ONLINE APPENDIX

POLITICAL BOOMS, FINANCIAL CRISES

HELIOS HERRERA, GUILLERMO ORDOÑEZ AND CHRISTOPH TREBESCH

ABSTRACT. In this Online Appendix we

(A) Describe in detail the sample and the variables used in the main text.

(B) Show robustness to using different samples, to explaining sudden stops and to including several additional economic, financial and political controls.

(C) Show out-of-sample forecasting results.

(D) Describe the new dataset on government approval based on polling results.

(E) Show that the dynamics of the ICRG stability index captures well the dynamics of popularity by comparing it with the new dataset on government approval. We present more detailed evidence of the evolution of popularity and government changes around specific events of financial crises.

(F) Present the proofs of Propositions.

(G) Provide further empirical support for the reputation mechanism we propose in the manuscript, in particular through the regulatory behavior of policymakers.

(H) Provide a numerical simulation of the reputational mechanism dynamics.

APPENDIX A. SUMMARY OF SAMPLE AND VARIABLES

Sample of Countries

Sample of Advanced Economies (22): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

Sample of Emerging Economies (40): Algeria, Argentina, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Czech Republic, Ecuador, Egypt, Estonia, Hong Kong, Hungary, India, Indonesia, Israel, Jordan, Latvia, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Thailand, Turkey, Uruguay, Venezuela.

Table A.1: Sample of Crises

Banking Crises (Laeven and Valencia)		Major Crises (Laeven and Valencia, Reinhart and Rogoff)		Sudden Stops (Calvo, Izquierdo and Mejía)	
Emerging Economies		**Emerging Economies**		**Emerging Economies**	
Costa Rica	1987	Hong Kong	1997	Argentina	1995
Argentina	1989	Indonesia	1997	Argentina	1999
Jordan	1989	Malaysia	1997	Brazil	1995
Algeria	1990	Philippines	1997	Brazil	1998
Brazil	1990	South Korea	1997	Bulgaria	1995
Romania	1990	Thailand	1997	Chile	1995
Hungary	1991	Russia	1998	Colombia	1997
Nigeria	1991	Argentina	2000	Costa Rica	1998
Estonia	1992	Turkey	2000	Ecuador	1995
Poland	1992			Ecuador	1999
Slovenia	1992	**Advanced Economies**		Estonia	1998
India	1993	Norway	1987	Hong Kong	1998
Costa Rica	1994	Finland	1991	Indonesia	1997
Mexico	1994	Sweden	1991	Jordan	1994
Venezuela	1994	Japan	1992	Jordan	1998
Argentina	1995	Iceland	2007	Latvia	1999
Latvia	1995	Ireland	2007	Lithuania	1999
Lithuania	1995	United Kingdor	2007	Malaysia	1994
Bulgaria	1996	United States	2007	Mexico	1994
Czech Rep.	1996	Greece	2008	Pakistan	1995
Indonesia	1997	Portugal	2008	Peru	1997
Malaysia	1997	Spain	2008	Philippines	1995
Philippines	1997			Poland	1999
South Korea	1997			Slovak Rep.	1997
Thailand	1997			Slovenia	1998
China	1998			South Korea	1997
Colombia	1998			Thailand	1996
Ecuador	1998			Turkey	1994
Russia	1998			Turkey	1998
Slovak Rep.	1998			Uruguay	1999
Turkey	2000				
Argentina	2001			**Advanced Economies**	
Uruguay	2002			Austria	1992
Hungary	2008			France	1992
Latvia	2008			Greece	1992
Russia	2008			Portugal	1992
Slovenia	2008			Spain	1992
				Sweden	1992
Advanced Economies					
United States	1988				
Finland	1991				
Norway	1991				
Sweden	1991				
Japan	1997				
United Kingdom	2007				
United States	2007				
Austria	2008				
Belgium	2008				
Denmark	2008				
France	2008				
Germany	2008				
Greece	2008				
Iceland	2008				
Ireland	2008				
Netherlands	2008				
Portugal	2008				
Spain	2008				
Sweden	2008				
Switzerland	2008				

Table A.2: List of Variables and Data Sources

Variable	Definition	Source
Economic and Financial Variables		
Banking crises	Crisis onset year (dummy)	Leaven and Valencia (2010, 2012)
Sudden stops	Crisis onset year (dummy)	Calvo et al. (2008)
Credit growth	Change in domestic credit to private sector (yoy, as % of GDP)	World Bank WDI dataset
Growth rate	Change in real GDP (yoy)	World Bank WDI dataset
Stock market prices	Change in main stock market index (yoy, inflation adjusted)	Reinhart and Rogoff (2009), updated dataset
House price changes	Change in real house prices (yoy, inflation adjusted)	Cesa-Bianchi (2013), complemented with data by Mack and Martínez-García (2011)
Expenditures/GDP	Change in general government total expenditure (yoy, as % of GDP)	IMF WEO dataset
Current account/GDP	Change in the current account balance (yoy, as % of GDP)	World Bank WDI dataset
Consumption/GDP	Change in household consumption expenditure (yoy, as % of GDP)	World Bank WDI dataset
Reserves	Change in total reserves (yoy, in months of imports)	World Bank WDI dataset
Inflation	Inflation rate (yoy, in logs)	World Bank WDI dataset
Terms of Trade	Change in terms of trade (yoy, constant local currency units)	World Bank WDI dataset
Contagion	Share of countries entering a banking crisis	Leaven and Valencia (2012), own calculatior
Country credit ratings	Change in credit rating score of the Institutional Investor magazine, which ranges from 0 (highest risk) to 100 (lowest risk).	Institutional Investor
Political and Institutional Variables		
Government stability	Indicator capturing the government's ability to stay in office and carry out its policy program(s)	ICRG dataset
Popularity	Government approval rates (in %) based on political polls. See Appendix D for details	Own data collection (Appendix D)
Democracy	Polity2 index ranging from -10 (full autocracy) to +10 (full democracy)	Polity IV project database
Executive constraints	Based on "XCONST" variable in Polity IV project	Polity IV project database
Presidential system	Based on "SYSTEM" variable (presidential systems)	Database of Politcal Institutions (DPI)
Rule of law	Law and order indicator, capturing strength and impartiality of the legal system and the popular observance of the law	ICRG dataset
Bureaucratic quality	Indicator capturing the institutional strength and quality of the bureaucracy	ICRG dataset
Quality of Government	Sum of institutional indicators on ”corruption”, ”rule of law” and ”bureaucracy quality”	ICRG dataset
Central bank independence	Central bank autonomy index, capturing both economic and political	Arnone et al. (2006)
New executive (gov. change)	Federal election (presidential or parliamentarian) in the last two years	DPI (Beck et al. 2001)
Political fractionalization	Based on "GOVFRAC" variable (probability that two deputies picked at random from among the government parties will be of different parties)	DPI (Beck et al. 2001)
Years in office	Based on "YRSOFFC" in the DPI (How many years has the chief executive been in office?)	DPI (Beck et al. 2001)
Years to next election	Based on "YRCURNT" in the DPI (years left in current term)	DPI (Beck et al. 2001)
Left government	Based on "EXECRLC" on the DPI (party orientation "Left")	DPI (Beck et al. 2001)
External conflicts	Scope of external conflicts, building on the subcomponents "War", "Cross-Border Conflict" and "Foreign Pressures"	ICRG dataset
Internal conflicts	Scope of internal conflicts, building on the subcomponents "Civil War", "Terrorism/Political Violence" and "Civil Disorder"	ICRG dataset
Violent riots	Any violent demonstration or clash of more than 100 citizens involving the use of physical force.	Banks and Wilson (2013)
General strikes	Any strike of 1,000 or more industrial or service workers that involves more than one employer and is aimed at national government policies or	Banks and Wilson (2013)
Anti-government demonstrations	Any peaceful public gathering of at least 100 people for the purpose of voicing opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature.	
Major government crises	Any rapidly developing situation that threatens to bring the downfall of the present regime, excl. situations of revolt aimed at such overthrow.	Banks and Wilson (2013)

APPENDIX B. ROBUSTNESS ANALYSIS

FIGURE B.1. Stability index surrounding **banking crises**: full sample

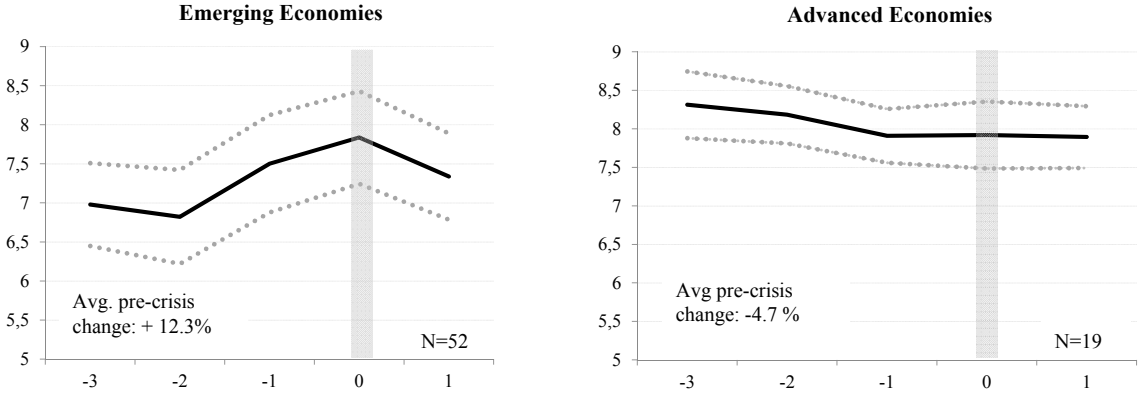


FIGURE B.2. Stability index surrounding **sudden stops**: full sample

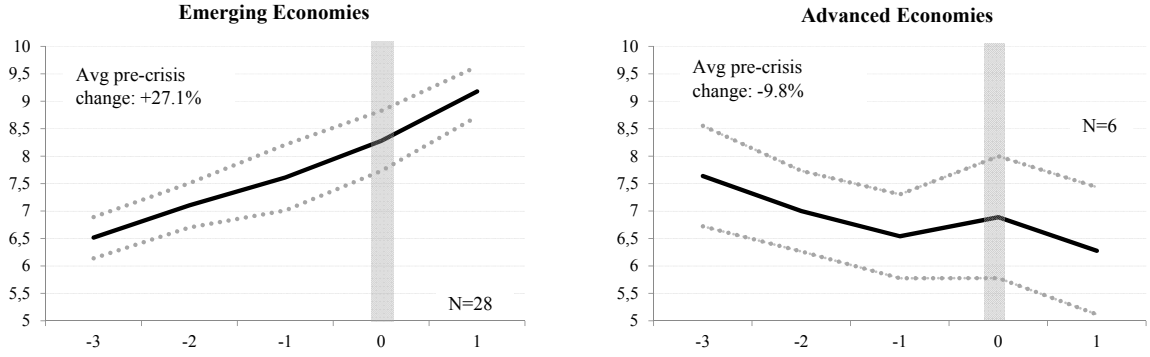


Table B.1: Predicting Banking Crises - Additional Economic and Financial Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Random Effects Panel	Time Fixed Effects	Without Asian Crisis and Fin. Cris. of 2008	Growth Rate (real)	House Prices (change, real)	Stock Prices (change, real)	Current Account to GDP	Household Consumption/GDP (change)	Inflation (log)	Terms of Trade (change, real)
Country FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ΔGovernment Stability (yoy change, lag 1)	-0.007	-0.014	-0.017**	-0.007	-0.006	-0.009	-0.007	-0.006	-0.012	-0.009
	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)	(0.010)
ΔGovernment Stability (yoy change, lag 2)	-0.001	-0.003	-0.003	-0.001	-0.000	0.001	-0.001	-0.001	-0.008	-0.000
	(0.007)	(0.008)	(0.003)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
ΔGovernment Stability (yoy change, lag 3)	-0.009*	-0.005	-0.007	-0.009*	-0.009	-0.010*	-0.008	-0.009*	-0.010	-0.008
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.007)	(0.005)
Interaction ΔGovStab & EME Dummy (lag 1)	0.026**	0.029**	0.031***	0.026**	0.028**	0.035**	0.027**	0.028**	0.032**	0.023*
	(0.012)	(0.012)	(0.011)	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)
Interaction ΔGovStab & EME Dummy (lag 2)	-0.005	-0.002	-0.000	-0.005	-0.013*	-0.008	-0.006	-0.005	0.002	-0.004
	(0.009)	(0.009)	(0.006)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
Interaction ΔGovStab & EME Dummy (lag 3)	0.020***	0.015**	0.015**	0.020**	0.020**	0.023**	0.020**	0.019***	0.023***	0.015*
	(0.008)	(0.007)	(0.007)	(0.008)	(0.010)	(0.009)	(0.008)	(0.007)	(0.009)	(0.008)
ΔPrivate credit to GDP (3-year moving avg.)	0.003***	0.003***	0.000	0.003***	0.004***	0.005***	0.003***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.029***	0.023	0.020***	0.025***	0.026***	0.030***	0.033***	0.028***	0.028*	0.028***
	(0.005)	(0.019)	(0.001)	(0.007)	(0.004)	(0.002)	(0.002)	(0.002)	(0.006)	(0.002)
Additional Controls	EME Dummy	Year fixed effects		Real GDP growth (%)	Δ House Prices (real)	Δ Stock Prices (real)	ΔCurrent Account to GDP	Δ Household Consumption	Inflation (in %)	Terms of Trade
Sum of Government Stability lag coefficients (those marked in grey)	0.040**	0.042**	0.046***	0.041**	0.035*	0.050**	0.041**	0.042**	0.057**	0.034**
	(0.017)	(0.019)	(0.016)	(0.017)	(0.019)	(0.020)	(0.017)	(0.017)	(0.018)	(0.018)
Observations	1,272	1,272	1,154	1,265	803	884	1,221	1,257	980	1,122
R2	0.023	0.123	0.016	0.026	0.033	0.034	0.027	0.029	0.032	0.024
Adjusted/Pseudo R2		0.103	0.010	0.020	0.024	0.025	0.020	0.022	0.024	0.017

The dependent variable is a binary indicator for the onset of banking crises from Laeven and Valencia. Our main explanatory variable is the change in government stability as measured by the continuous ICRG indicator (ranging from 1 to 12). Robust standard errors clustered on country in parentheses. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

Table B.2: Predicting Banking Crises - Additional Political and Institutional Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Only Developed Democracies (Polity>5)	Control for Political System	Quality of Institutions	Central Bank Indepen-dence	New Executive	Left Govern-ment	Wars: Internal & External Conflicts	Major Political Events and Turmoil	Country Risk (Credit Ratings)
Country FE	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
Δ Government Stability (yoy change, lag 1)	-0.008	-0.009	-0.009	-0.007	-0.006	-0.006	-0.006	-0.004	-0.006
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.007)	(0.010)
Δ Government Stability (yoy change, lag 2)	0.000	-0.000	0.000	-0.001	-0.001	-0.001	-0.000	0.001	-0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.003)	(0.007)
Δ Government Stability (yoy change, lag 3)	-0.010*	-0.010**	-0.011*	-0.009*	-0.009*	-0.009*	-0.010*	-0.006	-0.008
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)
Interaction Δ GovStab & EME Dummy (lag 1)	0.022*	0.028**	0.028**	0.026**	0.026**	0.021*	0.026**	0.028***	0.027**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.010)	(0.012)
Interaction Δ GovStab & EME Dummy (lag 2)	-0.007	-0.007	-0.008	-0.005	-0.006	-0.001	-0.007	-0.007	-0.007
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)	(0.009)	(0.007)	(0.009)
Interaction Δ GovStab & EME Dummy (lag 3)	0.026***	0.022***	0.022***	0.020***	0.020**	0.023**	0.020**	0.015**	0.019**
	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.007)	(0.007)
Δ Private credit to GDP (3-year moving avg.)	0.004***	0.004***	0.004***	0.003***	0.003***	0.005***	0.004***	0.002**	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.031***	0.021*	0.014	0.025*	0.036***	0.039***	0.043	0.002	0.034***
	(0.003)	(0.011)	(0.034)	(0.010)	(0.004)	(0.007)	(0.065)	(0.009)	(0.002)
Additional controls		Polity2 & Presidential System	Executive Constraints, Rule of Law, Bureaucratic Quality	Index of CB Indep-endence	Dummy for New Executive	Dummy for Left-wing Governm.	External or Internal Conflicts	Strikes, Riots, Gov. Crises, Elections, Cabinet Change	Country Credit Ratings (Institutional Investor)
Sum of government stability lag coefficients (those marked in grey)	0.041**	0.044**	0.042**	0.041**	0.040**	0.044**	0.039**	0.035**	0.039**
	(0.018)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)	(0.017)	(0.014)	(0.017)
Observations	958	1,216	1,160	1,249	1,240	926	1,210	1,004	1,272
R2	0.02	0.025	0.027	0.023	0.026	0.029	0.028	0.043	0.028
Adjusted/Pseudo R2	0.02				0.019	0.020	0.020	0.032	0.021

The dependent variable is a binary indicator for the onset of banking crises from Laeven and Valencia. Our main explanatory variable is the change in government stability as measured by the continuous ICRG indicator (ranging from 1 to 12). Robust standard errors clustered on country in parentheses. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

Table B.3: Predicting Banking Crises - Results in EME Sub-sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline	With Contagion Variable	With Ratings and Current Account	With Institutions	With Stock Prices	With House Prices	Without Asian Crisis	Without Financial Crisis of 2008
Country Sample	EME	EME	EME	EME	EME	EME	EME	EME
Country FE	Yes	Yes	Yes	No	No	No	No	No
ΔGovernment Stability (yoy change, lag 1)	0.019***	0.019***	0.022***	0.023***	0.031***	0.030***	0.018**	0.033***
	(0.006)	(0.006)	(0.007)	(0.008)	(0.009)	(0.010)	(0.009)	(0.009)
ΔGovernment Stability (yoy change, lag 2)	-0.007	-0.007	-0.006	-0.007	-0.005	-0.017**	-0.003	-0.006
	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
ΔGovernment Stability (yoy change, lag 3)	0.011*	0.011*	0.012*	0.012**	0.016**	0.017**	0.014*	0.018**
	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)	(0.007)	(0.007)
ΔPrivate credit to GDP (3-year moving avg.)	0.002*	0.002*	0.002*	0.002	0.004***	0.003	0.001	0.003**
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)	(0.001)	(0.001)
Share of Countries with Banking Crisis, lag 1		0.004	-0.053	-0.099	-0.109	-0.268***	-0.007	-0.098
		(0.051)	(0.070)	(0.079)	(0.100)	(0.092)	(0.097)	(0.105)
ΔCurrent Account to GDP (3-year mov. avg.)			-0.353	-0.377	-0.438	-0.870	-0.245	-0.415
			(0.399)	(0.449)	(0.577)	(0.530)	(0.576)	(0.575)
ΔCountry Credit Rating, (Intitutional Investor)			-0.122	-0.156	-0.158	-0.271***	-0.076	-0.172
			(0.087)	(0.099)	(0.114)	(0.099)	(0.119)	(0.109)
Quality of Government				0.009	-0.002	-0.001	-0.006	-0.002
				(0.009)	(0.008)	(0.013)	(0.007)	(0.008)
Executive Constraints				-0.001	-0.002	-0.003	-0.002	-0.002
				(0.004)	(0.004)	(0.008)	(0.004)	(0.004)
Central Bank Independence				-0.003	-0.006	0.053	-0.012	0.017
				(0.032)	(0.052)	(0.066)	(0.054)	(0.044)
Stock prices, real, deviation fr. trend (in %)					0.000**		0.000	0.000**
					(0.000)		(0.000)	(0.000)
House prices, real, deviation fr. trend (in %)						0.003		
						(0.002)		
Constant	0.033***	0.033***	0.040***	0.025	0.060	0.064	0.062	0.051
	(0.001)	(0.002)	(0.004)	(0.033)	(0.037)	(0.075)	(0.042)	(0.028)
Sum of Government Stability lag coefficients (those marked in grey)	0.024**	0.024***	0.028***	0.029***	0.042***	0.030**	0.029**	0.045***
	(0.009)	(0.009)	(0.009)	(0.011)	(0.013)	(0.014)	(0.014)	(0.014)
Observations	786	786	754	684	485	354	462	461
R2	0.024	0.024	0.029	0.032	0.050	0.090	0.023	0.057
Adjusted/Pseudo R2	0.019	0.017	0.020					

The dependent variable is a binary indicator for the onset of banking crises from Laeven and Valencia. Our main explanatory variable is the change in government stability as measured by the continuous ICRG indicator (ranging from 1 to 12). Robust standard errors clustered on country in parentheses. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

Table B.4: Results for Sudden Stops

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Advanced Economies Only	Emerging Economies Only	Main Model (Panel FE)	Main Model (Probit)	Random Effects Panel (Interact.)	Only Developed Democracies (Polity>5)	Growth, Consum-ption, Current Account	House Prices (change, real)	Stock Prices (change, real)	New Executive, Institutions, Wars
Country Sample	AE only	EME only	Full	Full	Full	Full	Full	Full	Full	Full
Country FE	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
ΔGovernment Stability (yoy change, lag 1)	-0.005	0.011*	-0.005	-0.025	-0.005	-0.005	-0.006	-0.005	-0.005	-0.005
	(0.005)	(0.006)	(0.005)	(0.017)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
ΔGovernment Stability (yoy change, lag 2)	-0.005	0.010*	-0.005	-0.030*	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006
	(0.005)	(0.005)	(0.005)	(0.017)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
ΔGovernment Stability (yoy change, lag 3)	-0.008	0.015***	-0.008	-0.043**	-0.007	-0.008	-0.009*	-0.003	-0.009*	-0.007*
	(0.005)	(0.005)	(0.005)	(0.019)	(0.005)	(0.005)	(0.005)	(0.002)	(0.006)	(0.005)
Interaction ΔGovStab & EME Dummy (lag 1)			0.016**	0.038**	0.016**	0.015	0.015*	0.016	0.013	0.013
			(0.008)	(0.017)	(0.007)	(0.009)	(0.008)	(0.013)	(0.010)	(0.008)
Interaction ΔGovStab & EME Dummy (lag 2)			0.016**	0.042**	0.016**	0.016*	0.015**	0.011	0.009	0.013*
			(0.007)	(0.016)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)
Interaction ΔGovStab & EME Dummy (lag 3)			0.024***	0.062***	0.024***	0.028***	0.025***	0.012***	0.027***	0.022***
			(0.007)	(0.017)	(0.007)	(0.008)	(0.007)	(0.004)	(0.008)	(0.007)
ΔPrivate credit to GDP (3-year moving avg.)	-0.000	0.003**	0.001	0.003**	0.000	0.001	0.000	0.001	0.002*	0.001*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.012***	0.028***	0.022***	-1.593***	0.010*	0.024***	0.004	0.013***	0.020***	-0.193**
	(0.001)	(0.001)	(0.001)	(0.074)	(0.005)	(0.002)	(0.006)	(0.003)	(0.002)	(0.064)
Additional Controls					EME Dummy		Growth, Consum-ption, Curr. Account	Δ House Prices (real)	Δ Stock Prices (real)	New Executive, Wars, Rule of Law, and Bureaucratic Quality
Sum of Government Stability lag coefficients (those marked in grey)	-0.019**	0.037***	0.055***	0.142***	0.056***	0.058***	0.055***	0.039**	0.049***	0.049***
	(0.009)	(0.010)	(0.013)	(0.029)	(0.013)	(0.016)	(0.013)	(0.018)	(0.016)	(0.013)
Observations	486	786	1,272	579	1,272	958	1,205	803	884	1,146
R2	0.013	0.027	0.021		0.025	0.021	0.026	0.013	0.022	0.042
Adjusted/Pseudo R2	0.004	0.022	0.016	0.137		0.014	0.018	0.003	0.013	0.031

The dependent variable is a binary indicator for the onset of systemic sudden stops taken from Calvo et al. (2008). Our main explanatory variable is the change in government stability as measured by the continuous ICRG indicator (ranging from 1 to 12). All regressions (except in column 5) include country fixed effects. Robust standard errors clustered on country in parentheses. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

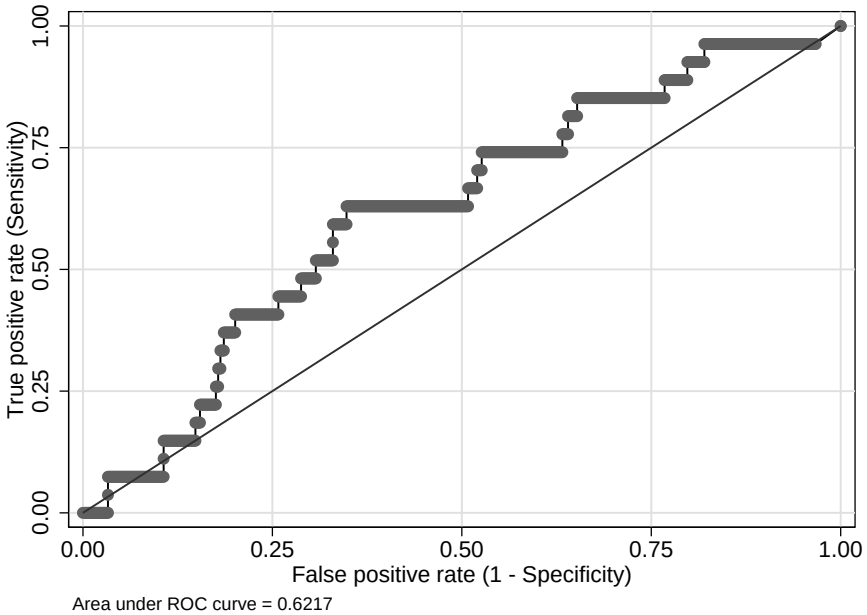
APPENDIX C. OUT-OF-SAMPLE FORECASTING

This appendix provides more details on our out-of-sample prediction exercise. Our forecasting rule generates out-of-sample predictions by iteratively fitting our baseline probit model to the available data up to $t-1$ and uses this to predict the EME crisis probability at year t (rolling regressions). In line with the literature we focus on predicting crises one year ahead.

We start by studying the predictive power of the ICRG index measure and of credit for EME banking crises and for all years 1990-2010 (recall that the ICRG data starts in 1985 and we use 3 lags, so using data before 1990 for forecasting is not an option). To be conservative and following the literature, we drop the country fixed effects in the out-of-sample regressions.

Figure C.1 presents the out-of-sample ROC curve for EME crises, with an AUC statistic of 0.62. This estimate is statistically different from the random coin toss value of 0.5, even when using bootstrapping methods as in Ward (2017).

FIGURE C.1. Out-of-sample ROC curve (EMEs; with political & credit booms)



Like in the main text (in-sample), we find that the joint model with lags of credit and of the ICRG measure ("credit booms" and "political booms") shows the best performance out-of-sample, as compared to credit-only or ICRG-only models. In a horse-race, the ICRG-only model (political booms) outperforms the credit-only model (credit booms) in EMEs, but the difference is not statistically significant.

With regard to advanced countries, we find the ICRG measure to have no predictive power, while the model with credit lags (credit booms only) performs well out-of-sample, with an AUC of 0.67. In the advanced country sub-sample, the credit-only model also outperforms the joint model (political and credit booms).

As discussed in the main text, another illustration of prediction results is a contingency table on the number of correctly/incorrectly classified crises (true/false positives). As a baseline we show a narrow classification, asking the model to predict exact crisis years - both in-sample and out-of-sample. As alternative, we follow the early-warning literature and ask the model to spot "danger zones" by including the crisis year as well as two years before (see Kaminsky and Reinhart 1999 or Ward 2017 for a similar approach).

Table C.1 shows that the model performs reasonably well overall, predicting 37% of the onset years of all crises correctly. The "danger zone" model (which includes the two years pre-crisis) predicts 63% of the financial distress episodes correctly one year ahead.

Though the above results are insightful, a limitation of contingency tables is that they hinge on the choice of the classification threshold (the levels of fitted variables above which the model sends a crisis signal), which trades off the model's ability to correctly predict crises when they occur (true positive rate) against its ability to avoid false alarms. To assess the sensitivity of the prediction results to different threshold choices, Figure C.2 shows the full range of attainable FSRs plotted against different classification thresholds. The thresholds represent the balance between sensitivity and specificity of the model. As the threshold increases, the model is more stringent in sending a signal of a crisis, reducing the number of binary crisis signals issued by the model. The FSR line moves up or downward depending on how many

Table C.1: Forecasting performance in EMEs: contingency table

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		In-sample (EMEs)				**Out-of-sample (EMEs)**			
		Narrow: "Onset" crisis year only		Broad: "Danger Zones" incl. two pre-crisis years		Narrow: "Onset" crisis year only		Broad: "Danger Zones" incl. two pre-crisis years	
		Observed:		Observed:		Observed:		Observed:	
		Crisis	No crisis	Crisis	No crisis	Crisis	No crisis	Crisis	No crisis
Predicted	Crisis	13	65	18	65	10	119	17	119
	No Crisis	16	418	11	418	17	587	10	587
Sample		EMEs only		EMEs only		EMEs only		EMEs only	
Correctly classified:		44.8 %	86.5 %	62.1 %	86.5 %	37.0 %	83.1 %	63.0 %	83.1 %
Forecast success ratio (FSR):		20.0 %		27.7 %		8.4 %		14.3 %	

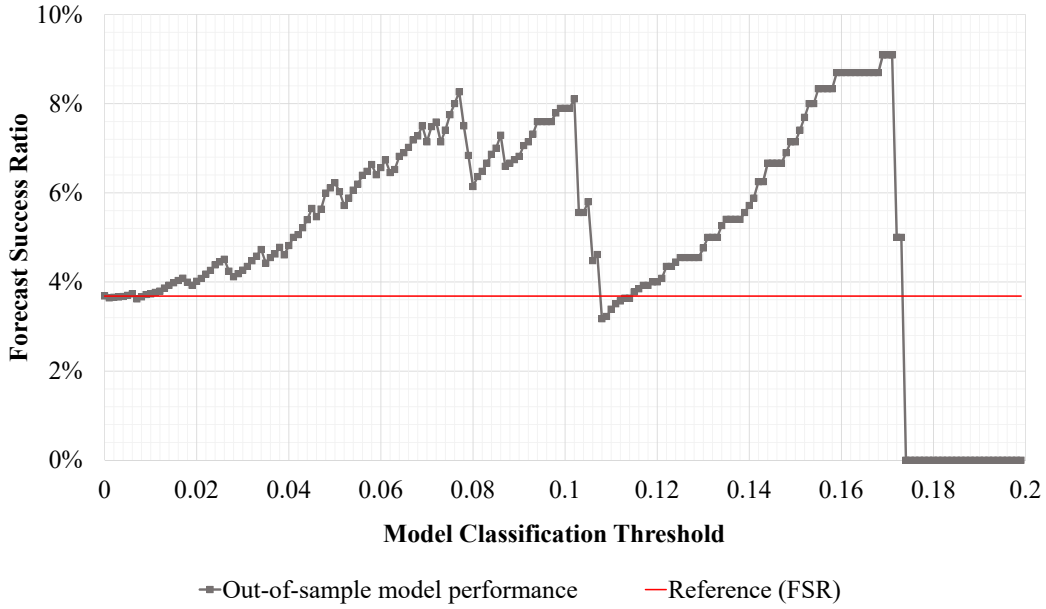
This table shows the number of correctly/wrongly classified crisis/non-crisis years in EMEs for model predictions in-sample (1985-2010) as well as out-of-sample (1990-2010). Crises are classified as "predicted" if the model signals a crisis exactly for the year of the crisis onset ("narrow") or if it spots a danger zone including the two years before each crisis ("broad"). The row with "correctly classified" events shows the share of correctly predicted crises as a share of all crises ("sensitivity" or "true positive rate"), see Columns 1, 3, 5 and 7. Morevover, in Columns 2, 4, 6 and 8 we also show the correctly predicted non-crisis years as a share of all non-crisis years ("specificity" or 1 - "false positive rate"). The "forecast-success-ratio" is the share of correct crisis signals as share of the model's total crisis signals (correct and false alarms). The classification threshold (the value above which the predicted model probabilities classify a crisis as 1) is set to 0.10 for in-sample and to 0.075 for out-of-sample predictions. The reason for setting a higher threshold in-sample is a higher unconditional crisis probability, as country fixed effects in the probit model require dropping countries where no crisis has been observed in the total sample. This leads to higher model predictions calling for a less conservative threshold to achieve similar sensitivity/specificity relations. For the same reason no country fixed effects could be used for out-of-sample predictions. The data on banking crises are from Laeven and Valencia.

crises the model identifies and may behave discontinuously across different thresholds depending on the proportions of correct and incorrect signals at the margin. As can be seen in the figure, the model does not send any crisis signal for thresholds larger than 18% (and consequently the FSR is just 0).

The resulting FSRs range from 3.2% to 9.1%. The relevant FSR measure, however, is the difference between the range above the unconditional probability of a crisis (a coin toss benchmark), which for emerging economies is a probability of 3.68%, represented in Figure C.2 by the horizontal red line: e.g. when the threshold is 0, the model always predicts a crisis and it is correct with a probability equal to the unconditional probability of a crisis (so the FSR is exactly 3.68%).

Figure C.3 replaces on the horizontal axis the threshold of Figure C.2 with its *sensitivity* (share of correctly classified crises). This is, in fact, the plot between the two variables in

FIGURE C.2. Forecast success ratios for different model classification thresholds (out-of-sample; EMEs)



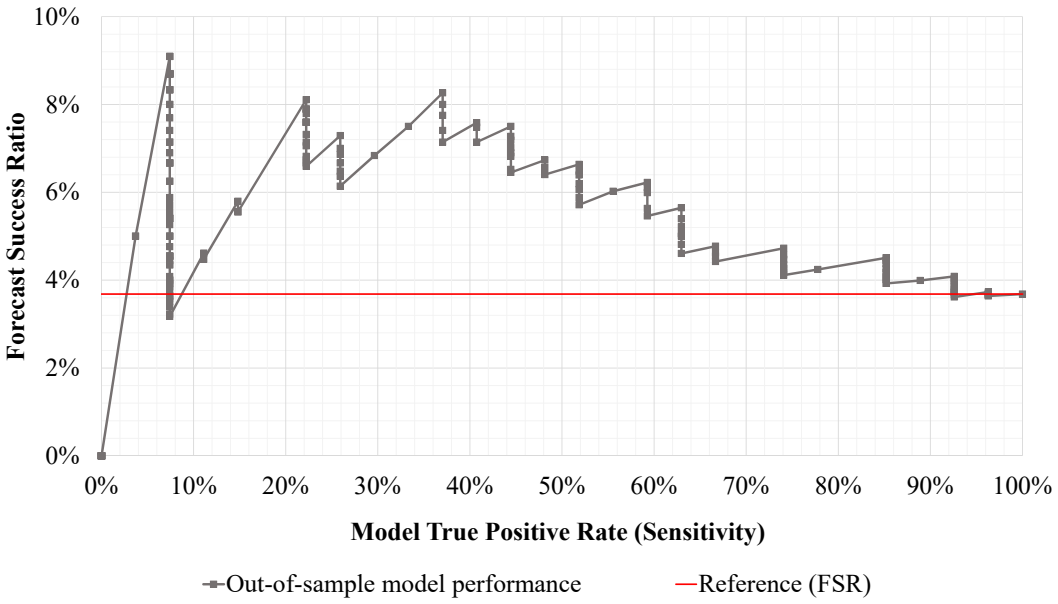
the last two rows of Table 2 in the text. The figure shows that for almost any given level of sensitivity our model produces a higher FSR than the toss-coin benchmark, up to more than doubling the forecast accuracy. Note that the model sensitivity is 0 when it does not predict any crisis (which happens when the thresholds are very high, above 18%) and the sensitivity is the same as the unconditional probability of a crisis when the model always predicts a crisis (which happens when the threshold is zero).[1]

These figures offer key insights to make an informed choice of the classification threshold and thus for computing the crisis contingency tables above: a crisis classification threshold of 0.075 appears to be a reasonable compromise between accuracy and coverage. This threshold choice results in an out-of-sample FSR of around 8% (relatively high accuracy) and a true-positive rate of around 40%, which is not overly conservative, thus allowing to identify many

[1]This representation is closer to the ROC representation which relates sensitivities to the share of wrongly classified non-crisis years (false-positive rate). For instance, a random ROC curve (45-degree line) corresponds to a constant FSR, namely to the red horizontal line indicative the sample prevalence rate of the event (unconditional crisis probability).

crises that did occur sacrificing only some signal accuracy. By contrast, the threshold of 0.17 for instance, which generates a slightly higher FSR (of 9.1%), implies a much smaller true-positive rate (of only 7.4%), granting therefore a bit more of accuracy at the expenses of not being able to correctly predict a large fraction of actual crises. In sum, presenting results using contingency tables necessarily entails a threshold choice and a trade-off. For this reason in the main text we opted to highlight more the ROC analysis.

FIGURE C.3. All possible FSR-Sensitivity combinations (out-of-sample; EMEs)



APPENDIX D. GOVERNMENT APPROVAL: A NEW DATASET

D.1. **The government approval dataset: overview, sources and definitions.** This appendix summarizes the sources, data coverage and definitions for each country in our dataset on government approval that directly captures popularity. As a general rule, we target the leading political polling organizations in each country, which are often local subsidiaries of Gallup, Ipsos, or TNS. In all cases, these polls are featured prominently in the domestic news. When multiple series were available we chose the one closest to the concept of "government approval", in particular, series on leader/presidential/government approval or series on the evaluation of the government's work. In case no such series were available, which was sometimes the case in parliamentary democracies, we use voter support for the government. This is measured by adding up the total share of vote intentions for the governing parties.

For an overview, we plot the coverage of the dataset across countries and years at the end of this appendix (Figures D.1 and D.2). We also show the overlap with banking crisis events and benchmark the data coverage against that of our baseline measure (the ICRG government stability index).

Argentina
Series: Trust in Government Index. *Coverage*: 2002 - 2012.
Polling Organization: Poliarquia Consultores.
Source: ICG Trust in Government Index by UTDT. Retrieved from `http://www.utdt.edu/ver_contenido.php?id_contenido=1351&id_item_menu=2970` on 11/12/2015.
Question/Answers: Five questions regarding the government, answer scale from 0 (low) to 5 (high): "Evaluacion general del gobierno; Interes en el beneficio general; Eficiencia en la administracion del gasto publico; Honestidad de los funcionarios; y capacidad para resolver problemas". Translation: "overall assessment of government; interest in the general welfare; efficiency in public expenditure management; honesty of officials; and ability to solve problems." We use the mean average.
Sample: Nationwide, representative of major urban areas.

Brazil
Series: Presidential Approval. *Coverage:* 1990 - 2015.
Polling Organization: Datafolha.

Source: Retrieved from Universo Online (UOL) and from Fernando Rodrigues on 01/28/2016 http://noticias.uol.com.br/fernandorodrigues/arquivos/pesquisas/.
Question/Answers: "Na sua opinião, a presidente ... esta fazendo um governo otimo, bom, regular, ruim ou pessimo?" Translation: "In your opinion, is president ... doing a great, good, regular, poor or very poor job"). We use the share of respondents who answered with "ótimo" or "bom" ("great" and "good")
Sample: Surveys in 10 major cities for 1987 - 1990, nation-wide surveys in 1995 - 2002. No information for other years.

Bulgaria
Series: Attitude towards the Government. *Coverage*: 1998 - 2015.
Polling Organization: Alpha Research.
Source: Alpha Research. Data received via email on 11/09/2015.
Question/Answers: "What is your assessment of the Government's work?". We use the share of respondents who answered with "positive".
Sample: Nationally representative sample.
Acknowledgements: We are very thankful to Genoveva Petrova (Alpha Research) for sending us the data.

Canada
Series: Government Approval. *Coverage*: 1980 - 1995.
Polling Organization: Decima Research.
Source: Retrieved from Canadian Opinion Research Archive (CORA). Retrieved from http://130.15.161.246:82/webview/ on 01/28/2016.
Question/Answers: "Generally speaking, how satisfied are you with the performance of the federal government? Would you say you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?". We use the share of respondents who answered with "very satisfied" or "somewhat satisfied".
Sample: Nationwide sample.

Denmark - until 1993
Series: Voter Support / Vote Intentions. *Coverage*: 1983 - 1993.
Polling Organization: Gallup A/S Denmark.
Source: Mattila, Mikko, 1996. "Economic Changes and Government Popularity in Scandinavian Countries". British Journal of Political Science 26 (4), 583 - 595; and the Danish Social Science Data Archive. Received via email on 11/11/2015.
Question/Answers: Survey on federal vote intentions. We use the aggregate share of responses in support of member parties in the governing coalition.
Sample: Nationally representative.
Acknowledgements: We are very thankful to Mikko Mattila for sending us the data.

Denmark - since 1999
Series: Vote Intentions. *Coverage*: 1999 - 2015.
Polling Organization: TNS Gallup.
Source: TNS Gallup.
Question/Answers: Survey on federal vote intentions. We use the aggregate share of responses in support of member parties in the governing coalition.
Sample: Nationally representative.
Acknowledgements: We are very thankful to Camilla Fjeldsøe (TNS Gallup) for the data.

Ecuador
Series: Presidential Approal. *Coverage*: 1979 - 2015.
Polling Organization: CEDATOS.
Source: CEDATOS. Retrieved from `http://www.cedatos.com.ec/detalles_noticia.php?Id=27` and `http://www.cedatos.com.ec/levantamiento_policia.html`.
Question/Answers: "Usted aprueba o desaprueba la gestión que ha realizado hasta el momento el Presidente de la República, ...?". Translation: "Do you approve or disapprove of the work carried out so far by the President of the Republic, ...?". We use the share of respondents who answer with "aprueba" ("approve").
Sample: Nationally representative.

Finland
Series: Voter Support / Vote Intentions. *Coverage*: 1983 - 1993.
Polling Organization: Taloustutkimus Oy.
Source: Mattila, Mikko, 1996. "Economic Changes and Government Popularity in Scandinavian Countries". British Journal of Political Science 26 (4), 583 - 595; and Taloustutkimus Oy. Received via email on 11/11/2015.
Question/Answers: Survey on federal vote intentions. We use the aggregate share of responses in support of member parties in the governing coalition.
Sample: Nationally representative.
Acknowledgements: We are very thankful to Mikko Mattila for sending us the data.

Germany
Series: Government Performance Approval. *Coverage*: 1998 - 2015.
Polling Organization: Infratest dimap.
Source: Infratest dimap and ARD-DeutschlandTrend. Received via email on 11/11/2015.
Question/Answers: "Wie zufrieden sind Sie mit der Arbeit der Bundesregierung?" Translation: "How satisfied are you with the work of the federal government?". We use the share of respondents who answered with "sehr zufrieden" ("very satisfied") and "zufrieden" ("satisfied").
Sample: Nationally representative.
Acknowledgements: We are very thankful to Heiko Gothe (Infratest dimap) for sending us the

data.

Hong Kong
Series: Trust in Government. *Coverage*: 1992 - 2015.
Polling Organization: Public Opinion Programme at the Hong Kong University.
Source: Public Opinion Programme at the Hong Kong University. Retrieved from `https://www.hkupop.hku.hk/english/popexpress/trust/trusthkgov/poll/datatables.html` on 01/28/2016.
Question/Answers: "On the whole, do you trust the HKSAR/Hong Kong Government?". We use the share of respondents who answered with "Very much trust" and "Quite trust."
Sample: No information available.

Hungary
Series: Prime Minister Popularity. *Coverage*: 1998 - 2014.
Polling Organization: IPSOS Hungary.
Source: IPSOS. Retrieved from `http://ipsos.hu/en/partpref#` on 01/28/2016)
Question/Answers: No information available (we contacted IPSOS)
Sample: Nationally representative.

Iceland
Series: Approval Rating of Government. *Coverage*: 1994 - 2015.
Polling Organization: Gallup Iceland.
Source: Received via email on 10/16/2015.
Question/Answers: No information available (we contacted Gallup).
Sample: Nationally representative.
Acknowledgements: We are very thankful to Matthias Thorvaldsson (Gallup) for sending us the data.

Ireland - before 2003
Series: Prime Minister Satisfaction. *Coverage*: 1982 - 2001.
Polling Organization: MRBI in cooperation with Irish Times.
Source: Jones, Jack. *In Your Opinion: Political and Social Trends in Ireland Through the Eyes of the Electorate*. Dublin: TownHouse and CountryHouse Ltd, 2001. Print.
Question/Answers: No information available.
Sample: Nationally representative.
Acknowledgements: We are very thankful to Hazel Scully (IPSOS) for helping us locating the data.

Ireland - after 2003
Series: Government Approval. *Coverage*: 2003 - 2015.
Polling Organization: IPSOS.

Source: IPSOS. Received via email on 11/23/2015.
Question/Answers: "Would you say you are satisfied or dissatisfied with the manner in which the Government is running the country?" We use the share of respondents who answered with "satisfied".
Sample: Nationally representative.
Acknowledgements: We are very thankful to Hazel Scully (IPSOS) for sending us the data.

Japan
Series: Government Approval. *Coverage*: 1998 - 2015.
Polling Organization: NHK Japan.
Source: NHK Japan. Retrieved from `http://www.nhk.or.jp/bunken/yoron/political/index.html` on 01/28/2016.
Question/Answers: No information available (we contacted NHK).
Sample: Nationally representative sample.

Latvia
Series: Government Approval. *Coverage*: 1996 - 2015.
Polling Organization: SKDS.
Source: SKDS. Data received by email.
Question/Answers: "Ludzu, atzimejiet, cik liela mera Jus uzticaties zemak uzskaititajam valsts un sabiedriskajam institucijam: pilniba uzticaties, drizak uzticaties, drizak neuzticaties, pilnigi neuzticaties?". Translation: "Please, note, to what extent do you trust in following state and public institutions ... : fully trust, rather trust, rather distrust, fully distrust?". We use the share of respondents who answered with "pilniba uzticaties" ("fully trust") or "drizak uzticaties" ("rather trust").
Sample: Nationally representative.
Acknowledgements: We are very thankful to Ieva Strode (SKDS) for sending us the data.

Malaysia
Series: Prime Minister Performance Approval. *Coverage*: 2006 - 2015.
Polling Organization: MERDEKA Center for Opinion Research.
Source: MERDEKA Center for Opinion Research. Retrieved from `http://merdeka.org/` on 01/28/2016.
Question/Answers: "How satisfied or dissatisfied are you with the performance of ... as Prime Minister?" We use the share of respondents who answered with "very satisfied", or "somewhat satisfied".
Sample: Nationally representative sample. Partially excludes Chin region (1% of population).
Acknowledgements: We are very thankful to Katharine Davis (IPSOS Malaysia) for helping us with locating data sources.

Mexico (first source)
Series: Presidential Job Approval. *Coverage*: 1989 - 2006.
Polling Organization: Surveys conducted by the Mexican Presidential Office.
Source: Banco de Informacion para la investigacion aplicada en ciencias sociales (BIIACS). Retrieved from `http://biiacs-dspace.cide.edu/handle/10089/1` on 01/28/2016.
Question/Answers: "En general, esta usted de acuerdo o en desacuerdo con la manera de gobernar del ÂĚ Presidente de la Republica?" Translation: "In general, do you agree or disagree with the way ... governs as the President of the Republic?". We use the share of respondents who answered with "acuerdo" ("agree").
Sample: Nationwide.

Mexico (second source)
Series: Presidential Approval. *Coverage*: 1989 - 2016.
Polling Organization: Varela y Asociados.
Source: Varela y Asociados. Data received by email on 10/19/2016.
Question/Answers: "Approval of the President". We use the share of respondents who answered with "aprueba" ("approve").
Sample: Nationally representative.
Acknowledgements: We are very thankful to Carlo Varela (Varela y Asociados) and Dr. Vidal Romero for providing us with the data.

Netherlands
Series: Trust in Government. *Coverage*: 1999 - 2013.
Polling Organization: TNS NIPO.
Source: TNS NIPO. Received via email on 11/23/2015.
Question/Answers: "Hoeveel vertrouwen heeft u in de regering ..?" Translation: "How confident are you in the government?" We use the share of respondents who answered "Veel vertrouwen" ("very confident.")
Sample: Nationally representative.
Acknowledgements: We are very thankful to Tim de Beer (TNS NIPO) for sending us the data.

Norway - until 1993
Series: Voter Support / Vote Intentions. *Coverage*: 1983 - 1993.
Polling Organization: Norsk Gallup Institutt A/S.
Source: Mattila, Mikko, 1996. "Economic Changes and Government Popularity in Scandinavian Countries," *British Journal of Political Science* 26 (4), 583 - 595; and the Norwegian Social Science Data Services. Received via email on 11/11/2015.
Question/Answers: Survey on federal vote intentions. We use the aggregate share of responses in support of member parties in the governing coalition.
Sample: No information available.

Acknowledgements: We are very thankful to Mikko Mattila for sending us the data.

Norway - since 1997
Series: Vote Intentions. *Coverage*: 1997–2017.
Polling Organization: Sentio Research Group.
Question/Answers: "If there were parliamentary elections tomorrow, which party would you vote for?".
Sample: Nationally representative.
Acknowledgements: We are very thankful to Arve Ostgaard (Sentio Research Group) for sending us the data.

Peru
Series: Presidential Approval. *Coverage*: 1990 - 2015.
Polling Organization: IPSOS Peru.
Source: IPSOS Peru.
Question/Answers: "En general, diga usted que aprueba o desaprueba la gestión del Presidente ...?" Translation: "In general, do you approve or disapprove of the administration of President ...?"). We use the share of respondents who answered with "aprueba" ("approve").
Sample: Lima only, not nationally representative.
Acknowledgements: We are very thankful to Carlos Ponce (IPSOS) for sending us the data.

Philippines
Series: Net Satisfaction Ratings with President. *Coverage*: 1986 - 2015.
Polling Organization: Social Weather Station (SWS).
Source: SWS. Retrieved from: `https://www.sws.org.ph/pr20150921a.htm`, on 11/28/2015.
Question/Answers: "Please tell me how satisfied or dissatisfied you are in the performance of ... as President of the Philippines. Are you very satisfied, somewhat satisfied, undecided if satisfied or dissatisfied, somewhat dissatisfied, or very dissatisfied?" Following the SWS approach and data, we use the balance of positive ("very satisfied", "somewhat satisfied") and negative ("somewhat dissatisfied" and "very dissatisfied?") responses.
Sample: Nationally representative.

Poland
Series: Government Support. *Coverage*: 1993 - 2017.
Polling Organization: CBOS (Centrum Badania Opinii Spolecznej).
Source: CBOS. Retrieved from `http://cbos.pl/EN/trends/01_stosunek_do_rzadu_tabela.php`
Question/Answers: "How would you describe your attitude towards the current government? Are you strong supporter, moderate supporter, moderate opponent, strong opponent or your attitude to the current government is indifferent, difficult to say." We use the share of respondents who answered with "strong supporter" and "moderate supporter".

Sample: Nationally representative.
Acknowledgements: We are very thankful to Renata Gierbisz (CBOS) for providing data support.

Romania
Series: Prime Minister Confidence. *Coverage*: 1994–2007.
Polling Organization: IMAS, IRSOP, ICCV, CURS, MMT, LUAS, GALLUP
Source: The Foundation for an Open Society. Retrieved from `http://www.fundatia.ro/en/databases`
Question/Answers: "How much confidence do you have in the following political personalities? Prime Minister.". We use the share of respondents who answered with "very much" and "much".
Sample: Nationally representative.
Acknowledgements: We are very thankful to Dorian Cazacu (IPSOS) for helping us with locating data sources.

Russia - before 2000
Series: Presidential Approval Rating. *Coverage*: 1993 - 1999.
Polling Organization: Russian Center for Public Opinion Research (VCIOM).
Source: Treisman, Daniel (2011). "Presidential Popularity in a Hybrid Regime: Russia under Yeltsin and Putin." *American Journal of Political Science* 55 (3), 590 - 609. Retrieved from `http://www.sscnet.ucla.edu/polisci/faculty/treisman/PAPERS_NEW/AJPS20dataset.xlsx` on 02/15/2016.
Question/Answers: Translation: "On the whole do you approve or disapprove of the performance of [the President's name]?"
Sample: Nationally representative.

Russia - after 2000
Series: Presidential Performance Approval. *Coverage*: 2000 - 2015.
Polling Organization: Levada Center.
Source: Levada Center. Retrieved from `http://www.levada.ru/eng/indexes-0` on 01/28/2016.
Question/Answers: "Do you approve the activities of ... as the President of Russia?" We use the share of respondents who answered with "Yes."
Sample: Nationally representative sample.

Slovenia
Series: Government Approval. *Coverage*: 2000 - 2015.
Polling Organization: Ninamedia
Source: Ninamedia. Retreived from `http://www.ninamedia.si/arhiv.php` on 01/28/2016.
Question/Answers: "Kako ocenjujete delo vlade, kot uspesno ali neuspesno?" Translation: "How do you assess the work of the government: as successful (or not)?" We use the share of

respondents who answered with "Yes".
Sample: Nationally representative

Spain
Series: Government Approval. *Coverage*: 1992 - 2015.
Polling Organization: Centro de Investigaciones Sociologicas.
Source: Centro de Investigaciones Sociologicas. Retrieved from `http://www.analisis.cis.es/cisdb.jsp` on 01/28/2016.
Question/Answers: "How satisfied are you with the national government?" We use the share of respondents who answered with "Very well" and "well"
Sample: Nationwide sample (including Ceuta and Melilla).
Acknowledgements: We are very thankful to Eva Aranda (TNS) for helping us with locating data sources.

Sweden
Series: Voter Support / Vote Intentions. *Coverage*: 1983 - 1993.
Polling Organization: SIFO Ab. Today: TNS SIFO, Sweden.
Source: Mattila, Mikko, 1996. "Economic Changes and Government Popularity in Scandinavian Countries," *British Journal of Political Science* 26 (4), 583 - 595; and SIFO Ab. Received via email on 11/11/2015.
Question/Answers: Survey on federal vote intentions. We use the aggregate share of responses in support of member parties in the governing coalition.
Sample: Nationally representative.
Acknowledgements: We are very thankful to Mikko Mattila for sending us the data.

Switzerland
Series: Trust in Government. *Coverage*: 1981 - 2010.
Polling Organization: gfs.bern,
Source: Retrieved via FORS from `http://forscenter.ch/de/daris-daten-und-forschungsinformationsservice/datenservice/datenzugang/spezialprojekte/vox-voxit/` on 01/30/2016.
Question/Answers: "Ich lese Ihnen jetzt zwei Ansichten vor, die man recht oft ueber unsere Regierung hoeren kann. Welcher stimmen Sie am ehesten zu? 1) Ich kann mich meistens auf die Regierung im Bundeshaus verlassen. Sie handelt nach bestem Wissen und Gewissen, zum Wohle aller. 2) Im Bundeshaus wird immer mehr gegen und immer weniger fuer das Volk entschieden. Die Regierung kennt unsere Sorgen und Wuensche nicht mehr." Translation: "I will now read to you two views that you can hear about our government quite often. Which do you agree with most? 1) I can usually rely on the government at the Federal Palace. It acts in all conscience for the good of all. 2) In the Federal House decisions are more and more taken against and less and less for the people. The government no longer knows our concerns and desires." We use the share of respondents who answered with option 1.

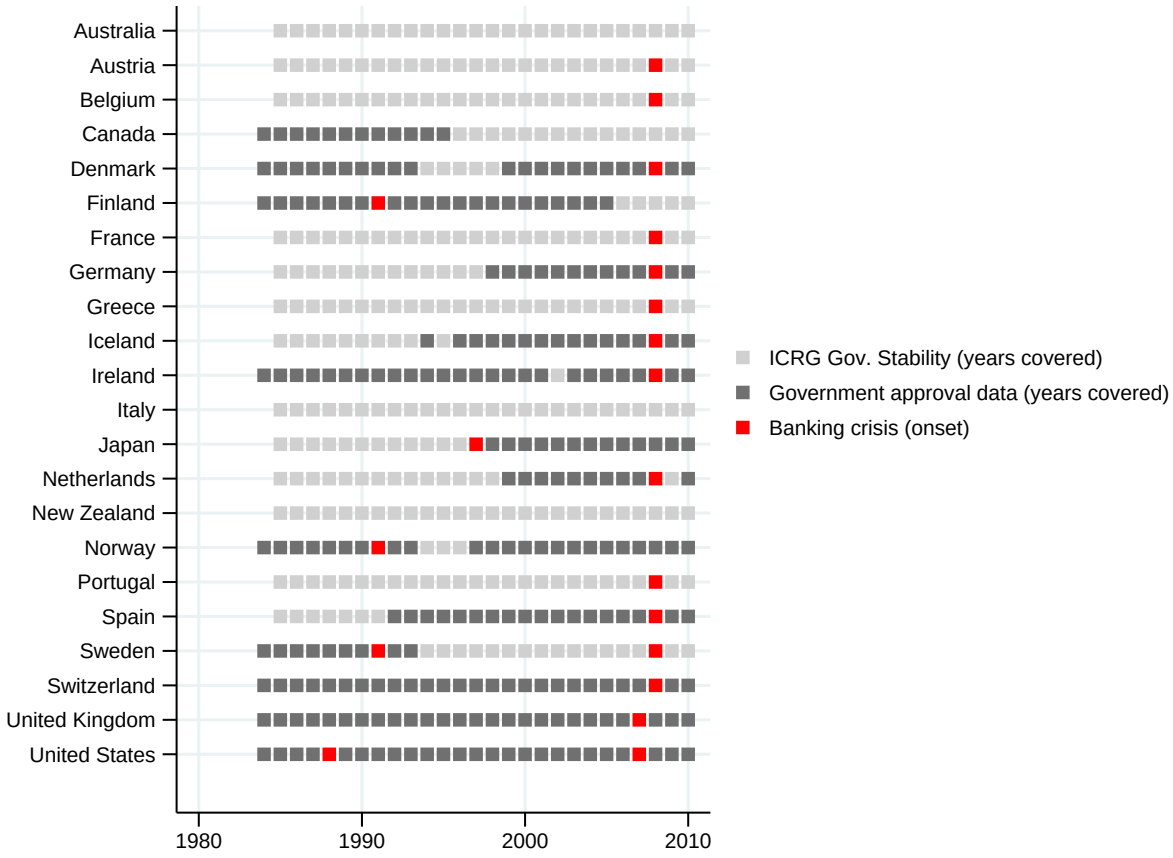
Sample: Nationally representative.
Acknowledgements: We are very thankful to Martina Mousson (gfs.bern) and Annick Michot (M.I.S. Trend) for helping us with locating data sources.

United Kingdom
Series: Government Performance Approval. *Coverage*: 1977 - 2015.
Polling Organization: IPSOS Mori.
Source: IPSOS Mori. Retrieved from `https://www.ipsos-mori.com/researchpublications/researcharchive/poll.aspx?oItemId=2437\&view=wide` on 01/30/2016.
Question/Answers: Question: "Are you satisfied or dissatisfied with the way the Government is running the country?" We use the share of respondents who answered with "satisfied."
Sample: Nationally representative sample.

United States
Series: Presidential Approval. *Coverage*: 1977 - 2015.
Polling Organization: Gallup US.
Source: The American Presidency Project/Gerhard Peters. Retrieved from `http://www.presidency.ucsb.edu/data/popularity.php` on 01/30/2016)
Question/Answers: "Do you approve or disapprove of the way ... is handling his job as President?" We use the share of respondents who answered with "approve".
Sample: Nationally representative.

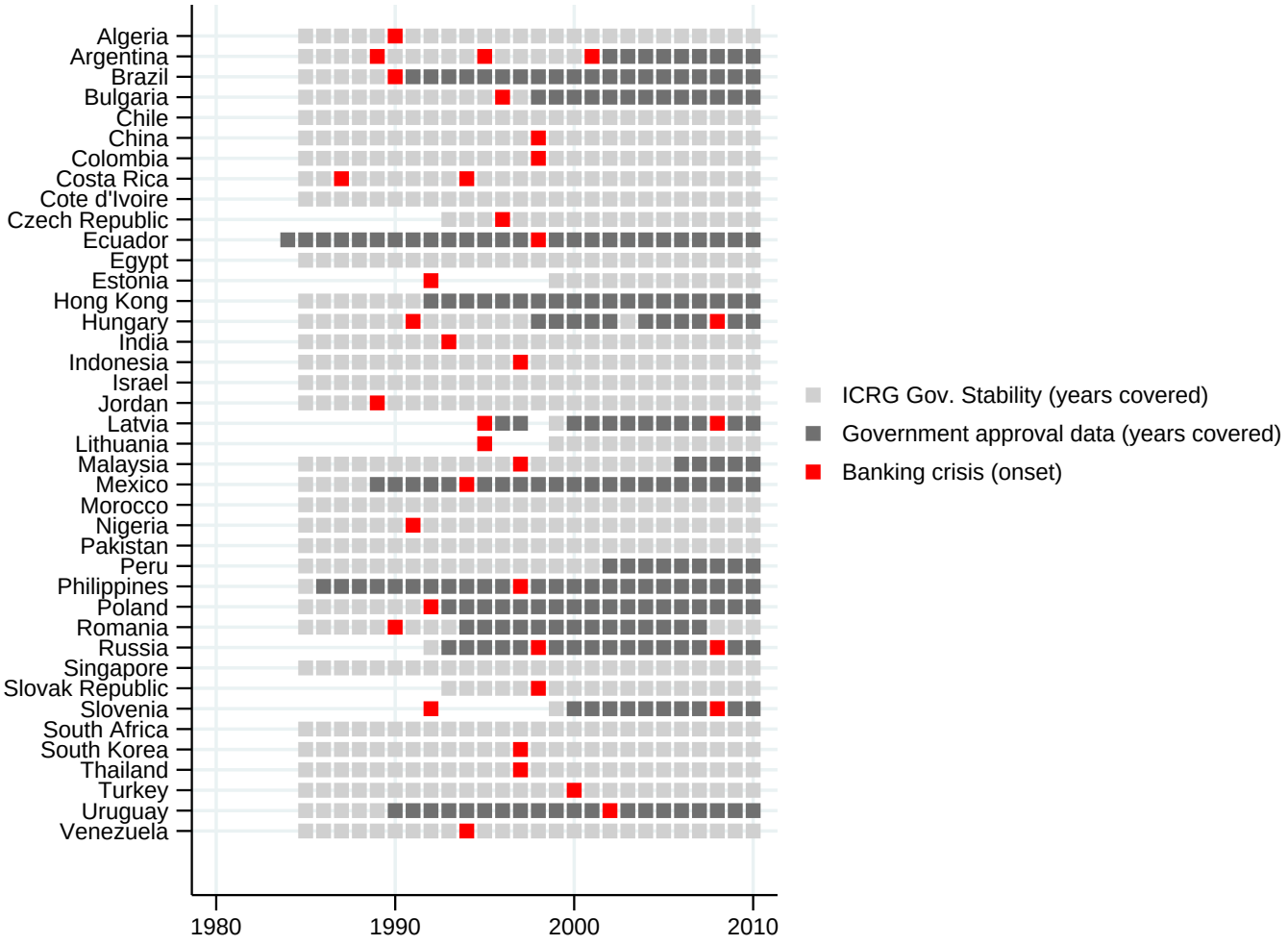
Uruguay
Series: Presidential Approval. *Coverage*: 1990 - 2015.
Polling Organization: Equipos Mori in cooperation with Diario El Pais.
Source: Received via email on 11/11/2015.
Question/Answers: "Usted aprueba o desaprueba la forma en que ... esta desempenandose como Presidente?" Translation: "Do you approve or disapprove of the way ... is serving as President?" We use the share of respondents who answered with "aprueba" ("agree").
Sample: Nationwide sample.
Acknowledgements: We are very thankful to Daniela Vairo (Universidad de la Republica) for sending us the data.

FIGURE D.1. Advanced Economies Data Coverage



Note: This figure shows the coverage of our government approval dataset across countries and years and compares it to the data coverage of the ICRG Government Stability index. Banking crises are marked in red.

FIGURE D.2. Emerging Economies Data Coverage



Note: This figure shows the coverage of our government approval dataset across countries and years and compares it to the data coverage of the ICRG Government Stability index. Banking crises are marked in red.

APPENDIX E. STABILITY INDEX AS A MEASURE OF POPULARITY

This appendix examines the link between the ICRG stability index that we use in the main text with our new polling dataset and with actual political outcomes.

E.1. **Government stability versus polling data: supplementary evidence.** First, we complement the finding in the main text of a positive cross-sectional correlation between the stability index and our newly gathered government approval by showing a scatter plot in levels (instead of first differences). Figure E.1 clearly illustrates that this correlation persists in levels as well.

Second, we show four examples on the time series correlation between the stability index and the government approval polling data. Even though the ICRG series is less volatile, it tracks the overall evolution in government approval well (note: changes in government are indicated by vertical lines).

E.2. **Government stability index and executive turnover.** Here we show that the lagged stability index used in the main text is a good predictor for re-elections and government turnover,

FIGURE E.1. ICRG index and government approval: levels

FIGURE E.2. Stability index and government approval in the **US**

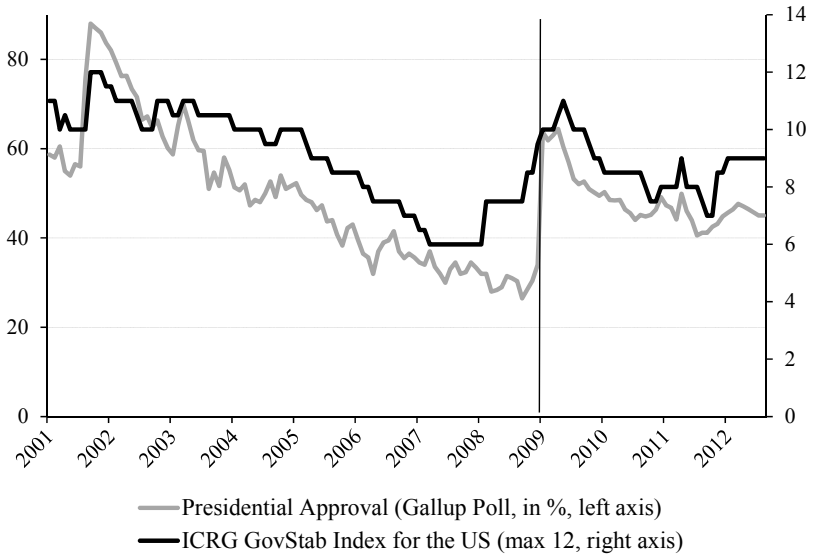
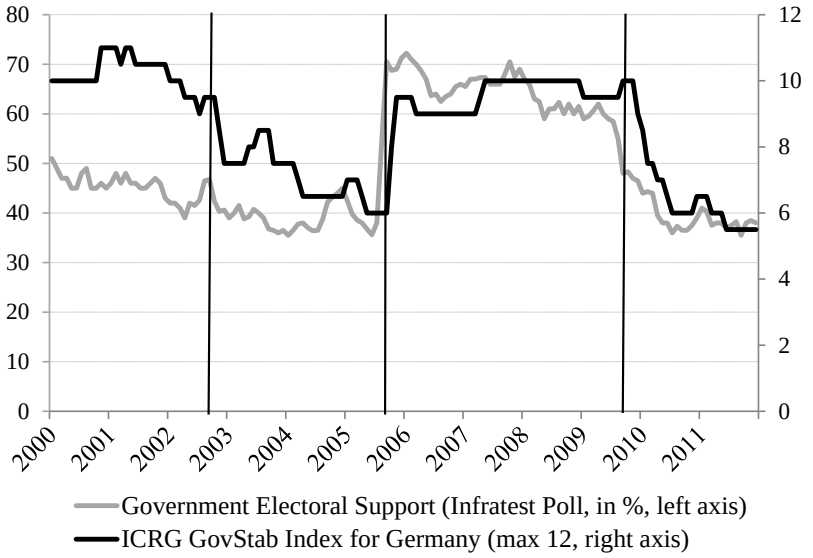


FIGURE E.3. Stability index and government approval in **Germany**



after controlling for country fixed effects, real growth and inflation. This is relevant as one of the model's premises is that governments care about popularity to remain in power.

FIGURE E.4. Stability index and government approval in **Argentina**

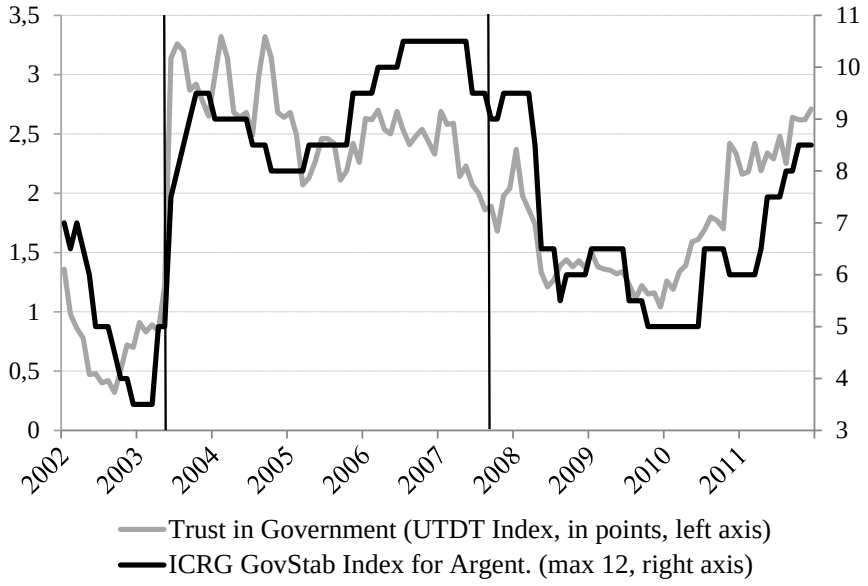
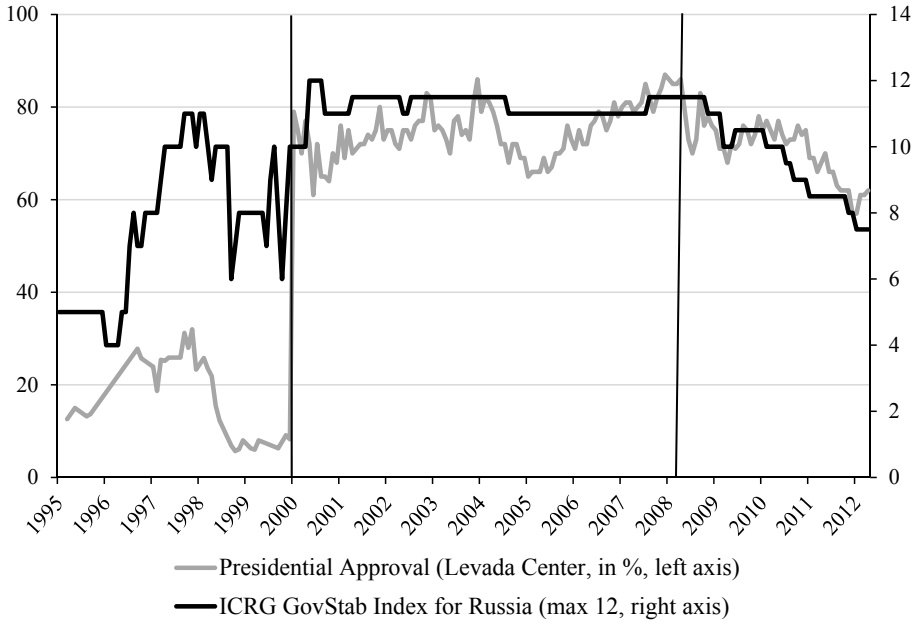


FIGURE E.5. Stability index and government approval in **Russia**



Column 1 in Table E.1 uses a reelection dummy coded by Brender and Drazen (2008) for 157 election events in our sample (62 countries, since 1984). The resulting coefficient for the stability index is statistically significant and large: a one standard deviation increase in the level of the stability index (1.88) is associated with a 10 percentage point higher reelection probability.[2] The second and third columns of Table E.1 report a similar finding, but using data on executive turnover from Banks and Wilson (2013) and Crespo-Tenorio et al. (2014).[3] The stability index is significant for both turnover measures and has a similar coefficient: a 2 point increase in the indicator is associated with an approximately 3 percentage point lower probability of a change in the ruling party/executive in any given year.

The last column of Table E.1 shows that government stability is correlated with the occurrence of major government crises using data from Banks and Wilson (2013).[4] All of these regressions include lagged real growth and lagged inflation (logs) as controls. The results are very similar when keeping only developed democracies or observations after 1995.

[2]This calculation follows from multiplying the standard deviation by the corresponding coefficient, 1.88*0.054=0.10.

[3]The data by Crespo-Tenorio et al. (2014) ends in 2004, but has the main advantage of tracking party affiliation of leaders: a change in the president or prime minister within the same party or political grouping is not coded as a turnover event, since the incumbent government de facto stays in power. In contrast, Banks and Wilson (2013) simply code any change in the executive, irrespective of party affiliation. Their dataset, however, has the advantage of being available annually for the entire sample 1984-2010.

[4]According to Banks and Wilson (2013), government crises are defined as "any rapidly developing situation that threatens to bring the downfall of the present regime - excluding situations of revolt aimed at such overthrow."

Table E.1: Stability index and executive turnover

	(1)	(2)	(3)	(4)
	Reelection (Brender and Drazen 2008)	Change in Ruling Party (Crespo-Tenorio et al. 2014)	Executive Turnover (Banks and Wilson 2013)	Major Government Crises
Government Stability (lag 1)	0.054**	-0.017**	-0.014**	-0.020**
	(0.026)	(0.008)	(0.007)	(0.009)
Growth and inflation controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	157	795	1,413	1,390
R2	0.052	0.009	0.008	0.022
Adjusted R2	0.033	0.005	0.006	0.020

The table shows results from a fixed effects panel regression using political events as dependent variables. Column 1 uses a dummy for reelection coded for 157 election events in advanced and developing countries by Brender and Drazen (2008), covering the period between 1984 and 2003. Column 2 uses a yearly dummy for changes in the ruling party from Crespo-Tenorio et al. (2014) for 1990-2004. Columns 3 and 4 use data from Banks and Wilson (2013) on executive turnover (yearly dummy) and on the number of major government crises, for 1984-2010. The main explanatory variable is the ICRG index of government stability in levels, lagged by one year. All regressions include country fixed effects as well as annual real GDP growth and log(inflation) as controls. Robust standard errors clustered on the country in parentheses. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

E.3. **Government approval surrounding financial crises.** This appendix shows case studies on government approval surrounding main financial crises, using the new polling dataset we constructed. First, we analyze five emerging market crises for which we could find sufficient polling data. The grey vertical bar indicates the start of each crisis. In all EME cases, popularity increases pre-crisis, sometimes strongly. Once the crisis breaks out popularity declines and/or the government loses power. This evidence is in line with our findings in the main paper based on the stability index and with the narrative from the model. The figures also provide support to the idea of "political booms gone bust" in emerging markets. Then, we show seven advanced economies crises. The overall pattern also strongly resembles the stylized facts in the main paper using the ICRG government stability data. Government approval does *not* increase during the pre-crisis (declining in some cases such as Spain, Sweden or the United States).

Part 1: Case Studies in Emerging Markets

FIGURE E.6. Executive approval surrounding crises: **Mexico 1995**

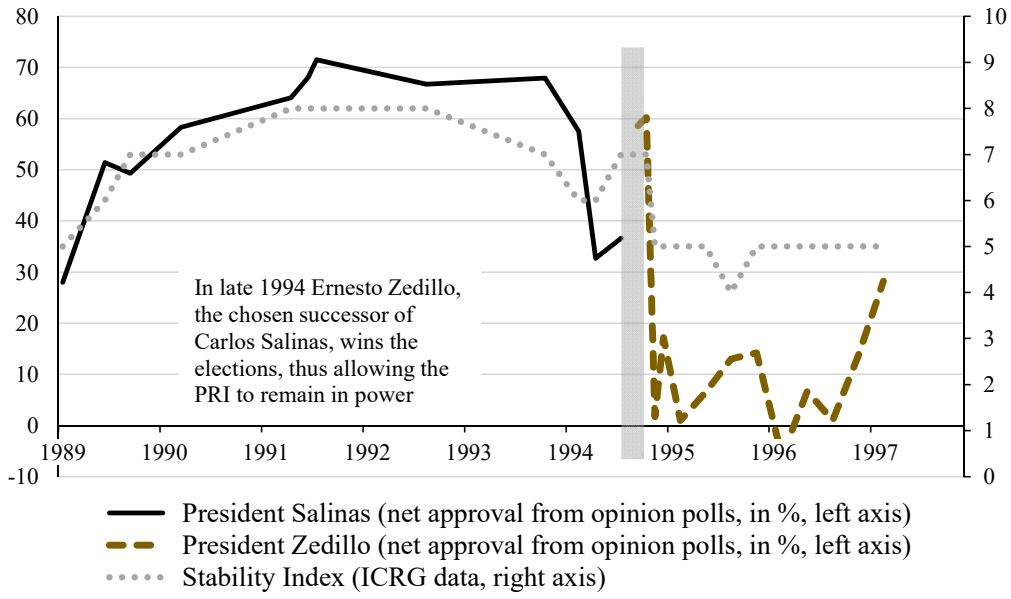


FIGURE E.7. Executive approval surrounding crises: **Hong Kong 1997**

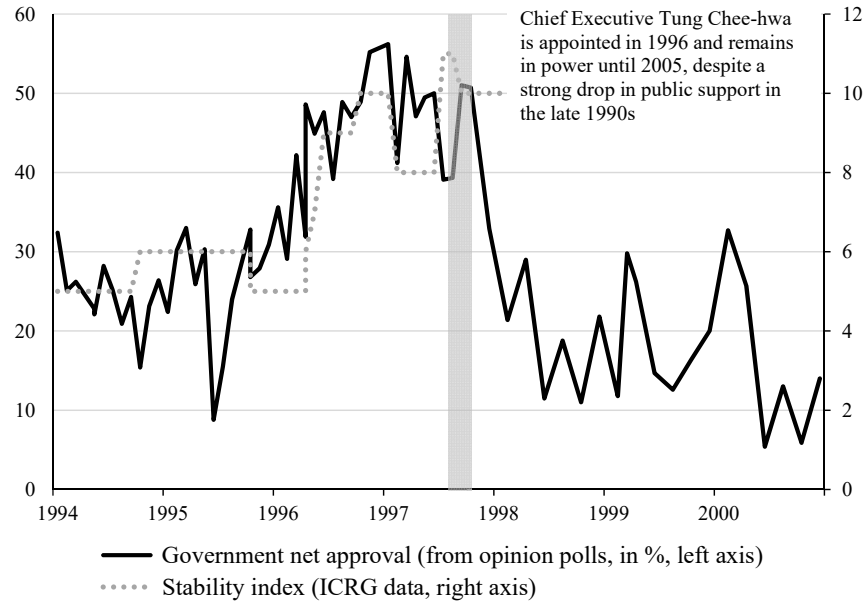


FIGURE E.8. Executive approval surrounding crises: **Russia 1998**

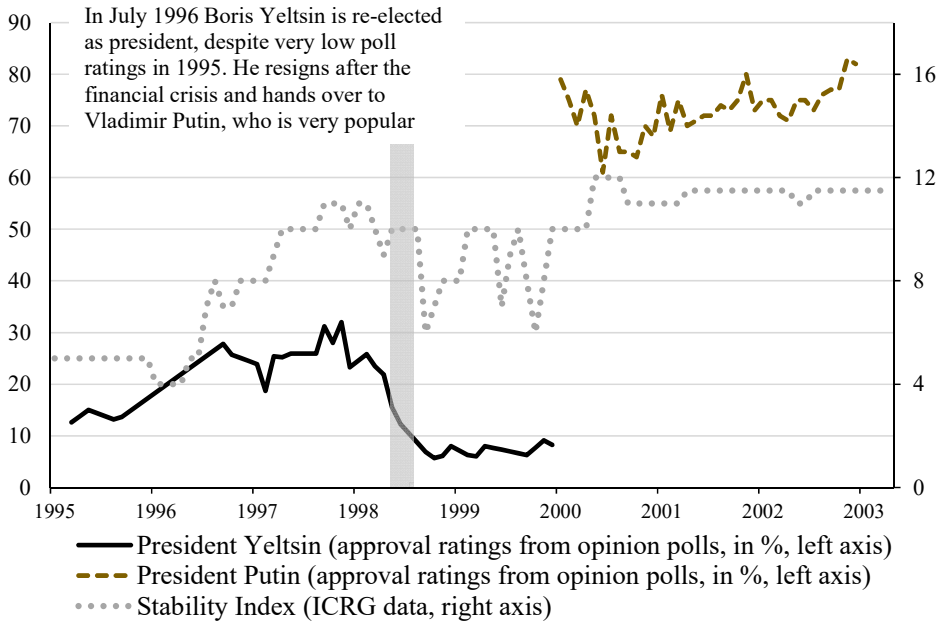
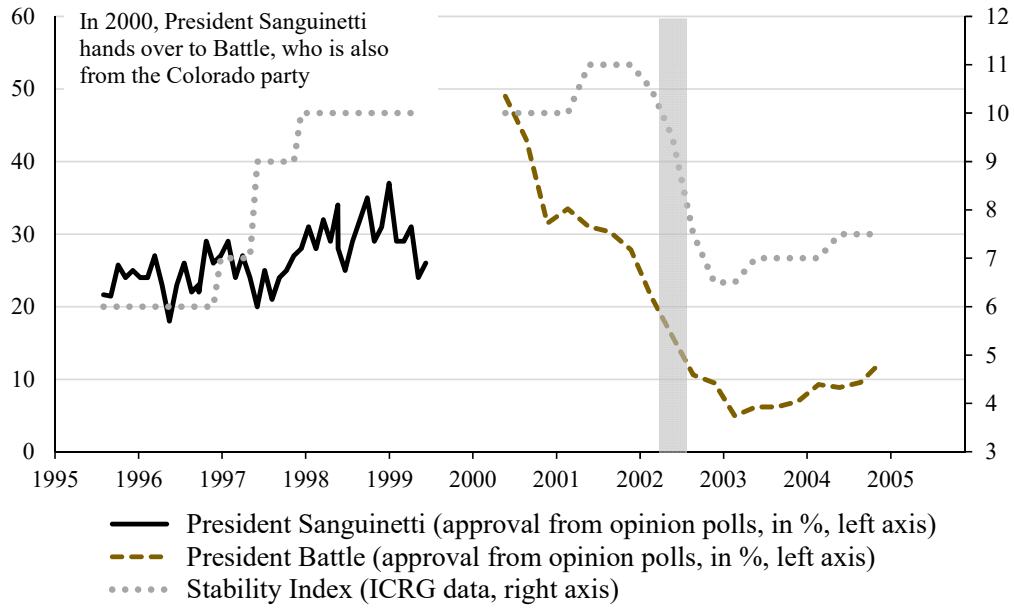


FIGURE E.9. Executive approval surrounding crises: **Uruguay 2002**



Part 2: Case Studies in Advanced Economies

FIGURE E.10. Executive approval surrounding crises: **Norway 1987**

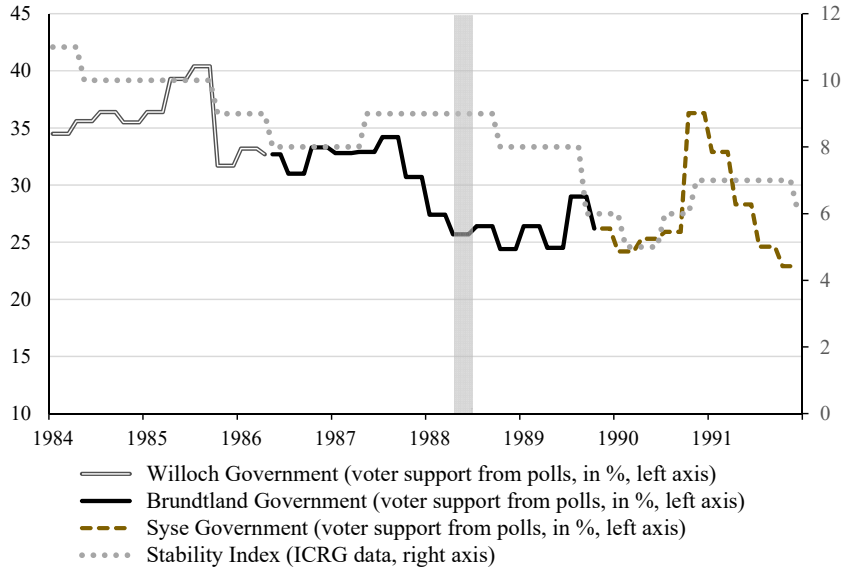


FIGURE E.11. Executive approval surrounding crises: **Finland 1991**

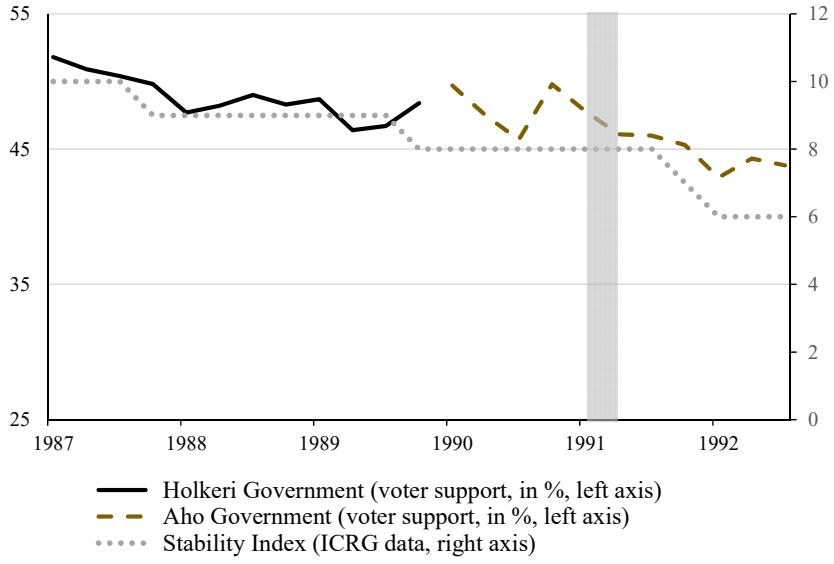


FIGURE E.12. Executive approval surrounding crises: **Ireland 2007**

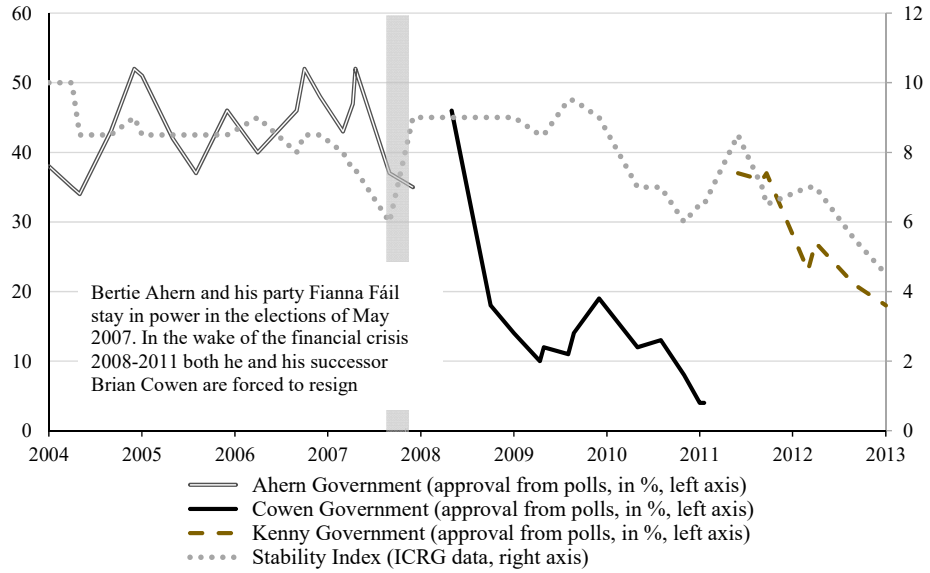


FIGURE E.13. Executive approval surrounding crises: **United Kingdom 2007**

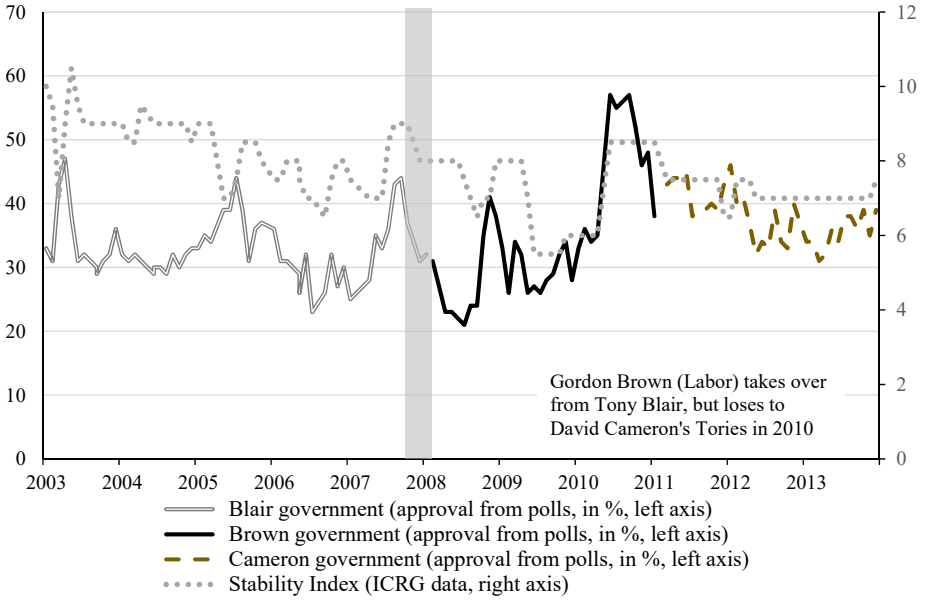


FIGURE E.14. Executive approval surrounding crises: **United States 2008**

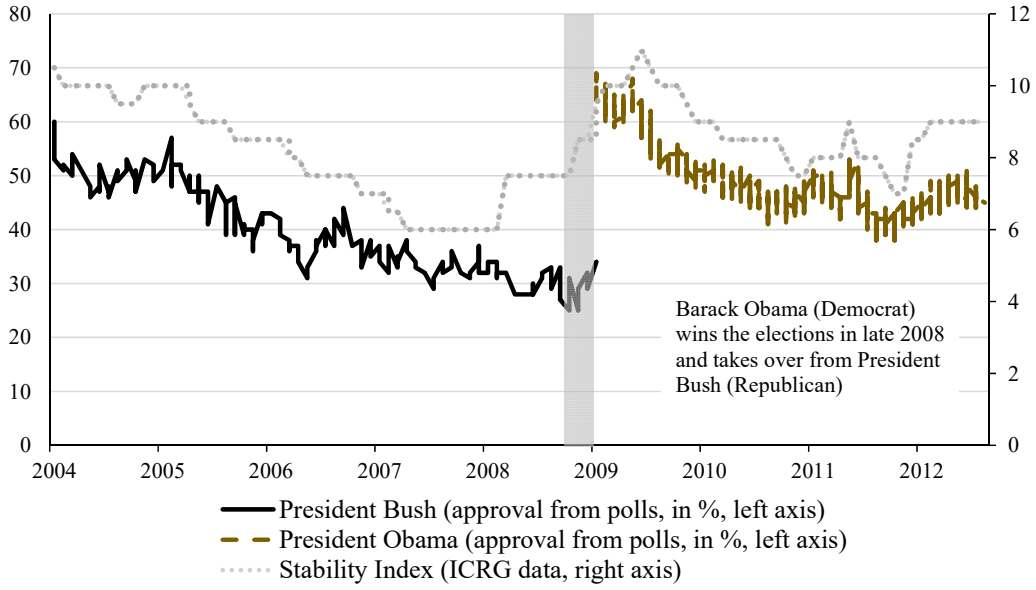
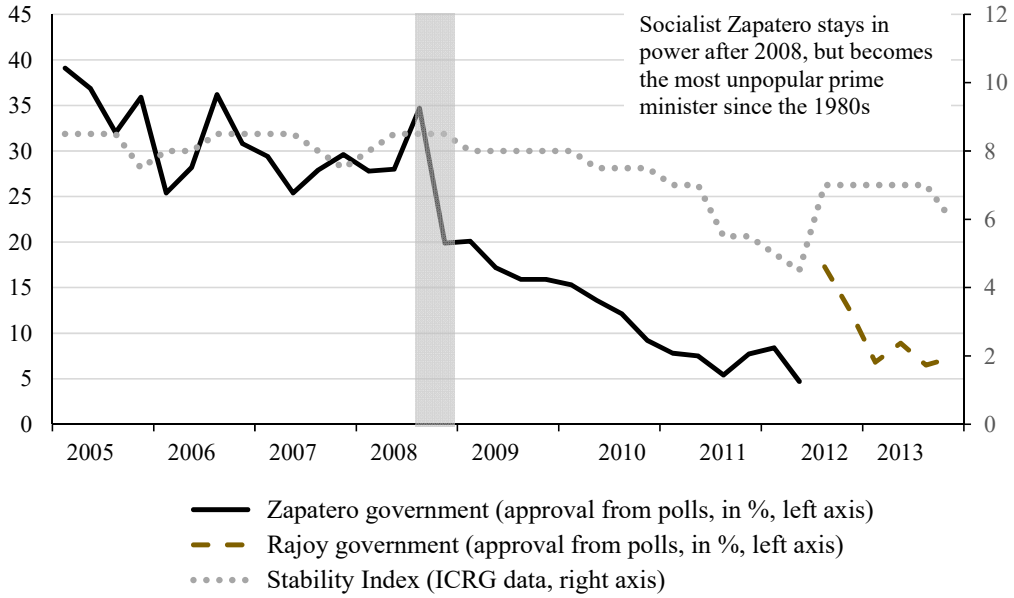


FIGURE E.15. Executive approval surrounding crises: **Spain 2008**



APPENDIX F. PROOFS

F.1. **Proof of Proposition 1 (No distortion in good booms).** The net gains for bad governments from enacting the "right policy" given the observed state is given by the difference between the expected gains from enacting the "right policy" versus the expected gains from enacting the "wrong policy". From equation (1), the net expected profits from taking the right policy and not regulating a good boom (that is $\sigma_B(\hat{g}|g) = 1$) are

$$\Delta u\,(g) = \rho + [E(\phi_{\hat{g}}|g) - \phi_{\hat{b}}]. \tag{F.1}$$

where $E(\phi_{\hat{g}}|g)$ is the expected reputation from not regulating a good boom and $\phi_{\hat{b}}$ is the (expected) reputation from regulating a good boom.[5] From equation (2), the net expected profits from taking the right policy and regulating a bad boom (this is $\sigma_B(\hat{b}|b) = 1$) are

$$\Delta u\,(b) = \rho + [\phi_{\hat{b}} - E(\phi_{\hat{g}}|b)]. \tag{F.2}$$

We need to show that $E(\phi_{\hat{g}}|g) > \phi_{\hat{b}}$, since it is otherwise inconsistent with an equilibrium. This implies that $\Delta u\,(g) > 0$, hence that $\sigma_B(\hat{g}|g) = 1$. The Bayesian updates of government's reputation, where $\phi_{r,cr}$ is the updated probability that the government is good conditional on observing regulation $r = \{\hat{b}, \hat{g}\}$ and crisis variable $cr = \{C, NC\}$ are

$$\phi_{\hat{g},NC} = \frac{p_G\phi}{p_G\phi + [p_B\sigma_B(\hat{g}|g) + (1-q)\,(1-p_B)\sigma_B(\hat{g}|b)](1-\phi)}, \tag{F.3}$$

$$\phi_{\hat{g},C} = \frac{p_G\phi}{p_G\phi + [p_B\sigma_B(\hat{g}|g) + (1-q+\frac{q}{\eta})(1-p_B)\sigma_B(\hat{g}|b)](1-\phi)}, \tag{F.4}$$

$$\phi_{\hat{b}} = \frac{(1-p_G)\phi}{(1-p_G)\phi + (1-p_B\sigma_B(\hat{g}|g) - (1-p_B)\sigma_B(\hat{g}|b))(1-\phi)}, \tag{F.5}$$

[5]The expectation is taken over the probability of facing a crisis or not. Since conditional on regulation there is no further updating conditional on crisis, the expectation term does not apply in this case. This is just a special result from assuming that upon regulation both booms have the same probability η of ending up in a crisis.

and

$$\phi_{\hat{b},C} = \phi_{\hat{b},NC} = \phi_{\hat{b}} \tag{F.6}$$

such that

$$E(\phi_{\hat{g}}|g) = \eta\phi_{\hat{g},C} + (1-\eta)\phi_{\hat{g},NC} \tag{F.7}$$

$$E(\phi_{\hat{g}}|b) = \widehat{\eta}\phi_{\hat{g},C} + (1-\widehat{\eta})\phi_{\hat{g},NC} \tag{F.8}$$

where $E(\phi_{\hat{g}}|s)$ is the reputation governments expect to obtain from choosing $\hat{g}$ when the true state is s.

If $E(\phi_{\hat{g}}|g) = \phi_{\hat{b}}$, equations (F.1) and (F.2) are both positive ($E(\phi_{\hat{g}}|g) > E(\phi_{\hat{g}}|b)$ as $\eta < \widehat{\eta}$,). Hence $\sigma_B(\hat{g}|g) = 1$ and $\sigma_B(\hat{g}|b) = 0$. From equations (F.3)-(F.8), these strategies imply $E(\phi_{\hat{g}}|g) > \phi_{\hat{b}}$, a contradiction.

If $E(\phi_{\hat{g}}|g) < \phi_{\hat{b}}$, equation (F.2) is positive, and hence $\sigma_B(\hat{g}|b) = 0$ (recall $E(\phi_{\hat{g}}|g) > E(\phi_{\hat{g}}|b)$). Then we have three cases. If (F.1) is positive, then $\sigma_B(\hat{g}|g) = 1$. Again, from equations (F.3)-(F.8), these strategies imply that $E(\phi_{\hat{g}}|g) > \phi_{\hat{b}}$, which is a contradiction. If (F.1) is negative, then $\sigma_B(\hat{g}|g) = 0$: the bad government always regulates ($\hat{b}$), which means that, if households do not observe regulation ($\hat{g}$) they believe for sure that the government is good, and hence $E(\phi_{\hat{g}}|g) = 1$, which is a contradiction. If (F.1) is zero, then $\sigma_B(\hat{g}|g) \in [0,1]$, which implies $E(\phi_{\hat{g}}|g) > \phi_{\hat{b}}$, a contradiction. ■

F.2. **Proof of Proposition 2 (Existence, uniqueness and distortion in bad booms).** Given the graphic argument for existence and uniqueness provided in the text, it suffices to prove the following properties of the function Z :

(*i*) For $\phi \in \{0,1\}$, $Z(\sigma,0) = Z(\sigma,1) = 0$ for all σ.

(*ii*) For $\phi \in (0,1)$, $Z(\sigma,\phi)$ is strictly decreasing in σ, with $Z(0,\phi) > 0$ and $Z(1,\phi) < 0$.

These properties of Z follow from $p_G > p_B$ and from

$$\begin{aligned} Z(\sigma,\phi) &= E(\phi_{\hat{g}}|b)(\sigma) - \phi_{\hat{b}}(\sigma) \\ &= \left(\begin{array}{c} \frac{\widehat{\eta} p_G \phi}{p_G\phi + [p_B + (1-p_B)\sigma(1-q+\frac{q}{\eta})](1-\phi)} \\ + \frac{(1-\widehat{\eta}) p_G \phi}{p_G\phi + [p_B + (1-q)(1-p_B)\sigma](1-\phi)} - \frac{(1-p_G)\phi}{(1-p_G)\phi + [(1-p_B)(1-\sigma)](1-\phi)} \end{array} \right) \\ &= \left(\frac{(q+\eta(1-q))}{1+\left[\frac{p_B}{p_G} + \sigma\frac{1-p_B}{p_G}(1-q+\frac{q}{\eta})\right]\frac{1-\phi}{\phi}} + \frac{(1-\eta)(1-q)}{1+\left[\frac{p_B}{p_G} + \sigma\frac{1-p_B}{p_G}(1-q)\right]\frac{1-\phi}{\phi}} - \frac{1}{1+(1-\sigma)\frac{1-p_B}{1-p_G}\frac{1-\phi}{\phi}} \right) \end{aligned}$$

It follows that $Z(\sigma,0) = Z(\sigma,1) = 0$ for all σ.

For $\phi \in (0,1)$, $Z(\sigma,\phi)$ is strictly decreasing in σ, and:

$$Z(0,\phi) = \frac{1}{1+\frac{p_B}{p_G}\frac{1-\phi}{\phi}} - \frac{1}{1+\frac{1-p_B}{1-p_G}\frac{1-\phi}{\phi}} > 0$$

$$\begin{aligned} Z(1,\phi) &= \frac{(q+\eta(1-q))}{1+\left[\frac{p_B}{p_G} + \frac{1-p_B}{p_G}(1-q+\frac{q}{\eta})\right]\frac{1-\phi}{\phi}} + \frac{(1-\eta)(1-q)}{1+\left[\frac{p_B}{p_G} + \frac{1-p_B}{p_G}(1-q)\right]\frac{1-\phi}{\phi}} - 1 \\ &< \frac{1}{1+\left[\frac{p_B}{p_G} + \frac{1-p_B}{p_G}(1-q)\right]\frac{1-\phi}{\phi}} - 1 < 0 \end{aligned}$$

■

F.3. **Comparative Statics for σ^*.**

i) The result hinges on the fact that

$$Z(\sigma,0) = Z(\sigma,1) = 0 < \rho \quad \Longrightarrow \quad \sigma^* = 0$$

ii) The result hinges on the fact that $Z(0,0) = Z(0,1) = 0$ and $Z(0,\phi)$ is increasing up to

$$\phi_{\max} = \frac{\sqrt{\frac{1-p_B}{1-p_G}\frac{p_B}{p_G}}}{1+\sqrt{\frac{1-p_B}{1-p_G}\frac{p_B}{p_G}}} \in (0,1)$$

and then decreasing. Finally

$$Z(0,\phi_{\max}) = 1 - \frac{2}{1+\sqrt{\frac{p_G(1-p_B)}{p_B(1-p_G)}}}$$

For any $\rho \in \left(0, 1 - \frac{2}{1+\sqrt{\frac{p_G}{1-p_G}/\frac{p_B}{1-p_B}}}\right)$ there exists a pair $\left(\underline{\phi}, \overline{\phi}\right) \in (0,1)^2$ which solves

$$Z(0,\phi) = \frac{1}{1+\frac{p_B}{p_G}\frac{1-\phi}{\phi}} - \frac{1}{1+\frac{1-p_B}{1-p_G}\frac{1-\phi}{\phi}} = \rho.$$

iii) For any $\rho \in (0,1)$ and $\phi \in (0,1)$ there exists a couple $(\overline{p}_B, \overline{p}_A) \in (0,1)^2$ which solves: $Z(0,\phi) = \frac{1}{1+\frac{p_B}{p_G}\frac{1-\phi}{\phi}} - \frac{1}{1+\frac{1-p_B}{1-p_G}\frac{1-\phi}{\phi}} = \rho$, because for $p_B \to 0$ and $p_G \to 1$ we have: $Z(0,\phi) \to 1$. Given the monotonicity of $Z(0,\phi)$ with respect to p_B and p_G for all $p_B < \overline{p}_B$ and $\overline{p}_G < p_G$,

$$Z(0,\phi) > \rho \quad \Longrightarrow \quad \sigma^* > 0$$

■

F.4. **Proof of Proposition 3 (Evolution of reputation).**

Define $\overline{\sigma}$ as

$$\overline{\sigma} : \phi_{\hat{g}}(\overline{\sigma}) = \phi_{\hat{b}}(\overline{\sigma}) = \phi \quad \Longleftrightarrow \quad \overline{\sigma} = \frac{p_G - p_B}{1 - p_B}$$

Since $\phi_{\hat{g}}$ decreases in σ while $\phi_{\hat{b}}$ increases in σ, we need to show

$$\sigma < \overline{\sigma} \quad \Longleftrightarrow \quad \phi_{\hat{g}} > \phi > \phi_{\hat{b}}$$

Given the equilibrium for $\rho = 0$:

$$\sigma^*(0) : Z(\sigma^*, \phi) = 0$$

and given that for $\rho > 0$, $\sigma^*(\rho) \leq \sigma^*(0)$, it suffices to prove that $\sigma^*(0) < \overline{\sigma}$, so we show that

$$Z(\overline{\sigma}, \phi) < 0 \quad \Longrightarrow \quad \sigma^*(0) < \overline{\sigma}$$

From the expression

$$Z(\overline{\sigma},\phi)=\frac{(q+\eta(1-q))}{1+[\frac{p_B}{p_G}+\left(1-\frac{p_B}{p_G}\right)(1-q+\frac{q}{\eta})]\frac{1-\phi}{\phi}}+\frac{(1-\eta)(1-q)}{1+[\frac{p_B}{p_G}+\left(1-\frac{p_B}{p_G}\right)(1-q)]\frac{1-\phi}{\phi}}-\frac{1}{1+\frac{1-\phi}{\phi}}$$

renaming the variables, $p:=\frac{p_B}{p_G}$ and $f:=\frac{1-\phi}{\phi}$, we need to show:

$$\frac{(\eta)\left(\frac{q}{\eta}+(1-q)\right)}{1+[p+(1-p)(1-q+\frac{q}{\eta})]f}+\frac{(1-\eta)(1-q)}{1+[p+(1-p)(1-q)]f}-\frac{1}{1+f}<0$$

The common denominator is positive, so by looking at the numerator, we have:

$$\begin{array}{rcl}\left(\begin{array}{c}\left((1+f)(\eta)\left(\frac{q}{\eta}+(1-q)\right)\right)(1+(p+(1-p)(1-q))f)-\\(1+(p+(1-p)(1-q))f-(1+f)(1-\eta)(1-q))\left(1+(p+(1-p)(1-q+\frac{q}{\eta}))f\right)\end{array}\right) & < & 0\\ -f\frac{q^2}{\eta}(1-\eta)(fp+1)(1-p) & < & 0\end{array}$$

■

APPENDIX G. EVIDENCE ON THE REPUTATION MECHANISM

This Appendix provides further empirical support for our argument that the regulation channel is a plausible explanation for the link between political booms and financial crises in emerging markets. We start by showing that, even among emerging markets, political booms predict financial crises better in countries with higher reputation concerns (subsection G.1). In the remainder of the section we then study the relation between popularity and crises using data on financial regulation and proceed in three steps. First, we document a negative correlation between regulation and reputation (subsection G.2.1). Second, we show that less regulation is indeed associated with a higher probability of crises (subsection G.2.2). Third, we show that emerging economies regulate less (relative to trend) during bad booms than during good booms, while the opposite happens in advanced economies (subsection G.2.3).

G.1. **Low popularity predicts financial crises, even among emerging markets.** Through the lens of our model, political booms predict financial crises in emerging markets mainly because their governments have high reputational concerns (intermediate reputation levels), corrupting their incentives to regulate. Table G.1 shows that the *initial level* of government stability (not only its change, as in previous regressions) is a good predictor of financial crises. When the stability index is low, crises are more likely to occur four years later. This result holds for all countries but also when restricting the sample to emerging economies. Furthermore, it is robust to including controls, country and year fixed effects. The magnitude of the estimated coefficient is also large: a one standard deviation increase in the level of the stability index lagged by 4 years (3.98 index points) can be associated with a 5.6 percentage point lower crisis probability (the calculation is -0.014*3.98=-0.056 from Column 3). Importantly, by adding country fixed effects we can rule out a number of alternative explanations for this finding, in particular deep-rooted differences in institutional quality or time-invariant characteristics of the political system (e.g. parliamentary vs. presidential).

Table G.1: Initial popularity (stability index) and banking crises

	(1)	(2)	(3)	(4)
	Full Sample	Emerging Economies Only	Main Model (levels)	Country and year FE
Country FE	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes
Government Stability (level, lag 4)	-0.005**	-0.009***	0.005	0.013*
	(0.002)	(0.003)	(0.005)	(0.007)
Interaction GovStab Level & EME Dummy (lag 4)			-0.014***	-0.017***
			(0.005)	(0.006)
Observations	1,340	834	1,340	1,340
Adjusted R2	0.002	0.008	0.005	0.090

The dependent variable is a binary indicator for the onset of banking crises taken from Laeven and Valencia. The main explanatory variable is the *level* of government stability (lagged by 4 years) as measured by the continuous ICRG indicator. All regressions include country fixed effects and standard errors are clustered on country. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

G.2. **Regulation as a link between popularity and crises.** The theoretical model interprets the evidence that links popularity during booms and subsequent crises as coming from governments avoiding or delaying regulation. Here we provide supportive evidence for this notion, by showing that (i) there is a negative correlation between regulation and the stability index, especially in emerging markets and that (ii) prior to crises there is a tendency to relax regulatory constraints in emerging markets.

For data on regulation we follow Abiad et al. (2010), who constructed a database of financial regulations and reforms between 1973 and 2005. The aggregate index of financial reforms, ranges from 0 to 21 and consists of seven sub-indicators covering credit controls, interest rate controls, entry barriers in the financial sector, state ownership of banks, restrictions on international capital flows, banking supervision and securities markets regulation. We also place special attention on sub-indicators that capture financial sector regulation in a narrow sense, namely (i) the indicator of credit controls and reserve requirements, (ii) the sub-indicators of banking supervision and securities market regulation (we sum the latter two), as well as (iii)

the sub-indicator on credit ceilings (limiting the expansion of bank credit). The index (and each indicator) is inverted so that high values stand for stricter regulation. Table G.3 shows this information for emerging economies.

G.2.1. *Negative correlation between regulation and stability index.* The data confirm that regulation and the stability index are negatively correlated in emerging markets: the correlation between the aggregate index and the ICRG measure is -0.44, suggesting that emerging markets with tightly regulated financial systems have less popular governments. In first differences, the correlation is still negative (-0.08), indicating that regulatory action is associated with a drop in popularity in EMEs. For advanced economies, we find the opposite: the correlation between regulatory changes (tightening) and changes in the stability index is positive (0.06).

Table G.2: Regulation and government stability index in emerging markets

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
	Stability index (level)	Stability index (change)	Stability index (change)	Stability index (change)	Stability index (change)
	EMEs only	EMEs only	EMEs only	EMEs only	EMEs only
Financial Regulation Index (in levels, lagged)	-0.250***				
	(0.026)				
ΔFinancial Regulation Index (yoy change, 3-year mov.avg.)		-0.173**			
		(0.066)			
ΔCredit Controls & Reserv. Req. - sub-indicator (yoy change, 3-year mov.avg.)			-0.670***		
			(0.230)		
ΔRegulation of Banking/ Securities markets (yoy change, 3-year mov.avg.)				-0.670***	
				(0.199)	
ΔCredit Ceiling (yoy change, 3-year mov.avg.)					-1.317**
					(0.510)
Observations	781	733	733	733	359
R2	0.308	0.010	0.011	0.014	0.010
Adjusted R2	0.307	0.010	0.011	0.015	0.009

The table shows results from a fixed effects panel regression using the ICRG index of government stability as dependent variable (in levels, Column 1, as well as in first differences, Columns 2-5. The explanatory variable in Columns 1 and 2 is based on the aggregate IMF index of financial reform (Abiad et al. 2010), which we invert and therefore call "Financial Regulation Index". It ranges from 0 (full liberalization) to 21 (very tight regulation and restrictions). The sub-indicator of credit controls (Column 3) ranges from 0 (no credit controls) to 3 (full credit controls). The sub-indicator of banking and securities market regulation (Column 4) ranges from 0 (full liberalization) to 6 (strict regulation of both banks and securities markets). The sub-indicator of credit ceilings (Column 5) is a dummy with 1 indicating if ceilings on the expansion of bank credit are in place. All regressions include country fixed effects and standard errors are clustered on the country level.

Table G.2 shows more systematic evidence based on fixed effects panel regressions in the subsample of EMEs. The dependent variable is the index of government stability in levels (Column 1) and year on year changes (Columns 2-4), respectively. The explanatory variables are the proxies for regulation, in particular the aggregate index of financial regulation, in levels (Column 1) and in first differences, using the three-year moving average of annual changes (Column 2). We also use changes in the sub-indicator of credit restrictions and reserve requirements (Column 3), changes in banking and securities market regulation (Column 4) and a sub-indicator capturing whether the regulator imposed a credit ceiling on some or all banks (dummy variable). In each case, we find regulation to have significant, negative correlation.[6] According to Column 2, a one point increase in overall regulatory intensity (ranging from 0 to 21) is associated with a decline in the government popularity index of 0.16. A one point increase in the credit restrictions indicator (ranging from 0 to 3) is associated with a decline of 0.64 in the stability index (which ranges from 1 to 12).

In line with our model these findings suggest that regulation has a negative reputational impact only for governments in emerging markets: in advanced economies the coefficient for regulatory action is either positive and/or insignificant.

G.2.2. *Emerging market crises are preceded by loose regulation.* Here we assess regulatory action in the run-up to financial crises in emerging markets. We find that the aggregate regulation index drops from an average of 7.3 to only 5.9 during the 5 years before the 9 major crisis events in our sample. Similarly, in the full sample of EME banking crises for which we have regulation data, the regulation index drops from an average of 12.5 three years prior to the crisis to 11.7 at the outbreak of the crisis. This suggests that regulation was typically loosened prior to EME crises. In contrast, in advanced economies, the regulation index increases in the run up to crises, suggesting that regulation is typically tightened.

The picture is confirmed when looking at changes in the aggregate regulation index country by country. Of the 36 banking crises and 28 sudden stop events of emerging markets for

[6]When we account for global trends by adding year fixed effects, we still find a negative correlation throughout, but the coefficient only remains significant with regard to the sub-indicator of credit controls.

which we have regulation data, there is not a single case that was preceded by significant regulation tightening (an index increase of more than 1 in the three pre-crisis years). As shown in Table G.3, the vast majority of EME crises saw either no change in regulation pre-crisis or a loosening of regulation. Indeed, more than one-third of banking crises and sudden stops occurred after a period of significant *de*regulation, defined as a loosening of 2 index points or more.[7]

Finally, case study evidence supports the view that governments in emerging markets tend to delay necessary regulatory action during most pre-crisis booms. The Asian crisis of the 1990s is an example. The economies of the "Asian tigers" boomed by the mid-1990s, with governments gaining strong popular support while financial systems were liberalized and little regulatory action was taken. An IMF (2000) paper on the Asian crisis concludes that "prudential regulations were weak or poorly enforced" and "those indicators of trouble that were available seem to have been largely ignored". Similarly, Corsetti et al. (1999) show that banking and financial systems were in general fragile "poorly supervised, poorly regulated and in shaky condition even before the onset of the crisis". This corresponds to the assessment of Radelet and Sachs (1998) that "financial sector deregulation was not accompanied by adequate supervision", which "allowed banks to take on substantial foreign currency and maturity risks". When vulnerabilities became visible, "little action was taken to strengthen the banks, and some policy changes [...] actually weakened the system further". It is beyond the scope of the paper to review anecdotal evidence on case studies, but similar evidence seems ubiquitous across many other crisis events.[8] Overall, this evidence supports the reputation mechanism we propose in this paper.

[7]This is finding is in line with Mendoza and Terrones (2012), who show that credit booms in emerging markets are frequently preceded by episodes of financial liberalization (regulatory loosening).

[8]Turkey introduced a new banking law and supervisory framework only after the first IMF bailout in 1999, see http://www.imf.org/external/np/loi/1999/120999.htm. Russia witnessed a largely unregulated boom in private credit and securities markets in the mid-1990s, before the 1998 crisis.

Table G.3: Regulation prior to crises in EMEs

Regulation prior to banking crises (EMEs)			
Country	Banking crisis	Pre-crisis change in regulation index	Significant deregulation?
Argentina	1988	-1	
Argentina	1994	-2	yes
Argentina	2000	1	
Bulgaria	1995	-1.5	
Brazil	1989	-5	yes
Chile	1980	-3	yes
China	1997	-1	
Colombia	1981	-1	
Colombia	1997	0	
Costa Rica	1986	-2	yes
Costa Rica	1993	-2	yes
Czech Republic	1995	1	
Algeria	1989	-0.25	
Ecuador	1981	-1	
Ecuador	1997	0	
Indonesia	1996	-1	
India	1992	-1	
Jordan	1988	1	
South Korea	1996	-2	yes
Lithuania	1994	-7.75	yes
Latvia	1994	-9.5	yes
Mexico	1980	-1	
Mexico	1993	0	
Malaysia	1996	1	
Nigeria	1990	-2	yes
Peru	1982	-2	yes
Philippines	1982	-2.75	yes
Philippines	1996	0	
Russia	1997	-2	yes
Thailand	1982	0	
Thailand	1996	-1	
Turkey	1981	-4	yes
Turkey	1999	1	
Uruguay	1980	-3	yes
Uruguay	2001	0	
Venezuela	1993	-0.75	
Average change 3 years pre-crisis:		-1.51	

Regulation prior to sudden stops (EMEs)			
Country	Sudden Stop	Pre-crisis change in regulation index	Significant deregulation?
Argentina	1995	-2	yes
Argentina	1999	0	
Bulgaria	1995	-2.25	yes
Brazil	1995	-1	
Brazil	1998	-2	yes
Chile	1995	0	
Colombia	1997	-1	
Costa Rica	1998	-2	yes
Ecuador	1995	-5	yes
Ecuador	1999	1	
Estonia	1998	-1	
Hong Kong	1998	0	
Indonesia	1997	-1	
Jordan	1994	0	
Jordan	1998	-1.75	
South Korea	1997	-2	yes
Lithuania	1999	-2.75	yes
Latvia	1999	0	
Mexico	1994	0	
Malaysia	1994	0	
Pakistan	1995	-1	
Peru	1997	-3	yes
Philippines	1995	-4.75	yes
Poland	1999	-3	yes
Thailand	1996	0	
Turkey	1994	0	
Turkey	1998	-1	
Uruguay	1999	-1	
Average change 3 years pre-crisis:		-1.30	

The table shows changes in the financial regulation using the (inverted) regulation index by Abiad et al. (2010). Higher index values indicate stricter regulation. The pre-crisis change in regulation is computed from year 3 to year 1 pre-crisis, i.e. changes in the three years before the crisis onset. An index reduction of 2 or more is considered as "significant deregulation". The sample of banking crises and sudden stops is listed in Table B.1. (note that regulation data is only available until 2005).

G.2.3. *Emerging (advanced) economies regulate less (more) during bad booms than during good booms.* Our model proposes a mechanism under which, in the presence of a credit boom, the government can identify when a crisis is likely to occur or not. In case of a crisis threat (a bad boom)

governments in emerging economies are more concerned about their reputation/popularity and tend to regulate less than governments in more developed economies, hence putting the economy at a higher risk of an actual crisis. In contrast, when there is no crisis threat (a good boom) governments in emerging and developed economies should behave similarly.

The main implication of this mechanism is that emerging economies regulate less during bad booms than during good booms, in comparison to their more advanced counterparts. In the previous subsection we showed one way to explore this correlation: in the run up to observed financial crises, regulation is relaxed in emerging economies, but this may be just a trend. Another way to explore the mechanism is to focus on the boom periods and then check whether advanced economies regulate more during booms than emerging economies, especially during bad booms (those with a high crisis threat).

To study regulation intensity during good and bad credit booms we need to first identify and measure credit booms in the data, which is the subject of a recent debate in the literature.[9] To avoid picking one measurement approach arbitrarily we show results for three alternative methodologies to measure credit booms, namely by Mendoza and Terrones (MT, 2012), Gorton and Ordonez (GO, 2016) and by Richter, Schularick and Wachtel (RSW, 2018). We apply each methodology to data on credit over GDP from the World Bank for our sample of 62 countries since 1970. All three approaches are summarized at the end of this subsection.

In a next step, we classify each boom as a bad boom or good boom following Gorton and Ordonez (2016). We label a credit boom a bad boom if a financial crisis occurs during the three years after the end of the boom. All other booms (without a crisis looming at the end of the boom) are classified as good booms.[10]

[9] For a longer discussion on this issue and the related literature see Gorton and Ordonez (2016).

[10] This definition is helpful to test the predictions on our mechanism, but strictly speaking this is not the definition of good booms and bad booms in our model. In our model we define a good boom as one that is "fundamentally good" and does not require regulation to avoid a crisis, while a bad boom is "fundamentally bad" and does require regulation to avoid a crisis. In this sense, the good booms that we identify in the data are either "fundamentally good" or "fundamentally bad" but successfully regulated before ending in crises. In contrast, the bad booms that we identify in the data are "fundamentally bad" booms that were unsuccessfully regulated or not at all.

We express regulatory changes in percent to the country's trend, captured by average regulatory change across all sample years. For example, assume that a country shows an average reduction in the regulation index by 0.5 annually. Now assume that regulation does not change in a particular year (the index has a change of 0). Then the country regulated 100% more than trend in that period (the calculation is (0-(-0.5))/0.5=1).

Table G.4 shows the summary of these results[11]

Table G.4: Regulation during Credit Booms

		Advanced Economies		Emerging Economies	
		Number	Regulatory Strength (relative to trend)	Number	Regulatory Strength (relative to trend)
Gorton and Ordonez	Good Booms	37	-3.5%	66	20.0%
	Bad Booms	13	86.0%	28	-31.0%
Mendoza and Terrones	Good Booms	14	17.0%	21	52.0%
	Bad Booms	3	138.0%	12	51.0%
Richter, Schularick and Wachter	Good Booms	13	6.0%	34	84.0%
	Bad Booms	1	100.0%	8	10.0%

On average, regardless of the definition of credit boom, advanced economies regulate more (relative to trend) during bad booms than during good booms, while the opposite happens in emerging economies. More precisely, comparing regulation intensity across booms for a given country, advanced economies regulate 89.5% more in bad booms than in good booms according to GO (121% more according to MT and 94% more according to RSW), while emerging economies regulate 51% less in bad booms than in good booms according to GO (virtually the same according to MT and 74% less according to RSW).

Furthermore, comparing regulation intensity across countries for a given boom type, during good booms, advanced economies regulate 23.5% less than emerging economies according to GO (35% less according to MT and 78% less according to RSW). In contrast, during bad

[11]Notice that the average between changes in regulation relative to trend does not add up to zero, as most periods in the sample are not in a credit boom, but are represented in the trend to obtain trend regulation.

booms, advanced economies regulate 117% more than emerging economies according to GO (87% more according to MT and 90% more according to RSW).

Measuring credit booms - three approaches:

- Gorton and Ordonez (2016): According to their definition, a boom starts when the average growth in private credit over GDP is greater than or equal to a threshold (set in that paper at 5% for three consecutive periods). The boom is assumed to be continuing until there are at least two consecutive periods in which credit growth is less than or equal to 0%. A year t is denoted to be a credit boom year if the growth from year $t-1$ to year t satisfies the aforementioned conditions.

  Applying this definition to our database we identify 50 credit booms in developed economies and 101 credit booms in emerging economies. The average length of these booms is 10 years and 8 years respectively. As in Gorton and Ordonez (2016), this definition basically implies that a country experiences a credit boom half of the time. Indeed, this methodology is intended to capture a low frequency expansion of credit, not only from bubbles but also from productivity driven expansions and financial deepening.
- Mendoza and Terrones (2012): The time series for aggregate private credit is detrended using a Hodrick-Prescott filter (with a smoothing parameter of 100). A boom period is defined as a large deviation of the credit from its usual business cycle trend. More precisely, for a country i we first define a set of contiguous boom dates for which deviation from the long-run trend in the logarithm of real credit per capita (we use aggregate private credit instead). $l_{i,t}$ is greater than the standard deviation of this cyclical component $\sigma(l_i)$ multiplied with a threshold factor ϕ. The peak of a credit boom $\widetilde{t}$ is defined as the date that shows the maximum deviation among these contiguous dates. Then, the starting date of the boom is set to be the date $t_s < \widetilde{t}$ such that $|l_{i,t} - \phi^s \sigma(l_i)|$ is smallest and the ending date of the boom is set to be the date $t_e > \widetilde{t}$ such that $|l_{i,t} - \phi^e \sigma(l_i)|$ is smallest. As these authors, we set $\phi = 1.75$, $\phi^s = 1$ and $\phi^e = 1$.

Applying this definition to our database we identify 17 booms in developed economies and 34 booms in emerging economies. The average length of these booms is 3.7 years in both cases. As discussed in Gorton and Ordonez (2016), this methodology defines and interprets a boom as a special and rare event. By construction, detrending reduces the boom length by discarding its initial phase, which is assigned to trend.

- Richter, Schularick and Wachtel (2018): This method is similar in spirit to Mendoza and Terrones (2012), but uses a different detrending methodology than the Hodrick-Prescott filter, based on the proposal of Hamilton (2017). The method first runs a regression of private credit per capita (we use aggregate private credit instead) y_t on y_{t-h}, y_{t-h-1},...,$y_{t-h-l+1}$ where h denotes the forecast horizon and l denotes the number of lags used and then compares predicted values with actual ones. If the actual value is larger than the predicted one for time t by a margin of $\frac{\phi}{\sigma(y_t)}$, it is denoted as a credit boom period. Lastly, if there are two boom periods with only one non-boom period in between, that non-boom period is also denoted as a boom period to generate contiguity. As these authors, we set $\phi = 0.75$, $h = 3$ and $l = 4$. Applying this definition to our database we identify 14 booms in developed economies and 43 booms in emerging economies. The average length of these booms is 1 year in both cases. This methodology is even more extreme than Mendoza and Terrones (2012) in defining and interpreting a boom as a particularly rare event, not on the frequency of its occurrence, but on its length when it does occur.

APPENDIX H. SIMULATED ILLUSTRATION OF THE MODEL

This paper proposes a reputation mechanism to explain how an increase in popularity predicts crises in emerging economies, but not in developed economies. Even though a reputation mechanism relies on a repeated game, we have focused on the decisions of a government in a single period. As the government starts with a reputation level that is updated based on government actions, we have used this single period change in reputation as the measure of popularity change and have shown analytically that an increase in reputation is correlated with the likelihood of a crisis only for intermediate initial reputation levels.

We argue that one potential difference between emerging and developed economies is the quality of the pool of politicians. Our conjecture is that developed economies have a higher fraction of good governments (political institutional differences, institutional quality of check and balances, long history of democracy, etc). In a single period setting the initial reputation of a government coincides with the fraction of good governments in the pool. In a repeated game economy, the fraction of good governments in the pool only determines the initial reputation of new governments, but may not have an overall effect for the predictability of popularity changes that we identified in the data.

Here we simulate a full-fledged repeated game version of the model for two reasons. First, by simulating shocks to fundamentals over time, we can illustrate the evolution of government decisions and the evolution of popularity leading to crises in an economy. Second, we can obtain a correlation between changes in popularity and the likelihood of a crisis in a dynamic setting, giving an answer to the previous concern. Even though we are not performing a calibration exercise to match our empirical results quantitatively, we show that the model is successful in capturing the signs and statistical significance of our main regression coefficients. In particular, by characterizing emerging economies as countries with a lower fraction of good governments, we show that popularity tends to increase in emerging economies leading to a crisis, but not in developed economies.

H.1. **Parameters.** We normalize the per period benefits of a boom to $\Pi = 1$ and assume the cost of a crisis is $X = 1.5$. We assume a "good boom" ends in a crisis with probability $\eta = 0.1$ and a "bad boom" ends in a crisis (in absence of regulation) with probability $\widehat{\eta} = 0.55$ (hence $q = 0.5$).[12] We assume that good governments generate good booms with probability $p_G = 0.7$ and bad booms with probability $p_B = 0.2$. As in the text, regulation reduces the probability that a bad boom ends in a crisis to $\eta = 0.1$, but reduces the gains of any credit boom by $\varepsilon = 0.3$. Finally, we assume the reward parameter that measures the policy motivation is $\rho = 0.1$. To avoid an absorbing state in which a government is known to be good, we also assume that governments exogenously die with a probability δ.

Based on these parameters, following the analysis in a single period in the text, the Markovian probability that a bad government raids a bad boom, σ is the same in all periods and is depicted in the figure below for all reputation levels ϕ, which is a numerical version of Figure 9 in the text.

H.2. **Repeated game computation.**

(A) Period 0

(a) A government's type is realized (the government is good with probability ϕ_0).

(b) A boom's type is realized (the boom is good with probability p_G if the government is good and with probability p_B if the government is bad).

(c) The government chooses to regulate or not. Conditional on the government's type and the boom's type, the government follows the strategy $\sigma(\phi_0)$ above.

(d) Based on regulation, or lack thereof, individuals update reputation to ϕ_0^I.

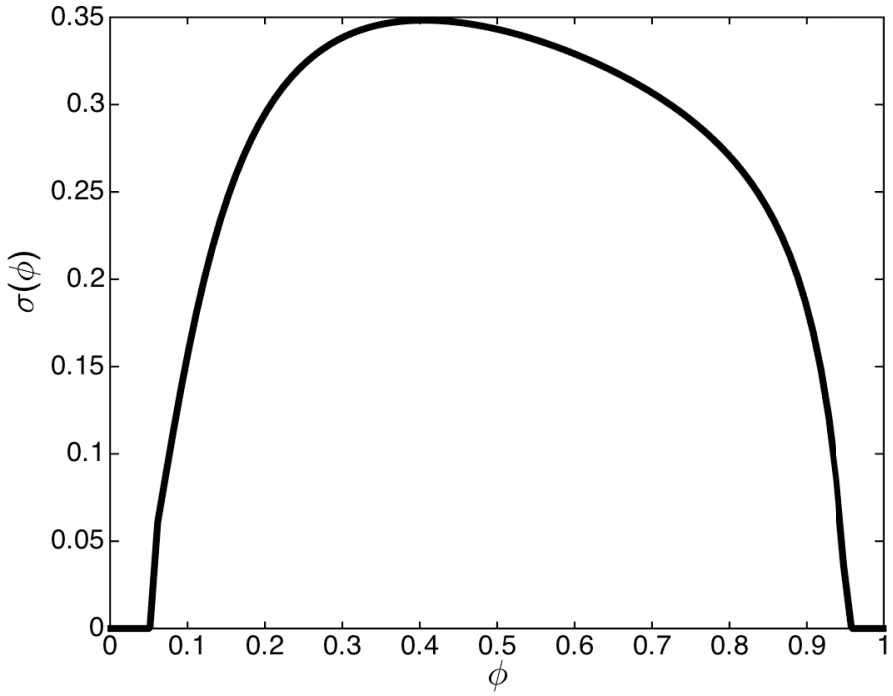
(e) A crisis, or lack thereof, is realized (the probability of a crisis depends on the boom's type and regulation).

(f) Based on crisis, or lack thereof, individuals update reputation to ϕ_1.

(B) Period $t \in \{1, ...\}$

[12] Notice that these parameters imply the condition: $\varepsilon < (\widehat{\eta} - \eta)X$.

FIGURE H.1. Distortion probabilities



(a) If the government exogenously dies or its updated reputation is such that $\phi_t < \phi_0$, there is a new realization of the government's type, which is good with probability ϕ_0, and we go back to the process described above for period 0. If not, the government's type remains as in the previous period with reputation ϕ_t.

(b) If the government is replaced, there is a new boom realization. If the previous government continues and there was no crisis, the previous boom's type remains.

(c) The government chooses to regulate or not (following the strategy $\sigma(\phi_t)$ above).

(d) Based on regulation, or lack thereof, individuals update reputation to ϕ_t^I.

(e) A crisis, or lack thereof, is realized (the probability of a crisis depends on the boom's type and regulation).

(f) Based on crisis, or lack thereof, individuals update reputation to ϕ_{t+1}.

H.3. **Popularity increases predict crises.** We run the previous simulation for 1,000 periods. Then we run 50,000 simulations. For each simulation we can compute the correlation between

Table H.1: Predictability of Popularity Changes on Crises

Fraction of G Gov. (ϕ_0)	0.1	0.3	0.5	0.7	0.9
Reputational Concerns					
Mean (Corr)	0.059	0.079	0.056	0.025	0.004
St. Dev. (Corr)	0.032	0.035	0.035	0.032	0.034
No Reputational Concerns					
Mean (Corr)	-0.001	0.000	0.000	0.000	0.001
St. Dev. (Corr)	0.032	0.033	0.032	0.034	0.033

the change in popularity and the breakout of crises. Then we can average this correlation across simulations and compute the "Montecarlo" standard deviation, providing the simulation counterpart of the lagged political boom coefficient (and its standard errors) from the main empirical findings. We perform this exercise for different fractions of good governments in the pool of potential governments, ϕ_0. In Table H.1, this correlation follows a similar non-monotonic pattern as σ, which is consistent with our analytical analysis in the main text. The standard deviation, however, does not depend on ϕ_0. This implies that, given our parameters, a country with a low fraction of good governments has a positive significant correlation between the increase in popularity and the likelihood of a crisis. This correlation is significantly positive (more than two standard deviations above zero) for countries with a low fraction of good governments and not significantly positive for countries with a relatively high fraction of good governments.

Notice that, absent strategic behavior by the government, there is no correlation between the change in popularity and the probability of a crisis, regardless of the fraction of good governments, ϕ_0. As in the text, without reputational concerns, the probability of observing a crisis conditional on observing an increase in popularity is the same. We confirm this also in Table H.1.

REFERENCES

[1] Abiad, Abdul, Enrica Detragiache and Thierry Tressel. 2010. "A New Database of Financial Reforms." *IMF Staff Papers* 57(2): 281-302.

[2] Arnone, Marco, Bernard J. Laurens and Jean-Francois Segalotto. 2006. "Measures of Central Bank Autonomy; Empirical Evidence for OECD, Developing, and Emerging Market Economies." IMF Working Paper 06/228.

[3] Banks, Arthur and Kenneth Wilson. 2013. "Cross National Time-Series Data Archive." Databanks International.

[4] Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer and Patrick Walsh. 2001. "New Tools in Comparative Political Economy: The Database of Political Institutions." *World Bank Economic Review* 15(1), 165-176.

[5] Brender, Adi and Allan Drazen. 2008. "How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries." *American Economic Review* 98(5): 2203-20.

[6] Calvo, Guillermo A., Alejandro Izquierdo and Luis-Fernando Mejía. 2008. "Systemic Sudden Stops: The Relevance Of Balance-Sheet Effects And Financial Integration." NBER Working Paper 14026.

[7] Cesa-Bianchi, Ambrogio. 2013. "Housing Cycles and Macroeconomic Fluctuations: A Global Perspective." *Journal of International Money and Finance* 37(3): 215-238.

[8] Corsetti, Giancarlo, Paolo Pesenti and Nouriel Roubini. 1999. "What Caused the Asian Currency and Financial Crisis?" *Japan and the World Economy* 11(3): 305-373.

[9] Crespo-Tenorio, Adriana, Nathan M. Jensen, and Guillermo Rosas. 2014. "Political Liabilities: Surviving Banking Crises." *Comparative Political Studies* 47(7): 1047-1074.

[10] Gorton, Gary and Guillermo Ordonez. 2016. "Good Booms, Bad Booms." NBER Working Paper 22008.

[11] Hamilton, James. 2017. "Why You Should Never Use the Hodrick-Prescott Filter." NBER Working Paper 23429.

[12] International Monetary Fund. 2000. "Financial Sector Crisis and Restructuring: Lessons from Asia." *IMF Occasional Paper* No 188.

[13] Jorda, Oscar. 2014. "Assessing the Historical Role of Credit: Business Cycles, Financial Crises and the Legacy of Charles S. Peirce." *International Journal of Forecasting* 30:3: 729-740.

[14] Kaminsky, Graciela L. and Carmen M. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance-of-payments Problems." *American Economic Review* 89:, 473?500.

[15] Laeven, Luc and Fabian Valencia. 2010. "Resolution of Banking Crises; The Good, the Bad, and the Ugly." IMF Working Paper 10/146.

[16] Laeven, Luc and Fabian Valencia. 2012. "Systemic Banking Crises Database: An Update." IMF Working Paper 12/163.

[17] Mack, Adrienne and Enrique Martínez-García. 2011. "A Cross-country Quarterly Database of Real House Prices: A Methodological Note." Federal Reserve Bank of Dallas Working Paper 99.

[18] Mendoza, Enrique G. and Marco E. Terrones. 2012. "An Anatomy of Credit Booms and their Demise." NBER Working Paper 18379.

[19] Radelet, Steven and Jeffrey Sachs. 1998. "The Onset of the East Asian Financial Crisis." NBER Working Paper 6680.

[20] Reinhart, Carmen M. and Kenneth Rogoff. 2009. "The Aftermath of Financial Crises." *American Economic Review* 99(2): 466-72.

[21] Richter, Bjoern, Moritz Schularick and Paul Wachtel. 2018. "When to Lean Against the Wind." CEPR Discussion Paper, 12188.

[22] Ward, Felix. 2017. "Spotting the Danger Zone: Forecasting financial crises with classification tree ensembles and many predictors." *Journal of Applied Econometrics*, 32: 359-378.