poorest 20 percent rise while poverty headcount ratio at $2 decreases with mean per capita incomes as economic growth proceeds. But inequality reduces this effect. The paper also found that globally growth has not been inclusive. A striking finding is that the combination of political, economic and institutional features of good governance improves the income of the poor and decreases poverty. Especially, the control of corruption and regulatory quality, have the most positive impact on the income of the poor. However, only two features of governance (government effectiveness and rule of law) have positive and significant effects on inclusive growth as they increase the income share of the poorest 20 percent.

When studying what determines pro-poor and inclusive growth, the results suggest that enhancing human capital through health and education spending, infrastructure improvement, and financial development are the main factors positively influencing poverty reduction and inclusive growth. The results also suggest that programs such as fighting infant mortality and HIV/AIDS are pro-poor. Finally, using the PSTR approach, we find evidence of a non-linear relationship regarding the impact of growth on poverty. The impact of growth in the income

of the poor is an increasing function of the control of corruption. However, the impact of growth on inclusiveness is linear.

This paper highlighted that important elements for pro-poor and inclusive strategies comprise continued efforts to strengthen governance, control corruption, government effectiveness and promote economic and social fairness. In addition, policies to attain pro-poor and inclusive growth need to be more broad-based by focusing on social development, including education, health, infrastructure and financial development.

Appendix

Table A1. Country list.[17]

Albania, Algeria, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Belgium, Belize, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chile, China, Columbia, Costa Rica, Cote d'Ivoire, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Arab Republic of Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, The Republic of Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Honduras, Hungary, India, Indonesia, Islamic Republic of Iran, Ireland, Israel, Italy, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Lao PDR, Latvia, Lesotho, Lithuania, Luxembourg, Macedonia FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mexico, Moldova, Montenegro, Mozambique, Namibia, Nepal, Netherlands, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, South Africa, Swaziland, Sweden, Switzerland, Tajikistan, Tanzania, Thailand, Timor-Leste, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Republic of Yemen, Zambia.

Table A2. Explanation of variables.

Variable	Source	Description/Definition
Survey means	POVCALNET, LIS	POVCALNET measures welfare by income or consumption as determined in the surveys. For LIS, DKK calculate survey means of disposable income directly from the micro survey data on household level
lnyp	POVCALNET, LIS	Logarithm of Income of the poorest 20 percent of the income distribution
lnQ	POVCALNET, LIS	Logarithm of the share of the Income of the 20 percent poorest of the income distribution- bottom quintile share
lnBot.40	POVCALNET, LIS	Logarithm of the share of the Income of the 40 percent poorest of the income distribution
lnP	WDI	Poverty headcount ratio at $2 a day (PPP) in percentage of population
lny	WDI	Logarithm of GDP per capita based on purchasing power parity (PPP constant 2005 international dollar)
log of gini index	WDI	Logarithm of GINI index. Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution.

[17] Since Armenia is an outlier, it was dropped from the estimation.

Governance variables		
Voice and accountability	WGI	It reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of association and media. Estimate of governance range from approximately from -2.5 to 2.5 (strong performance)
Control of corruption	WGI	It defines perceptions of the extent to which public power is exercised for private gain and captures the state by elites and private interests.
Government Effectiveness	WGI	It describes perceptions of the quality of public and civil services, the quality of policy design and implementation, and the reliability of the government's duty to such policies.
Regulatory quality	WGI	It defines perceptions of the capability of the government to formulate and realize sound policies and regulations
Rule of law	WGI	It reflects insights of the extent to which agents have confidence in and accept the rules of society (property rights, the police, the courts, the quality of contract implementation)
Political Stability and no violence	WGI	It defines perceptions of the likelihood that the government will be destabilized or defeated by unconstitutional or violent processes, including terrorism and politically-motivated violence
Structural Factors		
Hegdp	WDI	Public health expenditure (% GDP). It consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds.
Mortality5	WDI	Under-five mortality rate per 1,000 live births is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to current age-specific mortality rates.
pVIH	WDI	Prevalence of HIV refers to the percentage of people ages 15-49 who are infected with HIV.
SpendingEdu	WDI	Public expenditure on education as % of GDP is the total public expenditure on education expressed as a percentage of the Gross Domestic Product (GDP) in a given year. Public expenditure on education includes government spending on educational institutions (both public and private), education administration, and transfers/subsidies for private entities (students/households and other privates entities).

SchoolSec	WDI	Gross enrolment ratio. Secondary. All programs. Total is the total enrolment in secondary education, regardless of age, expressed as a percentage of the population of official secondary education age. GER can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition.
Sanitation	WDI	Improved Sanitation (% of population with access). Access to an improved sanitation structure refers to the percentage of the population using an improved sanitation structure.
Inflation	WDI	inflation, consumer prices (annual %) Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.
M2	WDI	Money and quasi-money (M2) as % of GDP
Openness	WDI	Trade openness is the sum of exports and imports of goods and services measured as a share of GDP
FinOpenness		The Chinn-Ito index (KAOPEN) is an index measuring a country's degree of capital account openness. The index is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. Source: http://web.pdx.edu/~ito/kaopen_Chinn-Ito_hi0523.pdf
Unemployment	WDI	Unemployment, total (% of total labor force) is the share of the labor.

Table A3. Descriptive Statistics of Main Variables.

Variables	Mean	Standard Deviation		Max		Min		Number of	Number of
		Between	Within	Between	Within	Between	Within	Observations	Countries
Log of income of the poorest 20 percent	6.71	1.46	0.27	9.89	7.79	4.3	5.67	531	112
Log of poverty Headcount ratio	2.75	1.73	0.63	4.55	5.39	-2.78	-1.49	434	92
Log of GDP per capita	8.47	1.17	0.25	10.79	9.79	6.21	7.15	944	112
Log of Gini index	3.68	0.23	0.09	4.23	4.09	3.16	3.31	456	112
Control of corruption	-0.05	0.97	0.17	2.43	0.7	-1.18	-0.69	557	112
Government Effectiveness	0.01	0.93	0.15	2.12	0.79	-1.44	-0.57	557	112
Political Statility	-0.16	0.84	0.27	1.48	1.07	-1.94	-1.39	557	112
Regulatory quality	0.06	0.87	0.18	1.81	1.06	-1.97	-0.55	557	112
Rule of law	-0.1	0.94	0.15	1.93	0.54	-1.47	-0.83	557	112
Voice and Accountability	-0.01	0.89	0.17	1.6	0.49	-1.9	-1.09	557	112

Table A4. Correlations between explanatory variables and lagged and differenced instruments used in the SYS-GMM estimation.[18]

Variables	Log of GDP per capita	Log of Gini index	Lag_1(Log of GDP per capita)	Lag_1(Log of Gini index)	Diff (Log of GDP per capita)	Diff (Log of Gini index)
Log of GDP per capita	1					
Log of Gini index	0.06	1				
Lag_1 (Log of GDP per capita)	0.98	0.07	1			
Lag_1 (Log of Gini index)	0.03	0.89	0.02	1		
Diff (Log of GDP per capita)	0.08	-0.05	-0.07	0.07	1	
Diff (Log of Gini index)	0.03	0.03	0.08	-0.41	-0.28	1

Note: if correlations are small, instruments are weakly correlated with the offending explanatory variable, thus instruments are poor predictors of the of the endogenous predictor. In this case, lagged variables of log of GDP per capita and of log of Gini are good instruments, but variables in in difference are are a little weak because correlations are smaller than 0.1.

[18] Table A4 presents correlations for Table 2 (Benchmark results) in which we use only lag 1 as instruments.

Table A5. Governance indicators and Pro-poor Growth Regressions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	lnP	lnP	lnP	lnP	lnP	lnP	lnP
Log of GDP per capita	-1.29***	-1.76***	-1.58***	-1.51***	-1.17***	-1.81***	-1.55***
	(0.27)	(0.29)	(0.29)	(0.18)	(0.25)	(0.27)	(0.2)
Log of Gini Index	2.99***	2.63***	3.06***	2.28**	3.59***	2.66***	2.75***
	(0.78)	(0.71)	(0.7)	(0.7)	(0.68)	(0.64)	(0.68)
Governance	-0.3*						
	(0.16)						
Control of corrup		-0.1					
		(0.35)					
Gov. Effectiveness			-0.007				
			(0.35)				
Political Stability				-0.31**			
				(0.15)			
Regulatory quality					-0.44*		
					(0.25)		
Rule of law						0.14	
						(0.32)	
Voice and Account.							-0.4*
							(0.23)
Constant	2.15	7.46*	4.45	6.60¨	-0.9	7.9**	5.22*
	(0.58)	(3.84)	(3.55)	(3.17)	(2.85)	(3.17)	(3.13)
Observations	284	284	284	284	284	284	284
AR(1) test	0.1	0.24	0.23	0.2	0.22	0.3	0.12
AR(2) test	0.03	0.01	0.01	0.04	0.06	0.02	0.01
P-Value Hansen test	0.22	0.15	0.21	0.10	0.08	0.38	0.24
Number of countries	90	90	90	90	90	90	90
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Note: Robust standard errors in parentheses:*** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

Table A6. Shared Prosperity and Structural Variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	lnBot.40	lnBot.40	lnBot.40	lnBot.40	lnBot.40	lnBot.40
Log of GDP per capita	-0.01	-0.16**	-0.24**	-0.19***	-0.31***	-0.35***
	(0.06)	(0.07)	(0.09)	(0.07)	(0.1)	(0.1)
Gov. Effectiveness	0.14*	0.12*	0.19**	0.02	0.16**	0.15**
	(0.08)	(0.07)	(0.08)	(0.06)	(0.07)	(0.07)
Spending in Education	0.02	0.00	-0.00			
	(0.03)	(0.02)	(0.02)			
SchoolSec				0.007***	0.004**	0.001
				(0.002)	(0.003)	(0.002)
FinOpenness	-0.04	-0.04	-0.03	-0.01	-0.06	-0.00
	(0.03)	(0.02)	(0.03)	(0.03)	(0.05)	(0.03)
Openness	0.003**	0.00	0.002**	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Inflation	0.00*	0.00	-0.03	0.00	0.003	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.002)	(0.00)
M2	-0.00	-0.00	-0.001*	0.00	0.00	0.00
	(0.00)	(0.001)	(0.001)	(0.00)	(0.00)	(0.001)
Sanitation		0.006***	0.007**		0.006**	0.008**
		(0.002)	(0.003)		(0.003)	(0.003)
Unemployment			-0.00			-0.005
			(0.00)			(0.007)
Health/GDP			0.00			0.02
			(0.02)			(0.02)
Constant	-2.03***	-1.01*	-0.33	-0.89*	-0.15	0.26
	(0.51)	(0.58)	(0.69)	(0.53)	(0.78)	(0.74)
Observations	274	269	226	277	272	231
AR(1) test	0.17	0.32	0.31	0.63	0.49	0.99
AR(2) test	0.8	0.31	0.25	0.44	0.67	0.18
P-Value Hansen test	0.55	0.72	0.86	0.22	0.03	0.94
Number of countries	99	98	88	100	99	88
Model	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM	SYS-GMM

Notes: The dependent variable is the share of the bottom 40 percent in the income distribution, in logarithm. Robust standard errors in parentheses: *** p<0.01,** p<0.05, * p<0.1. Diagnostic tests (Hansen and first and second-order autocorrelations) reveal no evidence against the validity of the instruments used by the SYS-GMM estimator.

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