

Income and Democracy: A Smooth Varying Coefficient Redux – Supplementary Material –

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The following tables correspond directly in number to those in Acemoglu et al. (2008). Table 1 from Moral-Benito and Bartolucci (2012) and Table 1 from Cervellati et al. (2014) were also replicated but are not included. The R code used to generate the results is available upon request.

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Table 1: Descriptive Statistics

	All countries	High-income countries	Low-income countries
	(1)	(2)	(3)
<i>Panel A</i>			
Freedom House measure of democracy	0.53 (0.36)	0.81 (0.27)	0.39 (0.29)
Log GDP per capita _{t-1} (chain weighted 1996 prices)	8.14 (1.03)	9.05 (0.59)	7.38 (0.64)
Observations	692	260	290
Countries	144	57	87
<i>Panel B</i>			
Polity measure of democracy	0.52 (0.38)	0.82 (0.29)	0.39 (0.32)
Observations	626	242	255
Countries	129	49	80
<i>Panel C</i>			
Log population _{t-1}	8.96 (1.75)	9.04 (1.91)	9.03 (1.45)
Education _{t-1}	4.46 (2.74)	6.28 (2.38)	2.89 (1.80)
Observations	488	184	218
Countries	100	44	56
<i>Panel D</i>			
Savings rate _{t-2}	0.16 (0.13)	0.16 (0.12)	0.17 (0.12)
Observations	592	220	251
Countries	125	52	73
<i>Panel E</i>			
Trade-weighted log GDP _{t-1}	10.55 (6.09)	11.96 (6.47)	10.15 (5.56)
Observations	656	249	272
Countries	128	52	76

This table corresponds to Table 1 in Acemoglu et al. (2008). It was generated using the plm library in R.

Table 2: Fixed Effects Results Using Freedom House Measure of Democracy

	Base sample, 1960-2000								
	Five-year data			Annual data			Ten-year data		Twenty-year data
	Pooled OLS	Fixed effects OLS	Anderson-Hsiao IV	Arellano-Bond GMM	Fixed effects OLS	Fixed effects OLS	Fixed effects OLS	Arellano-Bond GMM	Fixed effects OLS
Democracy $_{t-1}$	0.706 (0.035)	0.376 (0.047)	0.457 (0.120)	0.482 (0.098)	0.054 (0.042)	[0.00]	-0.025 (0.074)	0.190 (0.179)	-0.581 (0.121)
Log GDP per capita $_{t-1}$	0.072 (0.010)	0.008 (0.031)	-0.150 (0.308)	-0.078 (0.095)	0.054 (0.042)	[0.45]	0.053 (0.056)	-0.378 (0.234)	-0.030 (0.096)
Hansen J test				[0.10]				[0.03]	
AR(2) test				[0.53]				[0.76]	
Implied cumulative effect of income	0.246 [0.00]	0.012 [0.81]	-0.277 [0.61]	-0.151 [0.40]	0.052 [0.34]	-0.467 [0.10]	-0.019 [0.75]		
Observations	945	945	795	795	958	2664	457	330	192
Countries	150	150	127	127	150	135	127	118	118
R -squared	0.73	0.24			0.12	0.69	0.12		0.45

This table corresponds to Table 2 in Acemoglu et al. (2008). It was generated using the plm library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 3: Fixed Effects Results Using Polity Measure of Democracy

	Base sample, 1960-2000								
	Five-year data			Annual data			Ten-year data		Twenty-year data
	Pooled OLS (1)	Fixed effects OLS (2)	Anderson-Hsiao IV (3)	Arellano-Bond GMM (4)	Fixed effects OLS (5)	Fixed effects OLS (6)	Fixed effects OLS (7)	Arellano-Bond GMM (8)	Fixed effects OLS (9)
Democracy $_{t-1}$	0.749 (0.034)	0.449 (0.058)	0.537 (0.136)	0.591 (0.126)		[0.00]	0.060 (0.077)	0.276 (0.190)	-0.516 (0.103)
Log GDP per capita $_{t-1}$	0.053 (0.010)	-0.006 (0.035)	-0.471 (0.373)	-0.287 (0.116)	-0.011 (0.050)	[0.57]	0.007 (0.060)	-0.688 (0.366)	-0.126 (0.103)
Hansen J test				[0.17]				[0.11]	
AR(2) test				[0.45]				[0.45]	
Implied cumulative effect of income	0.211 [0.00]	-0.010 [0.87]	-1.017 [0.19]	-0.701 [0.01]			0.008 [0.90]	-0.950 [0.03]	-0.083 [0.22]
Observations	854	854	706	706	880	4055	419	300	168
Countries	136	136	114	114	136	137	114	107	100
R -squared	0.77	0.40			0.25	0.85	0.26		0.54

This table corresponds to Table 3 in Acemoglu et al. (2008). It was generated using the plm library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 4: Fixed Effects Results Using Freedom House Measure of Democracy: Robustness Checks

	<i>Five-year data</i>							
	Base sample, 1960-2000, without former socialist countries				Base sample, 1960-2000			
	Balanced panel, 1970-2000							
	Fixed effects OLS (1)	Arellano- Bond GMM (2)	Fixed effects OLS (3)	Arellano- Bond GMM (4)	Fixed effects OLS (5)	Arellano- Bond GMM (6)	Fixed effects OLS (7)	Arellano- Bond GMM (8)
	Dependent variable is democracy							
Democracy $_{t-1}$	0.283 (0.053)	0.365 (0.085)	0.362 (0.048)	0.441 (0.095)	0.353 (0.048)	0.490 (0.091)	0.351 (0.051)	0.469 (0.107)
Log GDP per capita $_{t-1}$	-0.031 (0.045)	-0.272 (0.122)	0.005 (0.033)	-0.094 (0.102)	0.015 (0.037)	0.120 (0.148)	-0.001 (0.045)	0.078 (0.147)
Log population $_{t-1}$				-0.109 (0.091)		0.047 (0.143)	-0.042 (0.100)	-0.006 (0.224)
Education $_{t-1}$							-0.007 (0.018)	-0.014 (0.028)
Age structure $_{t-1}$					[0.01]	[0.21]	[0.09]	[0.49]
Hansen J test		[0.43]		[0.14]		[0.03]		[0.31]
AR(2) test		[0.72]		[0.55]		[0.42]		[0.96]
Implied cumulative effect of income	-0.044 [0.49]	-0.429 [0.03]	0.008 [0.88]	-0.168 [0.34]	0.023 [0.69]	0.236 [0.43]	-0.002 [0.98]	0.147 [0.60]
Observations	630	486	908	780	863	706	676	573
Countries	90	81	128	124	142	117	95	90
R -squared	0.21		0.22		0.24		0.24	

This table corresponds to Table 4 in Acemoglu et al. (2008). It was generated using the plm library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 5: Fixed Effects Results Using Freedom House Measure of Democracy: Two-Stage Least Squares

		With Savings Rate Instrument									
		<i>Base sample, 1960-2000</i>									
		<i>All countries</i>									
		<i>Dependent variable is democracy</i>									
		Pooled OLS (1)	Fixed effects OLS (2)	Fixed effects OLS (3)	Fixed effects 2SLS (4)	Fixed effects 2SLS (5)	Arellano-Bond GMM (6)	Fixed effects 2SLS (7)	Fixed effects 2SLS (8)	Fixed effects 2SLS (9)	
<i>Panel A</i>											
Democracy $_{t-1}$				0.283 (0.042)		0.367 (0.039)	0.484 (0.056)		[0.00]		
Log GDP per capita $_{t-1}$		0.164 (0.020)	0.002 (0.119)	-0.010 (0.115)	-0.074 (0.093)	-0.073 (0.089)	-0.057 (0.068)	-0.066 (0.159)	-0.038 (0.115)	-0.049 (0.097)	
Labor share $_{t-1}$								0.336 (0.172)			
<i>Panel B</i>											
<i>First stage for log GDP per capita$_{t-1}$</i>											
Democracy $_{t-1}$				0.119 (0.056)					[0.00]		
Labor share $_{t-1}$								0.310 (0.169)			
Savings rate $_{t-2}$					1.230 (0.244)	1.092 (0.236)		1.230 (0.259)	1.124 (0.227)	1.016 (0.194)	
Savings rate $_{t-3}$										0.643 (0.180)	
Hansen J test									[0.09]		
AR(2) test									[0.53]		
Implied cumulative effect of income				-0.013 [0.93]		-0.116 [0.42]		-0.111 [0.57]			
Observations	667	672	672	813	810	795	451	681	686		
Countries	123	123	123	129	129	126	96	124	123		
R -squared				0.52	0.52		0.72	0.47	0.48		

This table corresponds to Table 5 in Acemoglu et al. (2008). It was generated using the plm library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 6: Fixed Effects Results Using Freedom House Measure of Democracy: Two-Stage Least Squares
With Trade-Weighted World Income Instrument

		<i>Base sample, 1960–2000</i>								
		<i>All countries</i>								
		<i>Dependent variable is democracy</i>								
		Pooled OLS (1)	Fixed effects OLS (2)	Fixed effects OLS (3)	Fixed effects 2SLS (4)	Fixed effects 2SLS (5)	Arellano-Bond GMM (6)	Fixed effects 2SLS (7)	Fixed effects 2SLS (8)	Fixed effects 2SLS (9)
<i>Panel A</i>										
Democracy $_{t-1}$				0.365 (0.038)		0.393 (0.037)	0.496 (0.114)			
Log GDP per capita $_{t-1}$		0.156 (0.046)	-0.230 (0.130)	-0.149 (0.115)	-0.213 (0.116)	-0.120 (0.101)	-0.043 (0.101)	-0.245 (0.103)	-0.275 (0.151)	-0.207 (0.182)
Trade-weighted democracy $_t$								-0.059 (0.336)		
<i>Panel B</i>										
		<i>First stage for log GDP per capita$_{t-1}$</i>								
Democracy $_{t-1}$				0.183 (0.058)						
Trade-weighted democracy $_{t-1}$								-1.586 (0.896)		
Trade-weighted log GDP $_{t-1}$					0.412 (0.077)	0.418 (0.076)		0.412 (0.075)		0.456 (0.302)
Trade-weighted log GDP $_{t-2}$								0.361 (0.083)		-0.047 (0.295)
Hansen J test							[0.08]			
AR(2) test							[0.51]			
Implied cumulative effect of income				-0.234 [0.21]		-0.197 [0.25]	-0.085 [0.66]			
Observations	856	863	863	906	906	895	795	906	795	678
Countries	123	123	123	124	124	124	127	124	123	121
R -squared				0.50	0.52	0.52	0.48	0.52	0.48	0.48

This table corresponds to Table 6 in Acemoglu et al. (2008). It was generated using the plm library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 7: Fixed Effects Results Using Polity Measure of Democracy In The Long Run

	<i>Balanced panel, 1875-2000</i>				
	Pooled OLS (1)	Fixed Effects OLS (2)	Arellano-Bond GMM (3)	Fixed Effects OLS (4)	Fixed Effects OLS (5)
<i>Panel A</i>					
<i>Dependent variable is democracy</i>					
Democracy $_{t-1}$	0.487 (0.083)	0.192 (0.087)	0.500 (0.154)		0.212 (0.123)
Log GDP per capita $_{t-1}$	0.116 (0.039)	-0.020 (0.103)	-0.076 (0.133)	0.003 (0.103)	0.074 (0.103)
Hansen J test			[0.23]		
AR(2) test			[0.22]		
Implied cumulative effect of income	0.227 [0.00]	-0.024 [0.85]	-0.153 [0.55]		0.093 [0.46]
Observations	150	150	125	150	78
Countries	25	25	25	25	13
R -squared	0.55	0.35		0.33	0.41
<i>Panel B</i>					
<i>Dependent variable is democracy</i>					
Democracy $_{t-1}$	0.233 (0.098)	-0.248 (0.085)	0.446 (0.218)		-0.266 (0.147)
Log GDP per capita $_{t-1}$	0.191 (0.047)	0.039 (0.095)	-0.154 (0.217)	-0.004 (0.088)	0.028 (0.173)
Hansen J test			[0.13]		
Implied cumulative effect of income	0.249 [0.00]	0.031 [0.68]	-0.278 [0.52]		0.022 [0.87]
Observations	111	111	74	111	48
Countries	37	37	37	37	16
R -squared	0.49	0.48		0.44	0.37

This table corresponds to Table 7 in Acemoglu et al. (2008). It was generated using the `plm` library in R. In part because of the different manner in which Stata subsets data, estimates based on IV methods, along with their standard errors (clustered at the country level), may differ somewhat from those of Acemoglu et al. (2008).

Table 8A: Democracy In The Very Long Run

	Base sample, 1500-2000			
	OLS (1)	OLS (2)	OLS (3)	OLS (4)
Change in log GDP per capita over sample period	0.134 (0.021)	0.061 (0.023)	0.088 (0.020)	0.047 (0.023)
Constraint on the executive at independence		0.260 (0.120)		0.164 (0.064)
Independence year/100		-0.206 (0.063)		-0.133 (0.036)
Fraction Muslim			-0.299 (0.097)	-0.233 (0.083)
Fraction Protestant			0.191 (0.112)	0.180 (0.091)
Fraction Catholic			0.155 (0.073)	0.117 (0.069)
Historical factors F-test		[0.00]	[0.01]	[0.00]
Observations	135	135	131	131
R-squared	0.20	0.34	0.40	0.45

This table corresponds to Table 8A in Acemoglu et al. (2008). It was generated using the plm library in R.

Table 8B: Democracy In The Very Long Run (Continued)

	Former colonies sample, 1500-2000						
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)
Change in log GDP per capita over sample period	0.136 (0.019)	0.067 (0.012)	0.099 (0.012)	0.057 (0.013)	0.081 (0.027)	0.025 (0.024)	0.029 (0.026)
Constraint on the executive at independence	0.189 (0.072)	0.189 (0.072)	0.189 (0.075)	0.189 (0.075)	0.166 (0.089)	0.167 (0.087)	0.167 (0.087)
Independence year/100	-0.190 (0.032)	-0.190 (0.032)	-0.105 (0.075)	-0.105 (0.075)	-0.179 (0.023)	-0.128 (0.074)	-0.128 (0.074)
Fraction Muslim	0.023 (0.101)	0.059 (0.105)	0.059 (0.105)	0.059 (0.105)	0.038 (0.088)	0.038 (0.088)	0.038 (0.088)
Fraction Protestant	0.508 (0.258)	0.491 (0.154)	0.491 (0.154)	0.491 (0.154)	0.411 (0.196)	0.411 (0.196)	0.411 (0.196)
Fraction Catholic	0.306 (0.130)	0.277 (0.229)	0.277 (0.229)	0.277 (0.229)	0.200 (0.221)	0.200 (0.221)	0.200 (0.221)
Historical factors F-test Observations	87 87	[0.00] 87	[0.01] 87	[0.00] 87	[0.01] 83	[0.00] 83	[0.00] 83
R-squared	0.20	0.30	0.33	0.37	0.25	0.34	0.38

This table corresponds to Table 8B in Acemoglu et al. (2008). It was generated using the plm library in R.

Table 9: Polynomial Interactions

	y	e	$y \times e$	e^2	$y \times e^2$
AJRY No Interaction	-0.012 (0.035)	-0.012 (0.016)			
Linear e interaction with y	0.007 (0.046)	0.019 (0.052)	-0.004 (0.006)		
Squared e interaction with y	-0.025 (0.066)	-0.211 (0.147)	0.018 (0.018)	0.032* (0.015)	-0.003* (0.001)

Note: This table provides coefficients (with standard errors in parentheses) from the original AJRY specification (1.1) augmented with polynomial education terms interacted with income, where y stands for the lag of income and the e is the lag of education.

Table 10: Sargan Test

	Polity	Freedom House
AJRY	0.029	0.016
MBB	0.106	0.550
CJSV	0.235	0.802
GENERAL	0.999	0.999

Note: This table contains p-values from a Sargan test for various specifications. The columns refer to the two different measures of the democracy variable. “AJRY” refers to the basic fixed effects estimator of equation (1.1) in the manuscript. “MBB” refers to equation (1.2), “CJSV” refers to equation (1.3), and “GENERAL” refers to (1.3) with a quadratic income term interacted as well.