Electing for stability: Democracy and output volatility, 1960-2019

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ABSTRACT

This paper examines the relationship between output volatility and democracy, decade by decade after 1960. Using a range of approaches to identification, we find that democracy lowers volatility.

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1 Introduction

It has often been suggested that GDP in democracies is less volatile than under autocracy. This raises an identification problem: at least in the long run, countries may select into democracy depending on their characteristics. For example, if countries that are inherently more stable are more likely to become democracies, the partial correlation between output volatility and democracy will overstate the benefits of democracy for stability.

In this paper, we examine the cross-section relationship between output volatility and democracy decade by decade from the 1960s. We first consider selection on observables. The use of controls weakens the partial correlation between democracy and output volatility, but it remains sizeable. Since we cannot rule out selection on unobservables, we also present IV estimates, using instruments for democracy taken from Schulz (2022). The results vary but the balance of evidence suggests that democracies are less volatile.

The recent literature finds that democratization leads to faster growth (for example, Acemoglu et al. 2019 and Eberhardt 2022). This work typically uses versions of difference-in-differences, but that approach is harder to apply when studying volatility: unlike growth, volatility at a point in time has to be assessed over a longer span of observations. In addition, the effect of democratization on volatility may miss some of the long-run effects of consolidated democracy.

Mobarak (2005) found that democracies are less volatile, instrumenting democracy using a dummy variable for countries with Muslim majority populations. Our work complements his by using other approaches to identification. Berg et al. (2012), Bluhm et al. (2020), Knutsen (2021), and Imam and Temple (2024) all find that autocracies are relatively unstable, using a range of methods. On political institutions more broadly see, among many others, Acemoglu et al. (2003) and Malik and Temple (2009).

2 Data

The time span considered is 1960-2019, and country-decades are the unit of observation. To measure output volatility for each country, we first use the standard deviation of

annual growth rates for each decade, using the national accounts data underlying version 10.01 of the Penn World Table (Feenstra et al. 2015). We call this measure VOL.

For political regimes, we use version 14 of the V-Dem dataset (Coppedge et al. 2024 and Pemstein et al. 2024). We classify country-decades using an approach similar to that in Millemaci et al. (2024). We start from the classification provided by the Regimes of the World variable (RoW) in the V-Dem data. We then consider a country-decade one of stable democracy if, throughout the entire decade, it was categorized as either an electoral or a liberal democracy. All other cases are treated as instances of non-democracy, so that we have a binary democracy indicator.

3 Results

We first estimate average treatment effects (ATEs) under selection on observables, assuming that the treatment effect is constant across countries but may vary over time. As well as presenting simple models that adjust for observable variables, we use a LASSO-based approach to estimate the average treatment effect in the presence of potentially many controls and a logit selection equation. The array of candidate controls draws on the paper on comparative development by Acemoglu et al. (2001); they include a set of religion and legal origin dummies, geographic and climate proxies, and the log of population density. For more details see Millemaci et al. (2024).

We estimate cross-sections decade by decade, and report the results in the upper panel of Table 1. We report standard errors that are heteroskedasticity-consistent; in the upper panel, for the estimation methods other than LASSO, we use the 'hc3' estimates of MacKinnon and White (1985). The table shows that adding exogenous covariates weakens the effect of democracy in three cases out of six. Compared to simple regression adjustment, the use of LASSO leads to more precise estimates, significant at least at the 10% level in each decade. Hence, selection on this set of observables does not explain away the partial correlation between VOL and the extent of democracy. Democracy reduces VOL by 0.5 of a (cross-section) standard deviation in the 1960s, and by between 0.19

and 0.54 standard deviations in the five subsequent decades.

Given the evidence for selection on observables, selection on unobservables will be more of a concern. Our IV approach draws on Schulz (2022). He argues that the Catholic Church's medieval marriage regulations worked to dissolve strong kin networks, thereby contributing to the emergence of participatory institutions at the country and municipal levels. In his cross-country results, ancestor-adjusted Eastern and Western Church exposure are strongly associated with the Polity IV democracy index.

The IV results using Schulz's instruments are shown in the lower panel of Table 1. We first present results from a 2SLS estimator. In the later decades, democracy has a stronger effect on VOL than in the upper panel. This could be attributed to some combination of measurement error in the democracy indicator, selection on unobservables in the upper panel, or endogeneity of the instrument. On the latter, note that Hansen J-tests do not reject the over-identifying restrictions. The strength of the instruments varies, so we supplement the 2SLS estimates with bias-adjusted LIML, using the Fuller (1977) estimator with associated parameter of unity.

In Table 2 we estimate the same models in samples which exclude high-income countries. In the LASSO results, the negative effect of democracy on volatility is significant at the 5% level in four decades out of six. The 2SLS and LIML estimates are rather weaker than before, but the point estimates are always negative, and significant at the 5% level in the 1980s and 1990s.

We now turn to an alternative measure of volatility, $VOL2$. For each country, this is the standard deviation of the residuals from an AR(3) autoregressive model for annual growth rates in that country. Compared to the first measure, this comes closer to measuring uncertainty, isolating the variation not predicted by a simple time series model. The pattern of results in Table 3 is similar to that in Table 1, but perhaps slightly weaker. In Table 4 we exclude high-income countries. Using this alternative volatility measure, the LASSO and 2SLS results continue to suggest that democracy lowers volatility, even when we exclude high-income countries. Once again the Hansen J-tests do not reject the over-identifying restrictions.

In further results (not shown) we supplement the Schulz instruments with an irrigation-based instrument for democracy from Bentzen et al. (2017). They show that the share of agricultural land inherently suitable for irrigation is correlated with modern-day political institutions. The exclusion restriction for this instrument could be questioned. When we use this instrument, it weakens the set of instruments in the first stage but, as before, Hansen J-tests do not reject the over-identifying restrictions. The ATEs are closely in line with those we report.

Table 1: ATEs for democracy and volatility

	I 1960s b/se	II 1970s b/se	III 1980s b/se	IV 1990s b/se	V 2000s b/se	VI 2010s b/se
ATE	-0.024***	-0.025***	-0.024***	-0.034***	-0.011**	-0.011***
	(0.005)	(0.004)	(0.004)	(0.008)	(0.004)	(0.004)
ATE with controls	-0.009	-0.010	-0.012*	-0.035***	-0.012**	-0.011*
	(0.007)	(0.007)	(0.006)	(0.010)	(0.005)	(0.006)
ATE using LASSO	-0.015**	-0.010***	-0.005*	-0.025***	-0.009*	-0.013***
	(0.007)	(0.004)	(0.005)	(0.010)	(0.005)	(0.004)
σ_{VOL}	0.030	0.033	0.026	0.063	0.028	0.024
N	98	127	127	150	151	151
ATE (2SLS)	-0.020***	-0.025*	-0.034***	-0.094***	-0.022*	-0.032**
	(0.008)	(0.014)	(0.013)	(0.026)	(0.013)	(0.014)
ATE (LIML)	-0.020***	-0.024*	-0.033***	-0.090***	-0.022*	-0.030**
	(0.007)	(0.014)	(0.012)	(0.025)	(0.013)	(0.013)
2SLS First stage F-stat	37.611	42.002	7.815	12.406	11.126	7.838
Effective F-stat	23.476	25.472	5.617	11.015	7.853	6.276
Kleibergen-Paap LM test (p-value)	0.000	0.000	0.003	0.000	0.000	0.002
Hansen J test (p-value)	0.693	0.665	0.544	0.560	0.123	0.938
σ_{VOL}	0.031	0.034	0.026	0.062	0.029	0.025
N	91	113	113	133	134	134

This table reports estimates of the average treatment effect (ATE) of a binary democracy indicator on output volatility (VOL), decade by decade, together with the standard deviation of the dependent variable, σ_{VOL}. In the upper panel, the first row presents the ATE from a bivariate regression, while the second row adjusts for exogenous covariates. The estimates with LASSO selection of covariates are presented in the third row. We report heteroskedasticity-robust ('hc3') standard errors based on MacKinnon and White (1985) for the first two cases and robust standard errors when using LASSO. The lower panel presents IV estimates where democracy is instrumented with Church exposure from Schulz (2022). We present estimates from 2SLS with heteroskedasticity-robust standard errors, while the LIML estimates report ATEs using the same instruments but employing Fuller's bias-corrected LIML with associated parameter set to one. We also report the corresponding first-stage F statistic, the Montiel Olea and Pflueger (2013) Effective F statistic computed using Pflueger and Wang (2015), the Kleibergen-Paap LM test of underidentification and the Hansen J test p-values associated with the 2SLS regressions. In all cases, ***, ** and * denote coefficients significant at 1%, 5% and 10% respectively.

Table 2: ATEs with first volatility measure, excluding high-income countries

	I 1960s b/se	II 1970s b/se	III 1980s b/se	IV 1990s b/se	V 2000s b/se	VI 2010s b/se
ATE	-0.029***	-0.027***	-0.025***	-0.037***	-0.010**	-0.008**
	(0.006)	(0.005)	(0.004)	(0.009)	(0.005)	(0.003)
ATE with controls	-0.008	-0.005	-0.012	-0.036***	-0.009	-0.003
	(0.011)	(0.008)	(0.008)	(0.011)	(0.006)	(0.005)
ATE using LASSO	-0.029***	-0.017***	-0.010**	-0.018	-0.003	-0.007***
	(0.006)	(0.005)	(0.005)	(0.019)	(0.006)	(0.003)
σ_{VOL}	0.033	0.032	0.026	0.067	0.030	0.020
N	77	106	106	128	129	129
ATE (2SLS)	-0.021	-0.010	-0.023**	-0.096***	-0.018	-0.021
	(0.014)	(0.015)	(0.010)	(0.028)	(0.012)	(0.013)
ATE (LIML)	-0.021	-0.010	-0.023**	-0.093***	-0.019	-0.022
	(0.013)	(0.015)	(0.010)	(0.026)	(0.012)	(0.014)
2SLS First stage F-stat	6.737	38.176	32.044	12.923	12.413	8.615
Pflueger-Wang Effective F-stat	7.879	19.950	15.863	8.067	7.363	5.096
Kleibergen-Paap LM test (p-value)	0.003	0.000	0.001	0.000	0.000	0.003
Hansen J test (p-value)	0.440	0.264	0.798	0.594	0.097	0.088
σ_{VOL}	0.034	0.034	0.027	0.067	0.031	0.021
N	71	93	93	112	113	113

ATEs of a democracy indicator on output volatility (VOL), decade by decade and excluding high-income countries. For other notes see Table 1.

Table 3: ATEs, second volatility measure

	I 1960s b/se	II 1970s b/se	III 1980s b/se	IV 1990s b/se	V 2000s b/se	VI 2010s b/se
ATE	-0.020***	-0.025***	-0.022***	-0.027***	-0.012***	-0.009***
	(0.005)	(0.004)	(0.004)	(0.007)	(0.004)	(0.003)
ATE with controls	-0.007	-0.011*	-0.009	-0.018**	-0.014***	-0.007
	(0.006)	(0.006)	(0.006)	(0.008)	(0.005)	(0.005)
ATE using LASSO	-0.010*	-0.012***	-0.006	-0.013	-0.010**	-0.010***
	(0.006)	(0.004)	(0.004)	(0.010)	(0.005)	(0.003)
σ_{VOL2}	0.028	0.032	0.025	0.054	0.028	0.022
N	98	126	127	150	151	151
ATE (2SLS)	-0.014**	-0.023	-0.030**	-0.058***	-0.023**	-0.032**
	(0.007)	(0.014)	(0.012)	(0.017)	(0.011)	(0.014)
ATE (LIML)	-0.014**	-0.022	-0.030***	-0.057***	-0.023**	-0.030**
	(0.007)	(0.014)	(0.011)	(0.017)	(0.011)	(0.012)
2SLS First stage F-stat	37.611	40.504	7.815	12.406	11.126	7.838
Effective F-stat	23.476	25.227	5.617	11.015	7.853	6.276
Kleibergen-Paap LM test (p-value)	0.000	0.000	0.003	0.000	0.000	0.002
Hansen J test (p-value)	0.578	0.731	0.310	0.434	0.168	0.903
σ_{VOL2}	0.029	0.033	0.025	0.057	0.029	0.023
N	91	112	113	133	134	134

ATEs for the second volatility measure, $VOL2$, decade by decade. For other notes see Table 1.

4 Conclusions

In this paper we examine the effect of democracy on output volatility, decade by decade since 1960. Using a range of approaches to identification and two different measures of

Table 4: ATEs for second volatility measure and excluding high-income countries

	I 1960s b/se	II 1970s b/se	III 1980s b/se	IV 1990s b/se	V 2000s b/se	VI 2010s b/se
ATE	-0.024***	-0.027***	-0.024***	-0.030***	-0.011**	-0.007**
	(0.005)	(0.004)	(0.004)	(0.007)	(0.005)	(0.003)
ATE with controls	-0.008	-0.008	-0.010	-0.020**	-0.010*	-0.0002
	(0.009)	(0.008)	(0.007)	(0.008)	(0.006)	(0.005)
ATE using LASSO	-0.023***	-.018***	-0.009**	-0.022***	-0.003	-0.006**
	(0.007)	(0.005)	(0.004)	(0.006)	(0.006)	(0.003)
σ_{VOL2}	0.031	0.032	0.025	0.058	0.029	0.019
N	77	105	106	128	129	129
ATE (2SLS)	-0.021*	-0.010	-0.022**	-0.058***	-0.019*	-0.024*
	(0.012)	(0.015)	(0.009)	(0.019)	(0.011)	(0.013)
ATE (LIML)	-0.020*	-0.010	-0.022**	-0.057***	-0.019*	-0.024*
	(0.011)	(0.015)	(0.009)	(0.018)	(0.011)	(0.013)
2SLS First stage F-stat	6.737	35.665	32.044	12.923	12.413	8.615
Effective F-stat	7.879	19.614	15.863	8.067	7.363	5.096
Kleibergen-Paap LM test (p-value)	0.003	0.000	0.001	0.000	0.000	0.003
Hansen J test (p-value)	0.728	0.218	0.662	0.460	0.118	0.150
σ_{VOL2}	0.031	0.032	0.026	0.061	0.030	0.020
N	71	92	93	112	113	113

ATEs for the second volatility measure, $VOL2$, decade by decade and excluding high-income countries. For other notes see Table 1.

volatility, we find that volatility is lower under democracy.

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