Democracy and National Economic Performance: The Preference for Stability

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Democracies differ from autocracies in that democracies produce stable, not high or low, growth in national income. We analyze the likely risk/return preferences of voters and hypothesize that the underlying causal mechanism generating democratic stability is that democracies more accurately reflect the risk aversion of ordinary citizens. We test our hypothesis in several ways. First, we reexamine three studies of comparative economic voting and find that voters penalize incumbents when economic volatility increases. Second, we use extreme bounds regression analyses to show that democracies, compared to autocracies, are characterized by less volatility in economic growth rates. Third, we find that democratic stability does not appear to arise because democracies ameliorate the effects of social cleavages, another mechanism that might explain democratic stability. When growth and volatility are jointly examined, democracies reveal highly favorable economic results.

Does democracy affect national economic performance and, if so, how? No question is more central to the study of political economics. Almost all previous work on democracy and economic performance has focused exclusively on growth rates, with contradictory and confusing results. In this article, we argue that, to reveal the impact of democratic institutions on economic performance, scholars must consider two dimensions of economic performance—growth rate *and* volatility.

We begin with a novel hypothesis: economic policy in democracy is risk avoiding relative to policy in nondemocracies.[1] Because voters are risk-averse, they penalize incumbent governments for economic volatility, and democratic governments respond accordingly. In nondemocracies, we posit that elites are more likely to seek risk that voters would reject. Consequently, autocracies produce systematically more economic volatility than

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[1]In this article, we do not try to draw systematic distinctions among types of nondemocracies. Therefore, we use "nondemocracies," "autocracies," and "dictatorships" as rough synonyms.

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do democracies. This implies that the stability of economic growth should vary with the degree of democracy, other things equal. Our analyses strongly support these hypotheses. We examine another explanation for the observed correlation between democracy and stable growth—that democracies ameliorate social conflicts in a way that produces stability. The available evidence does not support this hypothesis. We conclude this article by suggesting that risk aversion among voters may help account for the rise of institutions of economic management among democracies.

Democracy's Effect on the Rate of Economic Growth: A Theoretical and Empirical Review

Political economists have puzzled at length about democracy's effects on national economic performance. (Among the useful reviews are Brunetti 1997; Keech 1995; Przeworski et al.1996; and Remmer 1995.) The literature includes views on the relationship between democracy and growth that are both negative (pessimistic) and positive. The pessimistic strain, well reviewed by Keech (1995), dates from Adam Smith, and is restated in Alesina and Rodrik (1994) and Persson and Tabellini (1994). Here, democracies are vulnerable to demands for redistribution because they give voice to disadvantaged groups. Redistribution may divert resources from productive investment and thus harm economic growth.

Democracy may harm economic performance in other ways. Olson (1982) predicts stagnation due to interest group rent seeking. Nordhaus (1975) predicts costly economic manipulation for short run electoral gain. Barro and Gordon (1983) describe a "time-inconsistency problem," which makes inflation much more likely.

Positive views also abound. Wittman and others argue that democratic competition is inherently effective as a mechanism for revealing information (Wittman 1989, 1995; Baba 1997). The more developed the democracy, the more highly developed the institutions that guarantee transparency of policy and policy-making processes. This enables citizens to monitor elected officials more effectively and reduces the probability of purely rent-seeking or self-serving policies. Transparency makes democracy a system of moderation and constraint, with equilibrium properties (Przeworski 1991). Several studies build on North (e.g., 1989), arguing that institutions critical to growth (especially property rights) are enhanced in democracy, thereby encouraging growth (Kormendi and Meguire 1985; Knack and Keefer 1995; and World Bank 1997). Pastor and Sung (1995) argue that private sector actors are more likely to undertake investment in settings where property rights are better protected, and they find that higher rates of investment are correlated with democratic regimes. Scully (1992, 1997) goes beyond property rights to link a broader conception of liberty to stronger national economic performance. Lohmann (1999) proposes that elections serve to select competent leaders and that, over time, democracy should be correlated with higher output.

Empirical tests of the link between democracy and economic performance have produced ambiguous results to match the conflicted theory. Sirowy and Inkeles (1990), reviewing fifteen empirical investigations (drawn from thirteen reports), found that eleven showed either no relationship or a conditional relationship between growth and democracy. Przeworski and Limongi (1993) review eighteen studies (with twenty-one sets of findings), and also find inconsistent results: eight studies reported a positive link between democracy and growth; eight reported a negative link, five others, no link. Subsequent studies similarly disagree on the direct effects of democracy on growth: Helliwell (1994), negative; Keefer and Knack (1997), negative/none; Leblang (1997), positive; Przeworski et al. (1996), none; Burkhart and Lewis-Beck (1994), none; Pourgerami (1992), marginally positive; Weede (1996), mixed; Feng (1997) mixed; Feng (forthcoming), positive.[2] Przeworski and Limongi (1997) report that growth is stabilizing for democracies but do not explore the reverse relationship.

Two meta-studies summarize the state of knowledge. De Haan and Siermann (1995) reanalyzed many key studies and established no robust relationship between democracy and growth. Brunetti concluded, after reviewing seventeen prior studies, "there is no clear relationship between democracy, at least as measured in these studies, and economic growth" (1997, 172).

Brunetti (1997) and Przeworski and Limongi (1993) identify inconsistent modeling assumptions and selection bias, respectively, as reasons for ambiguous empirical results.[3] Inconsistent modeling assumptions are indeed problematic,[4] and we employ Leamer's (1983) extreme

[2]Helliwell (1994) concludes that the indirect effects of democracy via education produce a net effect that is neutral for growth. Feng (1997) concludes that political stability of democracies offsets democracy's negative direct effects.

[3]There are many differences among these studies in methods and samples that cannot be explored here.

[4]The models vary widely. For example, Leblang (1997) excludes investment, even though Levine and Renelt (1992) and Fagerberg (1994) demonstrate that investment is the most consistently robust correlate of long-run growth. Keefer and Knack (1997) also exclude investment. Helliwell (1994) includes investment but omits education and population measures others include. Alesina and Rodrik (1994), and Persson and Tabellini (1994) omit any measure of labor force growth, but do include indicators of human capital formation.

bounds analysis (EBA) as a strategy to test for robustness in specification. In contrast, we believe selection bias is not the main source of inconsistency in the existing literature, and the selection bias critique is likely overstated.[5]

An Alternative View: Democracy Reflects the Preferences of Voters for Both Stability and Growth

Our discussion begins from the supposition that citizens care about both economic growth *and* the volatility of that growth. The literature just reviewed has been couched in terms of rates of economic growth alone. The implicit assumption is that citizens have an unqualified preference for more rather than less growth. A related implicit assumption is that higher growth involves no significant costs in terms of economic disruption or volatility.

Both assumptions are questionable. Rational voters, like rational investors, care about volatility because it indicates the extent to which the world is predictable. Voters, like investors, use the past to make predictions about the future and prefer certainty to uncertainty. Moreover, in at least some cases, higher rates of growth are associated with greater economic volatility, and in those cases, citizens face a choice between growth and volatility. Citizens, in such a case, might reasonably prefer moderate levels of growth and greater stability. We can examine directly whether citizens appear to show an aversion to volatility and whether nations typically experience increased volatility along with increased growth.

Some relevant prior evidence. Public opinion surveys do not appear to have addressed questions of growth and volatility per se, but relevant questions have been asked a few times. In September 1964, Gallup asked an open-ended question, "What about your fears and worries for the future of our country?" Economic instability (13 percent) took third place to war (48 percent) and communism (25 percent) as core fears. Forty-five years later, Gallup asked the same open-ended question, with similar results: economic instability (20 percent) was in second place behind war (56 percent). In similar polls, U.S. voters identify economic instability either their greatest or one of their greatest fears.[6] While voter conceptions of economic instability might not be identical to volatility, the polling data provide a clue that politicians have ample reason to be wary of policy strategies that threaten economic stability.

Comparative voting studies also provide evidence that incumbent politicians have good reason to be cautious regarding risky policies. Pacek and Radcliff (1995) report that economic decline harms incumbent politicians in emerging market democracies, but incumbents gained little electoral benefit from increased economic performance. Nannestad and Paldam (1997) examined the voting behavior of 12,000 Danes, 1986–92 and also found an asymmetry: voters penalized incumbent governments three times more harshly for economic decline than they rewarded incumbents for a corresponding gain. The incentive for incumbents is clear: seek strategies with a lower risk of economic downturn.

While ordinary citizens prefer economic stability, elites, especially in autocracies, are likely be more risk seeking and to exhibit high-risk behaviors for two reasons. The first is a difference at the level of actor preferences; the second reason arises from characteristics of the choice situation (Lopes 1997).

Elites appear to differ from ordinary people in their orientation toward risk. Among elected politicians in the United States, the most ambitious and upwardly-mobile

[5] We intend to pursue selection bias issues further in subsequent work. Przeworski and Limongi (1993) cite selection bias as undercutting most empirical examinations of the link between democracy and economic performance. If some factors lead countries to "select" democracy, and those factors also lead independently to good or bad economic performance, regression models will result in biased and inconsistent estimates of the impact of democracy on growth. The solution to this problem, when the selection mechanism cannot be directly estimated, is to implement a two-step estimating procedure (see Greene 1993; Maddala 1983). This requires a categorical selection variable, which we do not have in this case, and, preferably, clear information about theoretical relationships.

In the best studies, we find two, seemingly inconsistent, selection mechanisms. In one view, poorly performing authoritarian regimes are likely to be displaced by democracies, whereas poorly performing democracies are likely to experience a change of government in an election (Przeworski and Limongi 1993). As a result, we would mistakenly find a *negative* relationship between economic performance and democracy. Others argue that economic failure "causes" dictatorships in poor countries, while democracies, which appear randomly ("spring up"), or spread by geographic contagion, are sustained by economic success (Przeworski et al. 1996; Przeworski and Limongi 1997). Thus, econometric analysis might mistakenly find a *positive* relationship between democracy and economic growth.

It is possible that more than one selection mechanism is at work. Failure to model the selection mechanism is probably not the main source of inconsistency in the existing literature. The Przeworski-Limongi rejection of "standard regression models" is probably overstated, given that there is currently no well-developed, widely accepted theory of the genesis of democracy that reliably shows how selection mechanisms are linked to economic performance.

[6] See USGALLUP.633POS.Q05B1, and USGALLUP.59IISR12, Q03b, Oct. 1999, respectively. See also USGALLUP.74POTA.Q02; USGALLUP.76POTM.Q07A; USGALLUP.74POTB.Q02; USROPER.780651.R03. We used Roper Center 1998 and 2000.

exhibit risk seeking (Rohde 1979; Abramson, Aldrich, and Rohde 1987). MacCrimmon and Wehrung show that US business executives are aggressively gain seeking and seem actually to seek out volatility (1986, 148–150). More generally, people with a high need for achievement, presumably disproportionately including those who actually end up in positions of leadership, exhibit risk-taking behavior (e.g., Atkinson and Feather 1966; Atkinson 1983).[7]

Findings from financial economics are relevant. The "equity premium puzzle" shows that ordinary investors are exceptionally averse to perceived risk in comprising their investment portfolios.[8] Within actual portfolios, wealthy investors appear to be far less risk-averse than ordinary citizens in the United States and Western Europe (Caroll 2000). Since voters have far fewer options to diversify away the risk of a failed political economic strategy than do investors in financial markets, we may expect citizens as voters to be even less willing to tolerate politically inspired economic volatility than citizens as investors.

Institutional and situational characteristics of democracies and autocracies may diminish or amplify respectively the tendency of elites for risk-taking behavior. Przeworski (1991) identifies the key element of democracy as being the expectation on the part of competing interests that there will be peaceful replacement of the incumbent government in the future. The expectation of future replacement induces a moderation in the treatment of opponents that reduces the cost of defeat. This implies a smaller incentive for incumbents to take highly risky policy gambles when faced with the prospect of defeat or removal from office. In contrast, some significant portion of nondemocratic executives have relatively short time horizons while in power, and their exit from power might be particularly costly (e.g., involving permanent exclusion from the benefits of power (Linz 1994) or risk of imprisonment or violence). Consequently, many autocrats are in a situation that encourages risk taking. As Olson has argued, democratic institutions provide credible guarantees against abusive behavior that are lacking for an autocrat. "Because of ... the obvious possibility that any dictator could, because of an insecure hold on power or the absence of an heir, take a short-term view, the promises of an autocrat are never completely credible" (Olsen 1993, 571). Moreover, Olsen observes, "most dictatorships are by their nature especially susceptible to succession crises and uncertainty about the future" (1993, 572).

Systematic data on these situational factors facing political elites are surprisingly hard to find. Even so, we see differences between democratic and autocratic elites. While longevity in office is substantial for bureaucratic-authoritarian systems, it is very short in other autocratic systems—shorter than the average government in a parliamentary system (Cheibub and Przeworski 1999, 227). Even the old Soviet bureaucratic systems saw substantial leadership turnover, and that turnover produced greater variation in subsequent policy (i.e., repudiation of prior priorities) than observed in western democratic settings (Bunce 1981). Nonconstitutional entry to executive office (e.g., by coup d'etat) increases the risks of losing power in every time period by 45 percent compared to a constitutional entry (Bienen and van de Walle1992). Past coups predict future coups (e.g., Wang 1998) and nonconstitutional leader entry is a significant predictor of domestic wars (Whitten and Bienen 1996).

While these findings do not range across as wide a range of cultures and polities as one would prefer, they are consistent in demonstrating two points. First, average individuals in the "upper tail" of the distribution of power and resources appear to be far less risk averse than those below them in the distribution—that is, if democracy tends to constrain policy to the risk preferences of the median voter, then policy will be systematically different in democracy.[9] Second, autocratic elites, compared to democratic elites, face situational factors that provide an incentive for riskier policies.

Implications. If voters prefer economic stability and have the means to act on those preferences in democracy but not in nondemocracy, we should observe two kinds of effects. First, in electoral politics, we should observe that incumbents are punished for increased volatility and rewarded for increased stability, other things equal. Second, in macroeconomic performance, we should observe that democratic nations enjoy more stable rates of subsequent growth than nondemocratic nations, controlling for other factors that would contribute to volatility.

Findings from several papers bear on the macroeconomic question. Quinn and Woolley (1996), using designs similar to the ones reported below, show that *prior* levels of democracy are very highly correlated with

[7] Power seekers appear to be different in biochemical ways as well. See Madsen (1985, 1986).

[8] Individuals can acquire portfolios that include assets from other countries and can thereby diversify some aspects of the risk of poor home-country performance. Individuals do not, however, diversify internationally as recommended by theory (Baxter and Jermann 1997). This point is consistent with, but not dependent upon, ideas about risk aversion illustrated by Kahneman and Tversky (1990) in experimental situations.

[9] Under some circumstances, prospect theory suggests that voters can become risk seeking. See Weyland 1996.

subsequent stability of growth rates. That sample included only sixty-four countries, however, with advanced industrial and Latin American nations disproportionately represented. Rodrik (1997) analyzed ninety countries, 1970–89, and found that the *contemporaneous* relationship between growth volatility and democracy was negative. Neither study offered an individual-level motivation for a link between democracy and stability.

Below, we examine another explanation for a correlation between democracy and low volatility. Rodrik (1999, 2000) posits that democracies better handle economic shocks because of the ways democratic institutions moderate intense social cleavages. We present below a direct test of whether the lower volatility of democracies arises because of the amelioration of social cleavages.

Comparative Economic Voting

The first step in our analysis is to demonstrate that volatility matters to the vote share of incumbents. In a large literature on economic voting, the usual model holds that citizens punish or reward politicians in reaction to prior economic growth and inflation.[10] To explore the effects of volatility on voting, we simply extend the analyses from three recently published studies on comparative economic voting. We believe this provides a straightforward test of the proposition that voters react negatively to economic volatility. Does an indicator of volatility contribute statistically to the analyses of comparative economic voting? If so, then our basic assumptions about voter risk aversion would be validated.

Because of likely selection bias, this test is a conservative one. That is, if democracy were a perfect feedback system, and if policymakers could avoid the events that caused negative feedback, then elections would turn only on events that could not be avoided or that were novel. Thus, if some volatility is avoidable, and if voters punish volatility, then the mechanism of democracy itself will tend to produce elections that do not depend on volatility. For example, voter aversion to volatility might lead politicians to create institutions that "automatically" diminish volatility. Whatever evidence we find in support of our hypothesis is in spite of selection bias against it.

[10]Studies show that voters apparently judge incumbent politicians based upon their success in increasing either income (Erikson 1989; Lewis-Beck 1988; Powell and Whitten 1993) or the "permanent" component of income (Suzuki and Chappell 1996). Some recent research is focused on the issue of distinguishing "naïve" retrospective from "rational" prospective voter evaluations (Suzuki and Chappell 1996 are an example of this genre). Still other research, primarily quite theoretical, is concerned with the problem of voters trying to identify a "type" of politician rather than to reward good policy (Fearon 1999; Lohmann 1999). An interesting compilation of recent papers is in *Electoral Studies* 2000.

Models, Methods, and Data

We build on economic voting studies by Powell and Whitten (1993), Pacek and Radcliff (1995), and Wilkin, Haller, and Norpoth (1997).[11] We chose these studies because these were the most current published studies available at the time we undertook this part of the investigation (in the Fall of 1997 and Spring of 1998). For the full details of the original analyses, we refer the reader to the respective papers.

We follow the conventions in finance by operationalizing the volatility of growth as its standard deviation (e.g., Ingersoll 1987), which provides information about the predictability of performance. Volatility enters the analysis in two modes depending on the dependent variable specified in these three studies. The models in Powell and Whitten (1993) and Pacek and Radcliff (1995) include a measure of past incumbent vote share, in which case the dependent variable (at least implicitly) is a measure of change. In those cases, we measure volatility as the change in volatility.[12] When, as in the Wilkin, Haller, and Norpoth (1997) study, the dependent variable is the *level* of the incumbent (dominant party) vote and the model does not include past vote share, volatility is entered as the standard deviation of economic growth over the past four years: i.e., the level of volatility. *Our hypothesis is that volatility will be negatively associated with votes for incumbents.*

[11]We thank Guy Whitten and Ben Radcliff for providing data. The data from Powell and Whitten (1993) have been lost, but Whitten constructed a very similar data set, from which only the data for Greece and the data to compute "previous government swing" were unavailable (email correspondence, Guy Whitten with Dennis Quinn, 20 April 1998). The Wilkins, Haller, and Norpoth (1997) study contains a data appendix. We used *Keesings' Contemporary Archives* to cross-check and validate the data, and for the PW study, we computed "Previous Government Vote Swing" from Keesings'. In general, the data for the dependent variables used in the other studies are very close to the data used in this study.

[12]Annual data. Change is measured as the difference between the standard deviation of growth over four years minus the standard deviation of growth for the prior four years. We chose a four-year interval because the average length of government in the samples is 3.9 years. Volatility, except as noted, is calculated from annual data from Penn World Tables 5.6. Another approach is to measure growth volatility during the term of an incumbent government and subtract from it the volatility of prior periods. The coefficient estimates for change in volatility, measured this way, are nearly identical to the estimates of the measure described above.

Regression Results

Powell and Whitten (1993) used regression analysis to examine 102 elections in nineteen advanced industrial nations from 1969 to 1988. They found that retrospective economic voting was evident only in countries with democratic institutions that give rise to "clear responsibility" for economic policy.[13]

Powell and Whitten's dependent variable was change in the percentage of the votes cast for the incumbent party or coalition in parliament (or the lower house). The independent variables included incumbent coalition's vote share in the previous election (i.e., at t-1), the "swing" of the vote toward those parties in the previous election (i.e., (t-1)-(t-2)), various comparative economic indicators, and a dummy variable for a minority government.

We use their model and similar data to examine the countries with "clear responsibility" for economic affairs[14] and add indicators of volatility. The results are presented in Table 1. Model 1 in Table 1 is a replication of Powell and Whitten (1993, 407), model 2. The adjusted R^2 is .22 (compared to .21 in the original), and the coefficient of economic growth is .533 (compared to .490) with similar levels of statistical significance. The other results are broadly similar to those reported by Powell and Whitten (1993), except for the "right-wing" interaction terms.

Model 2 of Table 1 includes our volatility change measure (Δ*Volatility*). Its coefficient is negative (as hypothesized) and statistically significant. The adjusted R^2 of the new equation increases from .22 to .27. Economic growth remains positive and statistically significant.

Pacek and Radcliff (1995) present a voting study of fifty-one elections in eight emerging market economies. The Pacek and Radcliff model uses the share of the incumbent's vote as a dependent variable and prior vote for the incumbent as an independent variable. In tests reported in models 3 and 4 of Table 1, we examine forty-three of these cases, omitting cases, all from the 1950s, for which the data necessary to compute change in volatility are unavailable in the Penn World Tables. Change in Volatility, once added to the Pacek and Radcliff model, is statistically significant and correctly signed (model 4), and increases adjusted R^2 over the base model.

The Wilkin, Haller, and Norpoth (1997) (WHN) study examined the effects of GDP growth and logged inflation on the *level* of support for the dominant party in an incumbent governing coalition. The WHN sample includes thirty-eight elections in thirty-eight different countries, mixing both developed and developing cases, 1989–1994.[15] In Table 2, model 1, we replicate the results from WHN model 1 (1997, 308), omitting several cases for reasons described in the notes to Table 2. The results are very similar to the published results.

In model 2, we add *level* of five-year volatility to the model. The coefficient on volatility is negative, as expected, and statistically significant. As in the original WHN model, inflation approaches statistical significance with a positive (but "wrong") sign. With volatility added, the explanatory power of the model increased from an adjusted R^2 of .16 to .21.

Unlike both the Powell and Whitten and the Pacek and Radcliff models, the WHN model does not include any measure of prior coalition vote. As a further experiment, we modified the WHN model by estimating, for the same sample, a simplified version of the Powell and Whitten model (model 3). The dependent variable is *change* in support for the incumbent party (coalition), with the addition of past vote level for the incumbent party and the previous vote swing for that party, as in Powell and Whitten (1993). In model 3, we enter change in volatility, which has a negative sign and is highly statistically significant. Inflation is now statistically significant and properly signed (negative). GDP growth is no longer statistically significant, and the coefficient has a negative sign. The past level of incumbent support and the previous vote swing are statistically significant in the analyses.

Discussion

The link between volatility and voting has not, to our knowledge, been established previously. Higher economic volatility works to the detriment of incumbents: that is the evidence from Tables 1 and 2.[16] Moreover, in most cases, the electoral impact of recent growth diminishes significantly when volatility is added to the model. The significant coefficients on volatility suggest the importance of voter expectations about economic stability. Perhaps the electorally optimal strategy for incumbents would be "surprising" decreases in volatility that are matched to positive economic growth. In the event of

[13]Other scholars refer to this clarity of responsibility as "majoritarianism" (e.g., Freeman 1989).

[14]Australia, Austria, Canada, France, Ireland, Japan, New Zealand, Sweden, United Kingdom, and the United States.

[15]Data for growth for years 1993 or 1994 are taken from Maddison (1995); volatility is calculated by the authors.

[16]The "change in volatility" measure reduces an obvious ambiguity about the "average volatility" measure, which is that very different time paths of growth are consistent with the same level of volatility.

TABLE 1 Comparative Economic Voting

A Replication of Powell and Whitten 1993 and Pacek and Radcliff 1995 with Volatility and Risk-Adjusted Growth Added

PW Dependent Variable Models 1 & 2—Change in the Vote% of the Incumbent Governing Coalition

PR Dependent Variable Models 3 & 4—Level of the Vote Percentage of the Governing Coalition

Variable	Model 1 (Base)	Model 2 (Base + ΔVolatility)	Model 3 Level of Votes (Base Model)	Model 4 Level of Votes (Base + ΔVolatility)
Comparative GDP Growth	.532*	.509*		
	(.259)	(.252)		
Growth (per capita PPP adjusted)			.882	.652
			(.518)	(.496)
Change in Volatility (Five year average)		**−.762***		**−.671***
		(.386)		**(.295)**
Previous Government Vote Percentage	.085	.079	.306	.398*
	(.081)	(.079)	(.209)	(.198)
Previous Government Vote Swing	−.226*	−.220*		
	(.103)	(.100)		
Comparative inflation	−.119	−.224	−.881	−.714
	(.215)	(.217)	(.772)	(.728)
Comparative Unemployment	−.336	−.291		
	(.189)	(.185)		
Right-wing Comparative Inflation	.101	.238	−2.388	−3.254
	(.379)	(.374)	(4.339)	(4.090)
Right-wing Comparative Unemployment	.201	.231		
	(.312)	(.304)		
Minority Government	2.883*	3.003**		
	(1.115)	(1.085)		
Growth x growth dummy			−.881	−.714
			(.772)	(.728)
Election Follows Irregularity			−2.388	−3.254
			(4.339)	(4.090)
Intercept	−7.627*	−7.661*	24.438*	21.080*
	(3.841)	(3.733)	(8.818)	(8.407)
Number of Observations	58	58	43	43
R-squared	.33	.38	.77	.81
Adj. R^2	.22	.27	.69	.73
Standard Error of Regression	3.58	3.48	6.54	6.13

(Standard errors are listed below the coefficients) *0.05>p-value>0.01; **p-value<0.01. We use one-tailed tests for volatility, and two-tailed tests otherwise.

Notes: Models 1 and 2 are nearly exact replications of Powell and Whitten (1993, 407) model 2. Coefficients were estimated using ordinary least squares (OLS). The data for Greece, used in the original analysis, are no longer available. Models 3 and 4 are a replication of Pacek and Radcliff (1995, 752), using ordinary least squares (OLS) with country dummies (not reported).

increased volatility, an incumbent might strive for electorally equivalent growth gains to offset the losses from volatility.

Taken together, the results provide a pessimistic message for elected officials. The penalty for increased volatility may make it exceedingly risky to pursue higher growth policies *if* growth and volatility are positively correlated in a particular country. These results, therefore, pose the question of whether, or under what circumstances, growth comes with a volatility penalty.

TABLE 2 Comparative Economic Voting from Argentina to Venezuela

A Replication of Wilkin, Haller, and Norpoth 1997 with Volatility and Risk-Adjusted Growth Added
Dependent Variable—Level of (or Change in) the Vote Share of the Largest Governing Party

Variable	Model 1 Level of Votes (Base Model)	Model 2 Level of Votes (Base + Volatility)	Model 3 Change in Votes (Base, past voting + ΔVolatility)
Log of Inflation	3.264	5.391	−4.815*
	(2.578)	(2.795)	(2.403)
GDP Growth	1.523**	1.314*	−.341
	(.529)	(.529)	(.592)
Volatility (Five year average)		**−1.921***	
		(1.125)	
Change in Volatility (Five year average)			**−2.221****
			(.956)
Previous Government Vote Percentage			.456*
			(.176)
Previous Government Vote Swing			−.027**
			(.009)
Intercept	−27.440**	30.950**	−15.908*
	(3.246)	(3.762)	(5.982)
Number of Cases	34	34	33
R-squared	.21	.28	.55
Adj. R^2	.16	.21	.47
Standard Error of Regression	9.31	9.03	8.27

Standard errors are listed below the coefficients. *0.05>p-value>0.01; **p-value<0.01

We use one-tailed tests for volatility and risk-adjusted growth, and two-tailed tests otherwise.

Notes: The table is a replication of Wilkin, Haller, and Norpoth (1997, 308) model 1. Coefficients were estimated using ordinary least squares (OLS). The data for Ecuador and Malta, used in the original analysis, are either unavailable or unreliable. Mexico, used in the original analysis, is excluded because of its −3 score on the summed autocracy/democracy index from Polity III (Jaggers and Gurr 1996; Burkhart 1997.) The 1991 Zambian election is excluded because Zambia's autocracy/democracy score moved from −9 to +6 in 1991, so that the incumbent party vote total for previous democratic elections cannot be calculated. The data for previous government vote swing are unavailable for Cyprus, and that case is dropped in models 4 and 5. (The results from models 1–3 are consistent, with or without data for Cyprus.)

Do Voters Have to Accept Volatility to Get More Economic Growth?

If growth and volatility are positively correlated, incumbent politicians face a hard choice: more growth *and* more volatility or less growth *and* less volatility. If the relationship is negative, however, decreasing volatility and increasing growth "go together," and politicians face no electoral cost to pursuing growth.

Prior studies of the relationship between economic growth and volatility report conflicting theory and evidence. Altman (1995) and Ramey and Ramey (1995) have reviewed the literature. Our analysis proceeds as follows. First, we review conflicting hypotheses about the relationship of growth and volatility. Then we examine increasingly complex specifications allowing for the possibility that different groups of countries are characterized by different relationships between growth and volatility.

A Positive Relationship?

One tradition in business cycle theory suggests growth and volatility are necessarily positively correlated. In both the Schumpeterian and real business cycle traditions, exceptional periods of growth follow from investments in technological innovations, but these innovations have *ex ante* uncertain benefits and occur in waves (Altman 1995). Waves of innovation manifest themselves as volatility.

A second view notes that government economic policies stabilize the economy, thereby dampening volatility in

growth rates. Governments worldwide, especially democratic governments employ counter-cyclical fiscal and monetary policies. Various social welfare guarantees have come to be referred to as "automatic stabilizers." In Schumpeterian and real business cycle theory models, these policies also dampen the speed of technological innovation, probably reducing long-run growth (Altman 1995).

Black (1987, 104–114) proposes a third, equilibrium-based argument for a positive association between economic growth rates and volatility, which depends on adjustment in factor markets. Black argues that unavoidable errors in forecasting tastes and technology lead to mismatches between skills and market demands, which can accumulate until manifested as an economic depression. By creating rigidities in labor markets, governments can avoid depressions (by forcing a match between skills and jobs), but only at the expense of reducing the quality of human capital investment and long-run growth. Ramey and Ramey observed that in Black's approach, "countries may have a choice between high-variance, high-expected-returns technologies and low-variance, low-expected-returns technologies. In such a world, countries with high average growth would also have high variance" (1995, 1138).

Black's propositions assume that in an efficient, equilibrium setting, efforts to forecast which policies and investments will produce high returns involve considerable error. This implies that countries with relatively high, sustained growth rates will experience higher growth variance. In these countries economic resources are already quite efficiently used, so the way to get additional gains is through innovation, which is inherently uncertain.

A Negative Relationship?

Other hypotheses suggest that volatility and growth are negatively correlated. In investment theory, when firms are faced with irreversible investment decisions, uncertainty about economic and political outcomes leads agents to invest at less than optimal levels (Pindyck 1991; Rivoli and Salorio 1996). Economic volatility is a source of uncertainty; higher volatility therefore leads economic agents to withhold investment, thus decreasing growth (Ramey and Ramey 1995).

Rivoli and Salorio (1996) and Ramey and Ramey (1995) describe a world where high volatility is not the result of uncertain choices at a technological frontier. Rather, volatility is the result, among other things, of unpredictable, arbitrary, or poor governmental policies. Ramey and Ramey (1995) found that growth volatility is substantially explained by government expenditure volatility (see also Brunetti 1998).

Ambiguous Empirical Results

Only a handful of empirical studies analyze growth and volatility; these have produced conflicting results. Kuznets (1930) offered evidence that growth and volatility are *positively* correlated, as did Kormendi and Meguire (1985). Ramey and Ramey (1995), in contrast, suggested that the relationship between growth and volatility is *negative*. Altman studied thirteen advanced industrial countries, 1870–1986, and wrote "one cannot conclude from the evidence presented here that cyclical volatility systematically either encourages or hinders the growth process" (1995, 573).

Could Both Effects Be Present?

The two mechanisms described in these hypotheses are, we believe, not mutually exclusive in cross-sectional analysis. Black describes how growth and volatility would appear in a relatively efficient set of cases. The competing view describes a world that has major sources of inefficiency. However, in the experience of the real world, both effects are likely present. That is, countries with efficient economies exist side by side with inefficient economies.

Regression Results of Volatility on Growth

In a 109 country sample, 1974–89, where average growth rates are regressed on within-period volatility, we find:

$$\underset{(6.459)(-3.773)}{\text{growth} = 2.917 - 1.19(\ln(\text{volatility}))} \qquad (1)$$

with an adjusted R^2 of .09 (t-statistics in parentheses). These results are consistent with those reported by Ramey and Ramey (1995, 1140) using a somewhat different sample. That is, the overall relationship in the data appears to be negative—economic growth declines with volatility. This suggests democratic politicians can increase growth by decreasing the sources of volatility, such as arbitrary and poor quality policies.

This linear specification, however, does not allow for both highly efficient and highly inefficient cases to be mixed in our sample. Such a mixture would imply instead a parabolic relationship between growth (on the Y axis) and volatility (on the X), or a sideways "V," with the mouth of the "V" to the right. Countries nearer the bot-

tom leg of the "V" are the inefficient, low-growth cases hypothesized by Ramey and Ramey, which can enhance growth merely by reducing avoidable sources of uncertainty. In the upper leg of the "V," the relationship changes. These cases are in the relatively efficient world posited by Schumpeter, Kuznets, and Black, where making gains in output entails risk and thus increased volatility.

If this is correct, the point of the "V" should coincide with the region of minimum volatility. In that region, countries have succeeded in removing the avoidable sources of inefficiency. These countries would have two choices—either attempting to maintain positive growth in a low-risk environment by matching economic innovations from the leading countries, or pursuing an aggressive growth strategy by inducing economic agents to take additional economic risks.

In Table 3, we display results that explore the second line of reasoning. The inflection point of the "V" was identified by taking the *ex post* growth rates for the five lowest variance cases, which would constitute the bottom of the "V" if one exists. For these cases (Austria, Colombia, France, Pakistan, and Sweden), we calculated an average growth rate of almost exactly 2 percent over the period 1974–89. Obviously, the observed rate would vary for a different time period, but that would in no way alter the logic of the analysis. Then, we conducted a test to see if the growth-variance relationship differed for the cases above the minimum-variance growth rate compared to those below. We created a dummy variable for cases with growth rates equal to or greater than the critical rate (2.0), and interacted that with volatility.[17]

In Table 3, model 1, we report results for this "V" shape (or two-line) model, and the results are striking. The basic volatility term remains negative and statistically significant, but the coefficient for the high-growth interaction term is positive and statistically significant. When both terms are combined to estimate the conditional coefficient for the high-growth cases, the result is a coefficient estimate of 0.807, a standard error of 0.281, and a t-statistic of 2.873.[18] The adjusted R^2 grows to 0.58 (from .09). The intercept is statistically significant, and its coefficient estimate is 2.05, which implies that the "risk-free" or minimum variance rate of growth in this sample is roughly 2 percent per year.

[17]The results reported below are not sensitive to substantial variation in the precise definition of the growth rate.

[18]This results from the sum of high-growth interaction coefficient and the coefficient for volatility. The standard errors are adjusted for the covariance between the coefficients of volatility and the interaction term.

Thus, as Black hypothesized for a relatively efficient world, the relationship between volatility and growth is positive for medium- to high-growth countries. In other words, it seems likely that higher volatility indeed is associated with higher rates of growth for many countries.

Are these relationships robust to plausible controls? We posed two versions of Levine and Renelt's (1992) (LR) "kitchen sink" test, which they use to implement Leamer's Extreme Bounds Analysis. In model 2, we use the LR variables and add an indicator of political instability from Feng, Kugler, and Zak (2000). In model 3, we use only the LR variables.[19] In neither model 2 nor model 3 was the baseline coefficient estimate for volatility statistically significant. In contrast, the coefficient estimate for the high-growth volatility interaction term remains highly statistically significant and positive.[20]

Thus, once a wide array of other information is added to the model, the relationship between growth and volatility is positive for high-growth countries. The initial negative relationship between growth and volatility is not robust—that is, we find no systematic negative relationship between growth and volatility for lower-growth countries in multivariate analysis.

Democracy and National Economic Performance

Having established that voters penalize incumbents for volatility and that growth and volatility are positively correlated in efficient economies, we ask: what is the relationship between democracy and national economic performance? Following the standard graphical representations of financial risk and return for investments, Figure 1 plots averaged national growth rates 1974–89 (vertical axis) against growth volatility, measured by the standard deviation, (horizontal axis, in logs). The sample is 109 countries (see appendix Table A; all former Soviet bloc countries are excluded due to missing data.). Differing levels of democracy as of 1972–73, which is before the sample period, are indicated with symbols.[21] (These and other data

[19]The political instability variable is unavailable for a substantial number of countries, including the United States.

[20]The conditional coefficient in model 3 is 1.674, its standard error is 0.484, and its t-statistic is 3.458, with the proper adjustments for coefficient covariation.

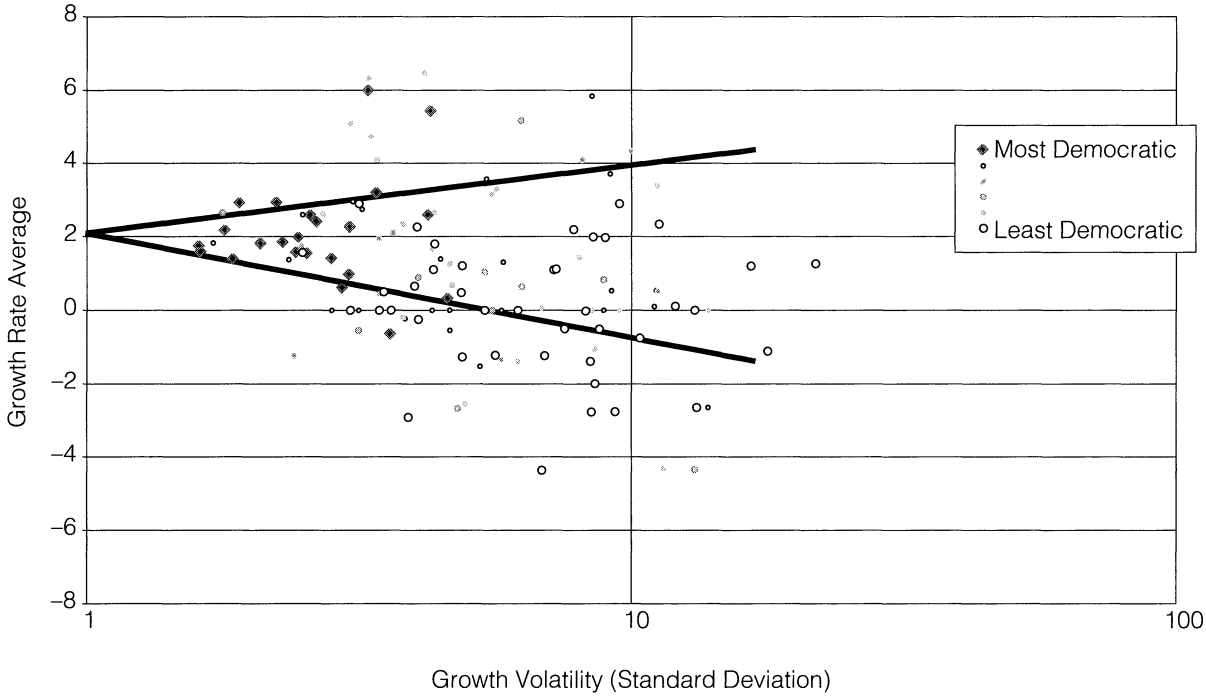
[21] The countries are grouped in terms of their points on combined Gastil scales, which are described below. The most democratic countries are those that scored a 13 or 14, the least democratic are those that scored 2, 3, or 4. The other groupings represent pairs of scores: 5–6, 7–8, 9–10, 11–12.

TABLE 3 Volatility and High Growth-Volatility Interaction as Correlates of Economic Growth

Variable	Model 1	Model 2	Model 3
Volatility of Growth, 1974–89 (log)	−1.226***	−.136	−.512
	(.325)	(.364)	(.370)
Volatility of Growth*Growth>=2%(log)	2.033***	2.149***	2.212***
	(.429)	(.361)	(.470)
Intercept for Countries with Growth>=2%	.113	−1.308***	−1.077*
	(.604)	(.490)	(.593)
Initial GDP per capita, 1973 (log)		−1.660***	−.803***
		(.349)	(.284)
Investment (logged) (INV)		2.500***	2.164***
		(.496)	(.473)
Population Growth (GPO)		−.572***	−.475***
		(.184)	(.186)
Secondary-School enrollment (log) (SEC)		.757***	.428*
		(.236)	(.222)
Primary-School enrollment (log) (PRI)		−.496*	−.430
		(.263)	(.305)
Trade Openness (log, Imports + Exports as a Percentage of GDP)		−.590*	−.381
		(.350)	(.340)
Index of Democracy, 1973		**.846**	**−.022**
		(.704)	**(.713)**
Change in *Index of Democracy* ΔDemocracy (1974–1989)		.205	−.417
		(.897)	(.896)
Government Consumption (log) (GOV)		−.011	.006
		(.028)	(.028)
Growth of Government Share (GSG)		−.009	−.051
		(.037)	(.048)
Revolutions/coups (REVC)		−.198	−.120
		(.765)	(.667)
Political Instability, 1974–89 (Feng, Kugler, and Zak 2000)		−12.448	
		(8.466)	
Africa dummy (AFRICA)		−.517	−.519
		(.467)	(.549)
Latin America dummy (LAAM)		−.513	−.499
		(.612)	(.438)
Growth of domestic credit (GDC)		.9E−05	−.003
		(.004)	(.004)
Standard Deviation of Domestic credit (STDC) (log)		−.032	.053
		(.156)	(.170)
Export-share growth (XSG)		−.011	.051
		(.054)	(.040)
Intercept	2.049***	9.355***	2.496
	(.465)	(3.757)	(2.942)
Observations	109	84	92
Adj. R^2	.58	.78	.67

(Standard errors are listed below the coefficients) *≤ .1, **≤ .05; ***≤ .01 Notes: Coefficients were estimated using ordinary least squares regression (OLS), with a Heteroskedasticity-Consistent Covariance Matrix (White 1984).

FIGURE 1 Growth Rates and Growth Volatility, 1974–89, by Level of Democracy with Growth/Volatility Relationships for Low and High Growth Cases



are described in more detail in the appendix.) Overlaid on Figure 1 is the "V" estimated from Table 3, model 1.

From Figure 1, we see that nations that were highly democratic in 1973 had less subsequent volatility than did more autocratic nations. In contrast, we see no evident relationship between initial levels of democracy and subsequent rates of growth. Highly democratic nations tend to cluster in a region of low volatility and moderate growth. In Figure 2, we present nearly identical results for a thirty-year period, 1967–1997, for sixty-four countries using Polity 98 indicators of political democracy and World Bank measures of economic growth and volatility. The relationship between democracy and growth volatility is not an artifact of the sample chosen.

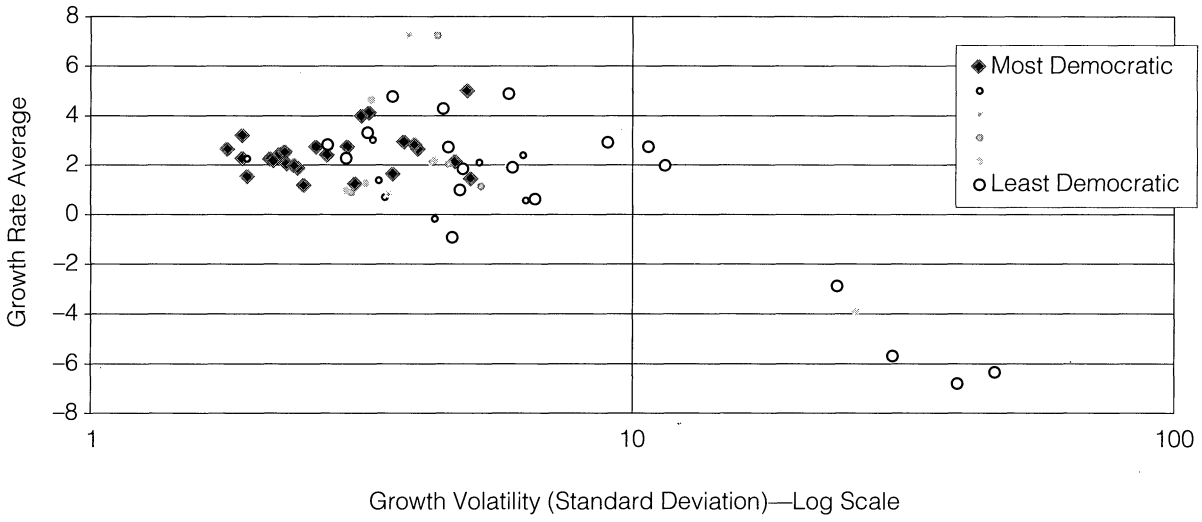
Sensitivity to economic volatility appears to be one of the distinguishing characteristics of democracy—more strikingly so than democracy's growth rates. The question is whether these results can be sustained in regression analyses once we control statistically for economic conditions facing these countries.

Regression Models for Democracy and Economic Growth

To examine whether democracy is robustly associated with economic growth, we build on familiar models of economic growth. Our base model is essentially the same as the widely cited Barro (1991) cross-sectional growth model. We have taken special note of the reviews of the growth literature by Barro and Sala-i-Martin (1995), Fagerberg (1994), and Levine and Renelt (1992). As determinants of economic growth, we follow these scholars in including investment (as a share of GDP), baseline levels (1973) of real per capita income, secondary school enrollment rates (1960), and annual rates of population growth (1974–89).[22] Alesina and Rodrik (1994) and Persson and Tabellini (1994) use primary education levels (1960) in their analyses, and for comparability we add that variable too. To capture the potential impact of external shocks, we included a measure of trade openness (imports + exports as a percentage of GDP). The initial

[22] Population growth has been included as a crude, but readily available measure of labor supply when used by economists, and as a generic measure of development when used by sociologists. Labor supply is a standard component of classical economic growth models. Levine and Renelt (1992) report that population growth was included in 29 (or 71 percent) of the forty-one studies they reviewed; Fagerberg reported that population measures were included in sixteen of the twenty-eight studies he surveyed (55 percent). Levine and Renelt are troubled by the fact that population growth has often entered with the wrong sign, but Feng, Kugler, and Zak (2000) offer a compelling explanation for why population growth is associated with subsequent decreases in growth. The negative association is, of course, well known (e.g., Blanchet 1991).

FIGURE 2 Growth Rates and Growth Volatility, 1967–97, by Level of 1966 Democracy (64 countries; Polity 98 and WB data)



level of income, investment, trade openness, secondary and primary school levels are expressed in logs.[23]

We measure initial levels of democracy (1972/3) using a simple transformation of the Gastil scales in which we rescaled the sum of two scales so that they ranged from 0 to 1 with 1 being the most democratic and 0 being the least democratic (note that this reverses the order of the Gastil scales, which assigns the lowest scores to democracies). Our models also include a measure of contemporaneous political change, 1974–89, which is the difference between the base-line democracy score and the democracy scale averaged over the sample period. We include the estimated contemporaneous relationship between democracy and economic performance as a control variable rather than as the object of study (cf. Rodrik 1997).

For these and other models, we use extreme bounds analysis to assess the robustness of the results. The robustness checks proceed as follows. After defining a basic model that includes the variable of interest (e.g., democracy), run additional sets of regressions. In each additional regression, add several other plausible independent variables to the base model to see if the variable of interest (e.g., base democracy) has a stable statistical relationship to the dependent variable (e.g. economic volatility). The point is to assure that the relationship of interest is not significantly affected by a wide variety of alternative changes in the conditioning information. (This approach precisely follows Levine and Renelt 1992 and is in line with Leamer 1983.)

Democracy and Volatility

Some of the correlates of the rate of growth probably differ in some respects from the correlates of economic volatility. We continue to use the Barro and Levine/Renelt framework to account for volatility while adding other plausible variables. Ramey and Ramey (1995) found that an indicator of the volatility of government expenditures is a robust correlate of volatility, and we use it too.[24] We also include each country's prior economic volatility (1963–72) as an independent variable in order to control for selection effects that volatility may have on baseline democracy and also to capture any additional country-level characteristic volatility.[25]

Given the ambiguities about how best to model the sources of volatility, we estimate two additional "base

[23]The growth models upon which we build are descendants of Harrod-Domar/Solow models that are specified as multiplicative interactions between capital and labor, each, exponentially weighted. When log-transformed, this specification is rewritten as an additive model.

[24]Two standard indicators of government expenditures, gov7489 used by Levine and Renelt 1992, and g7489, from the Penn World Tables, have a few extremely divergent observations for the same countries. The PWT data identify larger real government sectors in the developing world than are identified by nominal data. To offset the possible bias introduced by the use of ppp-based government expenditure measures, we add a variable, SHWBGOV, to all equations where the volatility of government expenditures is used, which is the ratio of the Summers and Heston indicator, g7489, to the World Bank indicator, gov7489. Results available on request.

[25]Many sub-Saharan Africa countries would be excluded from the analysis if we used data prior to 1963.

models." The first of these emphasizes plausible *political* sources of volatility and includes contemporaneous growth and growth squared to capture the possibly significant curvilinear relationship between growth and volatility.[26] The second model stresses external *economic* sources of volatility by including a measure of dependence on primary materials exports, as well as a measure of volatility in the terms of trade.[27]

Finally, we estimated a single large model that nests other models (excluding those few variables for which limited data are available). This "kitchen sink" model includes an extremely wide array of controls.[28] Except for the variable of interest, baseline democracy, we regard all of the independent variables as control variables. The estimated coefficients are not of direct interest in this investigation, but are used to insure the comparability of our results to those of other scholars.

Results for Economic Growth

We estimate models for democracy and economic growth, 1974–89. (To conserve space, we report only the coefficients of interest, those on base democracy. Full results are available upon request.) The signs and levels of significance of the estimated coefficients of the control variables are broadly consistent with our expectations based on previous studies of economic growth. The model appears to perform well from a statistical point of view. In all estimates, we report heteroskedasticity-consistent standard errors (White 1984).

The coefficient of interest is a country's level of democracy, 1972–73. The coefficient in model 1 is positive (2.691) and statistically significant at beyond the .05 level. The results are not close to robust using EBA, however. In model 2, we added indicators of political instability, and the t-statistic for democracy's coefficient was 1.263. In model 3, we replicate the broadest Extreme Bounds Analysis model used by Levine and Renelt to test for robustness (1992, 950; Table 5, model *iv*), and the t-statistic for democracy's coefficient was 0.878.[29] Democracy is *not* a robust correlate of economic growth. This result reproduces a core finding of prior research.

Results for Volatility

Does the bivariate relationship between democracy and volatility, evident in Figure 1, hold up in a multivariate model? Table 4 reports the results for four models. Model 1 in Table 4 is the "base" model for economic growth adapted for volatility, and models 2 and 3 include as independent variables other plausible determinants of growth volatility. The dependent variable is the logged volatility of a nation's growth, 1974–89; the data are available for 105 countries. All four models perform well from the statistical point of view. The adjusted R^2 ranges from .47 to .59.

In contrast to the results for growth, the estimated coefficient of the level of base-period democracy (1972–73) is negative and statistically significant in all four models. The greater the level of base-line democracy, the more *stable* subsequent economic growth.

Most of the coefficient estimates for the control variables are either statistically insignificant or not robust. The coefficient for 1973 per capita income, however, is statistically significant and positive in models 3 and 4 (Table 4). This implies that richer—presumably more efficient—countries experienced higher subsequent volatility, other things equal. Also, the estimates for logged volatility of government expenditures are positive and statistically significant in models 1, 3, and 4, a result consistent with Ramey and Ramey's findings (1995). Trade variables generally were also significant and positive. Trade might lead to the wealth of nations, but it is a source of economic instability as well. A potentially surprising finding is that political instability and political violence indicators never approached statistical significance in any volatility model.

Our cross-sectional research design does not allow for any conclusions about the contemporaneous relationship between democratization and stable economic performance. The dynamics of the relationship are better revealed with other methods. We note, even so, that the estimates of the contemporaneous relationship are

[26]These are the number of revolutions and coups (from Barro 1991), a measure of political stability (Feng, Kugler, and Zak 2000), and government expenditure levels (as a percent of GDP).

[27]The measure of volatility in the terms of trade is available for only about half the countries in our sample. The countries for which the trade shock data are available are significantly more democratic, wealthier, higher growing, and more stable than those without observations. This test involved, therefore, a substantial reduction in variation in both our dependent variable and in the independent variable of interest.

[28]Compare to Rodrik (2000), who uses a similar but much more restricted set of controls.

[29] We omit several Levine and Renelt 1992 variables that are collinear with democracy: e.g., CIVIL, which is one of the Gastil scales we use, and SOC, which is an indicator of a socialist economy. We also added variables not included in the LR models, including growth, growth squared, and log of government expenditure volatility.

TABLE 4 Democracy Is a Robust Determinant of the Volatility of Economic Growth

Variable	Model 1	Model 2	Model 3	Model 4
Prior Volatility (logged, 1963–1973)	.171**	.256***	.241*	.147
	(.073)	(.072)	(.127)	(.086)
Initial GDP per capita, 1973 (log)	.029		.260***	.341**
	(.073)		(.085)	(.095)
Investment (logged)	−.200		−.356	.203
(INV)	(.175)		(.282)	(.185)
Population Growth	.091			.122*
(GPO)	(.058)			(.061)
Secondary-School enrollment (log)	.093			.054
(SEC)	(.077)			(.076)
Primary-School enrollment (log)	.014			−.149
(PRI)	(.107)			(.105)
Trade Openness (log, Imports +	.083	.260**	.043	.260*
Exports as a Percentage of GDP)	(.075)	(.113)	(.125)	(.101)
Volatility of Government Expenditures	.080***	−.244	.063***	.187**
(log, as % of GDP)	(.016)	(0.151)	(.019)	(.053)
Index of Democracy, 1973	**−.787*** **	**−.524*** **	**−.673** **	**−.631** **
	(.234)	**(.197)**	**(.285)**	**(.214)**
Change in *Index of Democracy*	−0.689**	−.548**	−.455	−.432*
Δ*Democracy* (1974–1989)	(.030)	(.279)	(.373)	(.214)
Average Annual Growth (GDP7489)		−.090***		0.002
		(.026)		(0.035)
Growth, 1974–89, Squared		.012*		.009
		(0.006)		(.006)
Volatility in Terms of Trade (log)			.317***	
(VARTERMS)			(.093)	
Share of Primary Products as % of			1.694**	
Exports (SXP)			(.717)	
Government Consumption (log)				−.020
(GOV)				(.012)
Growth of Government Share				.011
(GSG)				(.015)
Revolutions/coups		.047		−.010
(REVC)		(.215)		(.225)
Political Instability, 1974–89		1.243		
(Feng, Kugler, and Zak 2000)		(1.768)		
Africa dummy				.308*
(AFRICA)				(.142)
Latin America dummy				.368*
(LAAM)				(.144)
Growth of domestic credit				−.001
(GDC)				(.001)
Standard Deviation of				.070
Domestic credit (STDC) (log)				(.062)
Export-share growth				.042**
(XSG)				(.012)
Intercept	2.369***	2.203***	.314	−1.69
	(0.834)	(.519)	(1.201)	(1.01)
Observations	105	96	45	88
Adj. R^2	.47	.48	.55	.59

(Standard errors are listed below the coefficients) *≤ .1, **≤ .05; ***≤ .01 Notes: Coefficients were estimated using ordinary least squares regression (OLS), with a Heteroskedasticity-Consistent Covariance Matrix (White 1984).

negative and statistically significant in models 1, 2, and 4, consistent with the theoretical position we have developed above—democracy induces stability.

Robustness Checks

Are these results robust to further changes in the conditioning information? Appendix Table B reports the results of these checks. The results for the initial level of democracy and subsequent economic volatility are highly robust to the sequential inclusion of a wide range of potential control variables. The results are also robust to the inclusion of dummy variables representing East and Southeast Asia, sub-Saharan Africa, and Latin America, and to the omission of OECD nations, East Asian nations, or both. Furthermore, outliers do not drive our results.[30] As a final robustness check, we substitute democracy scores from the Polity 98 data set in place of Gastil scores. The direction and statistical significance of the democracy coefficients using Polity 98 data are identical to those using Gastil data, and the explanatory power of the equations are almost identical.

Democratic Institutions and Volatility: An Alternative Explanation

Democracy's effects on dampening volatility might originate in other mechanisms in addition to voter preferences. Various mechanisms of "incorporation," developed as variants of democratic processes, might contribute to the creation of stability. Corporatist institutions serve as direct forms of interest mediation and compromise, as Katzenstein (1985)proposed. Corporatist institutions could generate lower economic volatility.

Rodrik (2000) posits another mechanism through which democracy might dampen volatility: democratic societies are more likely to respond to economic shocks through burden-sharing compromises—i.e., more fairly. Because external shocks are unavoidable (or nearly so), societies with deep social cleavages are particularly likely to exhibit high rates of economic volatility because ethnic and social cleavages impede the process of social compromise. In divided societies, democracy brings about compromise without resort to social conflict or to economically dysfunctional transfer payments. The mechanism inducing stability is "the propensity of democracy to moderate social conflict and induce compromise" (Rodrik 2000, 1).

As an empirical matter, Rodrik proposes that "democracy is of economic value precisely in societies where ethnic, linguistic, geographical, and other cleavages would otherwise result in excessive amounts of socially unproductive opportunistic behavior" (2000, 8). In a related work, he uses measures of ethno-linguistic fragmentation and income inequality as proxies for social cleavages to show that higher levels of social cleavage were associated with discontinuities in growth (1999). Rodrik (1999) shows that the interaction among shocks, ethno-linguistic fragmentation, and autocratic institutions produces adverse performance.

A first step in evaluating these other hypotheses is to ascertain the direct effects on economic volatility of mediating institutions or social cleavages. A second step is to inquire whether democracies produce lower volatility by mediating the effects of social cleavages. An appropriate test for the second task is a regression specification with democracy, indicators of social cleavages, and the multiplicative interaction terms using the indicators (Friedrich 1982). If lower volatility in democracy follows from the amelioration of social cleavages (rather than citizen preferences), the interaction terms will be significant, and the base-line measures of democracy will be statistically insignificant.

In model 1, Table 5, we add to the base model (1) from Table 4 an indicator of the presence of corporatist institutions (coded as 0,1) for nine corporatist societies.[31] The hypothesis is that those institutions, rather than voters' preferences (or some other aspect of democracy), provide a mechanism for reduced economic volatility in democracy.

The results in model 1, Table 5 show that the estimated coefficient for corporatism is negative and statistically significant. Societies with corporatist institutions were indeed characterized by lower levels of growth volatility than democracies in general. Baseline democracy,

[30] Even after dropping (simultaneously) the ten highest variance cases and the ten lowest variance cases in both models 1 and 4 of Table 5, our estimated coefficient on base-year democracy remains strongly negative, and statistically indistinguishable from the original estimate. That is, even when we reduce the sample (by nearly 25 percent in the case model 4) by dropping the cases likely to have unusual leverage, the estimated coefficient of the democracy variable is negative and statistically significant. Similarly, we excluded all of the most extreme cases of democracy (combined Gastil scale scores of 14, 13, 3, 2) and the results on democracy were still preserved, again with coefficients that are statistically indistinguishable from the unconstrained results. These and all referenced results are available from authors upon request.

[31] Measures of corporatism are analyzed and summarized in Lijphart and Crepaz (1991). Nine countries are clearly "above average" in their summary indicators: Austria, Belgium, Denmark, Finland, Germany, the Netherlands, Norway, Sweden, and Switzerland.

TABLE 5 The Institutional and Social Determinants of Volatility in Economic Growth
Dependent Variable: Logged Volatility of Economic Growth, 1974–1989

Variable	Model 1	Model 2	Model 3
Prior Volatility (logged, 1963–1973)	0.146**	.133*	.136*
	(.071)	(.073)	(.072)
Initial GDP per capita, 1973 (log)	.041	.095	.097
	(.074)	(.075)	(.077)
Investment (logged) (INV)	−.206	−.396	−.066
	(.176)	(.153)	(.148)
Population Growth (GPO)	.062	.053	.049
	(.057)	(.059)	(.061)
Secondary-School enrollment (log) (SEC)	.090	.083	.072
	(.078)	(.077)	(.079)
Primary-School enrollment (log) (PRI)	−.002	−.047	−.032
	(.106)	(.102)	(.103)
Trade Openness (log, Imports + Exports as a Percentage of GDP)	.104	.111	.116
	(.075)	(.075)	(.075)
Volatility of Government Expenditures (log, as % of GDP)	.078***	.076***	.074***
	(.015)	(.014)	(.015)
Index of Democracy, 1973	**−.777*** **	**−.769*** **	**−.904*** **
	(.232)	**(.237)**	**(.274)**
Change in *Index of Democracy* *ΔDemocracy* (1974–1989)	−.715**	−.586*	−.586*
	(.297)	(.305)	(.306)
Corporatist Institutions (0,1 dummy variable)	−.303***	−.309***	−.281***
	(.113)	(.107)	(.105)
Ethno-linguistic Fractionalization		.0018	**.0002**
		(.0014)	**(.002)**
Ethno-linguistic Fractionalization* *Index of Democracy, 1973*			.004
			(.004)
Intercept	2.201***	1.078	1.194
	(.846)	(.861)	(.863)
Observations	105	99	99
Adj. R^2	.48	.49	.49

(Standard errors are listed below the coefficients) *≤ .1, **≤ .05; ***≤ .01 Notes: Coefficients were estimated using ordinary least squares regression (OLS), with a Heteroskedasticity-Consistent Covariance Matrix (White 1984).

however, continues to have a strong and statistically significant effect on volatility, so the effect of voter preferences (or some other mechanism) is not eliminated.

This finding causes us to pause and revisit the theory in Powell and Whitten (1993). They propose that elections in nonmajoritarian countries do not hinge on economic issues because voters cannot assess fully who is responsible for a country's economic performance. The countries they treat as nonmajoritarian, however, include most of those normally treated as being corporatist.[32] Another plausible explanation for the nonresults they report is that elections in most nonmajoritarian countries do not turn on macroeconomic events because voters have corporatist institutions through which to express their preferences.

In assessing the "social cleavage" hypothesis, we follow Rodrik (1999) and use data on a society's ethno-linguistic fragmentation from Mauro (1995). In model 2, Table 5, the estimated coefficient for this variable is positive as expected (fragmentation increases volatility), but the coefficient is not statistically significant. In this model, corporatism and base-year democracy both are statistically significant and correctly signed. The Rodrik (2000) hypothesis, however, is that democracy's effect is to ameliorate social cleavages. One direct test of that hypothesis is whether an interaction term between democ-

[32]Their list of nonmajoritarian countries includes Belgium, Denmark, Finland, Germany, Italy, the Netherlands, Norway, and Switzerland. All but Italy are corporatist countries.

racy and ethno-linguistic fragmentation is statistically significant.[33] We see in model 3, Table 5, that such a term is not statistically significant and has the wrong sign. Further, neither the ethno-linguistic measure nor the interaction term influences the explanatory power of the equations.

As a further test, we divided the sample of countries evenly into highly fragmented societies (ELF scores of 42 or greater) and less fragmented (ELF scores of less than 41), and reestimated Model 1 from Table 4. The baseline democracy measures remain negative and statistically significant in both equations—the only consistent coefficient estimate, save one, across the two samples.[34]

Rodrik (1999) notes that his preferred measure of social cleavage is a measure of income inequality. Using the "high quality" data on income inequality produced by Deininger and Squire (1996), we estimate the effects of a country's income inequality on growth volatility. (Rodrik 1999 also uses the GINI coefficients from the same source.) Because of missing data, our sample of countries is comparatively small: n = 49. Latin American and OECD member nations are disproportionately represented.

Table 6, model 1 presents the results for forty-nine countries, using the base model of volatility from before, adding the "high-quality" Deininger and Squire measures of income inequality (as close to 1973 as possible) and dummy variables for Latin American and African countries.[35] The coefficient estimates for democracy remain negative and highly statistically significant. The estimated coefficient for inequality is negative, but not statistically significant. Model 2 in Table 6 shows the results of the interaction term, GINI*Democracy.[36] Neither it nor the estimated coefficient of the inequality variable approach statistical significance, whereas the estimated coefficient of initial democracy remains negative and highly statistically significant.

In model 3, Table 6, we add three multiplicative interaction terms to the base model (following Friedrich 1982): democracy*GINI index of inequality;[37] democracy*ethno-linguistic fragmentation; and GINI index of inequality*ethno-linguistic fragmentation. The only statistically significant interaction term is that between income inequality and ethno-linguistic fragmentation, which is positive and which suggests that the more inequitable an ethnically divided society is, the higher the level of its growth volatility. Democracy's estimated coefficient remains negative and highly statistically significant. The coefficient estimate of ethno-linguistic fragmentation is positive and statistically insignificant. That of the GINI index of inequality is negative and statistically significant at the .1 level.[38] (The results for all aspects of our analysis are nearly identical when we substitute Polity 98 democracy scores for Gastil scores.)

Our analysis offers mixed evidence regarding the "social cleavage" hypothesis. Ethnically divided, highly inequitable societies do experience somewhat greater economic volatility. One type of political arrangement, corporatist institutions, does reduce growth volatility in addition to the direct and general effects of democracy. Democracy's effects on lower growth volatility, however, do not arise principally if at all from the amelioration of social cleavages. Democracy's direct effects are not substantially modified in the presence of social cleavages—and vice versa.

Discussion of the Results

The results from our analyses are as follows. First, voters only modestly rewarded incumbent governments for increased economic growth, but severely penalized them for increased economic volatility. Second, and unfortunately for incumbents, growth and volatility are positively correlated in efficient democracies. Perhaps in consequence of these together, levels of democracy have no robust relationship with subsequent growth. Third, the initial level of democracy has a robust, powerful relationship with the second moment—the volatility—of growth. We report the results here of twenty-one different models where growth volatility was the dependent variable and

[33] Note that the estimated coefficients of the original variables (base democracy and ethno-linguistic fragmentation) are now conditional coefficients, which can be interpreted directly only when the other term in the interaction is assumed to take the value zero.

[34] For the less divided societies, the coefficient estimate for baseline democracy was –1.160***, and for the more diverse societies, it was –0.713**.

[35] In adding these dummy variables, we maintain comparability to specifications used by Levine and Renelt. Including the regional dummy variables clearly improves fit and the normality of the residuals, but does not affect the magnitude or significance of our variables of interest.

[36] The GINI coefficients are rescaled so that zero is in the range. We did this by subtracting the value of the most equitable country, Great Britain, from all values. The ethno-linguistic fragmentation variable has a zero score (Korea) in its range.

[37] Increasing inequality is indicated by an increasing GINI index; increasing ethno-linguistic fragmentation is indicated by an increasing index.

[38] As a further experiment, we added a three-way interaction term: GINI*ELF*Dem. The coefficient estimate of the three-way interaction term is not statistically significant. Results available on request.

TABLE 6 Social Cleavage and Volatility in Economic Growth. Dependent Variable: Logged Volatility of Economic Growth, 1974–1989

Variable	Model 1	Model 2	Model 3
Prior Volatility (logged, 1963–1973)	.242**	.243**	.153*
	(.106)	(.110)	(.082)
Initial GDP per capita, 1973 (log)	.216*	.218*	.102
	(.116)	(.117)	(.094)
Investment (logged) (INV)	−.078	−.027	.381
	(.280)	(.288)	(.251)
Population Growth (GPO)	.212**	.202**	.085
	(.095)	(.088)	(.068)
Secondary-School enrollment (log) (SEC)	.013	−.020	.143
	(.100)	(.104)	(.089)
Primary-School enrollment (log) (PRI)	.244	.247	.293
	(.291)	(.297)	(.203)
Trade Openness (log, Imports + Exports as a Percentage of GDP)	.143	.152	.083
	(.099)	(.100)	(.074)
Volatility of Government Expenditures (log, as % of GDP)	.118***	.121***	.116***
	(.038)	(.039)	(.028)
Index of Democracy, 1973	**−1.016*** **	**−.780** **	**−.801*** **
	(.198)	**(.372)**	**(.287)**
Change in *Index of Democracy* *ΔDemocracy* (1974–1989)	−.536*	−.554*	−.361
	(.285)	(−.291)	(.263)
Corporatist Institutions (0,1 dummy variable)	−.248**	−.291***	−.198*
	(.113)	(.103)	(.099)
Ethno-linguistic Fractionalization			.005
			(.004)
Ethno-linguistic Fractionalization* *Index of Democracy, 1973*			−.003
			(.004)
GINI Index, 1973	−.013	−.005	−.018*
	(.008)	(.015)	(.010)
GINI Index, 1973* *Index of Democracy, 1973*		−.014	**−.0001**
		(.019)	(.013)
GINI Index*Ethno-linguistic Fractionalization			**.0003** **
			(.0001)
Latin America (0,1 dummy variable)	.444***	.441***	.734***
	(.147)	(.151)	(.147)
Africa	.055	−.011	.264
	(.347)	(.366)	(.247)
Intercept	.435	.055	−.208
	(1.400)	(1.613)	(1.295)
Observations	49	49	47
Adj. R^2	.55	.54	.70

(Standard errors are listed below the coefficients) *≤ .1, **≤ .05; ***≤ .01 Notes: Coefficients were estimated using ordinary least squares (OLS), with a Heteroskedasticity-Consistent Covariance Matrix (White 1984).

estimated many others: the coefficient estimate of prior levels of democracy was always negatively and highly statistically significantly associated with subsequent volatility. Fourth, political institutions might lessen economic volatility, but we find no support for the proposition that democracies produce lower volatility by ameliorating the consequences of social cleavages. Our results are consistent with the proposition that the risk aversion of voters moves democracies to the realm of efficiency where they find that higher growth requires higher volatility.

Conclusion

We suggest a new way of reconciling the inconsistent empirical and theoretical literature about the relationship between democracy and economic growth. We propose that risk-averse voters in democracy care about two aspects of their economic life—their prosperity relative to the past (i.e., growth) and the instability they experience (volatility). We argued that policies in democratic systems reflect their more highly developed mechanisms for representing citizens' risk-aversion. The implication of our analysis is that we should observe a strong, robust, positive association between democracy and lower rates of economic volatility. And, we do.

These results point to a new agenda for research on how democratic institutions affect economic performance. In the short-term, this new agenda would examine performance in terms of both growth and volatility. In particular, scholars should probe the relationships among democracy, volatility, and growth, perhaps using, once the technology has developed, some version of pooled, Vector Autoregressive modeling.

Longer-term, the link between lower volatility, democracy, and citizen voting behavior connects to many strands of political economy scholarship. This new agenda might follow Wittman (1995) in developing the implications of the proposition that democracy is the economically efficient form of government or it might look to the historical development of democracies and the way in which volatility has been a factor (distinguishable from prosperity) in electoral outcomes.

The idea that economic policy in democracy seeks to moderate risks relates to some of the most significant thinking about market systems. Polanyi ([1944] 1957, 130 and following) wrote that the dynamics of market societies were governed by a "double movement," a clash of two great organizing principles. The first, the principle of economic liberalism, reveals itself in our commitment to creating self-regulating markets. The second, Polanyi calls "the principle of social protection aiming at the conservation of man and nature as well as productive organization. . ." ([1944] 1957, 13). This "second principle," the search for social protection, is, we suspect, the fundamental source of democratic concern for economic stability. This persisting concern finds expression through modern democratic history in the creation of institutions to enhance and expand stability in the face of instabilities emerging from markets. Articulating and unraveling this history would go back to some of the most important themes in the history of political economy. And, perhaps most importantly, this agenda will involve the search for better understanding of economic volatility in the processes "selecting" for and against democracy. Restating our core thesis again: the mechanisms of democratic competition and the preferences of voters lead democracies to select away from very low and very high growth, and away from high volatility.

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Appendix
Data Sources

We use the Gastil scales, which include one seven-point scale for "political freedom" and another seven-point scale for "civil rights." Following Burkhart and Lewis-Beck (1994), we summed the scales together. We then calculated averages for the period 1974–89, and also for the "base" period 1972–73. Democracy has been operationalized in various ways, which has engendered some controversy (Diamond and Plattner 1996). In a validation study, Bollen (1993) recommends the scales published by Freedom House, referred to as Gastil scales, which are available from 1972/1973 onward. Bollen suggests that the Gastil measure is preferable to an alternative provided by Jaggers and Gurr (1996) in the Polity III (now Polity 98) data set. Burkhart (1997) revisits the question and comes to similar conclusions about the utility of the Gastil/Freedom House scales. Others using the Gastil measure are Keefer and Knack (1997), Burkhart and Lewis-Beck, (1994), and Helliwell (1994).

Several standard quantitative measures are, in any event, highly correlated. We found a correlation of .94 between the 1974–89 average of the Gastil data and a 1974–89 average of the ten-point Democracy scale from the Polity III data set. Our base measure (averaging 1972–73) was correlated at .90 with a similar Polity III average. We used the 1974–89 average Gastil Index to correctly predict 92 percent of the democratic/nondemocratic classifications used by Alesina and Rodrik (1994). We therefore use Gastil scales here modifying them to create a 0–1 scale in which 1 is the most democratic and 0 is the least democratic.

Average growth rates, economic volatility, and volatility of government expenditures are computed from the Penn World Tables Mark 5.6 (Heston et al. 1995). Data on most of the other economic variables come from publicly available data sets developed by Levine and Renelt (1992). The measure of natural-resource exports as a percentage of GDP comes from Sachs and Warner (1997), and the data on logged change in terms of trade is from Bruno and Easterly

(1998). This study covers long-run behavior for the period 1974–89 and baseline data are drawn from 1972–73. Our complete data set includes observations for 119 countries, but many countries have missing data for one or more variables. The "base model" for volatility contains observations for 109 countries.

Appendix Table A1 Country, Volatility and Democracy by Real GDP per capita Quartiles

Group	Mean Volatility	Mean Democracy	Mean Elf	Mean GINI	N	Proportion of group in each income quartile: Top	second	third	Bottom	
Latin America	6.53	8.49	28.94	53.36	19	0.11	0.63	0.26	0.00	1.00
OECD	2.81	13.22	21.85	33.69	26	0.85	0.15	0.00	0.00	1.00
Africa	7.17	4.93	63.50	47.66	43	0.00	0.12	0.40	0.49	1.00
Sub-Saharan	7.57	4.82	66.97		38	0.00	0.13	0.32	0.55	1.00
Asia/Pacific	4.99	7.95	51.83	39.80	16	0.06	0.25	0.31	0.38	1.00
Caribbean	5.11	10.69	17.70	45.00	5	0.20	0.40	0.20	0.20	1.00
Middle East	9.38	5.24	23.13		8	0.50	0.25	0.13	0.13	1.00
					N = 117	30	29	29	29	117

Appendix Table B Summary of Sensitivity and Robustness Results for Estimated Coefficient of Index of Democracy on *Volatility* of Growth

Variables	Regression Coeff. on Democracy	Standard Error	t-ratio	adj R^2	Number of Observations
1. Base model (Table 2, model 1)	–.708**	.241	–2.94	.46	105
Sets of controls:					
2. Growth + Growth^2	–.601*	.243	–2.473	.46	105
3. STDC, REVC, GOV	–.695**	.259	–2.683	.55	88
4. X, PI, REVC added	–.688**	.260	–2.644	.47	103
5. Natural Resource Exports as percentage of GDP (SXP) added	–.589*	.267	–2.209	.52	86
6. Natural Resource Exports as percentage of GDP (SXP) and logged volatility of terms of trade (VARTERMS)	–.801*	.360	–2.225	.55	45
Regional dummy variables:					
7a. East Asia, Latin America and sub-Saharan Africa dummies added	–.662**	.206	–3.206	.50	105
7b. OECD countries omitted from the analysis	–.689**	.216	–3.193	.25	83
7c. OECD, East Asia countries omitted from the analysis	–.647**	.204	–3.174	.26	77

Notes: *0.05>p-value>0.01; **p-value<0.01. Coefficients were estimated using OLS with heteroskedasticity-consistent covariance matrix (White 1984). The variables are from Levine and Renelt (1992) except natural-resource exports as a percent of GDP (SXP) (Sachs and Warner 1997) and volatility in terms of Trade (VARTERMS; Bruno and Easterly 1998). REVC is numbers of coups and revolutions; STDC is standard deviation of domestic credit; GOV is government expenditure as a proportion of GDP; X is export share of GDP; and PI is inflation of GDP deflator. The models replicate those found in Levine and Renelt (1992, 947; Table 1).

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