EC569 Economic Growth
Seminar 6

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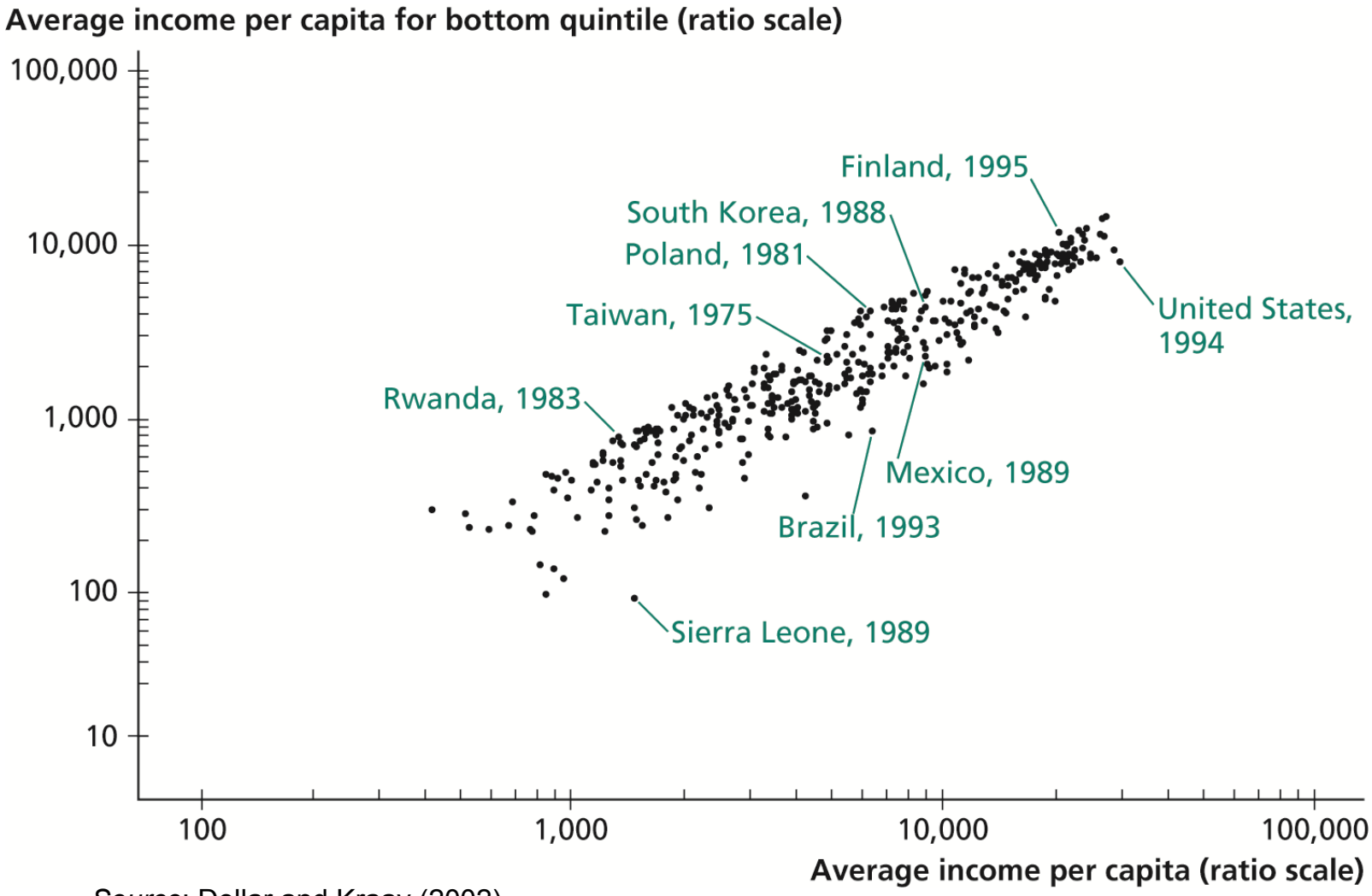
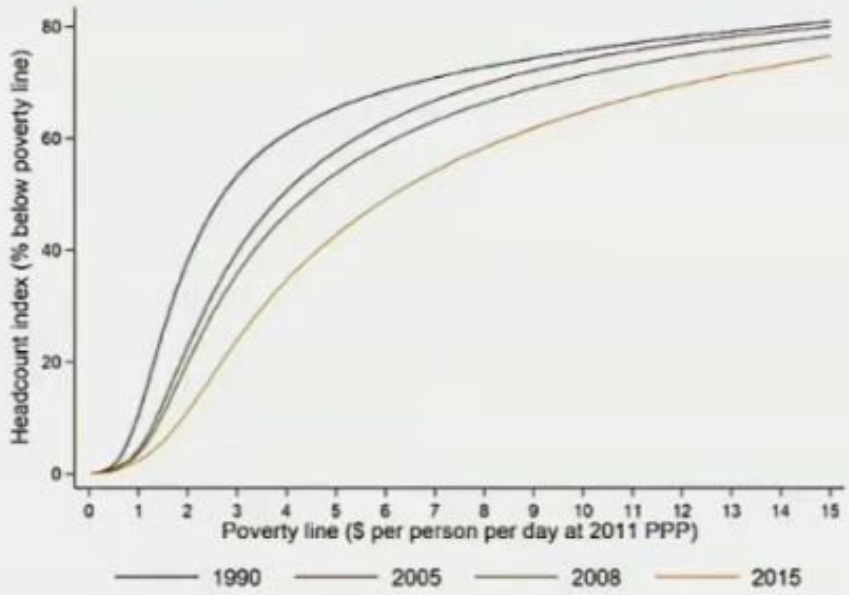
Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. Journal of economic growth, 7(3), 195-225.



Source: Dollar and Kraay (2002).

Graphic from: Weil (2013)

iii. The decline over the last 25 years is robust to the choice of poverty line



World cdf for household consumption per capita, truncated at the US poverty line. First order stochastic dominance holds across all years.

Source: Francisco Ferreira (@fhgferreira)

Questions

What are the questions asked in Dollar and Kraay (2002)?

Questions

- Does the income share of the first quintile vary systematically with average income?
- Do the policies and institutions that raise the average incomes have systematic effects on the share of income accruing to the poorest quintile which might magnify or offset their effects on incomes of the poor?
- Is greater economic integration across countries associated with increases in inequality within countries?
- Do 'pro-poor' policy interventions raise the share of income captured by the poorest in society?

Estimation

$$y^p_{ct} = \alpha_0 + \alpha_1 \cdot y_{ct} + \alpha_2' X_{ct} + \mu_c + \epsilon_{ct}$$

$$y^p_{ct} - y^p_{ct,-k(c,t)} = \alpha_1(y_{ct} - y_{c,t-k(c,t)}) + \alpha_2'(X_{ct} - X_{c,t-k(c,t)} + (\epsilon_{ct} - \epsilon_{c,t-k(c,t)})$$

- c : country index, t : time index
- $y^p ct$: logarithm of per capita income of the poor
- y_{ct} : logarithm of per capita income
- X_{ct} : additional control variables
- μ_c : country fixed effects
- System GMM
- restriction coefficients in the level and difference equations are equal
- Null: $\alpha_1 = 1$

Does the income share of the first quintile vary systematically with average income?

Table 3. Basic specification.

	Estimates of Growth Elasticity				
	(1) Levels No Inst	(2) Inst	(3) Differences No Inst	(4) Inst	(5) System
Intercept	− 1.762	− 2.720			− 1.215
	(0.210)***	(1.257)**			(0.629)*
Slope	1.072	1.187	0.983	0.913	1.008
	(0.025)***	(0.150)***	(0.076)***	(0.106)***	(0.076)***
P-Ho: $\alpha_1 = 1$	0.004	0.213	0.823	0.412	0.916
P-OID				0.174	0.163
T-NOSC					− 0.919
# Observations	269	269	269	269	269

	First-Stage Regressions for System	
	Dependent Variable:	
	ln (Income)	Growth
Intercept	8.238	
	(0.064)***	
Lagged Growth	0.956	
	(0.293)***	
Lagged Income		0.011
		(0.002)***
Twice Lagged Growth		0.284
		(0.094)***
P-Zero Slopes	0.007	0.001

Notes: The top panel reports the results of estimating equation (1) (columns 1 and 2), equation (4) (columns 3 and 4), and the system estimator combining the two (column 5). OLS and IV refer to ordinary least squares and instrumental variables estimation of equations (1) and (4). The bottom panel reports the corresponding first-stage regressions for IV estimation of equations (1) and (4). The row labeled P-Ho: $\alpha_1 = 1$ reports the *p*-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled P-OID reports the *p*-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the *t*-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

Table 4. Variants on the basic specification.

	Regional Dummies		Regional Dummies Common Trend		Regional Dummies Slopes Differ by Decade		Regional Dummies Slopes Differ by Region		Regional Dummies Slopes Differ with Income		Regional Dummies Slopes Differ +/− Growth	
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.
Constant	− 0.114	0.876	− 0.050	4.824	− 0.465	0.698	− 4.308	1.421***	− 0.762	0.815	− 1.254	0.647*
ln (per capita GDP)	**0.905**	**0.094****	**1.003**	**0.139****	**0.941**	**0.079****	**1.355**	**0.153****	**0.988**	**0.196****	1.027	0.070***
EAP	− 0.168	0.102*	− 0.079	0.143	− 0.127	0.088	3.733	1.568**	− 0.103	0.064	− 0.050	0.081
ECA	− 0.023	0.147	0.085	0.202	0.003	0.131	2.965	3.944	0.050	0.115	0.132	0.109
LAC	− 0.618	0.121***	− 0.512	0.166***	− 0.572	0.101***	8.244	3.083***	− 0.542	0.095***	− 0.490	0.095***
MENA	− 0.275	0.140**	− 0.152	0.199	− 0.246	0.118**	2.213	2.380	− 0.189	0.100*	− 0.127	0.109
SA	− 0.079	0.208	0.128	0.311	0.000	0.166	2.615	1.616	0.055	0.135	0.185	0.154
SSA	− 0.685	0.288**	− 0.369	0.355	− 0.550	0.243**	2.111	2.008	− 0.422	0.170**	− 0.384	0.210*
Time			0.000	0.003								
$y \times$ 1970s					− 0.001	0.008						
$y \times$ 1980s					0.003	0.010						
$y \times$ 1990s					0.005	0.010						
$y \times$ EAP							− 0.413	0.173**				
$y \times$ ECA							− 0.290	0.474				
$y \times$ LAC							− 1.019	0.368***				
$y \times$ MENA							− 0.243	0.285				
$y \times$ SA							− 0.239	0.188				
$y \times$ SSA							− 0.230	0.256				
$y \times$ y90									− 0.001	0.013		
$y \times$ (Dummy Negative Growth)											0.009	0.008
P-Ho: $\alpha_1 = 1$	**0.313**		**0.983**		**0.455**		**0.020**		**0.949**		**0.694**	
P-OID	0.390		0.240		0.126		0.133		0.209		0.174	
T-NOSC	− 0.948		− 0.921		− 0.938		− 1.571		− 0.932		− 0.907	
# Observations	269		269		269		269		269		269	

Notes: The row labeled P-Ho: $\alpha_1 = 1$ reports the p-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled P-OID reports the p-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the t-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

Result 1

- We cannot reject the null hypothesis that the income share of the first quintile does not vary systematically with average incomes.
- There is no systematic relationship between average incomes and the share of income accruing to the poorest the income distribution.

Do the policies and institutions that raise the average incomes have systematic effects on the share of income accruing to the poorest quintile which might magnify or offset their effects on incomes of the poor?

Growth Determinants and Incomes of the Poor

Table 5. Growth determinants and incomes of the poor.

	Trade Volumes		Government Consumption/GDP		log(1 + Inflation Rate)		Financial Development		Rule of Law Index		All Growth Variables		All Growth Variables, Instrument	
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.
ln (per capita GDP)	**1.094**	**0.108*****	**1.050**	**0.085*****	**1.020**	**0.089*****	**0.995**	**0.119*****	**0.914**	**0.105*****	**1.140**	**0.100*****	**1.020**	**0.128*****
(Export + imports)/GDP	− 0.039	0.088									0.023	0.056	− 0.067	0.208
Government consumption/ GDP			− 0.571	0.419							− 0.746	0.386*	0.401	1.013
ln(1 + inflation)					− 0.136	0.103					− 0.163	0.107	− 0.216	0.077***
Commercial bank assets/total bank assets							0.032	0.257			− 0.209	0.172	0.264	0.282
Rule of law									0.084	0.069	− 0.032	0.060	− 0.011	0.071
P-Ho: $\alpha_1 = 1$	**0.386**		**0.555**		**0.825**		**0.968**		**0.412**		**0.164**		**0.876**	
P-OID	0.257		0.168		0.159		0.350		0.279		0.393		0.716	
T-NOSC	− 0.751		− 0.506		− 0.261		− 0.698		− 0.945		− 0.762		− 0.563	
# Observations	223		237		253		232		268		189		137	

Notes: All regressions include regional dummies. The row labeled P-Ho: $\alpha_1 = 1$ reports the *p*-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled *p*-OID reports the P-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the *t*-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

- openness to international trade
- macroeconomic stability
- moderate size of government
- financial development
- strong property rights
- rule of law
- We find little evidence that these policies and institutions have systematic effects on the share of income accruing to the poorest quintile.
- The only exceptions are that there is some weak evidence that smaller government size and stabilization from high inflation disproportionately benefit the poor by raising the share of income accruing to the bottom quintile.

Table 6. Growth and distribution effects.

	Growth Regression		Income of Poor Regression		Standard Deviation	Growth Effect	Distribution Effect
	Coefficient	Std. Err.	Coefficient	Std. Err.			
Income			1.140	0.101***			
Lagged income	0.668	0.169***					
Lagged inequality	− 0.089	0.062					
Secondary education	0.097	0.057*					
Trade volumes	0.045	0.074	0.024	0.056	0.280	0.035	0.012
Inflation	− 0.145	0.131	− 0.162	0.107	0.275	− 0.104	− 0.059
Government consumption	− 0.973	0.415**	− 0.744	0.387*	0.054	− 0.143	− 0.060
Financial development	0.374	0.167**	− 0.208	0.172	0.153	0.175	− 0.007
Rule of law	0.180	0.082**	− 0.032	0.060	0.250	0.133	0.011

Notes: The first column reports the results of estimating the growth regression in Equation All regressions include regional dummies. The row labeled P-Ho: $\alpha_1 = 1$ reports the p-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled P-OID reports the p-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the t-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

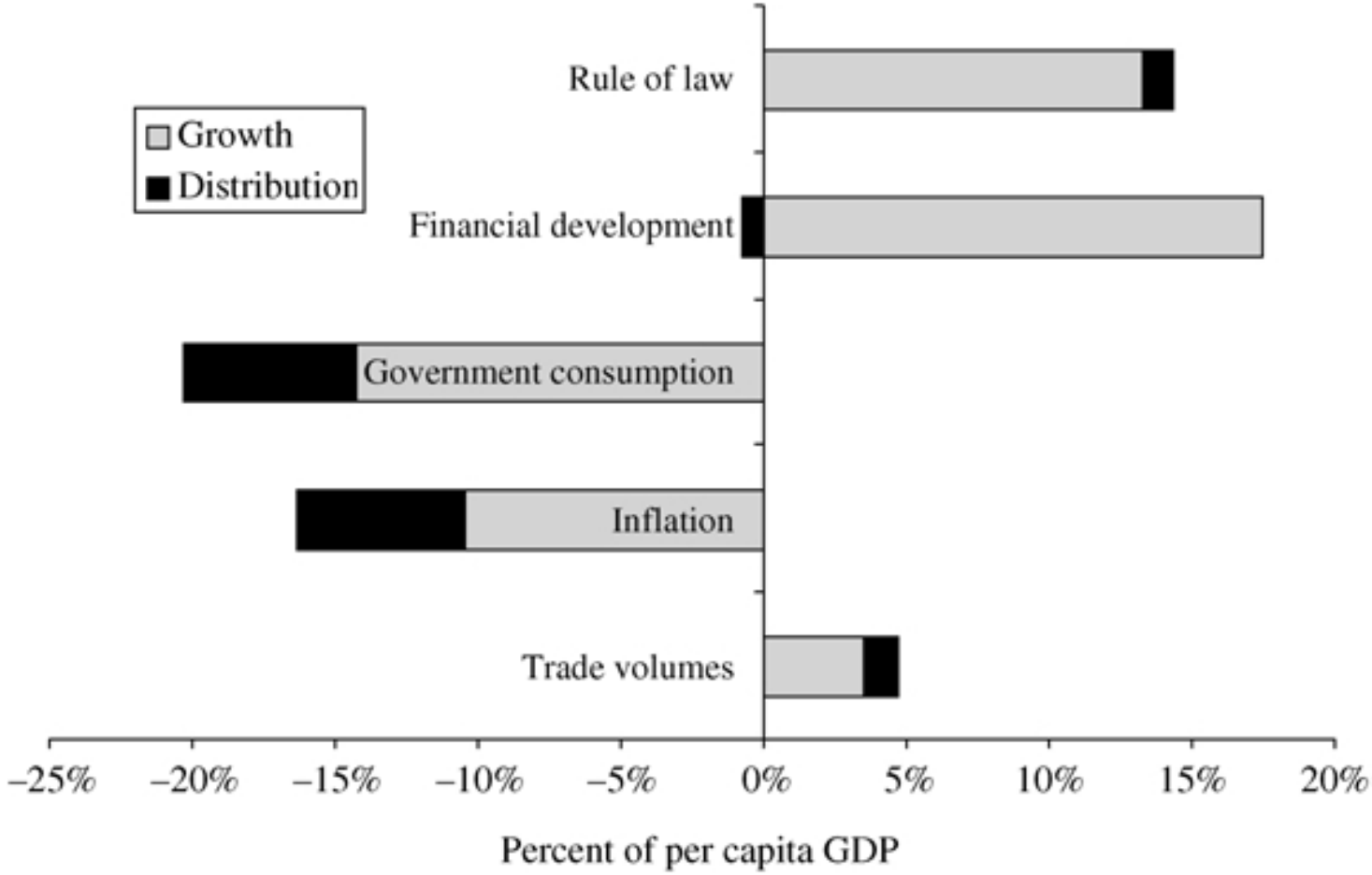


Figure 2. Growth and distribution effects of policies.

The main story here is that the growth effects are large and the distribution effects are small.

Is greater economic integration across countries associated with increases in inequality with countries?

Table 7. Opennes and incomes of the poor.

	Trade Volumes		Adjusted Trade Volumes		Sachs–Warner Trade Policy Index		Import Taxes As Share of Imports		Dummy for WTO Membership		Dummy for Capital Controls	
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.
Basic												
ln (per capita GDP)	**1.094**	**0.108*****	**1.047**	**0.133*****	**1.077**	**0.092*****	**0.936**	**0.136*****	**0.917**	**0.104*****	**0.869**	**0.116*****
Openness measure	−0.039	0.088	−0.038	0.167	−0.071	0.065	−0.161	0.358	0.021	0.043	−0.090	0.051*
P-Ho: $\alpha_1 = 1$	**0.386**		**0.724**		**0.407**		**0.638**		**0.428**		**0.259**	
P-OID	0.257		0.135		0.431		0.074		0.425		0.183	
T-NOSC	−0.751		−0.767		−0.677		1.263		−0.998		−1.084	
# Observations	223		213		234		137		269		208	
Interaction with per capita GDP												
ln (per capita GDP)	**1.102**	**0.092*****	**0.991**	**0.126*****	**1.066**	**0.076*****	**1.013**	**0.082*****	**1.012**	**0.078*****	**0.969**	**0.084*****
Openness measure	−0.323	1.363	1.188	1.601	0.237	0.573	0.604	3.133	−0.026	0.558	−0.515	0.587
Opennes measure × ln (per capita GDP)	0.030	0.146	−0.123	0.169	−0.036	0.072	−0.085	0.396	0.002	0.070	0.052	0.064
P-Ho: $\alpha_1 = 1$	**0.267**		**0.942**		**0.386**		**0.873**		**0.876**		**0.708**	
P-OID	0.218		0.144		0.567		0.126		0.226		0.121	
T-NOSC	−0.742		−0.816		−0.696		1.253		−0.905		−1.005	
# Observations	223		213		234		137		269		208	
Interaction with per capita GDP and land												
ln (per capita GDP)	**1.120**	**0.105*****	**0.901**	**0.099*****	**1.046**	**0.084*****	**1.063**	**0.083*****	**1.101**	**0.072*****	**1.009**	**0.081*****
Openness measure	0.304	1.780	1.161	1.485	0.109	0.605	2.552	2.858	0.513	0.569	−0.574	0.607
ln(arable land/worker)	−0.090	0.031***	−0.086	0.023***	−0.018	0.032	−0.037	0.029	−0.054	0.039	−0.038	0.025
Opennes measure × ln (per capita GDP)	−0.036	0.198	−0.074	0.170	−0.024	0.075	−0.378	0.385	−0.066	0.072	0.050	0.066
Openness measure × ln (arable land per worker)	0.061	0.070	0.245	0.111**	−0.041	0.035	−0.366	0.262	0.016	0.039	−0.023	0.031
P-Ho: $\alpha_1 = 1$	0.253		0.322		0.582		0.443		0.163		0.915	
P-OID	0.030		0.062		0.267		0.082		0.208		0.095	
T-NOSC	−0.755		−0.896		−1.134		0.421		−1.019		−1.492	
# Observations	207		207		219		131		243		193	

Notes: All regressions include regional dummies. The row labeled P-Ho: $\alpha_1 = 1$ reports the *p*-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled P-OID reports the *p*-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the *t*-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

- In all but one case, we cannot reject the null hypothesis that the relevant openness measure is not significantly associated with the income share of the bottom quintile, holding constant average incomes.
- The only exception to this overall pattern is the measure of capital controls, where the presence of capital controls is significantly (at the 10 percent level) associated with a lower income share of the poorest quintile.

Do ‘pro-poor’ policy interventions raise the share of income captured by the poorest in society?

Table 8. Other determinants of incomes of the poor.

	Year Primary Education		Social Spending		Agricultural Productivity		Voice		Voice with Macro Controls	
	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.	Coefficient	Std. Err.
ln(per capita GDP)	**1.067**	**0.088*****	**1.025**	**0.101*****	**0.985**	**0.104*****	**0.933**	**0.095*****	**1.117**	**0.098*****
Years primary education	0.014	0.031								
Government consumption/GDP			− 1.553	0.547***						
Social spending/Total public spending			− 0.664	0.429						
Agricultural relative productivity					0.060	0.081				
Voice							0.095	0.053*	0.029	0.058
P-Ho: $\alpha_1 = 1$	**0.448**		**0.803**		**0.886**		**0.480**		**0.233**	
P-OID	0.213		0.028		0.166		0.302		0.419	
T-NOSC	− 0.384		0.594		− 0.837		− 0.970		− 0.767	
# Observations	222		111		197		265		207	

Notes: All regressions include regional dummies. The row labeled P-Ho: $\alpha_1 = 1$ reports the *p*-value associated with the test of the null hypothesis that $\alpha_1 = 1$. The row labeled P-OID reports the *p*-value associated with the test of overidentifying restrictions. The row labeled T-NOSC reports the *t*-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey–West procedure. * (*) (***) denote significance at the 10 (5) (1) percent levels.

- We find that while years of primary education and relative productivity in agriculture both enter positively, neither is significant at conventional levels.

This of course does not mean that growth is all that is required to improve the lot of the poorest in society, and that the distributional effects of policies should be ignored. As we discuss in greater detail below, **existing cross-country data on income distribution that we use contains substantial measurement error.** We therefore cannot rule out the possibility that our failure to uncover systematic effects of average incomes and policy on the income share of the poorest quintile is simply a consequence of this measurement error. We also cannot rule out the possibility that there are complex interactions between inequality and growth, not captured by our simple empirical models, that net out to small changes in the former that are uncorrelated with the latter.

What is the policy implication of Dollar and Kraay (2002)?

- What we can conclude however is that policies that raise average incomes are likely to be central to successful poverty reduction strategies
- existing cross-country evidence including our own provides disappointingly little guidance as to what mix of growth-oriented policies might especially benefit the poorest in society.
- Look for direct policies that directly targets policy