

# Regression Results to Accompany “Why Democracies Fail” by Ethan Kapstein and Nathan Converse

## THE REGRESSION MODEL

The dependent variable in our analysis is binary—whether or not a particular young democracy reverts to authoritarianism in a given year. Consequently, it is appropriate to use event history methodology to analyze the dataset we have built. We employ a continuous time hazard model, which can deal with variables that vary from year to year, like inflation or economic growth. Specifically, we used a Weibull model as opposed to, for example, an exponential model because descriptive statistics (discussed in the article) indicate that the rate of democratic reversal may decline over time. The Weibull will allow us to explicitly test this hypothesis with the following model:

$$h(t|\mathbf{x}_t) = p^{p-1} \exp(\mathbf{b}_0 + \mathbf{x}_{1t}\mathbf{b}_1 + \mathbf{x}_{2t}\mathbf{b}_2 + \mathbf{x}_{3t}\mathbf{b}_3 + \mathbf{x}_{4t}\mathbf{b}_4),$$

where  $h(t|\mathbf{x}_t)$  is the (limiting or instantaneous) probability of democratic reversal and  $p$  is a time-dependence parameter. If the rate of democratic reversal is independent of the age of the democratic regime,  $p$  will be equal to one. The vectors  $\mathbf{x}_1$ ,  $\mathbf{x}_2$ ,  $\mathbf{x}_3$ , and  $\mathbf{x}_4$  contain independent variables selected based on the descriptive statistics we saw in the previous section. In particular,  $\mathbf{x}_1$  contains economic variables,  $\mathbf{x}_2$  institutional variables,  $\mathbf{x}_3$  variables characterizing initial conditions, and  $\mathbf{x}_4$  variables measuring economic policies.

## REGRESSION RESULTS

The regressions results are summarized in Tables 1 to 3, which report the effect in percentage terms of a one-unit increase in each independent variable on the baseline hazard rate (the instantaneous probability of democratic reversal). For example, according to our estimates, a one-point increase in a country’s Polity IV score for constraints on the executive reduces the risk of reversal by around 20 percent (when all other variables are set at zero).

Table 1 presents the results on the relationship between economic performance and political institutions on the one hand and the risk of democratic reversal on the other, controlling for initial conditions using log GDP per capita and a dummy indicating the decade of democratization, as well as for government policy, as represented by government spending on consumption as a percentage of GDP. In Table 2, we report our findings on how initial conditions and democratic reversal are related, controlling for economic performance (average GDP growth during the previous five years and log consumer price inflation), political institutions (constraints on executive power), and government policy. The sample used for the regressions reported in Table 2 was smaller than that used in Table 1, due to the more limited availability of data on, for example, income inequality. Table 3, making use of a further reduced sample because of the availability of data on foreign aid, contains the result of regressions assessing the relationship between government policy and democratic reversal, controlling for economic performance, political institutions, and initial conditions. Note that all our specifications significantly (at a 99 percent level) improve on a constant-only model, as indicated by a Wald test of the joint null hypothesis that all coefficients are equal to zero.

## ROBUSTNESS CHECKS

We conducted two sets of robustness checks on our results. First, we ran the regressions using an exponential model (equivalent to fixing the time dependence parameter at one) and a non-parametric Cox proportional hazard model. In both cases, the coefficient estimates and the results of significance tests were nearly identical to the results for the Weibull model that we present here. Second, we ran the regressions presented here on a data set created using an alternate definition of democracy. Defining democracy as having a strictly positive Polity score identifies 136 democratizations in the period from 1960 to 2004. The resulting data set, consisting of 1,481 country-years of democracy, yielded coefficient estimates very similar to those presented here and unchanged significance levels (these results are available from the authors on request).

**TABLE 1—ECONOMIC PERFORMANCE, POLITICAL INSTITUTIONS, AND RISK OF DEMOCRATIC REVERSAL**

**Regressions: Impact on Risk of Democratic Failure, Weibull Hazard Model**  
Reporting estimated % change in baseline hazard rate resulting from a one-unit increase in the independent variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Growth	-0.072 (0.022)	***							
Growth, 5Yr Ave		-0.114 (0.029)	***						
Log Inflation			1.343 (0.330)						
Investment				-0.050 (0.037)					
Investment, 5Yr Ave					-0.050 (0.032)				
Executive Constraints	-0.206 (0.110)		-0.223 (0.110)	*	-0.191 (0.110)		-0.201 (0.110)		-0.190 (0.110)
Presidential									
Prior Democratizations									
Cumulative Years of Democracy									
Log GDP per capita	-0.576 (0.087)	***	-0.593 (0.088)	***	-0.620 (0.084)	***	-0.542 (0.089)	***	-0.541 (0.089)
Pre-1980	3.986 (1.950)	***	5.366 (2.540)	***	5.230 (2.530)	***	3.752 (1.840)	***	3.800 (1.850)
Government Consumption (% GDP)	-0.105 (0.038)	***	-0.110 (0.037)	***	-0.105 (0.036)	***	-0.095 (0.038)	**	-0.092 (0.037)
Time Dependence Parameter	1.051 (0.100)		1.085 (0.110)		1.081 (0.110)		1.095 (0.130)		1.085 (0.120)
Log Likelihood <sup>1</sup>	-69.08 (54.0)		-66.51 (49.5)		-65.81 (70.4)		-69.76 (34.9)		-69.81 (35.0)
Observations	1140		1140		1140		1140		1140

Note: Robust standard errors, clustered on democratic episode, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<sup>1</sup> Chi-squared statistic from a Wald test against a constant-only model in parentheses.

**TABLE 2—INITIAL CONDITIONS AND RISK OF DEMOCRATIC REVERSAL**

**Regressions: Impact on Risk of Democratic Failure, Weibull Hazard Model**

Reporting estimated % change in baseline hazard rate resulting from a one-unit increase in the independent variable

	(10)		(11)		(12)		(13)		(14)		(15)		(16)	
Growth, 5yr Ave	-0.174	***	-0.133	***	-0.136	***	-0.134	***	-0.131	***	-0.130	***	-0.229	***
	(0.041)		(0.044)		(0.045)		(0.047)		(0.046)		(0.045)		(0.058)	
Log Inflation	0.220		0.272		0.323		0.266		0.282		0.286		0.528	*
	(0.240)		(0.320)		(0.320)		(0.330)		(0.340)		(0.330)		(0.340)	
Executive Constraints	-0.269	**	-0.225	**	-0.236	*	-0.215		-0.218		-0.227	*	-0.290	**
	(0.097)		(0.120)		(0.120)		(0.120)		(0.120)		(0.120)		(0.110)	
Log GDP per capita	-0.296		-0.628	***	-0.593	***	-0.634	***	-0.639	***	-0.637	***	-0.550	***
	(0.160)		(0.086)		(0.110)		(0.080)		(0.082)		(0.079)		(0.120)	
Pre-1980	4.693	***	8.024	***	7.147	***	8.031	***	8.026	***	7.896	***	7.491	***
	(2.690)		(3.970)		(3.690)		(4.290)		(4.410)		(3.730)		(3.730)	
Infant Mortality	0.024	***												
	(0.008)													
Gini Coefficient			0.031											
			(0.039)											
Ethnic					1.316									
					(3.110)									
Oil Dependent							-0.230							
							(0.740)							
Post-Colonial									-0.097					
									(0.470)					
World Growth											-0.018			
											(0.130)			
Lat.Am													-0.727	
													(0.230)	
E.Europe													-0.970	**
													(0.043)	
Sub-Saharan Africa													-0.301	
													(0.340)	
Government Consumption (% GDP)	-0.133	***	-0.139	***	-0.144	***	-0.141	***	-0.138	***	-0.141	***	-0.164	***
	(0.037)		(0.042)		(0.042)		(0.041)		(0.044)		(0.041)		(0.044)	
Time Dependence Parameter	1.373	***	1.179		1.176		1.185		1.189		1.177		1.273	**
	(0.17)		(0.12)		(0.12)		(0.13)		(0.14)		(0.12)		(0.15)	
Log Likelihood <sup>1</sup>	-51.37		-54.99		-54.94		-55.18		-55.22		-55.23		-52.43	
	(91.1)		(98.8)		(84.4)		(113.9)		(101.4)		(101.7)		(94.8)	
Observations	1052		1052		1052		1052		1052		1052		1052	

Note: Robust standard errors, clustered on democratic episode, in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<sup>1</sup> Chi-squared statistic from a Wald test against a constant-only model in parentheses.

**TABLE 3—GOVERNMENT POLICIES AND RISK OF DEMOCRATIC REVERSAL****Regressions: Impact on Risk of Democratic Failure, Weibull Hazard Model**

Reporting estimated % change in baseline hazard rate resulting from a one-unit increase in the independent variable

	(16)		(17)		(18)		(19)	
Growth, 5yr Ave	-0.053	**	-0.072	**	-0.051	*	-0.05	*
	(0.03)		(0.03)		(0.03)		(0.03)	
Log Inflation	0.895	***	0.85	***	0.773	***	0.94	***
	(0.33)		(0.34)		(0.33)		(0.34)	
Executive Constraints	-0.174	*	-0.172	*	-0.154	*	-0.18	*
	(0.10)		(0.09)		(0.10)		(0.09)	
Log GDP per capita	-0.559	***	-0.548	***	-0.555	***	-0.604	***
	(0.09)		(0.08)		(0.09)		(0.09)	
Pre-1980	6.213	***	6.141	***	4.395	***	5.524	***
	(2.43)		(2.42)		(1.88)		(2.25)	
Government Consumption (% GDP)	-0.086	***	-0.064	**	-0.094	***	-0.078	**
	(0.03)		(0.03)		(0.03)		(0.03)	
Trade (%GDP)			-0.016	*				
			(0.01)					
Liberalization					-0.735	***		
					(0.13)			
Aid (%GDP)							-0.021	
							(0.02)	
Time Dependence Parameter	1.073		1.214		1.26	**	1.108	
	(0.11)		(0.15)		(0.14)		(0.12)	
Log Likelihood <sup>1</sup>	-72.1		-69.56		-68.21		-71.53	
	(106.0)		(72.4)		(111.4)		(103.3)	
Observations	987		987		987		987	

Note: Robust standard errors, clustered on democratic episode, in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

<sup>1</sup> Chi-squared statistic from a Wald test against a constant-only model in parentheses.