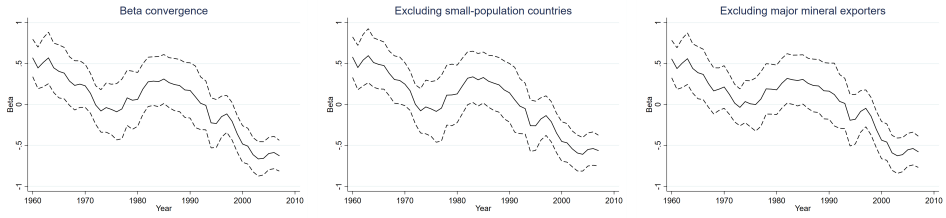
A ONLINE APPENDIX: Figures and tables

A.1 Convergence in income

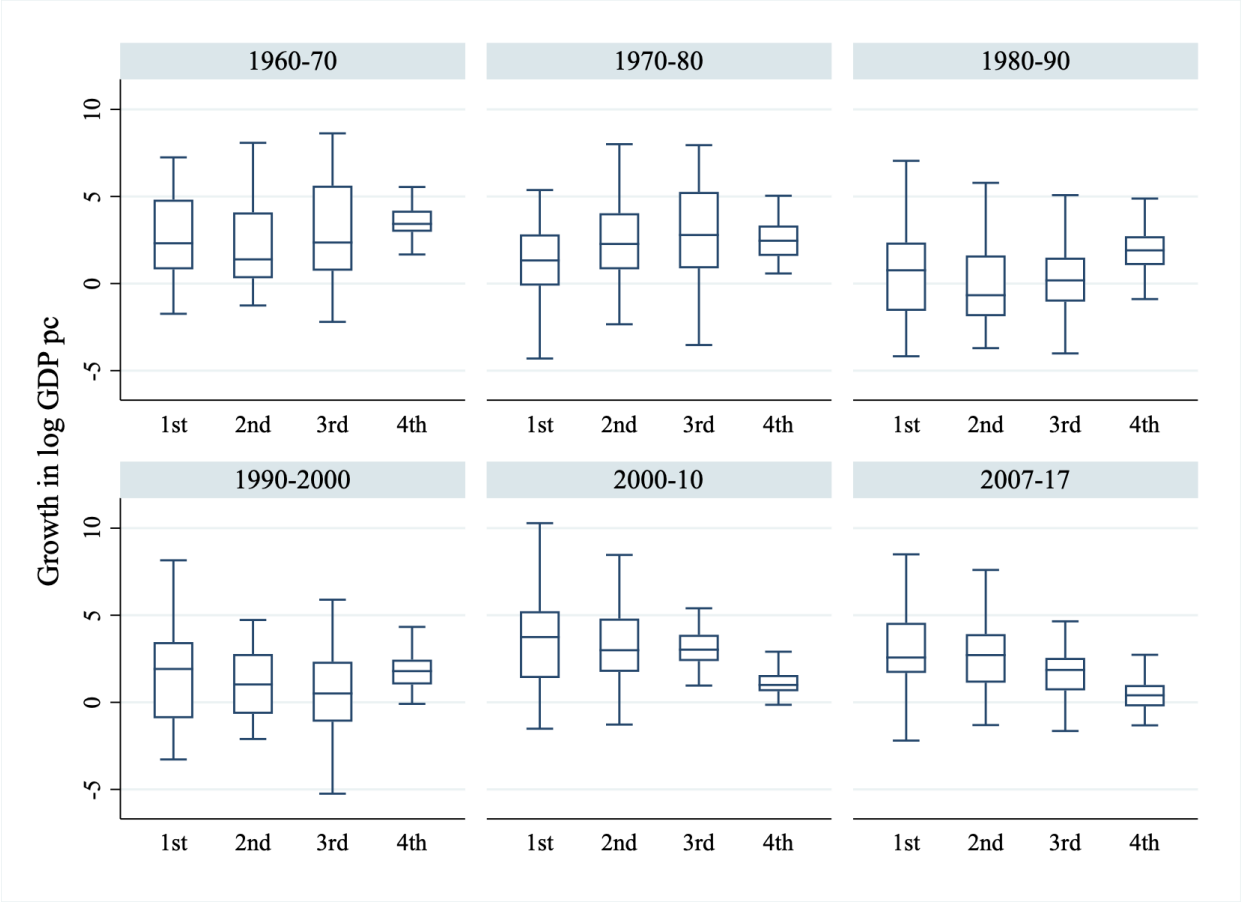
Figure A.1: Robustness of $\beta-$convergence to excluding small countries and major mineral exporters.



(a) Main specification. (b) Excluding small population countries. (c) Excluding major mineral exporters.

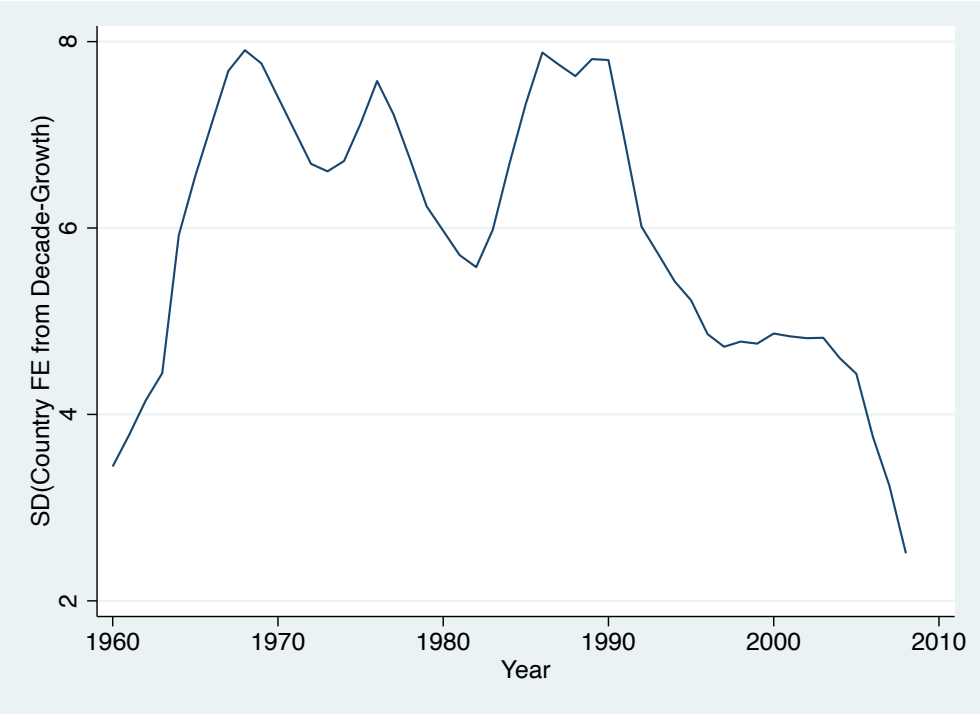
Notes: These graphs show the robustness of the β-convergence plot to natural changes in the set of countries. a) is the original, main specification. b) Excludes countries whose maximum population during the period was $< 200,000$. c) Excludes countries whose natural resources accounted for at least 75% of GDP (as reported in the World Development Indicators) at some time during the period. Dashed lines represent the 90% confidence intervals.

Figure A.2: Boxplot of growth vs. country quintile, split by decade.



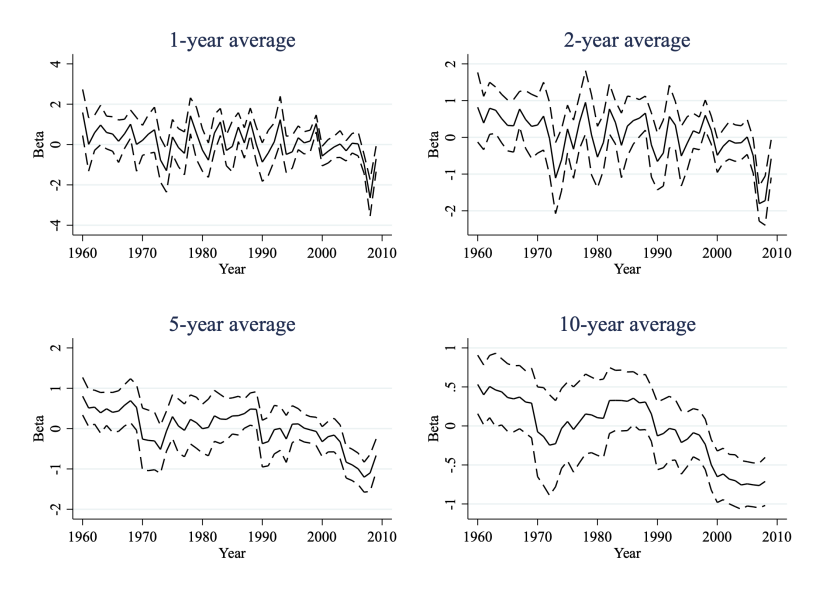
Notes: These are boxplots of the country's average growth in GDP per capita for a decade. Each facet shows one decade. Within a facet, the plot shows how decade average growth varied by quartile of baseline GDP per capita. The top of the box is the 75th percentile of average growth in that quartile, the center is the median (the 50th percentile), and the bottom is the 25th percentile. The whiskers represent the corresponding maximum and minimum. The last decade starts in 2007 since our data runs to 2017.

Figure A.3: σ-convergence of country fixed effects



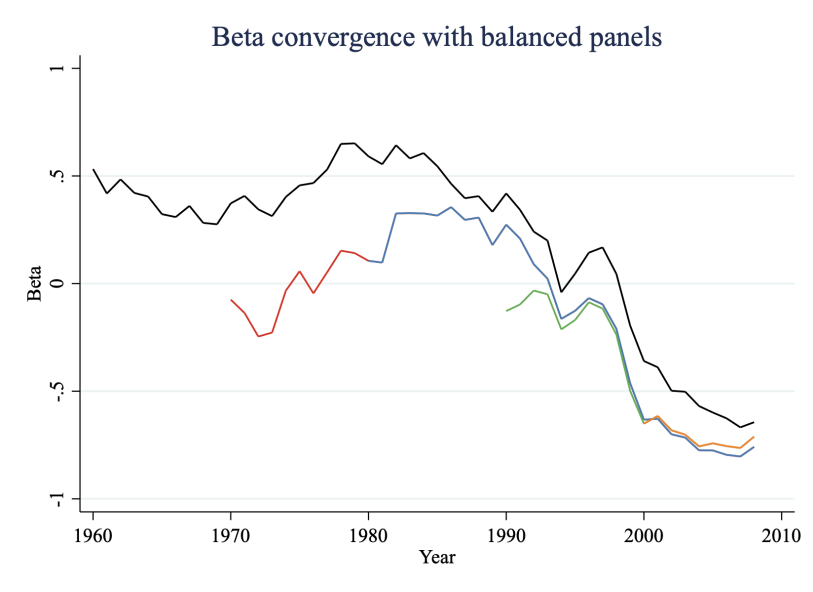
Notes: The figure plots the standard deviations of (decade) country fixed effects in the convergence regression, by year (equation 2, but with a rolling 10-year window).

Figure A.4: Robustness of $\beta-$convergence to averaging period

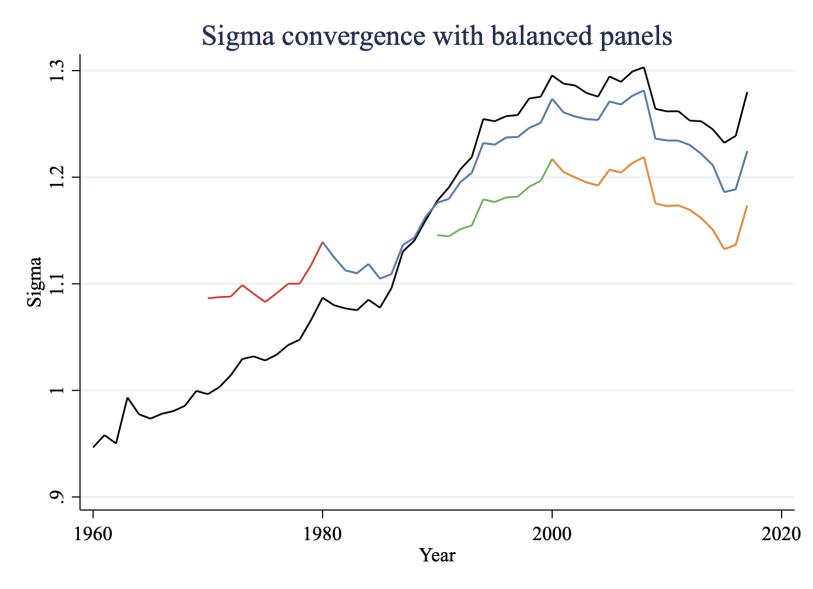


Notes: This figure shows robustness to the averaging period used for β-convergence. In particular, the plots show the β-convergence coefficients using subsequent 1, 2, 5, and 10 year average growth rates.

Figure A.5: Robustness of convergence to balanced panel



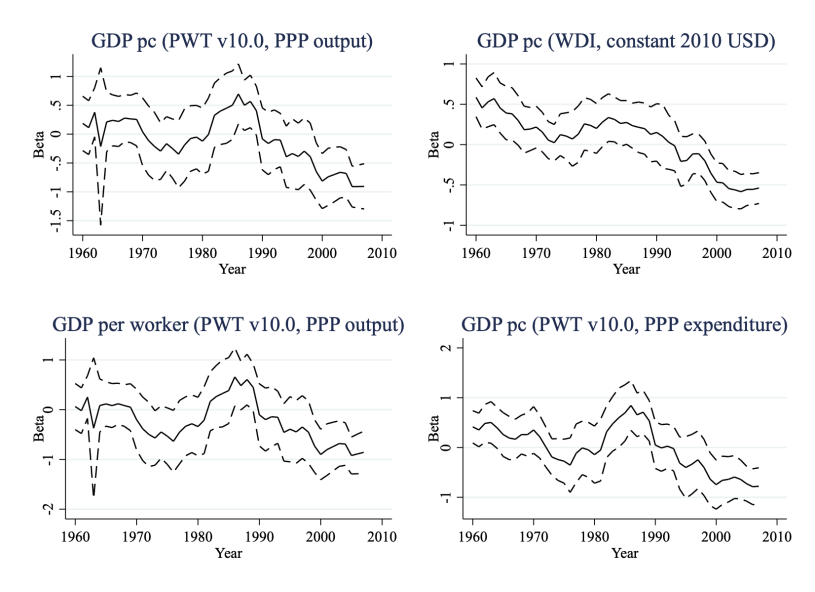
(a) Robustness of $\beta-$convergence.



(b) Robustness of $\sigma-$convergence.

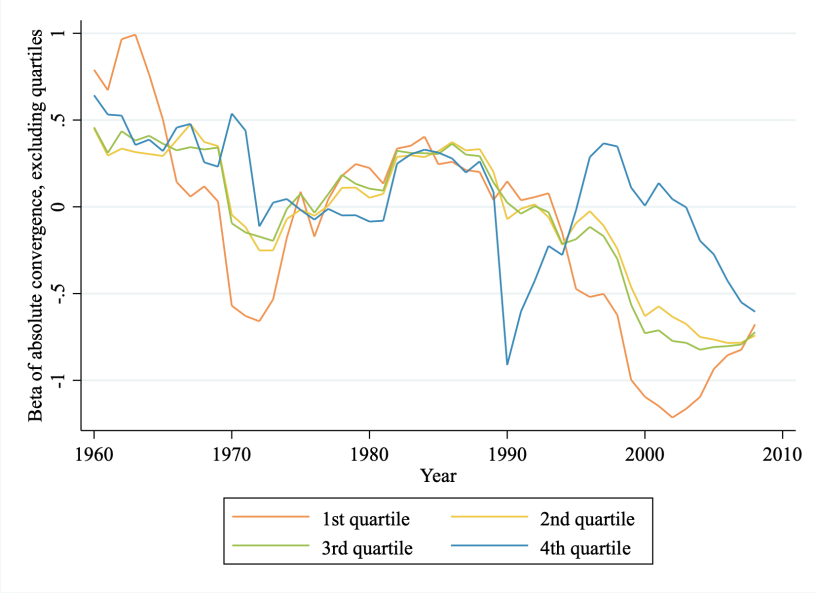
Notes: This figure shows robustness of the convergence coefficients to using balanced panels. Since countries are joining our dataset over time, we plot 5 different curves, one starting at the beginning of each decade. A given decades curve shows the evolution of the convergence coefficients going forward from the start of that decade, based upon the constant set of countries who were in the dataset at the start of that decade.

Figure A.6: Robustness of $\beta-$convergence to measure of output



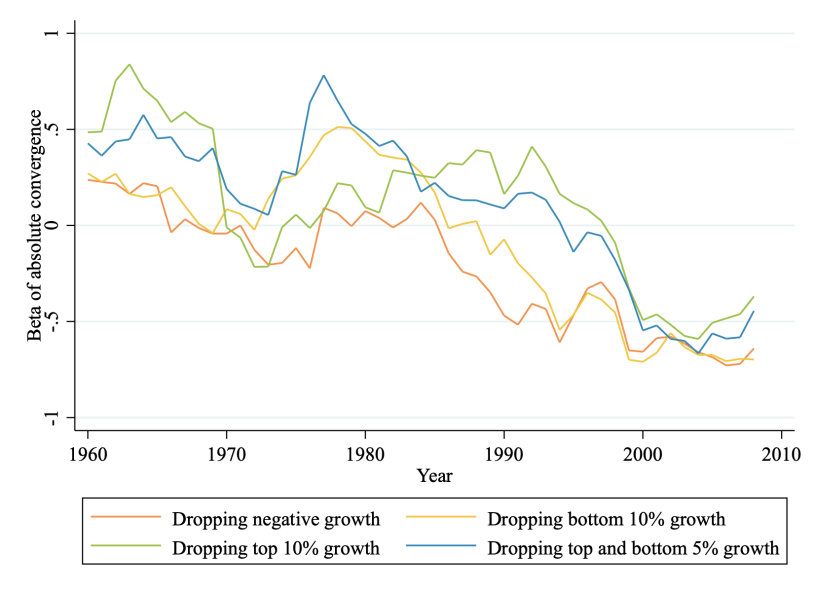
Notes: This figure shows robustness to the outcome used for β-convergence. Our baseline specification uses GPD pc in constant PPP output, from the PWT v10.0.

Figure A.7: Catch-up of the poor or slow-down of the rich? $\beta-$convergence when excluding countries from different quartiles of per capita income



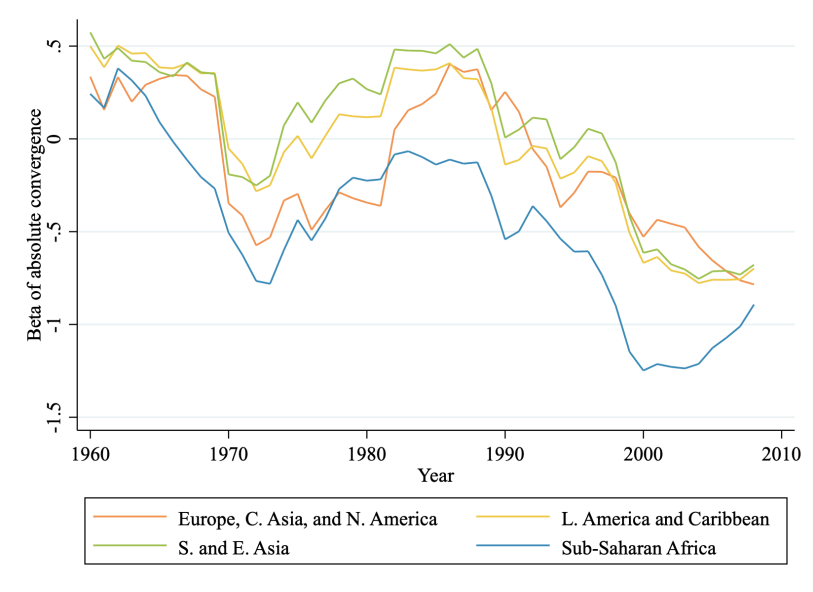
Notes: This figure reports the sensitivity of the absolute convergence coefficient β to excluding different quartiles of wealth from the sample. The legend refers to which wealth quartile is being dropped, where the 1st is the poorest.

Figure A.8: Disasters, growth miracles, and stagnation. $\beta-$convergence when excluding outlying growth rates



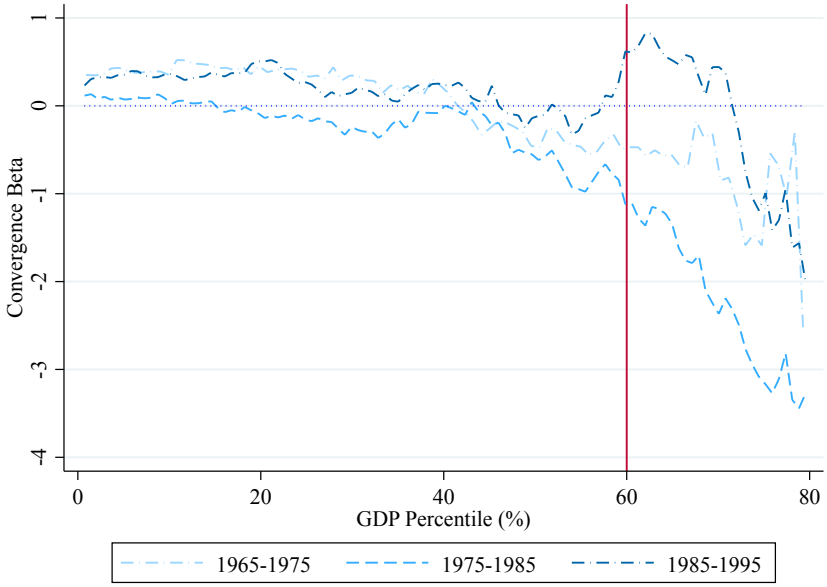
Notes: This figure reports the sensitivity of the absolute convergence coefficient β to excluding countries based on their subsequent 10-year growth (which is conditioning on an outcome variable, but we report here for diagnostic purposes). The legend refers to which countries are being dropped.

Figure A.9: Which regions are converging? $\beta-$convergence when excluding regions

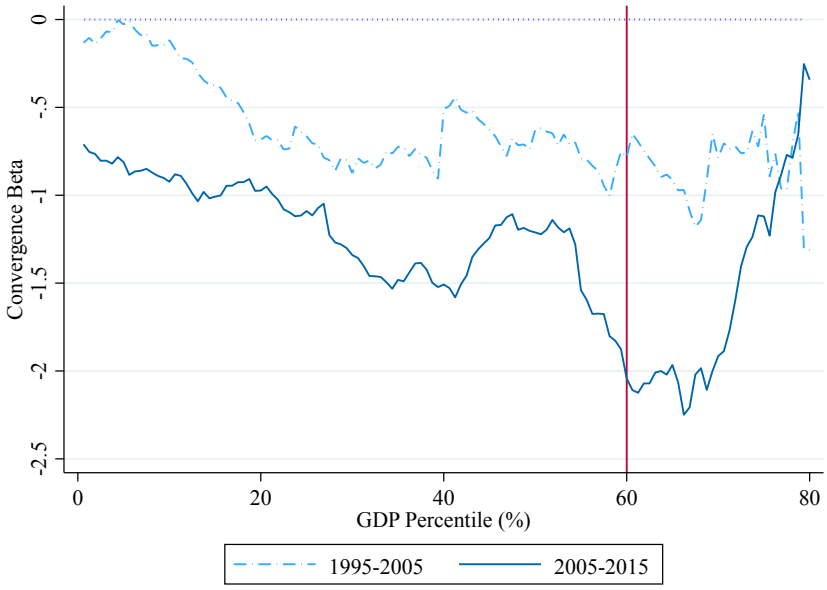


Notes: This figure reports the sensitivity of the absolute convergence coefficient β to excluding different regions. The legend refers to which region is being dropped.

Figure A.10: Club convergence by income



Panel A: Conditional convergence in decades from 1965 to 1995



Panel B: Conditional convergence in decades 1995 to 2005

Notes: This figure plots β convergence conditional on the rank of GDP per capita ($> X\%$), from absolute convergence β ($X = 0$) to β conditional in top 20% income percentile ($X = 80$). Panel A reports the convergence β conditional on income for the three decades in the pre-convergence era: 1965-1975, 1975-1985, and 1985-1995. Panel B reports the β for the two decades in the post-convergence era: 1995-2005 and 2005-2015. The red vertical lines imply the cutoff for the country sub-sample in the top 40% income percentile. The blue dotted lines are the benchmark of no convergence.

Table A.1: Convergence β with country fixed effects

	Panel A: Average growth in next decade ($\Delta t = 10$)					
	1960-1969	1970-1979	1980-1989	1990-1999	2000-2007	
log(GDPpc)	-7.794***	-7.990***	-8.552***	-10.38***	-9.186***	
	(0.896)	(0.820)	(0.685)	(0.625)	(0.849)	
Year FE and Country FE	Y	Y	Y	Y	Y	
Obs	1,107	1,370	1,371	1,600	1,440	
	Panel B: Growth in the next year ($\Delta t = 1$)					
	(1)	(2)	(3)	(4)	(5)	(6)
	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017
log(GDPpc)	-21.56***	-15.30***	-15.76***	-19.99***	-12.86***	-11.52*
	(3.561)	(3.419)	(3.366)	(3.698)	(3.481)	(4.570)
Year FE and Country FE	Y	Y	Y	Y	Y	Y
Obs	1,107	1,370	1,371	1,600	1,600	1,120

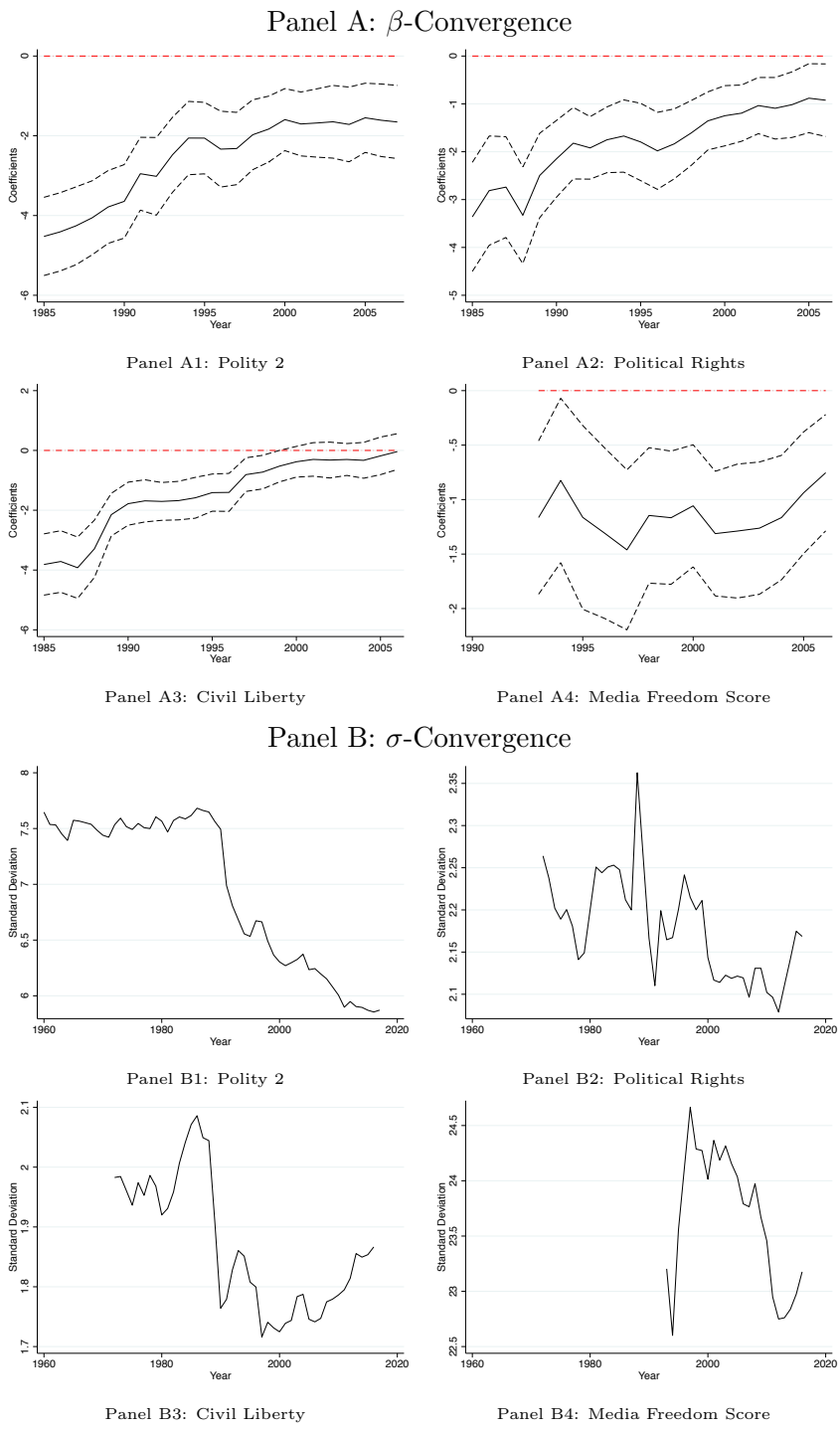
Notes: This table reports the β-convergence estimation with both country and year fixed effects included.

$$log(GDP_{i,t+\Delta t}) - log(GDP_{i,t}) = \beta log(GDP_{i,t}) + \mu_t + \gamma_i + \epsilon_{i,t}$$

The data sample is 1960-2017. Each column reports the β coefficient estimated for each decade. Panel A reports average growth in the next decade ($\Delta t = 10$), and Panel B report growth in the next year ($\Delta t = 1$). Standard deviations are clustered at country level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

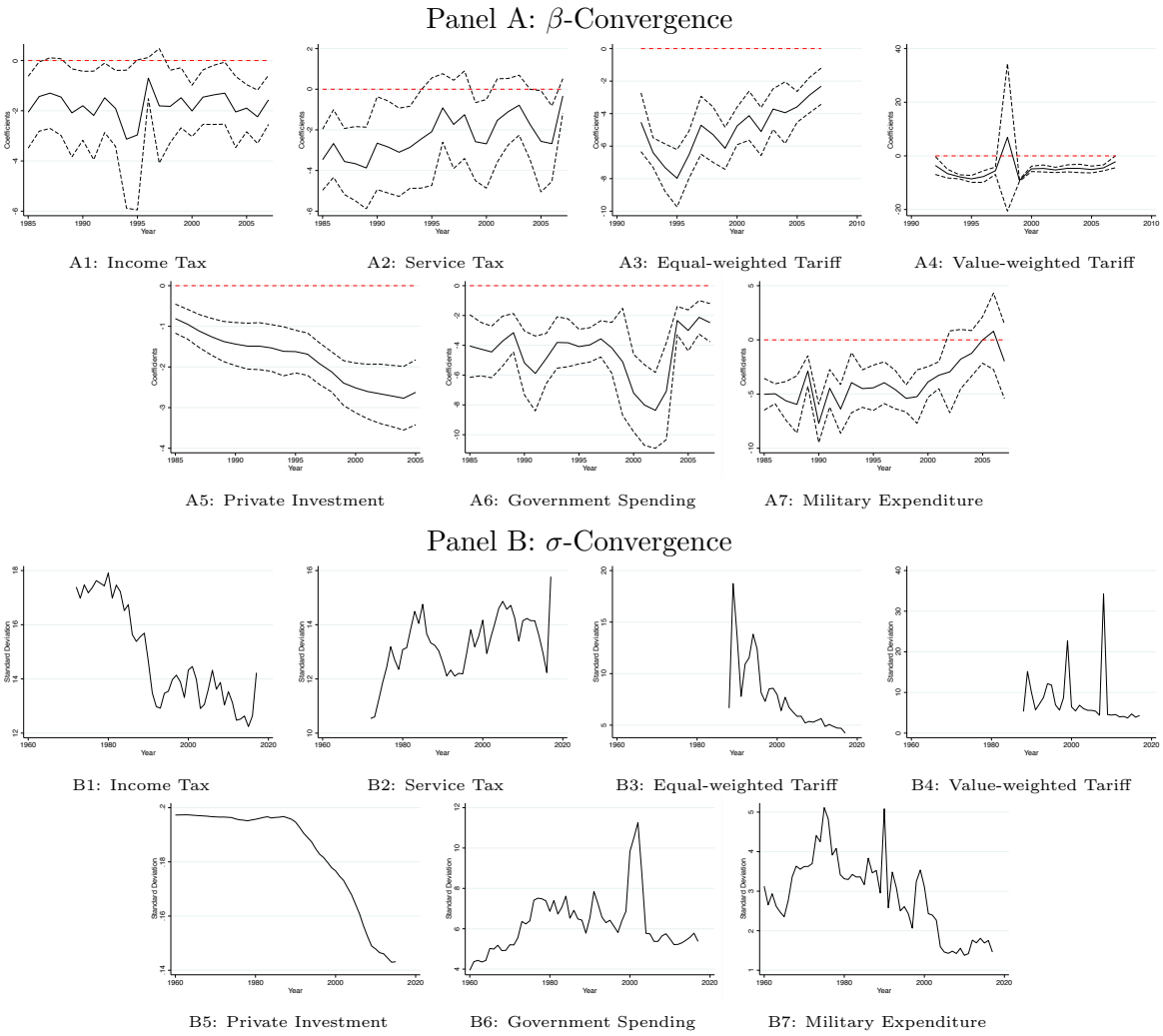
A.2 Convergence in correlates of growth

Figure A.11: Convergence in political institutions



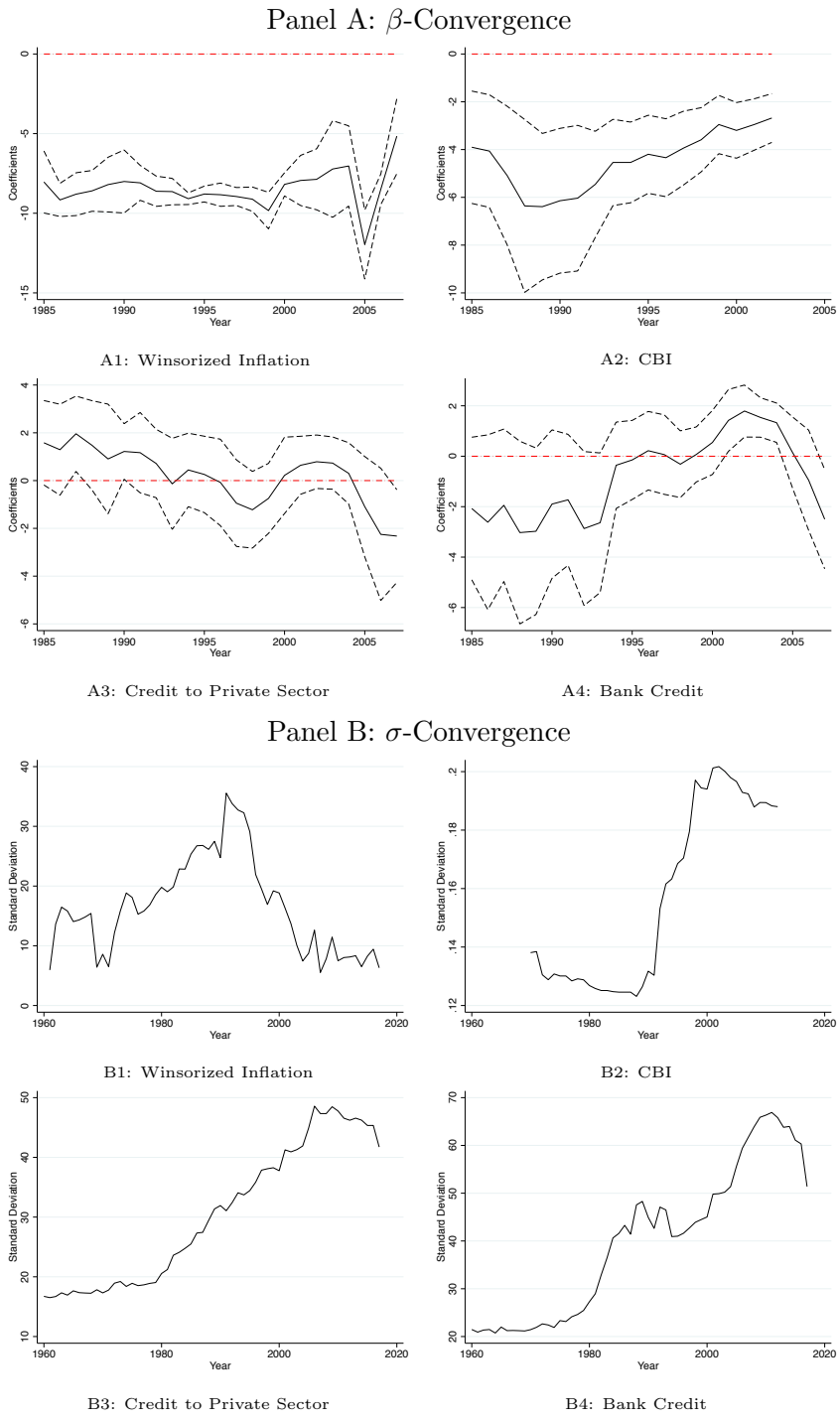
Notes: Political institution measures include Polity 2 score from Center of Systematic Peace (1960-2015), Freedom House political rights score (1973- 2015), Freedom House civil liberty score (1973-2015), Press Freedom score (1995-2015), and WGI political stability. The top panels (A1-A4) report results of β-convergence. The bottom panels (B1-B4) report results of σ-convergence. Dashed lines represent the 90% confidence intervals.

Figure A.12: Convergence in fiscal policies



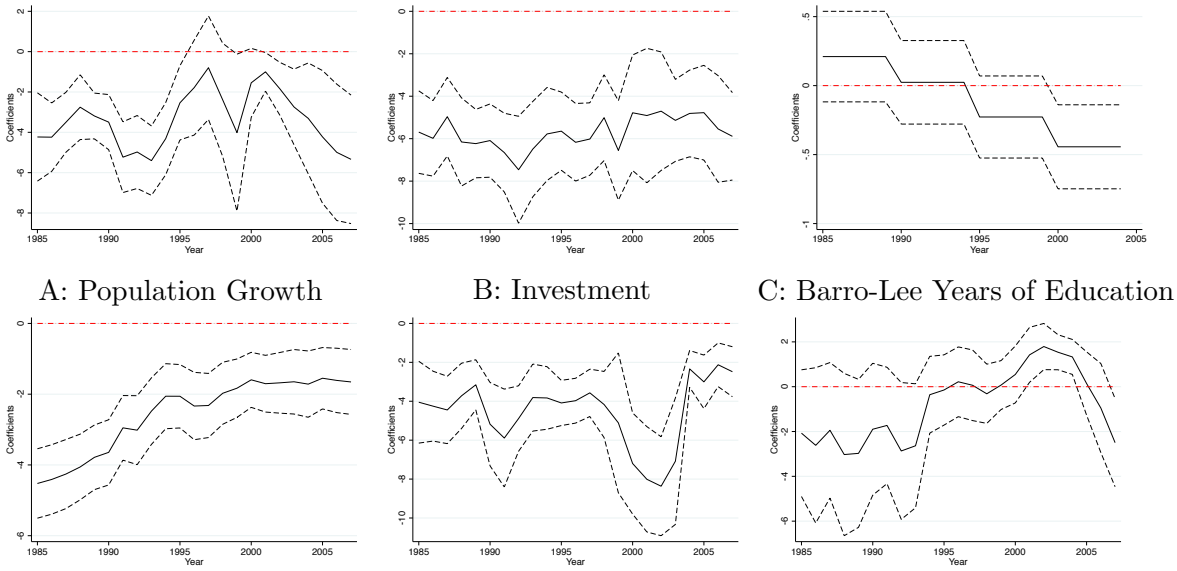
Notes: Fiscal policy measures include tax on income and capital gain (% tax revenue),tax on goods and service (% tax revenue), tax burden score, equal-weighted tariff rate, value-weighted tariff rate, private investment (% total investment), government spending (% GDP), and military expenditure (% GDP). The top panels (A1-A7) report results of β-convergence. The bottom panels (B1-B7) report results of σ-convergence. Dashed lines represent the 90% confidence intervals.

Figure A.13: Convergence in financial institutions



Notes: Financial institution measures include winsorized inflation, central bank independence, credit to private sector, credit by financial sector (bank credit), and financial freedom score. The annual inflation data is winsorized by 100% to reduce the impact of outliers. The top panels (A1-A4) report results of β-convergence. The bottom panels (B1-B4) report results of σ-convergence. Dashed lines represent the 90% confidence intervals.

Figure A.14: Convergence in correlates of growth



A: Population Growth | B: Investment | C: Barro-Lee Years of Education

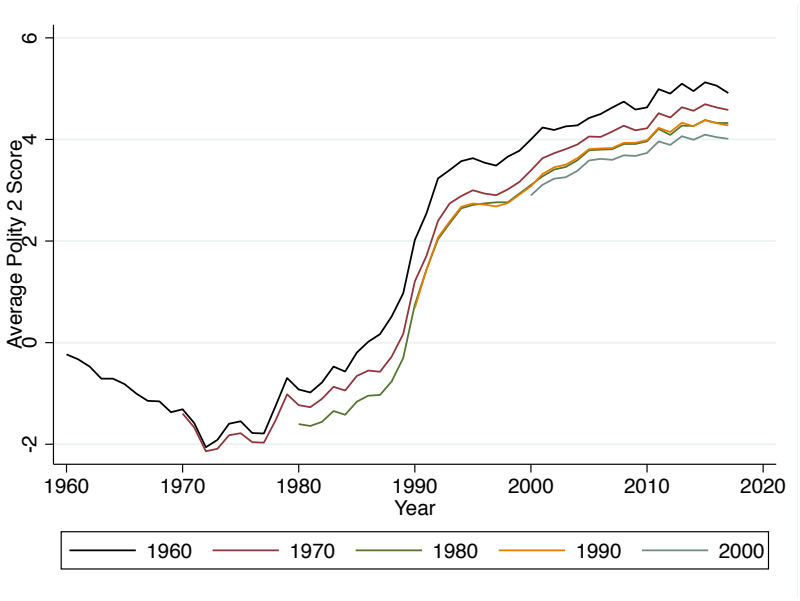
D: Polity 2 | E: Government spending | F: Credit by Financial Sector

Notes: This figure plots the correlate convergence β_t as a function of year t estimated from regressing the correlate change in the next decade (from year t to $t+10$) on the current correlate (in year t):

$$100\frac{Inst_{i,t+10} - Inst_{i,t}}{10} = \beta_t Inst_{t,i} + \mu_t + \epsilon_{t,i}$$

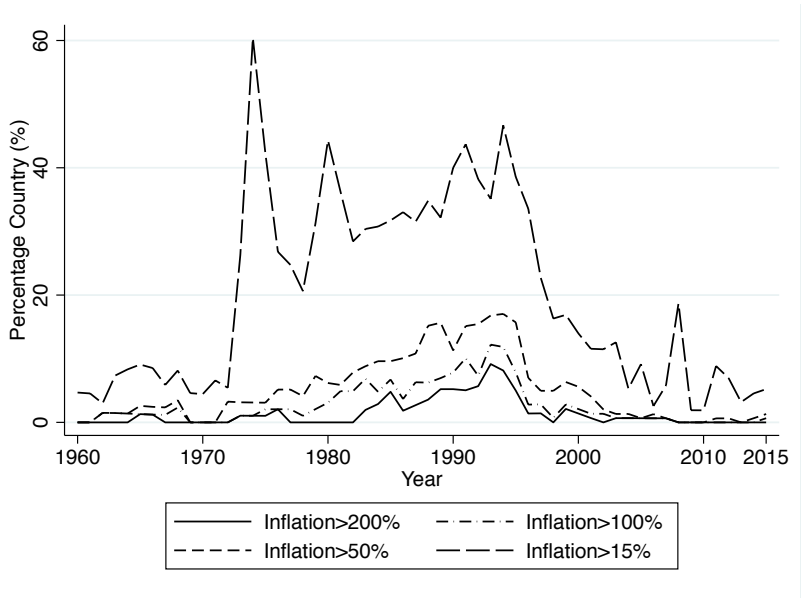
Five institutions are included: polity 2 score, rule of law (WGI), government spending (% GDP), credit provided by the financial sector, and Barro-Lee education attainment of age cohorts from 20 to 60. The dashed horizontal red lines are benchmark $\beta_t = 0$

Figure A.15: Polity 2 score with fixed country samples



Notes: Average Polity 2 score with the country samples available in 1960, 1970, 1980, 1990, and 2000.

Figure A.16: Hyper-inflation over time



Notes: This figure plots four series of the percentage of countries experience inflation above 200%, 100%, 50%, and 15%.

Table A.2: Short-run correlate convergence: joint tests

	Chi-squared	P-value	Number of Institutions
		Panel A: 1996-2006	
Labor Force	4.600	0.100	2
Political Institutions	139.749	0.000	4
Fiscal Policies	512.293	0.000	7
Financial Institutions	216.534	0.000	4
		Panel B: 2006-2016	
Labor Force	21.405	0.000	2
Political Institutions	65.906	0.000	4
Fiscal Policies	239.728	0.000	7
Financial Institutions	284.074	0.000	4

Notes: This table reports the joint significance test for two decades 1996-2006 and 2006-2016. The null hypothesis is that there is no correlate convergence in all Solow fundamentals and short-run correlates (all βs are zeros). 1996 is the first year, we have a full data for all institutional variables. Barro-Lee education and private investment are extended to 2016 with the latest value available in our data (2010 and 2014 respectively).

Table A.3: Polity 2 Score Change by Decade

Decade	Increase in Polity 2	Decrease in Polity 2	Unchanged Polity 2	Obs
1960-1970	19.4%	30.1%	50.5%	103
1970-1980	23.8%	25.4%	50.8%	122
1980-1990	37.3%	9.7%	53.0%	134
1990-2000	52.9%	10.1%	37.0%	134
2000-2010	31.6%	13.3%	55.1%	158
2010-2015	19.3%	6.8%	73.9%	161

Notes: This table reports the portion of countries with an increase, decrease, and unchanged Polity 2 score for each decade: 1960-1970, 1970-1980, 1980-1990, 1990-2000, 2000-2010, and 2010-2015.

Table A.4: Democratization and income by decade

	(1)	(2)	(3)	(4)	(5)	(6)
	1960-1970	1970-1980	1980-1990	1990-2000	2000-2010	2010-2015
	Panel A: Dummy {Increase in Polity 2 Score}					
Log(GDP)	-0.403**	0.0575	0.0707	-0.468***	-0.137	-0.0173
	(-2.36)	(0.44)	(0.63)	(-3.99)	(-1.46)	(-0.18)
Obs	91	114	137	169	193	203
	Panel B: Dummy {Decrease in Polity 2 Score}					
Log(GDP)	-0.328*	-0.690***	-0.438*	-0.0895	-0.292*	-0.280
	(-1.68)	(-3.32)	(-1.81)	(-0.47)	(-1.79)	(-1.22)
Obs	68	96	114	127	154	158

Notes: This table reports the logit regressions of dummies of Polity 2 score increase or decrease on log(GDP). The dependent variable in Panel A is the indicator dummy of the increase in Polity 2 score, and the sample excludes the countries with perfect democracy (where the score increase is not possible). The dependent variable in Panel B is the indicator dummy of the decrease in Polity 2 score, and the sample excludes the countries with perfect dictatorship (where the score decrease is not possible).t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.5: Culture Variables from World Value Survey

Variable	WVS Question ID	Question Content
Trust	A165	Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?
Perception on Inequality	E035	Incomes should be made more equal / We need larger income differences as incentives for individual effort
Politics - Respect for Authority	E018	Greater respect for authority (Good/ Don't mind/ Bad)
Interest in Politics	E023	How interested would you say you are in politics?
Political Actions	E026	Whether you might do the political action or would never under any circumstances do it? Joining in boycotts
Importance of Politics	A004	How important it is in your life? Politics
Importance of Family	A001	How important it is in your life? Family
Importance of Work	A005	How important it is in your life? Work
Religion	A006	How important it is in your life? Religion
Tradition	B016 / A198	Tradition is important to this person/ Which one is more important? Tradition or Economic growth.

Notes: The list of World Value Survey (WVS) questions used to study the dynamics of culture.

Table A.6: Convergence in culture using the World Value Surveys

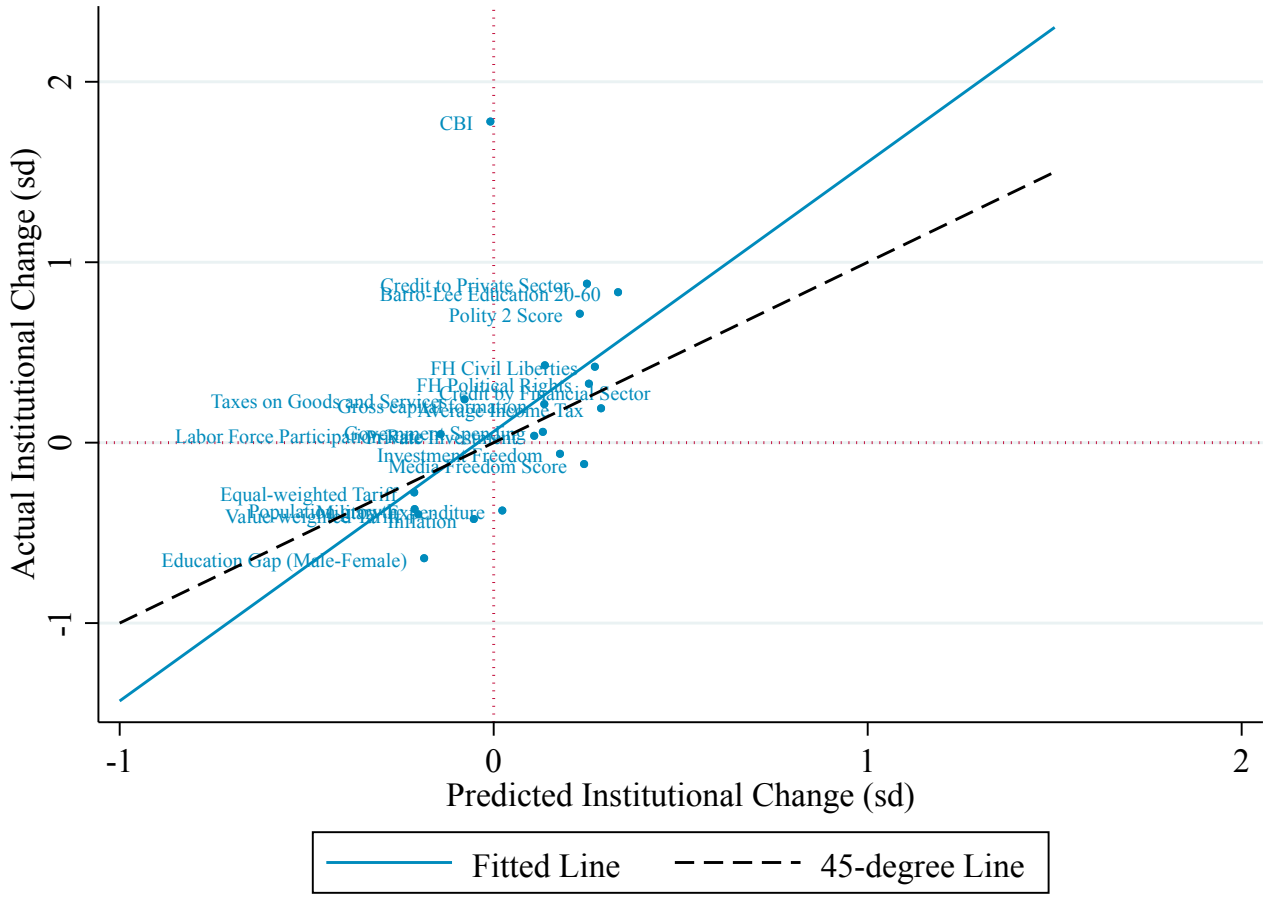
Cultural Variable	Convergence β	Sample Size
Trust	-0.00645	33
	(0.008)	
Perception on Inequality	-0.0265**	32
	(0.0123)	
Politics - Respect for Authority	-0.0177**	32
	(0.0083)	
Interest in Politics	-0.0269**	31
	(0.0104)	
Political Actions (Boycott)	-0.0214***	33
	(0.0051)	
Importance of Politics	-0.0184**	33
	(0.0078)	
Importance of Family	-0.0435***	33
	(0.0085)	
Importance of Work	-0.0329***	33
	(0.0111)	
Religion	0.00376	33
	(0.0048)	
Tradition	-0.0708***	33
	(0.0131)	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports $\beta-$ convergence regressions, for country-level changes in cultural traits in the World Value Surveys (WVS). Country level traits are calculated as the population-weighted average of the traits reported in the WVS. The sample is countries which are surveyed both in Wave 3 (1995-1998) and Wave 6 (2010-2014) of the WVS. To adjust for the different survey frequency, we take the annualized change. Robust standard errors are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

A.3 Linking converging income with convergence of its correlates

Figure A.17: Actual and predicted change in correlates of growth from 1985 to 2015

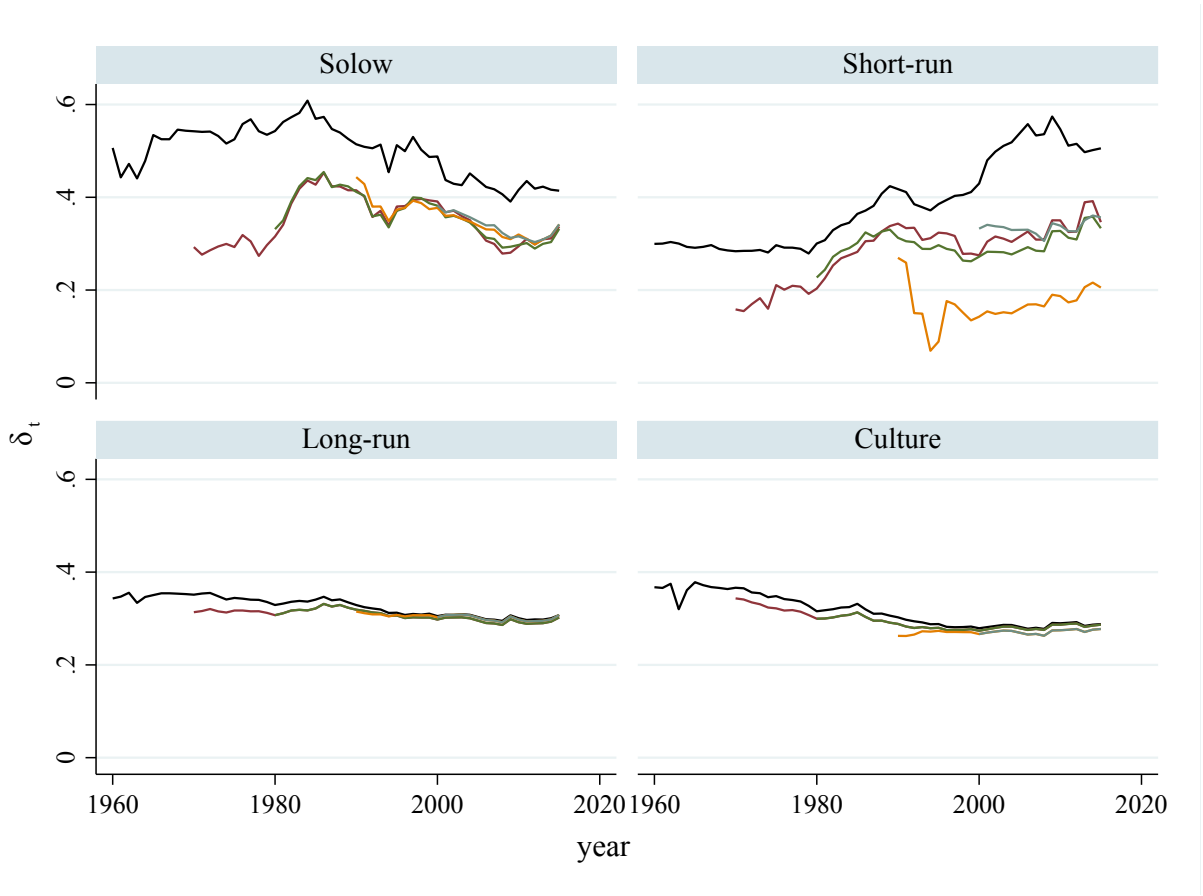


Notes: This figure plots the actual average correlate change from 1985 to 2015 versus the predicted average correlate change due to GDP growth, predicted using the GDP-correlate relationship in 1985 which is estimated by the following regression:

$$\frac{Inst_{i,1985}}{SD(Inst_{1985})} = \delta_{1985} log(GDPpc)_{i,1985} + \nu_{1985} + \epsilon_{i,1985}$$

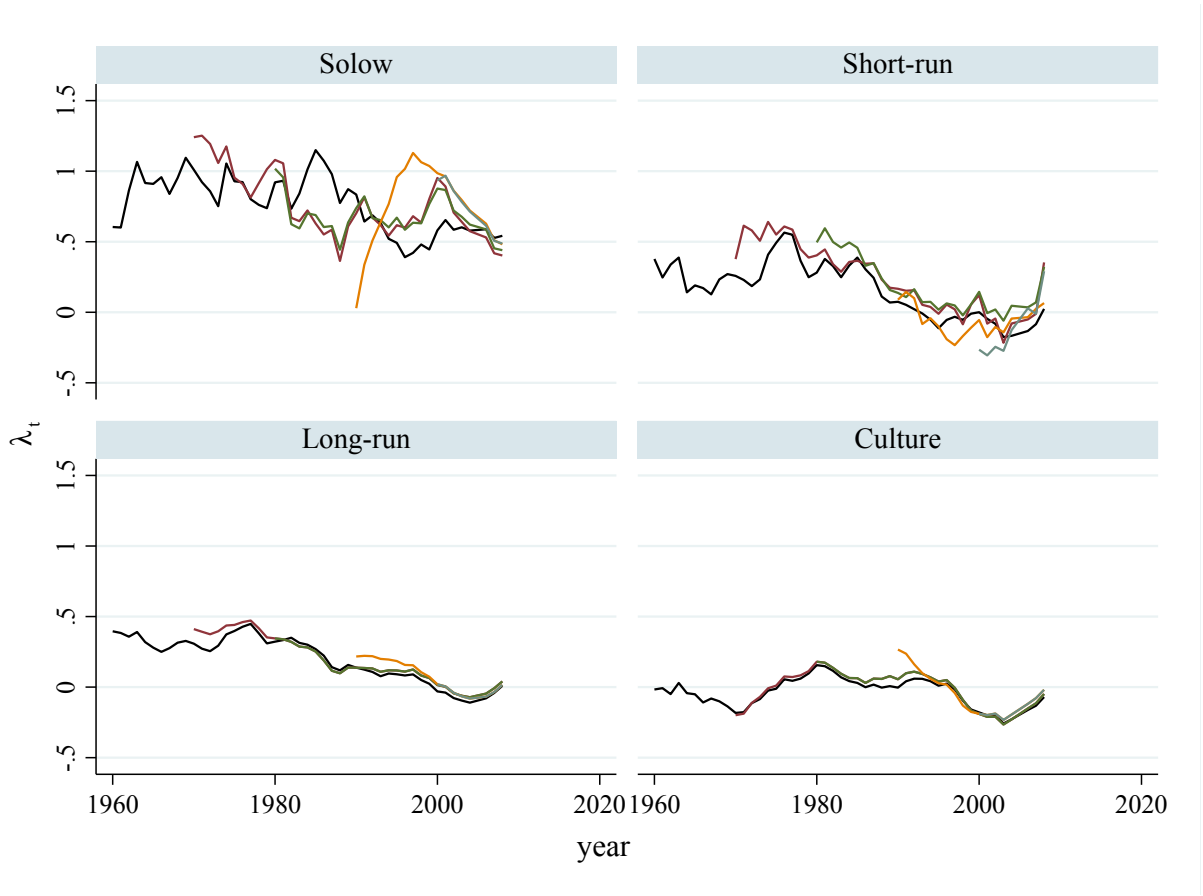
The predicted correlate change (on X-axis) is defined as $\delta_{1985}\text{mean}_i(log(GDPpc)_{i,2015} - log(GDPpc)_{i,1985})$. The actual correlate change (on Y-axis) is defined as $\text{mean}_i\left(\frac{Inst_{i,2015} - Inst_{i,1985}}{SD(Inst_{1985})}\right)$. The solid line is the fitted line of all correlates. The dashed line is the 45-degree degree line as a benchmark.

Figure A.18: Trends in relationship between income and correlates of Growth (δ)



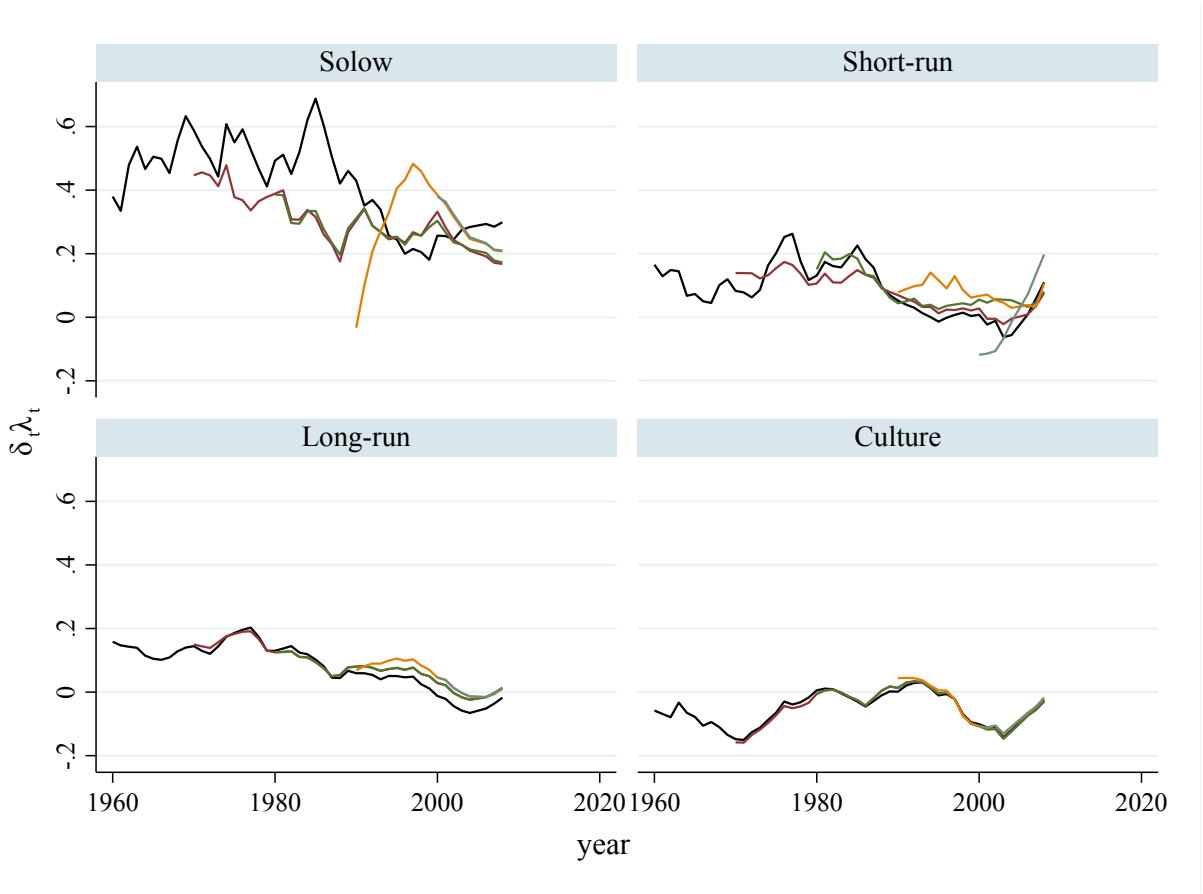
Notes: These figures plot δ_t - the slope of the relationship between income and correlates of Growth - averaged across the different correlates. Each line represents a balanced panel, so that, for example, the line starting in 1960 is estimated from those country-correlate pairs for which data was available in 1960.

Figure A.19: Trends in relationship between growth and correlates of Growth (λ)



Notes: These figures plot λ_t - the growth regression coefficient, controlling for baseline income - averaged across the different correlates. Each line represents a balanced panel, so that, for example, the line starting in 1960 is estimated from those country-correlate pairs for which data was available in 1960.

Figure A.20: Trend in difference between unconditional and conditional convergence, univariate ($\delta\lambda$)



Notes: These figures plot $\delta_t\lambda_t$ - the difference between unconditional and conditional convergence - averaged across the different correlates. Each line is estimated from balanced panels of correlate-country pairs, so that, for example, the line starting in 1960 is the average of those country-correlate coefficients for which data was available starting in 1960, and each country-correlate coefficient is estimated for the set of countries for which income data and that specific correlate were available in 1960.