SUPPLEMENTARY MATERIAL

PARTY STRENGTH AND ECONOMIC GROWTH

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APPENDIX A: Data

Table A1: Variable Definitions

Components of the Party Strength Index

National organizations (v2psorgs) How many political parties for national-level office have permanent organizations? A permanent organization connotes a substantial number of personnel who are responsible for carrying out party activities outside of the election season. Responses: (0) No parties. (1) Fewer than half of the parties. (2) About half of the parties. (3) More than half of the parties. (4) All parties. Source: V-Dem (Coppedge et al. 2017b).

Local branches (v2psprbrch) How many parties have permanent local party branches? Responses: (0) None. (1) Fewer than half. (2) About half. (3) More than half. (4) All. Source: V-Dem (Coppedge et al. 2017b).

Legislative cohesion (v2pscohesv) Is it normal for members of the legislature to vote with other members of their party on important bills? Responses: (0) Not really. Many members are elected as independents and party discipline is very weak. (1) More often than not. Members are more likely to vote with their parties than against them, but defections are common. (2) Mostly. Members vote with their parties most of the time. (3) Yes, absolutely. Members vote with their parties almost all the time. Source: V-Dem (Coppedge et al. 2017b).

Party linkages (v2psprlnks) Among the major parties, what is the main or most common form of linkage to their constituents? A party-constituent linkage refers to the sort of "good" that the party offers in exchange for political support and participation in party activities. Responses: (0) Clientelistic. Constituents are rewarded with goods, cash, and/or jobs. (1) Mixed clientelistic and local collective. (2) Local collective. Constituents are rewarded with local collective goods, e.g., wells, toilets, markets, roads, bridges, and local development. (3) Mixed local collective and policy/programmatic. (4) Policy/programmatic. Constituents respond to a party's positions on national policies, general party programs, and visions for society. Source: V-Dem (Coppedge et al. 2017b).

Candidate selection—national/local (v2pscnslnl_neg) How centralized is legislative candidate selection within the parties? The power to select candidates for national legislative elections is often divided between local/municipal party actors, regional/state-level party organizations, and national party leaders. One level usually dominates the selection process, while sometimes candidate selection is the outcome of bargaining between the different levels of party organization. Responses: (0) National legislative candidates are selected exclusively by national party leaders. (1) National legislative candidate selection is dominated by national party leaders but with some limited influence from local or state level organizations. (2) National legislative candidates are chosen through bargaining across different levels of party organization. (3) National legislative candidates are chosen by regional or state-level organizations, perhaps with some input from local party organizations or constituency groups. (4) National legislative candidates are chosen by a small cadre of local or municipal level actors. (5) National legislative candidates are chosen by constituency groups or direct primaries. Scale reversed. Source: V-Dem (Coppedge et al. 2017b).

Party switching (v2psswitch_neg) Roughly what percentage (%) of the members of the national legislature changes or abandons their party in between elections? Does not include official party splits (when one party divides into two or more parties) or dissolutions (when a party formally dissolves). Scale reversed. Source: V-Dem (Coppedge et al. 2017b).

Other variables

Access to Justice (v2xcl_acjst). Do citizens enjoy secure and effective access to justice? The index is formed by taking the point estimates from a Bayesian factor analysis of indicators focused on access to justice for men (v2clacjstm) and women (v2clacjstw). Source: V-Dem (Coppedge et al. 2017b).

Core Civil Society (v2xcs_ccsi). Provides «a measure of a robust civil society, understood as one that enjoys autonomy from the state and in which citizens freely and actively pursue their political and civic goals, however conceived.» (Coppedge et al. 2017b). The index is formed by taking the point estimates from a Bayesian factor analysis model of the indicators for CSO entry and exit (v2cseeorgs), CSO repression (v2csreprss) and CSO participatory environment (v2csprtcpt). For additional information see Bernhard et al. (2015). Source: V-Dem (Coppedge et al. 2017b).

Political corruption index (v2x_corr). Comprised of six measures of corruption that cover different areas and levels of a polity. The index taps into both 'petty' and 'grand' corruption; bribery and theft; corruption aimed at law making and at implementation. Calculated as the average of (a) public sector corruption index (v2x_pubcorr); (b) executive corruption index (v2x_execorr); (c) legislative corruption (v2lgcrrpt); and (d) judicial corruption (v2jucorrdc). Source: V-Dem (Coppedge et al. 2017b).

Democracy, Boix (e_boix_regime). Dichotomous democracy measure based on contestation and participation. Countries coded democratic have (1) political leaders that are chosen through free and fair elections and (2) a minimal level of

suffrage. Source: Boix et al. (2013).

Democracy, Polity2 (polity2). A weighted additive aggregation procedure across five sub-components: competitiveness and openness of executive recruitment, competitiveness and regulation of political participation, and constraints on the chief executive. Source: Polity IV database (Marshall, Gurr & Jaggers 2014).

Ethnic fractionalization (al_ethnic). The probability that two randomly chosen individuals within a society are members of different ethnic groups, calculated with the Herfindahl index. Source: Alesina et al (2003).

Freedom from Forced Labor (v2xcl_slave). Are adult citizens free from servitude and other kinds of forced labor? The index is formed by taking the point estimates from a Bayesian factor analysis of indicators focused on freedom from forced labor for men (v2clslavem) and women (v2clslavef). Source: V-Dem (Coppedge et al. 2017b).

Freedom from Political Killings (v2clkill). Is there freedom from political killings? Responses: 0: Not respected by public authorities. Political killings are practiced systematically and they are typically incited and approved by top leaders of government. 1: Weakly respected by public authorities. Political killings are practiced frequently and top leaders of government are not actively working to prevent them. 2: Somewhat respected by public authorities. Political killings are practiced occasionally but they are typically not incited and approved by top leaders of government. 3: Mostly respected by public authorities. Political killings are practiced in a few isolated cases but they are not incited or approved by top leaders of government. 4: Fully respected by public authorities. Political killings are non-existent.. Source: V-Dem (Coppedge et al. 2017b).

Freedom from Torture (v2cltort). Is there freedom from torture? Responses: 0: Not respected by public authorities. Torture is practiced systematically and is incited and approved by the leaders of government. 1: Weakly respected by public authorities. Torture is practiced frequently but is often not incited or approved by top leaders of government. At the same time, leaders of government are not actively working to prevent it. 2: Somewhat. Torture is practiced occasionally but is typically not approved by top leaders of government. 3: Mostly respected by public authorities. Torture is practiced in a few isolated cases but is not incited or approved by top government leaders. 4: Fully respected by public authorities. Torture is non-existent. Source: V-Dem (Coppedge et al. 2017b).

Freedom of Domestic Movement (v2xcl_dmove). Do citizens enjoy freedom of movement and residence? This indicator specifies the extent to which citizens are able to move freely, in daytime and nighttime, in public thoroughfares, across regions within a country, and to establish permanent residency where they wish. The index is formed by taking the point estimates from a Bayesian factor analysis model of the indicators for Freedom of domestic movement for men (v2cldmovem) and women (v2cldmovew). Source: V-Dem (Coppedge et al. 2017b).

Freedom of Foreign Movement (v2clfmove). Is there freedom of foreign travel and emigration? Responses: 0: Not respected by public authorities. Citizens are rarely allowed to emigrate or travel out of the country. Transgressors (or their families) are severely punished. People discredited by the public authorities are routinely exiled or prohibited from traveling. 1: Weakly respected by public authorities. The public authorities systematically restrict the right to travel, especially for political opponents or particular social groups. This can take the form of general restrictions on the duration of stays abroad or delays/refusals of visas. 2: Somewhat respected by the public authorities. The right to travel for leading political opponents or particular social groups is occasionally restricted but ordinary citizens only met minor restrictions. 3: Mostly respected by public authorities. Limitations on freedom of movement and residence are not directed at political opponents but minor restrictions exist. For example, exit visas may be required and citizens may be prohibited from traveling outside the country when accompanied by other members of their family. 4: Fully respected by the government. The freedom of citizens to travel from and to the country, and to emigrate and repatriate, is not restricted by public authorities. Source: V-Dem (Coppedge et al. 2017b).

Freedom of Religion (v2clrelig). Is there freedom of religion? Responses: 0: Not respected by public authorities. Hardly any freedom of religion exists. Any kind of religious practice is outlawed or at least controlled by the government to the extent that religious leaders are appointed by and subjected to public authorities, who control the activities of religious communities in some detail. 1: Weakly respected by public authorities. Some elements of autonomous organized religious practices exist and are officially recognized. But significant religious communities are repressed, prohibited, or systematically disabled, voluntary conversions are restricted, and instances of discrimination or intimidation of individuals or groups due to their religion are common. 2: Somewhat respected by public authorities. Autonomous organized religious practices exist and are officially recognized. Yet, minor religious communities are repressed, prohibited, or systematically disabled, and/or instances of discrimination or intimidation of individuals or groups due to their religion occur occasionally. 3: Mostly respected by public authorities. There are minor restrictions on the freedom of religion, predominantly limited to a few isolated cases. Minority religions face denial of registration, hindrance of foreign missionaries from entering the country, restrictions against proselytizing, or hindrance to access to or construction of places of worship. 4: Fully respected by public authorities. The population enjoys the right to practice any religious belief they choose. Religious groups may organize, select, and train personnel; solicit and receive contributions; publish; and engage in consultations without undue interference. If religious communities have to register, public authorities do not abuse the process to discriminate against a religion and do not constrain the right to worship before registration. Source:

V-Dem (Coppedge et al. 2017b).

GDPpc, ln (e_migdppc_ln). Gross domestic product per capita, transformed by the natural logarithm. Source: Maddison Project (Bolt & van Zanden 2014).

Infant mortality rate, ln (e_peinfmor). Number of deaths prior to age 1 per 1000 live births in a year, transformed by the natural logarithm. Sources: Gapminder (gapminder.org), with additional data imputed from Clio-Infra (clio-infra.eu).

Inflation (e_miinflat). Annual inflation rate, missing data within a time-series interpolated with a linear model, transformed by the natural logarithm (after first converting negative values to positive values). Source: Clio Infra (clio-infra.eu).

Internal conflict (e_miinterc). Coded 1 if the country suffered in an internal armed conflict in a given year, 0 otherwise. The original source codebook (Brecke 2001) states that no war is coded as 0 and war is coded as 1. However, the data contains only 1's along with missing data (no 0's). Following the authors' instructions (personal communication), we re-code missing observations as non-conflict (0) for countries where at least one year in the original times series (which runs from 1500 until present) was coded as 1. Sources: Clio Infra (clio-infra.eu), drawing on Brecke (2001), compiled by V-Dem (Coppedge et al. 2017b).

Investment (pwt_isg1). Share of investment as a percentage of GDP. Source: Penn World Tables (Heston, Summers & Aten 2012).

Irregular Exit (exit_1_irregular1). Coded 1 if head of state ("leader") died of natural causes while in power, retired due to ill health, lost office as a result of suicide, lost power through irregular means, or was deposed by another state. Source: Archigos (Goemans et al. 2009).

GDPpc growth (e_migdpgro). Annual growth rate of GDP per capita. Source: Maddison Project (Bolt & van Zanden 2014).

Individual Liberties (liberties). The first component derived from a principal components analysis of seven variables designed to measure the extension of fundamental individual liberties: Access to Justice (v2xcl_acjst), Freedom from Forced Labor (v2xcl_slave), Freedom from Political Killings (v2clkill), Freedom from Torture (v2cltort), Freedom of Domestic movement (v2xcl_dmove), Freedom of Foreign movement (v2clfmove), and Freedom of Religion (v2clrelig).

Judicial Constraints (v2x_jucon). The index is formed by taking the point estimates from a Bayesian factor analysis model of the indicators for executive respects constitution (v2exrescon), compliance with judiciary (v2jucomp), compliance with high court (v2juhccomp), high court independence (v2juhcind), and lower court independence (v2juncind). Source: V-Dem (Coppedge et al. 2017b).

Land area (wdi_area). Land area, square kilometers. Source: World Development Indicators (World Bank 2013).

Latitude, ln (lp_lat_abst_ln). The absolute value of the latitude of the capital city, divided by 90 (so as to take values between 0 and 1), transformed by the natural logarithm. Source: La Porta et al. (1999).

Legal origin (lp_legor). The legal origin of the Company Law or Commercial code of each country, classified as (1) English Common Law, (2) French Commercial Code, (3) Socialist/Communist Laws, (4) German Commercial Code, (5) Scandinavian Commercial Code. Source: La Porta et al. (1999).

Legislative Constraints (v2xlg_legcon). The index is formed by taking the point estimates from a Bayesian factor analysis model of the indicators for legislature questions officials in practice (v2lgqstexp), executive oversight (v2lgotovst), legislature investigates in practice (v2lginvstp), and legislature opposition parties (v2lgoppart). Source: V-Dem (Coppedge et al. 2017b).

Life expectancy (e_pelifeex). Expected longevity at birth based on current age-specific mortality rates. Sources: Gapminder (gapminder.org), with additional data imputed from Clio Infra (clio-infra.eu).

Muslim (lp_muslim80). Muslims as percentage of population in 1980. Source: La Porta et al. (1999).

Party age (partyage). Average age of three largest parties in the lower (or unicameral) chamber of the national legislature. Source: Authors.

Party linkage index (bti_q5). The extent to which there is a stable and socially rooted party system, able to articulate and aggregate societal interests. This includes a consideration of the extent to which parties are socially rooted and organizationally institutionalized, the degree of clientelism and the effects it has in promoting or inhibiting stability, the fragmentation of the party system, the level of polarization, and the degree of voter volatility (Bertelsmann Transformation Index 2014).

Party vote volatility (total_EV_vote). Change in share of votes received by each party from election to election according to the Pedersen (1979) index. Source: Collected by the authors from multiple sources.

Petroleum (e_mipetrol). Real value of petroleum produced per capita. Source: Haber & Menaldo (2011).

Political Corruption (v2x_corr). The index is arrived at by taking the average of (a) public sector corruption index (v2x_pubcorr); (b) executive corruption index (v2x_execorr); (c) the indicator for legislative corruption (v2lgcrrpt); and (d) the indicator for judicial corruption (v2jucorrdc). For additional information see McMann et al. (2015).

Polyarchy (v2x_polyarchy). The index is formed by taking the average of, on the one hand, the sum of the indices measuring freedom of association (thick) (v2x_frassoc_thick), suffrage (v2x_suffr), clean elections (v2xel_frefair), elected executive (de jure) (v2x_accex) and freedom of expression (v2x_freexp_thick); and, on the other, the five-way interaction between those indices. Source: V-Dem (Coppedge et al. 2017b).

Property Rights (v2xcl_prpty). Do citizens enjoy the right to private property? The index is formed by taking the point estimates from a Bayesian factor analysis of indicators focused property rights for men (v2clprptym) and women (v2clprptyw).

Protestant (lp_protmg80). Protestants as percentage of population in 1980. Source: La Porta et al. (1999).

Public administration (law). The first component derived from a principal components analysis of two variables designed to measure the effectiveness of public administration: extent to which public officials are rigorous and impartial in the performance of their duties (v2clrspct), and the extent to which the laws of the land are clear, well-publicized, coherent (consistent with each other), relatively stable from year to year, and enforced in a predictable manner (v2cltrnslw). Constructed by the authors. Source: V-Dem (Coppedge et al. 2017b).

Regime type (Geddes) (gwf_regimetype_num). Classification of autocratic regimes into ten categories. Source: Geddes, Wright & Frantz (2014).

Regime type (Hadenius, Teorell) (ht_regtype). Classification of regimes into eighteen categories. Source: Hadenius & Teorell (2007).

Rigorous and Impartial Public Administration (v2clrspct). Are public officials rigorous and impartial in the performance of their duties? Responses: 0: The law is not respected by public officials. Arbitrary or biased administration of the law is rampant. 1: The law is weakly respected by public officials. Arbitrary or biased administration of the law is widespread. 2: The law is modestly respected by public officials. Arbitrary or biased administration of the law is moderate. 3: The law is mostly respected by public officials. Arbitrary or biased administration of the law is limited. 4: The law is generally fully respected by the public officials. Arbitrary or biased administration of the law is very limited.

State ownership of economy (v2clstown). This question gauges the degree to which the state owns and controls capital (including land) in the industrial, agricultural, and service sectors. Reverse scale (high values=less state ownership). Source: V-Dem (Coppedge et al. 2017b).

Transparent laws and enforcement (v2cltrnslw). Are the laws of the land clear, well-publicized, coherent (consistent with each other), relatively stable from year to year, and enforced in a predictable manner? Responses: 0: Transparency and predictability are almost non-existent. The laws of the land are created and/or enforced in completely arbitrary fashion.
1: Transparency and predictability are severely limited. The laws of the land are more often than not created and/or enforced in arbitrary fashion. 2: Transparency and predictability are somewhat limited. The laws of the land are mostly created in a non-arbitrary fashion but enforcement is rather arbitrary in some parts of the country. 3: Transparency and predictability are fairly strong. The laws of the land are usually created and enforced in a non-arbitrary fashion. 4: Transparency and predictability are very strong. The laws of the land are created and enforced in a non-arbitrary fashion.

Urbanization (e_miurbani). Ratio of urban population to total population. Source: V-Dem (Coppedge et al. 2017a), constructed from data from CLIO Infra (clio-infra.eu).

Table A2: Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
Party Strength	16413	0	0.54	-1.69	1.42
Party Strength (Stock)	15954	62.82	39.98	0	191.88
Party Strength (Ordinal)	16413	2.22	0.91	0	4
Party Strength (PCA)	16413	0	1.7	-4.22	4.14
Party Strength (Multiplicative)	16413	-0.39	5.06	-86.08	26.95
Party Strength (No Switching)	16413	0	0.57	-1.52	1.51
Party Strength (No Cohesion)	16435	0	0.52	-1.59	1.45
Party Strength (No Candidate Selection)	16413	0	0.7	-2.24	1.73
Party Strength (No Linkages)	16413	0	0.55	-1.7	1.5
Party Strength (No Organizations)	16414	0	0.51	-1.72	1.31
Party Strength (No Branches)	16413	0	0.54	-1.69	1.42
Party Strength (With Nationalization)	16338	0	0.55	-1.75	1.41
Party Strength (Structural variables)	16450	0.01	0.58	-1.73	1.75
Party Strength (5 year average)	3164	0	0.53	-1.69	1.42
Party Strength (Regional average)	16413	0	0.32	-0.57	0.85
Party Strength (Global Average)	16413	0	0.13	-0.24	0.17
National Organizations	16578	0	1	-1.98	1.99
Local Branches	16579	0	1	-1.95	2.23
Legislative Cohesion	16414	0	1	-2.99	1.6
Candidate Selection (National)	16451	0	1	-3.49	1.65
Party Linkages	16456	0	1	-2.21	2.23
Party Switching	16436	0	1	-5.29	0.97
GDP Growth	10244	1.89	6.21	-61.49	86.95
GDP Growth (5 year average)	2002	1.86	3.59	-19.3	27.98
GDP Growth (Regional Average)	10158	1.9	2.81	-26.36	20.88
GDP Growth (Global Average)	10244	1.89	1.92	-5.46	10.05
GDPpc (ln)	10444	7.81	1.02	5.32	10.67
GDPpc (ln) (5 year average)	2010	7.84	1.02	5.36	10.54
Urbanization	15118	0.34	0.24	0.01	0.97
Life Expectancy	12926	55.23	14.75	11.6	83.42
Infant Mortality Rate	11224	77.41	57.26	1	420
Petroleum	10256	271.1	2102.76	0	78588.8
External Conflict	11512	0.1	0.31	0	1
Internal Conflict	13754	0.08	0.27	0	1
Irregular Exit	10977	0.21	0.41	0	1
Land Area	6891	818592.9	1858298.19	300	16389950
Latitude (ln)	8556	-1.55	0.92	-4.5	-0.33
Ethnic Fractionalization	8164	0.44	0.27	0	0.93
Legal Origin	8609	2.07	0.99	1	5
Muslim	8609	21.53	34.54	0	99.9
Protestant	8609	12.54	21.27	0	97.8
Investiment	7237	22.11	10.64	-11.5	82.96
Inflation (logged)	8082	1.96	1.46	-31.44	26.08
Electoral Volatility	1111	26.38	19.19	1.73	85.93
Party Age	4760	32.42	28.78	1	183
Party linkages Index (BTI)	569	4.85	2.29	1	10
Polity2	11226	0.61	7.28	-10	10
Boix et al. Regimes	10188	0.38	0.48	0	1
Geddes et al. Regimes	5828	42.26	45.78	1	100
Hadenius and Teorell Regimes	7688	4.85	3.88	1	11
Polyarchy (V-Dem)	16259	0.32	0.28	0.01	0.96

Property Rights (V-Dem)	16620	0.5	0.29	0	0.96
Judicial Constraints (V-Dem)	16519	0.52	0.29	0.01	0.99
Legislative Constraints (V-Dem)	13387	0.47	0.3	0.02	0.99
Political Corruption	16519	0.44	0.26	0.01	0.95
State Ownership of the Economy (V-Dem)	16620	0.12	1.41	-3.91	3.52
Core Civil Society Index (V-Dem)	16620	0.47	0.31	0.01	0.98
Transparent laws and enforcement (V-Dem)	16620	0.08	1.47	-3.64	4.29
Access to Justice (V-Dem)	16620	0.49	0.3	0	0.99
Freedom from Torture (V-Dem)	16620	0.02	1.55	-3.34	3.53
Freedom from Political Killings (V-Dem)	16620	0.35	1.57	-3.17	3.69
Freedom from Forced Labor (V-Dem)	16620	0.52	0.3	0	0.97
Freedom of Religion (V-Dem)	16620	0.43	1.36	-3.78	3.12
Freedom of Foreign movemement (V-Dem)	16620	0.33	1.47	-3.89	3.24
Freedom of Domestic Movement (V-Dem)	16620	0.53	0.28	0	0.98
Civil Liberties	16620	0	2.29	-5.65	4.81
Rule of Law	16620	0	1.35	-3.56	4.05
Control of Corruption (WBDI)	2495	-0.15	0.99	-2.06	2.59
Government Effectiveness (WBDI)	2495	-0.12	0.99	-2.48	2.36
Political Stability (WBDI)	2498	-0.22	0.98	-3.32	1.67
Rule of Law (WBDI)	2498	-0.2	0.99	-2.67	2.12
Regulatory Quality (WBDI)	2496	-0.13	0.99	-2.68	2.08
Voice and Accountability (WBDI)	2498	-0.15	1	-2.28	1.83
Rigorous and Impartial Pub. Adm. (V-Dem)	16620	0.17	1.46	-3.47	4.66
State Capacity (Hanson & Sigman)	6730	-0.04	0.99	-3.51	2.63
StateHist5 (Bockstette et al. 2002)	6176	0.41	0.26	0.04	1
Tax Revenue (WBDI)	3211	19.61	30.52	0.23	1009.98
Presidentialism (Shugart & Samuels 2007)	2540	2.19	1.31	1	4
Electoral System	2861	0.56	0.66	0	2

APPENDIX B: V-Dem Data Collection

The Party Strength index, along with several of the covariates tested in Table 2 (Public administration, Rule of law, Corruption control. Property rights, Judicial power, Judicial threats, and Civil society freedom), are based on six indicators drawn from the Varieties of Democracy (V-Dem) project. Let us, therefore, describe how the V-Dem data was collected and aggregated across coders.[1]

Each indicator in the V-Dem dataset that is not factual in nature (about half of the V-Dem indicators) is coded by multiple Country Experts, generally about five (5). Most experts do not possess the requisite expertise to code the entire V-Dem questionnaire, which means that a single country will typically be coded by a dozen or more experts, each working on different facets of the questionnaire. To date, V-Dem has engaged in collaboration with more than 2,500 Country Experts.

Recruitment

The following procedure is used to recruit Country Experts. First, we identify a list of potential coders for a country (typically 100-200 names per country). This bulk of names on the list are provided by Regional Managers (members of the V-Dem project located in universities and think-tanks throughout the world) in consultation with other members of the V-Dem team. Assistant Researchers (located at V-Dem Institute, University of Gothenburg) also contribute to this list, using information about potential country experts gathered from the web. Other members of the project team provide additional names if they have country-specific expertise. At present, V-Dem has accrued a roster of 15,000+ potential Country Experts.

For each potential Country Expert on the resulting list, we compile basic information – country of origin, current location, highest educational degree, current position, and area of

[1] For further information see Coppedge et al. (2017c) and Pemstein et al. (2017).

expertise in terms of the surveys the expert could code as evidenced by a short biographical sketch and/or list of publications, website information and the like. We also take note of any possible biases that might affect their ability to code questions in a dispassionate manner.

In selecting whom to recruit from this list five criteria come into play:

The most important selection criterion, naturally, is expertise in the country(ies) and the section of the survey they are assigned to code. This is usually signified by an advanced degree in the social sciences, law, or history; a record of publications; and positions in civil society that establish their expertise in the chosen area (e.g. a well-known and respected journalist). Naturally, potential coders are drawn to areas of the survey that they are most familiar with, and are unlikely to agree to code topics they know little about. So, self-selection also works to achieve our primary goal of matching questions in the survey with country-specific expertise.

The second criterion is origin in the country to be coded. V-Dem's goal is that a minimum of three out of five (60%) Country Experts should be nationals or permanent residents of the country they code (preferably both). Exceptions are required for a few countries where it is difficult to find in-country coders who are both qualified and independent of the governing regime. This criterion should help avoid potential Western/Northern biases in the coding.

The third criterion is the prospective coder's seriousness of purpose. By this, we mean a person's willingness to devote time to the project, to deliberate carefully over the questions asked in the survey, and to report their honest judgment. Sometimes, personal acquaintanceship is enough to convince a Regional Manager that a person is fit, or unfit, for the job. Sometimes, this feature becomes apparent in communications with Project Coordinators that precede the offer to work on V-Dem.

The fourth criterion is impartiality. V-Dem aims to recruit coders who will answer survey questions in an impartial manner. This means avoiding those who might be beholden to powerful actors – by reason of coercive threats or material incentives – or who serve as spokespersons for a political party or ideological tendency (in some instances, such as North Korea, this may entail avoiding all in-country coders). Where this is difficult, or where the reality is difficult to determine, we aim to include a variety of coders who, collectively, represent an array of views and political perspectives on the country in question.

The final criterion is obtaining diversity in professional background among the coders chosen for a particular country. For certain areas (e.g the media, judiciary, and civil society surveys) this entails a mixture of highly recognized professionals from the sector along with academics who study these topics. Generally, it also means finding experts who are located at a variety of institutions, universities and research institutes.

After weighing these five criteria, the 100-200 potential experts on the list are given a rank from "1" to "3" indicating order of priority.

The two Project Coordinators at the V-Dem Institute, University of Gothenburg, then handle the enrolment of Country Experts from the list of potential country experts. In handling the recruitment, the continuously review the resulting mix of actual country experts in light of the five criteria to ensure that V-Dem ends up with a set of experts for each country that fulfill our standards.

If the quota of five Country Experts per section of the survey for each country is not met, we work down the list of potential Country Experts until the quota is obtained. Others, following the same procedure, replace those who fail to complete the survey in a reasonable time. Coders

receive a modest honorarium for their work that is proportional to the number of surveys they have completed.

A number of steps are taken to assure informed consent and confidentiality among participants. The on-line survey provides full information about the project (including this document) and the use of the data, so that coders are fully informed. It also requires that prospective coders certify that they accept the terms of the agreement. They can access the surveys only with a randomized username that we assign and a secret password that they create themselves. The data they supply is stored on a firewall-protected server. Any data released to the public excludes information that might be used to identify coders. All personal identifying information is kept in a separate database in order to ensure the protected identities of coders.

In order to ensure that we are able to recruit widely among potential experts, and in order to minimize confusion due to unfamiliarity with English, questions are translated from English into five additional languages: Arabic, French, Portuguese, Russian, and Spanish. Approximately 15 percent of the experts code in a non-English version of the questionnaire.

About 35 percent of the Country Experts are women, and over 80 percent have PhDs or MAs and are affiliated with research institutions, think tanks, or similar organizations.

Coding

Coding is carried out using the V-Dem online survey tool. The web-based coding interfaces are directly connected with a postgres database where the original coder-level data is kept, maintaining coder confidentiality.

In addition to country-specific ratings, Country Experts are requested to code several additional countries that they are familiar with for a shorter time-slice. This «bridge» or «lateral»

coding assures cross-country equivalence by forcing coders to make explicit comparisons across countries, and provides critical information for the measurement model (described below).

For each question, and for each country-year, experts are required to report a self-assessed level of certainty. This is an indicator of their subjective level of uncertainty for the data point they provide. This is scored on a scale from 0 to 100 with substantive anchor points for each 10-percent interval.

Measurement

Having discussed the process of data collection, we proceed to the task of measurement. Under this rubric, we include (a) the questionnaire, (b) our measurement model, (c) methods of identifying error in measurement, (d) studies of measurement error, and (e) methods of correcting error. In principle, the discussions are relevant for different types of data collected by V-Dem, but most if not all of them are much more acute when it comes to expert-based coding of evaluative indicators, so-called C indicators. Hence, most of the following is focused on the C-type indicators.

The most important feature of a survey is the construction of the questionnaire itself. In crafting indicators we have sought to construct questions whose meaning is clear and specific and not open to a wide variety of interpretations. They should mean the same thing (more or less) in each context and not suffer from temporal or spatial non-equivalence. Our methodology involves enlisting some of the leading scholars in the world on different aspects of democracy and democratization – known as Project Managers.

Each Project Manager was enrolled because of his/her specific and evidenced expertise in a particular area (e.g. legislatures, executives, elections, civil society, and so on) and with a view to generate a group that also had substantive experiences and expertise on all regions of the

world. Starting in 2009, Project Managers designed survey-questions in their area to measure democraticness in relation to the different traditions of democratic theory. All suggestions were reviewed and refined collectively over the course of two years. The V-Dem pilot test carried out in 2011 served as an initial test of our questionnaire, prompting quite a few revisions in the next round of surveys. Another round of collective deliberation followed that also involved a number of consultations with scholars outside of the project team. The revised questions for C-coding thus went through several rounds of review with the Project Managers and outside experts over the course of two years before emerging in their final form, depicted in the Codebook.

Even with careful question design, a project of this nature cannot help but encounter error. This may be the product of linguistic misunderstandings (recall that most of our coders do not speak English as their first language and some take the survey in a translated form), misunderstandings about the way in which a question applies to a particular context, factual errors, errors due to the scarcity or ambiguity of the historical record, differing interpretations about the reality of a situation, variation in standards, coder inattention, errors introduced by the coder interface or the handling of data once it has been entered into the database, or random mistakes.

Some of these errors are stochastic in the sense of affecting the precision of our estimates but not their validity. Other errors are systematic, potentially introducing bias into the estimates that we produce.

Having five coders for each question is immensely useful, as it allows us to identify wayward coders as well as to conduct inter-coder reliability tests. These sorts of tests – standard in most social science studies – are rarely if ever employed in extant democracy indices.

While we select experts carefully, they clearly exhibit varying levels of reliability and bias, and may not interpret questions consistently. In such circumstances, the literature recommends that researchers use measurement models to aggregate diverse measures where possible, incorporating information characterized by a wide variety of perspectives, biases, and levels of reliability.[2] To combine expert ratings for a particular country/indicator/year to generate a single "best estimate" for each question, we employ methods inspired by the psychometric and educational testing literature.[3]

The underpinnings of these measurement models are straightforward: they use patterns of cross-rater (dis)agreement to estimate variations in reliability and systematic bias. In turn, these techniques make use of the bias and reliability estimates to adjust estimates of the latent—that is, only indirectly observed—concept (e.g. executive respect for the constitution, judicial independence, or property rights) in question. These statistical tools allow us to leverage our multi-coder approach to both identify and correct for measurement error, and to quantify confidence in the reliability of our estimates. Variation in these confidence estimates reflect situations where experts disagree, or where little information is available because few raters have coded a case. These confidence estimates are tremendously useful. Indeed, the tendency of most researchers to treat the quality of measures of complex, unobservable concepts as equal across space and time, ignoring dramatic differences in ease of access and measurement across cases, is fundamentally misguided, and constitutes a key threat to inference.

The majority of expert-coded questions are ordinal: they require raters to rank cases on a discrete scale, generally with four or five response categories. To achieve scale consistency, we

[2] Bollen and Paxton 2000, Clinton and Lapinski 2006, Clinton and Lewis 2008, Jackman 2004, Treier and Jackman 2008, Pemstein, Meserve and Melton 2010.
[3] See e.g. Lord and Novick 1968, Patz and Junker 1999.

fit ordinal IRT models to each question.[4] These models achieve three goals. First, they work by treating coders' ordinal ratings as imperfect reflections of interval-level latent concepts. Therefore, while an IRT model takes ordinal values as input, its output is an interval-level estimate of the given latent trait (e.g. election violence). Interval-valued estimates are valuable for a variety of reasons; in particular, they are especially amenable to statistical analysis. Second, IRT models allow for the possibility that coders have different thresholds for their ratings (e.g. one coder's somewhat might fall above another coder's almost on the latent scale), estimate those thresholds from patterns in the data, and adjust latent trait estimates accordingly. Therefore, they allow us to correct for this potentially serious source of bias. This is very important in a multi-rater project like V-Dem, where coders from different geographic or cultural backgrounds may apply differing standards to their ratings. Finally, IRT models assume that coder reliability varies, produce estimates of rater precision, and use these estimates—in combination with the amount of available data and the extent to which coders agree—to quantify confidence in reported scores.

With lateral and bridge coding we are able to mitigate the incomparability of coders' thresholds and the problem of cross-national estimates' calibration. While helpful in this regard, our tests indicate that given the sparsity of our data, even this extensive bridge-coding is not sufficient in solving cross-national comparability issues. We therefore also employ a data-collapsing procedure. At its core, this procedure relies on the assumption that as long as none of the experts change their ratings for a given time period, we can treat the country-years in this period as one year. The results of our statistical models indicate that this technique is extremely helpful in increasing the weight given to lateral/bridge coders, and thus further mitigates cross-national comparability problems.

[4] See Johnson and Albert 1999 for a technical description of these models.

APPENDIX C: Measuring Party Strength

As we discuss in the paper, strong parties are, by definition, characterized by the four following features: unity, centralization, organizational complexity, and a mass constituency. The six chosen indicators are intended to map onto this definition, as discussed below (additional discussions on choice of indicators are provided in Appendix E). We refer to Table A1 for the specific questions, question clarifications, and the answer categories provided to the country experts. For details on how the scores, for each indicator, are aggregated across experts to the country-year level, as well as discussions on measurement level and scale consistency, please see the discussion under "Measurement" in Appendix B. As discussed in the paper, the aggregation across indicators is – due to the theorized partial substitutability between indicators in achieving high levels of party strength – conducted by averaging the six indicators.

Party organizations (v2psorgs) measures the extent to which political parties in a country have permanent organizations, understood as personnel responsible for carrying out party activities in between elections. This speaks most clearly to the organizational complexity of a party, but also presumably to the strength of its ties to a mass constituency.

Party branches (v2psprbrch) measures the existence of permanent local party branches. This, again, speaks to organizational complexity and connections to constituencies.

Legislative party cohesion (v2pscohesv) measures party voting in parliament, i.e., the extent to which a party's representatives vote together on important bills. This provides a direct measure of unity and an indirect measure of centralization (and perhaps also of organizational complexity).

Party linkages (v2psprlnks) measures the predominant relationship between parties and constituents in a country, understood along a spectrum from clientelistic (constituents are rewarded with goods, cash, or jobs), to localistic (constituents are rewarded with spending

targeted on their district), to programmatic (constituents' relationship to a party is based on the party's policies and overall ideology). We regard clientelistic and localistic ties as a measure of decentralization; parties with these characteristics are likely to contain strong local leaders who can resist pressures from the leadership, perhaps egged on by their constituents. These characteristics are also likely to impair party unity, especially if payoffs are discontinued (e.g., by a loss of power or by a fiscal crisis). At this point, party members may look around for alternatives, and perhaps even bolt to another party that can offer more attractive material incentives. By contrast, if a party is defined by its programmatic appeals conflict among its members, or between leaders at the apex and the periphery, is likely to be muted, as they agree on most issue-positions and on over-arching goals, and have strong incentives to stick together to pursue those goals and may accept leadership cues in the service of achieving those goals. Leninist parties are strong, in part, because of their clear ideological orientation.

Candidate selection (v2pscnslnl_neg) measures the degree of centralization in the process of nominating candidates for the national legislature. At one extreme, all candidates are chosen by national party leaders. At the other extreme, candidates are chosen by constituency groups or direct primaries and party leaders play a peripheral role. This provides a direct measure of party centralization and presumably serves as an important ingredient of party unity.

Party switching measures (v2psswitch_neg) the share of MPs who desert their party – either joining another party or becoming an independent – in between elections. This serves as a direct measure of party unity and an indirect measure of party centralization.

Figure C1: Party Strength Through Time

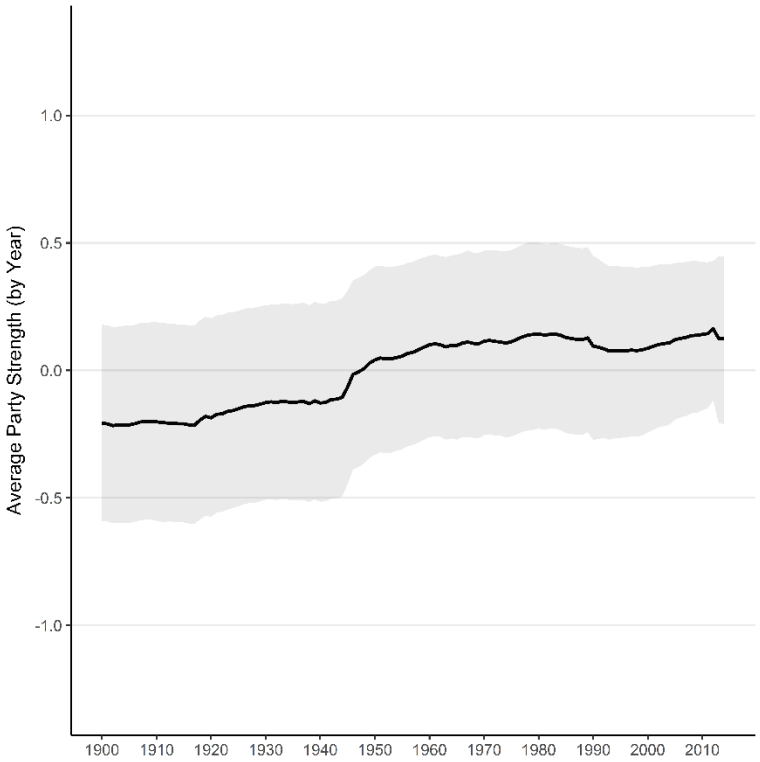


Table C1: Party Strength in 2011

Country	*Score*	*Interval*		*Country*	*Score*	*Interval*		*Country*	*Score*	*Interval*	
Sweden	1.11	0.71	1.53	Armenia	0.36	0.06	0.64	Togo	0	-0.21	0.2
Germany	1.05	0.78	1.3	Hungary	0.36	0.02	0.65	Egypt	0	-0.24	0.21
Spain	0.97	0.71	1.19	Cyprus	0.35	-0.13	0.8	Zimbabwe	-0.01	-0.23	0.2
Netherlands	0.96	0.63	1.24	Croatia	0.35	0.15	0.52	Morocco	-0.01	-0.28	0.26
Belgium	0.88	0.53	1.18	Guyana	0.34	0.03	0.65	Honduras	-0.02	-0.32	0.26
Uzbekistan	0.81	0.55	1.05	South Africa	0.34	0.18	0.49	Sao T. and P.	-0.03	-0.26	0.21
Denmark	0.77	0.4	1.14	Russia	0.33	0.09	0.55	Somaliland	-0.05	-0.35	0.28
China	0.76	0.52	0.95	Israel	0.32	-0.04	0.66	Ivory Coast	-0.05	-0.27	0.16
Vietnam	0.75	0.45	1.02	Iceland	0.31	-0.09	0.67	Comoros	-0.05	-0.44	0.33
Austria	0.72	0.38	1.07	Albania	0.3	0.08	0.47	Tanzania	-0.05	-0.26	0.16
New Zealand	0.72	0.42	1.01	Venezuela	0.3	0.04	0.56	Dominican Rep.	-0.05	-0.32	0.21
Norway	0.7	0.35	0.98	Jamaica	0.29	-0.02	0.55	Algeria	-0.06	-0.33	0.21
Portugal	0.68	0.46	0.89	United States	0.28	0.07	0.49	Tunisia	-0.06	-0.3	0.21
Uruguay	0.67	0.38	0.92	Kosovo	0.28	0.08	0.46	Paraguay	-0.1	-0.35	0.15
Finland	0.65	0.35	0.95	Bulgaria	0.27	0.04	0.49	Senegal	-0.11	-0.36	0.15
Australia	0.64	0.33	0.9	Malaysia	0.27	-0.02	0.55	Cambodia	-0.11	-0.38	0.14
Turkmenistan	0.64	0.35	0.91	Serbia	0.26	0.04	0.48	Uganda	-0.11	-0.4	0.16
Syria	0.63	0.3	0.92	Rwanda	0.26	-0.04	0.54	Burundi	-0.12	-0.5	0.27
France	0.63	0.41	0.83	Burma	0.26	0.07	0.44	Iraq	-0.13	-0.46	0.18
Switzerland	0.62	0.3	0.9	Sudan	0.25	-0.05	0.53	Zambia	-0.14	-0.35	0.08
India	0.62	0.32	0.88	Azerbaijan	0.24	-0.1	0.55	Yemen	-0.16	-0.4	0.1
Czechia	0.6	0.33	0.82	Georgia	0.24	0	0.46	Mali	-0.16	-0.37	0.06
Greece	0.6	0.25	0.91	Costa Rica	0.24	0.03	0.44	Ghana	-0.17	-0.39	0.06
Chile	0.59	0.39	0.79	Laos	0.24	-0.37	0.81	Guinea	-0.19	-0.48	0.09
UK	0.58	0.38	0.79	Namibia	0.23	-0.01	0.46	Congo, DR	-0.2	-0.5	0.08
Estonia	0.58	0.35	0.78	Indonesia	0.23	0	0.44	Jordan	-0.21	-0.55	0.13
Montenegro	0.58	0.33	0.79	Nepal	0.22	-0.08	0.5	Nigeria	-0.22	-0.43	0
Kazakhstan	0.57	0.36	0.78	East Timor	0.21	-0.14	0.53	Congo, Rep.	-0.23	-0.61	0.15
Mexico	0.56	0.36	0.76	Ethiopia	0.2	-0.04	0.46	Guinea-Bissau	-0.27	-0.62	0.09
Seychelles	0.55	0.22	0.85	Taiwan	0.17	-0.11	0.39	Colombia	-0.27	-0.51	-0.03
Mauritius	0.54	0.19	0.86	Italy	0.16	-0.15	0.45	Iran	-0.3	-0.57	-0.02
Bangladesh	0.54	0.2	0.83	Thailand	0.16	-0.08	0.4	CAR	-0.32	-0.59	-0.04
Turkey	0.53	0.25	0.75	Lesotho	0.16	-0.1	0.42	Djibouti	-0.33	-0.73	0.09
Japan	0.52	0.29	0.72	Mozambique	0.14	-0.04	0.31	Mauritania	-0.35	-0.79	0.08
Slovenia	0.52	0.3	0.71	Bolivia	0.13	-0.11	0.36	Kenya	-0.35	-0.64	-0.05
Poland	0.52	0.3	0.73	Ecuador	0.13	-0.06	0.33	Sierra Leone	-0.36	-0.67	-0.02
Canada	0.5	0.21	0.79	Moldova	0.13	-0.05	0.29	Eritrea	-0.39	-0.67	-0.05
Tajikistan	0.5	0.26	0.73	Ukraine	0.13	-0.09	0.34	Peru	-0.42	-0.7	-0.15
Suriname	0.5	0.07	0.89	Panama	0.13	-0.27	0.51	Malawi	-0.45	-0.72	-0.17
Palestine, WB	0.49	0.17	0.81	Latvia	0.12	-0.13	0.35	Benin	-0.47	-0.74	-0.2
Macedonia	0.48	0.27	0.68	Botswana	0.12	-0.18	0.37	Kyrgyzstan	-0.48	-0.81	-0.14
Slovakia	0.48	0.17	0.74	Belarus	0.12	-0.07	0.31	Swaziland	-0.49	-0.85	-0.1
T. & Tobago	0.47	0.15	0.74	Gambia	0.12	-0.26	0.46	Vanuatu	-0.53	-1.05	-0.07
Niger	0.44	0.04	0.81	Cameroon	0.11	-0.11	0.32	Philippines	-0.66	-0.93	-0.4
South Korea	0.44	0.15	0.68	Nicaragua	0.11	-0.14	0.36	Chad	-0.68	-1.01	-0.34
Lebanon	0.43	0.14	0.69	Cuba	0.11	-0.31	0.47	Guatemala	-0.68	-0.98	-0.41
Barbados	0.42	0.05	0.78	Burkina Faso	0.09	-0.07	0.25	Somalia	-0.76	-1.12	-0.36
Romania	0.41	0.07	0.75	Bhutan	0.08	-0.17	0.31	Madagascar	-0.76	-1.12	-0.38
El Salvador	0.41	0.15	0.65	Brazil	0.04	-0.13	0.2	Afghanistan	-0.77	-1.08	-0.45
Bosnia	0.4	0.18	0.61	Fiji	0.04	-0.21	0.28	Libya	-0.78	-1.38	-0.19
Lithuania	0.4	0.14	0.64	Angola	0.03	-0.27	0.29	Solomon Isl.	-0.8	-1.2	-0.35
N. Korea	0.39	0.07	0.73	Maldives	0.03	-0.3	0.34	Liberia	-0.8	-1.11	-0.46
Sri Lanka	0.39	0.03	0.72	Mongolia	0.02	-0.31	0.32	Qatar	-0.96	-1.32	-0.59
Cape Verde	0.39	0.14	0.6	South Sudan	0.01	-0.26	0.26	Saudi Arabia	-1.11	-1.7	-0.48
Pakistan	0.38	0.13	0.6	Argentina	0	-0.2	0.22	Haiti	-1.17	-1.62	-0.69
Ireland	0.37	0.06	0.64	Gabon	0	-0.4	0.4	Papua New Guinea	-1.19	-1.63	-0.73
Palestine, G	0.37	0.07	0.61								

Point estimates for Party Strength for all countries in 2011 along with 70% high-posterior density intervals.

APPENDIX D: Convergent Validity Tests

Table D1: Regime types (Geddes et al. 2014)

	1
Democracy	0.475***
	(0.079)
Party	0.499***
	(0.096)
Party-Personal	0.286**
	(0.120)
Party-Military-Personal	0.442**
	(0.213)
Party-Military	0.110
	(0.091)
Indirect Military	0.285***
	(0.093)
Military	0.170
	(0.109)
Military / Personal	0.062
	(0.160)
Monarchy	-0.351***
	(0.114)
Oligarchy	0.343***
	(0.130)
Obs	7652
Countries	148
Min # Years	4
Avg # Years	51
Max # Years	65
R-squared	0.227

Party Strength index regressed against nominal categories representing regime-types, as defined and coded by Geddes et al. (2014). Reference group: Personal. Estimator: ordinary least squares, standard errors in parentheses. ***p<.01 **p<.05 *p<.10

Table D2: Regime-types (Hadenius & Torell 2007)

	1
No-Party	-1.068***
	(0.123)
Military	-0.121*
	(0.072)
Military No-Party	-0.346**
	(0.174)
Military Multiparty	0.182
	(0.119)
Military One-Party	0.069
	(0.149)
One-Party	0.318***
	(0.083)
Other	-0.660*
	(0.362)
One-Party Monarchy	-0.236***
	(0.043)
Monarchy	-0.853***
	(0.123)
Rebel Regime	-0.202*
	(0.104)
Civil War	-0.437
	(0.280)
Occupation	-0.269
	(0.250)
Theocracy	-0.538***
	(0.080)
Transitional Regime	-0.120
	(0.093)
No-Party Monarchy	-0.431***
	(0.050)
Multiparty Monarchy	-0.195***
	(0.046)
Democracy	0.366***
	(0.060)
Obs	5800
Countries	166
Min # Years	4
Avg # Years	34.9
Max # Years	39
R-squared	0.307

Party Strength index regressed against nominal categories representing diverse regime-types as defined and coded by Hadenius & Teorell (2007). Reference group: Limited multiparty. Estimator: ordinary least squares, standard errors in parentheses. *** p<.01 **p<.05 *p<.10

Table D3: Correlations

	Correlation w/ Party Strength	
	Pearson's r	*Obs*
Party and Party System		
Party Age	0.310	4760
Electoral Volatility	-0.434	1111
Party System Institutionalization	0.384	569
Democracy		
Polyarchy	0.496	16093
Polity	0.317	11130
WB Governance Indicators		
Control of Corruption	0.501	2495
Government Effectiveness	0.55	2495
Political Stability	0.413	2498
Rule of Law	0.536	2498
Regulatory Quality	0.488	2496
Voice and Accountability	0.476	2498
State Capacity		
Public and Imp. Administration	0.369	16413
State Capacity (Hanson & Sigman)	0.467	6695
Tax ratio	0.317	1924
Statehist5	0.409	6141

APPENDIX E: Party Strength and Party Age

Studies of the economic consequences of political parties in autocratic settings often employ a variable measuring the average age of the three largest parties (two governing, one opposition) as an indicator of party strength and institutionalization (Gehlbach and Keefer 2011). Our paper is the first to use V-Dem indicators to measure party strength and to study its effects on economic outcomes.

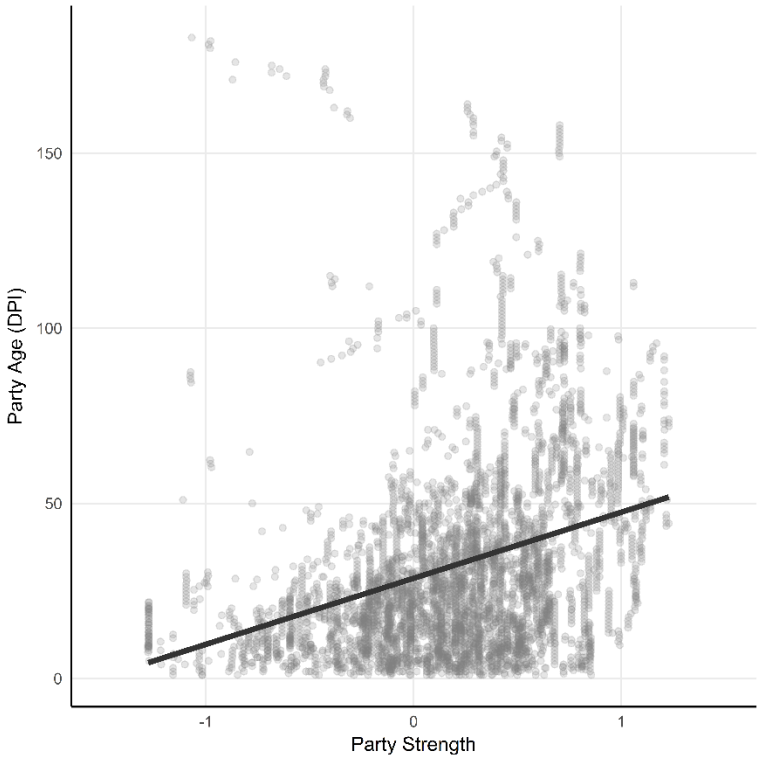
In this appendix, we compare and contrast our index with the widely used Party Age variable available from the Database of Political Institutions.[5] For further discussion and comparison of the V-Dem party- and DPI variables, we refer to Bizzarro et al. (2017). We also use the opportunity to offer further explication about the choice of indicators in the Party Strength index.

It is well-established in the literature on political parties that party strength and institutionalization tend to be associated with greater adaptability,[6] and therefore, should lead to longer-lasting party organizations. Similarly, party building is itself a "long and painstaking" process.[7] Consequently, the older the parties in the system, the stronger and more institutionalized they should be, everything else equal. This expectation has informed authors studying parties across the globe and is the theoretical underpinning for using the average age of the parties in the system as a proxy for party and party system strength/institutionalization.

Figure E1 plots Party Strength against the DPI party age variable for the same country-years. As expected, the two measures are positively correlated (Pearson's r of 0.31). However, it is evident that they are by no means redundant.

[5] DPI; Beck et al. 2001.
[6] Panebianco 1988; Kitschelt 1994; Levitsky 2003.
[7] Kalyvas 1996.

Figure E1: Scatterplot, Party Strength x Party Age



The imperfect correlation between these two indices is not surprising given that Party age is a proxy measure while Party strength is closer to a direct measure of the latent concept of interest (party strength/institutionalization). Consider that there are plenty of examples of long-lived parties that don't satisfy expectations associated with party strength or institutionalization. Well-known examples include faction-ridden parties like the Christian Democratic Party in Italy and the Liberal Democratic Party in Japan, or highly decentralized, porous parties such as the Democratic and Republican parties in the United States.

Margit Tavits in her book about party strength in the Post-Communist world divides the subject into an eight-fold typology:[8] professionalization of the central organization, organizational extensiveness, membership size and activism, party performance, issue

[8] Tavits 2013, 17.

orientation, lack of personalization, centralization, and autonomy. Applying this scheme, the indicators entering into the Party strength index captures seven of these eight characteristics:

a) V-Dem's *National organizations* indicator explicitly measures the extent to which a country's parties are professionalized at the national level;
b) *Party branches* asks explicitly about the local penetration of party organizations;
c) *Legislative cohesion* is a direct measure of party performance, associated with influential work by Janda;[9]
d) *Programmatic linkages* capture the programmatic orientation of the parties in the system;
e) *Party switching* captures personalization;
f) *Centralized candidate selection* captures the degree of centralization within the party;

We do not include indicators related to party membership or autonomy in our Party Strength index. While these have been certainly important for parties across the globe during most of the 20th century, they are more clearly associated with the mass party model,[10] a model of party organization that is limited to democracies and perhaps also to a specific region and time period. In addition, indicators of party membership and partisan connections to other political and social actors are usually hard to access, even for experts (and thus the V-Dem coders). The feasibility of collecting information on these issues could itself be a function of a party's organizational strength (weak parties should have a harder time keeping track of their membership lists, for example) and the public availability of such information is certainly limited by the degree of democratization.[11]

The advantage of a proxy measure such as Party age, as measured by DPI, is that it records a feature of party life that is factual in nature, or fairly so (although one may question the

[9] Janda 1980.
[10] Duverger 1959
[11] For a longer discussion, see Bizzarro et al. 2017.

arbitrary assignment of a single date of foundation for parties that have endured many splits, merges, or name changes). This mitigates certain types of measurement error. In contrast, the questions that form the basis for V-Dem indicators involve considerable judgment on the part of expert coders, and these judgments can be questioned. However, because there are multiple coders V-Dem can provide a confidence interval for each estimate, allowing for the systematic estimation of uncertainty. These estimates are incorporated into Model 2, Table 1 of the paper.

V-Dem indicators also circumvent the ubiquitous problem of party-system aggregation.[12] V-Dem aggregates "by design," asking coders explicitly to consider the relevant parties in a system when answering the questions in the survey. We believe this is preferable to setting threshold rules that define which parties matter, and which do not. In the DPI, information is included for the two largest governing parties and the largest opposition party, which may suffice for small party systems but would capture only a small portion of the party system in highly fragmented systems like Brazil's (whereas information on only two parties may be sufficient to capture the relevant features in systems such as those in the United States).

In sum, the Party strength index gets closer to our concept of theoretical interest than Party age proxies. To further illustrate the differences between the measures and to address more specific validity issues, we examine a set of country cases, namely Colombia, the United States, Portugal, and Uzbekistan.

Colombia: for more than a century, Liberals (founded in 1848) and Conservatives (founded in 1849) dominated the Colombian party system. The two parties still exist and compete in Colombian elections. Yet since the 1990s the two parties have been in decline. In the early 2000s the Colombian party system experienced an important change, with the rise of the independent candidacy of Alvaro Uribe, which led to a considerable further decline in the

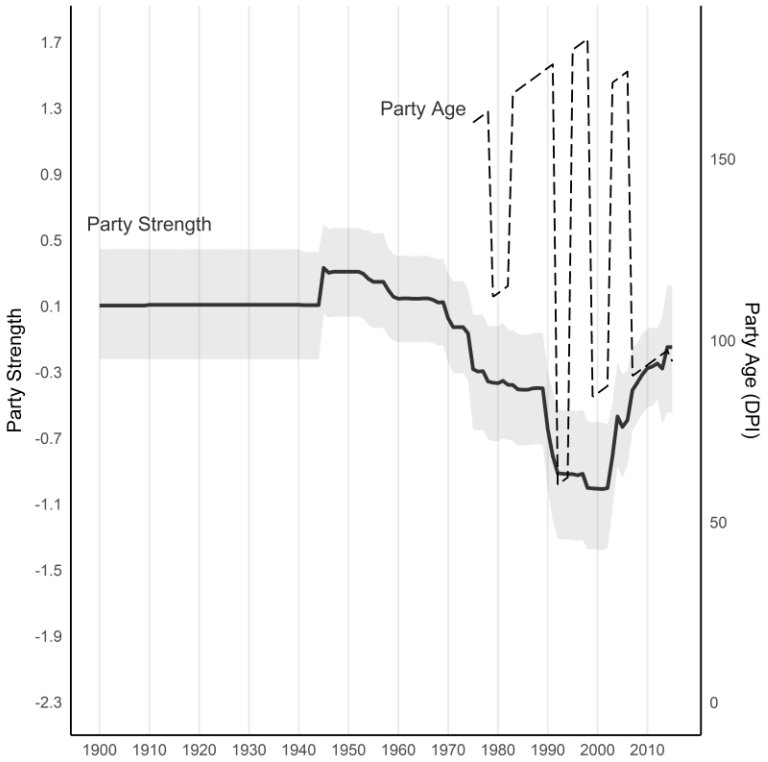
[12] Bizzarro et al, 2017.

support of the two old parties and a related rearrangement in the set of the main parties.[13] A measure that includes Conservatives' and Liberals' ages as a proxy for party strength in Colombia may overestimate the level of party strength in the country at present, since the two parties no longer play a dominant role in the party system. In Figure E1, the observations in the upper left corner of the plot are for Colombia since 1990.

Figure E2 plots the values of both Party Strength and Party Age for Colombia as measured in our index and in the DPI dataset, respectively. We note that the DPI measure changes every two years, likely a consequence of their aggregation formula and changes in the identities of the largest governing and opposition parties. This index over-estimates the short-term variance in party strength if the features of the main parties in the system are stable but the third- and fourth-largest parties change. More importantly, however, a close reading of Albarracín et al. suggests that the Party Strength index maps onto trends in the Colombian party system better than the Party Age measure from DPI does.

[13] Albarracín et al. forthcoming.

Figure E2: Party Strength and Party Age in Colombia



Other measurement issues occur due to the absence of a "ceiling" in the DPI Party Age variable. Given that every new year, surviving parties enter the indicator with an additional year, Party Age keeps increasing. This may be problematic when Party Age is used as a proxy for party strength or institutionalization, as the measure will keep increasing linearly even if parties have not changed much (or at all) over time. In fact, if older parties are more resilient and therefore stronger and more institutionalized, one might expect that they tend to change less every new year. The Party Strength index we use does not equate time and strength in this way.

We use the US case to illustrate this point. Although American parties have grown more ideological and the American party system has become more polarized,[14] scholars have highlighted how party strength in the US has remained relatively stable, with a moderate

[14] McCarty et al. 2016.

improvement since the 1960s.[15] While our index captures this important but subtle variation, the DPI Party Age measure indicates that parties in America have grown stronger and stronger, at a constant rate, during the same period. Because there is no celling, parties are considered more and more institutionalized if Party Age is used as a proxy, even if their levels of strength and institutionalization changed only marginally during this time.

Figure E3: Party Strength and Party Age in the United States

Finally, not all young parties are weak. As recent scholarship has highlighted,[16] strong parties tend to be forged in revolutionary struggles, civil wars, or other situations of intense conflict. Because many of these situations also lead to regime change and the organization of a

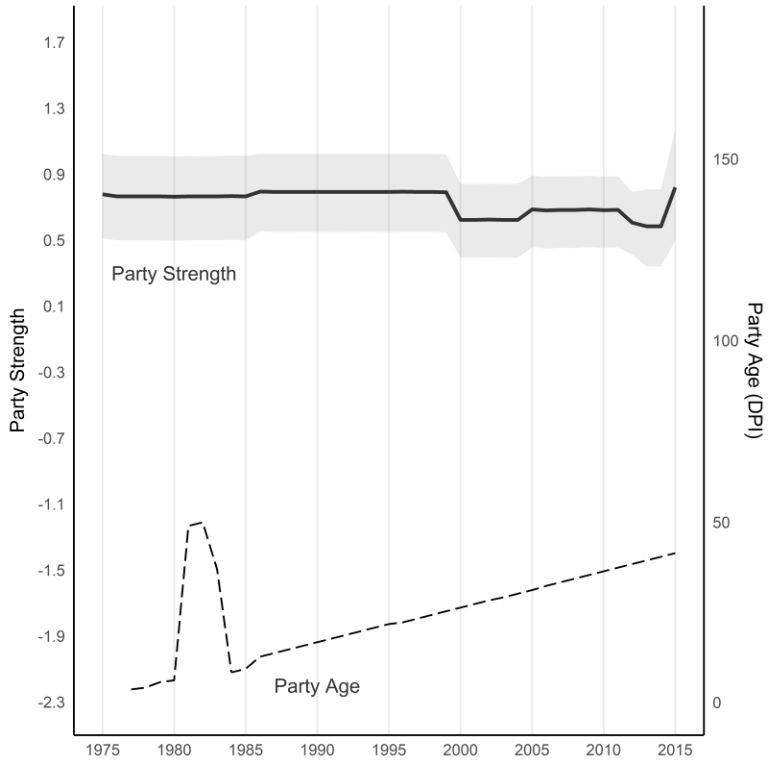
[15] Galvin 2009.
[16] See, e.g., Levitsky et al 2016.

ruling party (in autocracies), or a set of new (and potentially) strong democratic parties, there are many cases where a measure based exclusively on party age tends to underestimate the level of party strength in post-conflict or post-revolutionary contexts. Similarly, where new authoritarian regimes form ruling parties using state resources or inherit party organizations from previously organized parties (sometimes it is admittedly hard to measure exactly when an old party ceases to exist, de facto, and a new party begins), parties tend to be strong even when young.[17]

We consider the data from two countries to illustrate these issues. First, Figure E4 contains scores on both Party Strength and Party Age for Portugal since 1975, where a revolutionary movement led by the armed forces overthrew the previous autocratic Salazar regime, in April of 1974, and subsequently created the conditions for the emergence of a set of fairly strong and institutionalized democratic parties. Except for the Communist Party, all other Portuguese parties were created either immediately prior to the Revolution (the Socialist party, created in 1973, is the oldest of the main Portuguese parties) or immediately after it, in preparation for the 1975 legislative elections. Experts have celebrated the success of Portuguese parties in quickly building a party-based democracy, with national party organizations and cohesive partisan legislatures and governments.[18] Figure E4 highlights the contrasting pictures observed when plotting a Party Age to our indicator of party strength, with Portugal obtaining a high score very early on, on the latter measure.

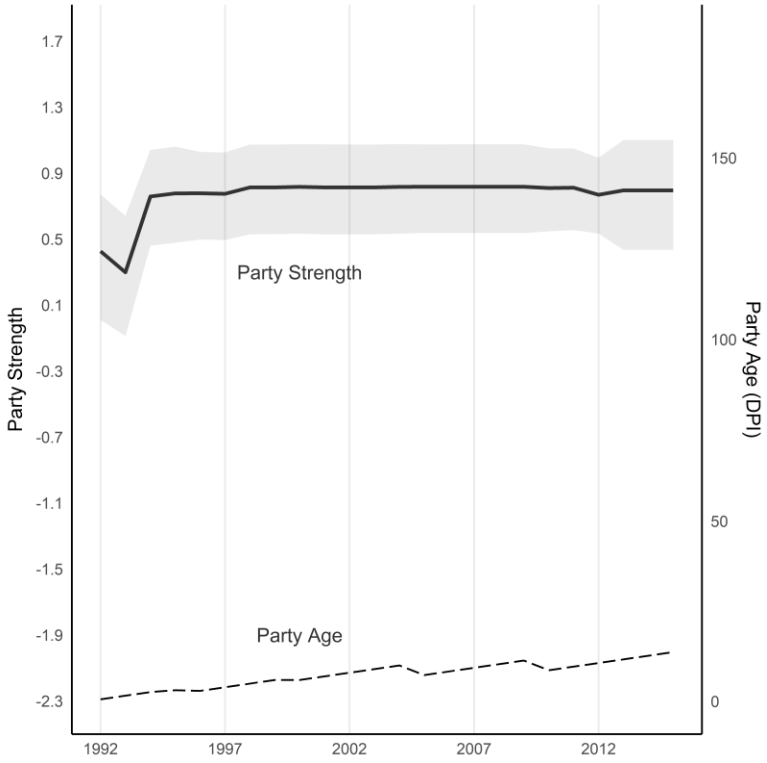
[17] Grzymala-Busse 2002; Loxton 2015.
[18] Jalali 2007; Costa Lobo 2011.

Figure E4: Party Strength and Party Age in Portugal



The second case we discuss to illustrate this point is Uzbekistan, a former Soviet Republic where a single-party regime followed after the fall of the Soviet Union and its communist regime. After the break-up of the Soviet Union, the Communist party was reorganized as the PDPU in Uzbekistan, and it has ruled the country since 1992, under the leadership of President Islam Karimov. The PDPU inherited the Communist organization and since the beginning of the new regime, has been a strong, dominant party over the country's politics. The DPI codes Uzbekistan as a country with a young party, arguably underestimating the level of party strength in the country.

Figure E5: Party Strength and Party Age in Uzbekistan



We note, finally, that these cases also highlight another important advantage of the Party Strength index over the Party Age measure: temporal coverage. While the DPI data extends at most a few decades back in time, our index consistently measures Party Strength across the globe since the beginning of the 20th century. In sum, the new Party Strength measure that we propose has several important benefits in terms of reliability and validity, and the measure compares favorably with extant measures often used as proxies for party institutionalization or party strength.

APPENDIX F: Multiple Imputation

This appendix provides additional information about the multiply imputed datasets we use in Table 1 (Model 3). We employ the Amelia II package in R[19] to impute 10 datasets with data on Party Strength and Economic Growth, following recommendations provided by the software's developers. Table F1 provides descriptive statistics for the variables included in the datasets before and after imputation.

Results show that there are no substantial differences between the two datasets. Over-imputation graphs (not shown, but available on request) also suggest acceptable accuracy of the imputation model. The imputation model accounts for the time-series cross sectional nature of the data, and we included a linear time trend (polytime = 1) to account for secular changes. In order to increase numerical stability, we included a ridge prior of 10%. Imputed values were bounded to the observed maximum and minimum values. All those specifications are in line with Honaker and co-authors' suggested specification for this kind of analysis.[20]

[19] Honaker, King, and Blackwell 2015.
[20] Honaker, King, and Blackwell 2015.

Table F1: Descriptive Information about the Original and Imputed Datasets

	Dataset	Party Strength	Growth	GDP per capita
Obs	Original	16413	10244	10444
	Imputed	166240	166240	166240
Mean	Original	0.00	1.89	7.81
	Imputed	0.01	1.42	7.64
SD	Original	0.54	6.21	1.02
	Imputed	0.54	5.94	1.01
Min	Original	-1.69	-61.49	5.32
	Imputed	-1.69	-61.49	5.32
Max	Original	1.42	86.95	10.67
	Imputed	1.42	86.95	10.67

APPENDIX G: Robustness Tests

This appendix reports a wide variety of robustness tests which are referred to – briefly – in the paper.

Tables G1 and G2 check the robustness of our findings when using alternate aggregation rules for the Party Strength index. Because index aggregation is usually difficult and permeated by important theoretical and empirical considerations that can profoundly affect the final product, we adopt two strategies to assess whether the association between the strength of political parties and economic growth is dependent on specific decisions we made when constructing the index.

In order to ease comparisons, in both tables the first model (1) is the benchmark model as listed in model 1 of Table 1 of the main text. To recapitulate, in this model the yearly rate of economic growth is regressed on Party Strength, lagged 1 year, controlling for levels of GDP per capita, also lagged 1 year, using an OLS Fixed Effects estimator that includes country and year fixed effects and estimates robust standard errors clustered by country. This specification is also used in every other model in Tables G1 and G2.

In Table G1, Model 2 strips our index from some of its constitutive parts and includes only what one could consider the "structural" part of party strength: the scope of professionalization of national party bureaucracies, the scope of partisan penetration in the territory through local branches, and the degree to which the selection of candidates for national level offices is centralized. These three indicators speak directly to the organization of political parties, while the other indicators (not included) tend to be associated with party performance (legislative cohesion), party control (party switching), and partisan connections to the electorate (programmatic linkages). The latter features is, as theorized in the paper, a function of a party's organizational strength, but they might also be reinforced by a party's performance in delivering

economic growth. Thus, by excluding the latter three indicators, we leave out relevant measures of party strength but do so in order to minimize concerns with endogeneity when economic growth is the outcome of interest. Reassuringly, the results show that the association between party strength and economic growth is robust to employing this alternative specification.

The measure in Model 3 includes all six indicators from the original index. But, instead of averaging the standardized version of the scores, as in our main specification, we employ Principal Component Analysis, a common technique for data reduction. The range of the scores grows in this case (see Table A2), proportionally to the decline in the size of the coefficient, suggesting that the coefficients are very similar regardless of the aggregation strategy we adopt.

Models 4 through 9 assesses sensitivity to the inclusion of specific indicators, and the results show that the association between Party Strength and growth is robust to the *exclusion* of any single indicator included in the original index.

Table G2 flips the last approach on its head. Rather than excluding indicators one-by-one, we test each of the indicators separately in Models 2 through 7. Every indicator of party strength yields a positive coefficient though only some of them are statistically different from zero – corroborating our assumption that party strength is a composite concept with many relevant components, and that there is no perfect (but partial) substitutability between these components.

Table G3 provides further tests for possible endogeneity. The first two columns perform a prima facie check of endogeneity. Model 1 shows that Party Strength predicts subsequent rates of economic growth, controlling for level of economic development and the lagged rate of economic growth. Model 2 shows that economic growth does not predict subsequent levels of

Party Strength when tested with an equivalent specification. In other words, X predicts Y but Y does not predict X when lagged values of the outcomes are included in the specification.

The next four columns in Table G3 show the benchmark model when Party strength is lagged 1, 5, 10, and 20 years prior to the outcome, i.e., growth. (GDP per capita is also lagged accordingly.) The estimated coefficient for Party Strength, and its t statistic, declines over time, but remains positive.

Columns 7 through 10 follow this same specification but with leads instead of lags. In other words, Party Strength (and GDP per capita) is measured 1, 5, 10, and 20 years *after* growth. Here, the estimated coefficient for Party Strength oscillates and then turns negative. Subsequent values of Party Strength predict growth for several leads, but not in a recognizable pattern. Bear in mind that with institutional variables such as Party Strength, the values for a particular country are not expected to change very much from year to year. As such, it is no surprise that there is a statistically significant relationship between growth at *t* and Party Strength at *t*+5 or *t*+10. Indeed, the same pattern is evident for per capita GDP in Table G3, and we anticipate similar patterns would be found for other sluggish variables such as democracy or state capacity.

Subsequent tests in this Appendix and in Appendix H also address the issues of sluggishness of Party Strength and possible endogeneity through different strategies, but Tables G4, and G5 highlight another issue, namely the short and long-term consequences of party strength. Our theoretical argument highlights that strong parties have positive consequences for economic growth both in the short-run (e.g., because of better management of economic policy) and in the long-run (e.g., because of investments in public goods). To explicitly test the long-term effects of party strength, we mimic the "long differences" estimator employed in Acemoglu

and Johnson in Table G4.[21] These models analyze only two observations, separated by a long period of time, and measure the effect of changes in the IV on changes in the DV over many years. To maximize the number of cases included, we compare countries' growth rate in 1956 (Party Strength and level of economic development in 1955), with countries' values in the same variable in 2006 (a 50-year gap). Table G4 also includes tests with samples that include only democracies *or* only autocracies, based on the classification by Boix, Miller, and Rosatto.[22] Models include country and year fixed effects and estimate standard errors clustered by countries. Coefficients are positive and different from zero (at least at $p<0.1$), despite the relatively small number of observations, in all the three models and also consonant with the benchmark model in Table 1: a unit increase in party strength over the period 1956-2006 is projected to increase GDP per capita by about 30% over this 50-year period.

Returning to the issues of autocorrelation and sluggishness of our Party Strength index, in Table G5, we run models using Generalized Estimation Equations (GEE). GEE models are similar to fixed effects models in the sense that they seek to model unobserved unit level effects. They differ by allowing for the explicit definition of the correlation matrix between the included variables (and for being a maximum likelihood estimator), a feature that makes possible the estimation of time dependence between observations. In order to explicitly deal with the sluggishness of Party Strength, we replace OLS fixed effects models with GEE models and test for five different specifications of the correlation structure: a structure that treats the observations as independent (exchangeable), and auto-regressive correlations of 1, 2, 5 and 10 years. Reassuringly, the results show very little sensitivity when it comes to the main finding: party

[21] Acemoglu and Johnson 2007.
[22] Boix, Miller, and Rosatto 2013.

strength is a positive and statistically significant predictor of economic growth, even after we account for the temporal interdependence of the observations.

In Figure G1, we assess potential context-sensitivity of the relationship under study by exploring variation over time with "rolling" regressions. Specifically, the benchmark model (Model 1, Table 1) is repeated for each 30-year interval from 1900 to 2009 (1901-1930, 1902-1931,…). Next, the coefficients from the resulting 89 regression models are plotted, along with 90% confidence intervals. The results of this exercise show that there is a positive relationship between Party Strength and growth in all periods. Granted, many of the coefficients are not statistically different from zero, but this is as expected by virtue of the small samples. As noted in the paper fixed-effect tests for sluggish variables within short time-periods can very easily lead to statistically insignificant results despite the presence of an effect (i.e., Type II errors).

Table G6 experiments with alternative ways of modeling time- and unit fixed effects. Model 1 is the benchmark model (Model 1, Table 1). Model 2 replaces annual dummies with decade dummies. Model 3, a random effects model, includes decade dummies, region dummies, as well as their interactions. Results are robust, though slightly attenuated.

In Model 5, Table 2, we include as covariates several indices from the V-Dem dataset that measure various alternative institutional features that may act as confounders for our relationship. Table G7 focuses on the disaggregated components of those indices, tested individually as covariates in the benchmark model. Thus, these tests serve a dual function; they allow us to assess whether any of the more particular aspects of, e.g., the composite measures of "individual liberties" or the "public administration" influence, and these models mitigate concerns of multi-colinearity. These tests show that Party Strength is robust to the inclusion of

all of these more specific indicators; indeed, the coefficient is virtually unchanged across Models 1-10.

In Table 3 of the paper, we assessed the potential context sensitivity of our relationship by running the benchmark on various reduced samples. Table G8 presents another way of assessing this by tests various interactions among contextual variables contained in Table 3, on the one hand, and Party Strength, on the other. In Model 1, Party Strength is interacted with a binary regime measure (BMR). In Model 2, Party Strength is interacted with a continuous measure of regime type (Polity2). The absence of statistical significance in the interaction coefficients suggest that the effect of party strength on growth is independent from regime type.

Model 3 in Table G8 tests for conditional effects of party strength across time, and Model 4 tests for the conditional effects based on regions. We find that effects of party strength are not conditional on the period at which we measure the association (prior or after 1945; see Figure G1 for estimates on various shorter time periods). Interaction with regions show some statistically significant conditional effects, specifically for Latin America (-), MENA (-), and East Asia (+).

In the paper, we noted how the Party Strength coefficient actually increased when we added controls, for example for alternative institutional features, such as regime type, property rights protection, and protection of liberties. However, given the substantial missingness on many of these controls, the samples of the models in Table 2 varied quite a lot, and it was hard to judge whether or not the change in Party Strength coefficient was due to the added control or to the changed sample. Further analysis do, indeed, suggest that adding the controls in Table 2 tends to (slightly) increase the Party Strength coefficient. Table G9 displays the benchmark model run on the samples of the different models in Table 2. The benchmark coefficients displayed in Table G9 are typically smaller than the extended models with corresponding

samples in Table 2. To further illustrate this, Table G10 runs the models listed in Table 2 on a constant sample including only the 3302 country-year observations that have data on all variables included in Table 2 (and are thus included in all models). The standard errors increase substantially in this very limited sample, as expected, but the main lesson from Table G10 is that the Party Strength coefficient tends to be higher in the models including institutional and other covariates. These investigations further add credence to the proposition that our main result reported in the paper is not driven by omitted variable bias.

In Table G11, we test the role of presidentialism/parliamentarism, which might influence both party strength[23] and economic performance.[24] To do so, we rely on the typology developed by Samuels and Shugart,[25] who categorize democratic government systems into four groups: parliamentary, premier-presidential, president-parliamentary, and presidential. While the two extreme categories match conventional understandings of these government systems, the two intermediate categories add nuance to the semi-presidential type: in the first, premier-presidential, presidents are weak, and premiers behave as de facto heads of government; the second, president-parliamentary, is an intermediate category with the signal switched, where presidents are strong and legislature-originated governments have limited control over the system.

Model 1 in Table G11 is our benchmark model but limits the sample to the 2409 observations that Samuels and Shugart code. The Party Strength coefficient is large, positive, and statistically different from 0 (4.17, t =2.04), along the lines of the main finding reported in the paper. Models 2 and 3 add government system types as control, with parliamentarism as the

[23] See, e.g., Samuels and Shugart 2010.
[24] See, e.g., Persson and Tabellini 2003.
[25] Samuels and Shugart 2010, 32.

reference group. Model 2 includes the Samuels and Shugart typology, and model 3 shows a reduction of these four categories into two (collapsing the first two categories and the last two categories). The magnitude and statistical significance of the coefficient for party strength barely changes after we add these controls (4.29, t=2.03, and 4.17, t=2.03, respectively).

Model 4 interacts Party Strength with the binary measure of government system. No clear interaction effect is apparent. Models 5 and 6 split the sample between countries with presidential systems (column 5) and parliamentary systems (column 6). In both samples, the coefficient for party strength remains positive (2.56 and 7.15), though it is statistically significant only in Model 6. These are, however, very small samples so we do not read too much into this result.

We follow the same strategy in Table G12 to test for the robustness of or findings in light of different electoral systems. Electoral systems have long been considered crucial to determine the strength of parties[26] and may also affect economic growth.[27] We employ the electoral systems data from V-Dem, and include this as an additional covariate in our model. Since electoral rules may influence not only party-internal characteristics, but critically shape inter-party competition[28] this allows us to control institutional features related to political competition that may also affect growth but that are not in focus in our theoretical argument. Yet, we find similar results when adding electoral system controls, with positive associations between party strength and growth across the board. We note that the sample with information on electoral systems in very limited, however, and pertain mostly to democracies, and the standard errors are typically larger in these specifications.

[26] Duverger 1959; Carey and Shugart 1995.
[27] Persson and Tabellini 2003; Knutsen 2011.
[28] Cox 1997.

One important potential confounding factor highlighted throughout the paper is state capacity. Strong states have been highlighted as the driving force behind economic growth through various mechanisms,[29] some of which are that are somewhat similar to the ones that we highlight in our theoretical argument. In order to ensure that it is not differences in state capacity that is driving our results, we engage in a closer investigation and test different measures, drawn from different sources, pertaining to state institutional features. Tables G13, G14, and G15 assess empirically how the association between Party Strength and economic growth conditional on different levels of state capacity. We select three different measures of state-ness, each speaking to a different dimension of the concept.

The first measure, from the V-Dem dataset, is Impartial and rigorous public administration– "the extent to which public officials generally abide by the law and treat like cases alike, or conversely, the extent to which public administration is characterized by arbitrariness and biases (i.e., nepotism, cronyism, or discrimination)."[30] If qualified, rule-following bureaucracies could promote good policies is the key determinant of economic growth, as argued by, for instance, Evans and Rauch,[31] we should see a positive effect of this variable on the yearly rate of economic growth.

Yet, "state capacity" is a concept that arguably has multiple facets, whereof several may affect growth.[32] Our second indicator of state capacity is thus Hanson and Sigman's (2013) latent measure of state capacity, which combines many commonly used indicators of capacity into a single, comprehensive index through latent variable estimation. This measure should capture states' extractive, coercive and administrative capacities, and thus provides us with an

[29] See, e.g., Evans and Rauch 1999; Kohli 2004; Leftwich 1995; Wade 1990; Woo-Cumings 1999; Amsden 1992.
[30] Coppedge et al. 2017b, 212.
[31] Evans and Rauch 1999.
[32] See, e.g. Fukuyama 2005.

encompassing control strategy when investigating whether or not party strength matters above and beyond features of state institutions.

Finally, we employ a measure of historical state capacity constructed by Bockstette et al. (StateHist5).[33] This captures experience with historical institutions from 1 to 1950 CE by coding whether government (above the tribal level) existed, whether the government was foreign or not, and how much of the contemporary territory such government ruled, discounting each half century by 5%.[34] This may be considered a proxy for state capacity insofar as state features are sluggish, as advocated by much of the literature, and historical state features thus are correlated with current. The resulting index varies from 0 to 1.

Results of these tests are shown in Tables G13, G14, and G15, respectively. Tables G13 and G14 include country and year fixed effects, while G15 estimates random effects model because StateHist5 is a time-invariant predictor. To Table G15 we therefore also add a set of other time-invariant predictors, besides year and region dummies, similar to model 4 in Table 2.

Each table follows the same structure. In column 1, we run our benchmark model (GDP growth regressed on Party Strength and GDP per capita (logged)) using only the observations for which we also have data on state capacity. Column 2 replaces the Party Strength indicator by the state capacity indicators. The first two columns should set the baseline for our comparison of coefficients. Column 3 includes both Party Strength and the relevant state capacity indicator, while column 4 also includes both as well as their interaction.

[33] Bockstette et al. 2002.
[34] Bockstette et al. 2002, 351-352

Because of the focus of many of the core studies and discussions pointing to possible scope-conditions in the literature[35] on the economic effects of strong states, highlight in particular the role of strong states in authoritarian settings, in the second half of the twentieth century, and in the developing world, the next four models split the sample to mimic those contexts. Columns 5 reports results from the same regression in column 3 using only country-years coded as democracies by Boix, Miller, and Rosato,[36] while column 6 does the same for autocracies. Column 7 excludes observations prior to 1946 (in Table G14 and G15, because all observations in the benchmark model are after 1945, they do not include this column) and column 8 excludes observations for the "old" OECD democracies, i.e., countries in North America, Western Europe, Australia, and New Zealand.

Overall, the results yield support both for the notion that Party Strength carries an independent positive effect on growth and for the notion that state capacity also enhances growth. Despite the (often) reduced samples and more limited variation, relative to our benchmark, the coefficients for both party strength and the different state measures are consistently positive and often statistically significant.

To be more specific, the results in Table G13 provide strong support for the hypothesis that Party Strength enhances growth, with substantially large and highly significant coefficients in all specifications. The coefficient on Impartial and rigorous public administration is also consistently positive, but only achieves statistical significance at conventional levels in the sub-sample of democracies. When substituting the latter measure with the comprehensive Hanson and Sigman state capacity measure in Table G14,[37] there is fairly clear support both for a

[35] See, e.g., Kohli 2004; Wade 1990; Amsden 1992.
[36] Boix, Miller, and Rosatto 2013.
[37] Hanson and Sigman 2013.

positive relationship between state capacity and growth and for a positive relationship between Party Strength and growth, with both coefficients being large and positive and at least weakly significant in most specifications. The same holds true when employing the State History measure as a proxy of state capacity. In sum, these analyses provide support that both state feature and features of political parties matter for economic development.

Finally, we note that there is no clear support for an interaction effect between Party Strength and state capacity. The exception is the interaction model (4) in Table G15 that uses the State History measure. The interaction term is statistically significant, and the sign suggests that the effect of Party Strength on growth is reduced when State History increases, and vice versa.

Table G1: Alternative versions of the Party Strength Index

	1	2	3	4	5	6	7	8	9
	Benchmark	Structural	PCA	Not Included: Switching	Cohesion	Cand. Sel.	Linkages	Organizations	Branches
Party strength	1.411***	1.026***	0.317*	1.262***	1.383***	1.056***	1.263***	1.374***	1.411***
	-0.366	-0.354	-0.166	-0.388	-0.371	-0.331	-0.359	-0.349	-0.366
GDP per cap	-1.938***	-1.886***	-1.868***	-1.906***	-1.963***	-1.918***	-1.904***	-1.939***	-1.938***
	-0.343	-0.34	-0.326	-0.336	-0.347	-0.334	-0.344	-0.343	-0.343
Constant	13.904***	13.392***	13.310***	13.696***	13.997***	13.741***	13.604***	13.909***	13.904***
	-2.382	-2.348	-2.273	-2.345	-2.394	-2.33	-2.387	-2.385	-2.382
Obs	10178	10215	10178	10178	10200	10178	10178	10178	10178
Countries	153	153	153	153	153	153	153	153	153
Max Years	110	110	110	110	110	110	110	110	110
R2 (within)	0.11	0.109	0.108	0.109	0.109	0.109	0.109	0.11	0.11

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects.
* p<0.10, ** p<0.05, *** p<0.01

Table G2: Regression on indicators of the Party Strength Index

	1 Benchmark	**2** Organizations	**3** Branches	**4** Cohesion	**5** Ntl. Cand.	**6** Linkages	**7** Switching
Party Strength	1.411***	0.319	0.484*	0.441**	0.468*	0.278	0.251
	(0.366)	(0.241)	(0.253)	(0.187)	(0.238)	(0.212)	(0.229)
GDP per capita	-1.938***	-1.837***	-1.857***	-1.808***	-1.832***	-1.861***	-1.854***
	(0.343)	(0.328)	(0.325)	(0.327)	(0.343)	(0.330)	(0.340)
Constant	13.904***	12.988***	13.186***	12.938***	12.880***	13.193***	13.051***
	(2.382)	(2.267)	(2.255)	(2.272)	(2.348)	(2.284)	(2.330)
Obs	10178	10227	10227	10178	10215	10215	10200
Countries	153	153	153	153	153	153	153
Max # Years	110	110	110	110	110	110	110
R-squared (within)	0.11	0.107	0.108	0.108	0.108	0.107	0.107

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects.

* p<0.10, ** p<0.05, *** p<0.01

Table G3: Lags and Leads

Outcome	Growth	Party Strength	Growth				Growth			
Right side lag	1 year	1 year	1 year	5 years	10 years	20 years				
Right side lead							1 year	5 years	10 years	20 years
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Party Strength	1.22***	0.95***	1.41***	0.86***	0.68*	0.38	0.94**	0.67**	0.88***	-0.04
	(0.33)	(0.00)	(0.37)	(0.32)	(0.37)	(0.34)	(0.37)	(0.33)	(0.33)	(0.31)
GDP Growth	0.18***	0.00								
	(0.03)	(0.00)								
GDP per capita	-2.20***	-0.00	-1.94***	-2.65***	-2.77***	-2.94***	2.52***	3.29***	3.41***	2.71***
	(0.32)	(0.00)	(0.34)	(0.36)	(0.35)	(0.38)	(0.30)	(0.31)	(0.30)	(0.30)
Constant	21.96***	0.02	19.42***	25.14***	25.63***	27.18***	-23.53***	-24.22***	-26.01***	-23.06***
	(2.64)	(0.03)	(2.82)	(2.98)	(2.87)	(3.11)	(2.58)	(2.60)	(2.53)	(2.59)
Obs	10024	10186	10178	9509	8701	7230	10024	9353	8553	7080
Countries	153	153	153	153	153	144	153	153	153	132
Min # Years	11	12	11	7	2	1	11	7	2	2
Avg # Years	65.52	66.58	66.52	62.15	56.87	50.21	65.52	61.13	55.9	53.64
Max # Years	109	110	110	106	101	91	109	105	100	90
R-squared (within)	0.14	0.93	0.11	0.11	0.12	0.11	0.12	0.12	0.12	0.11

Dependent variable is yearly rate of economic growth (Models 1, 3-10) or Party strength (Model 2). Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects. * p<0.10, ** p<0.05, *** p<0.01

Table G4. Long differences

Sample	Full Sample	Democracies	Autocracies
Party Strength	0.27*	0.49*	0.58***
	(0.16)	(0.28)	(0.15)
Constant	8.06***	9.15***	7.65***
	(0.03)	(0.12)	(0.06)
Obs	250	67	63
Countries	125	34	32
Max # Years	2	2	2
R-squared (within)	0.44	0.85	0.38

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects.
* p<0.10, ** p<0.05, *** p<0.01

Table G5: GEE models

	1	**2**	**3**	**4**	**5**
	Exchangeable	AR-1	AR-2	AR-5	AR-10
Party Strength	1.28***	1.14***	1.20***	1.26***	1.31***
	(0.22)	(0.23)	(0.23)	(0.23)	(0.24)
GDP per capita	-0.21*	-0.13	-0.21*	-0.28**	-0.35***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)
Constant	2.52**	2.01**	2.66***	3.13***	3.68***
	(1.02)	(1.00)	(1.01)	(1.03)	(1.05)
Obs	10178	10178	10178	10178	10178
Countries	153	153	153	153	153
Max # Years	110	110	110	110	110

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: GEE. Year dummies included.

* p<0.10, ** p<0.05, *** p<0.01

Figure G1: Rolling regressions

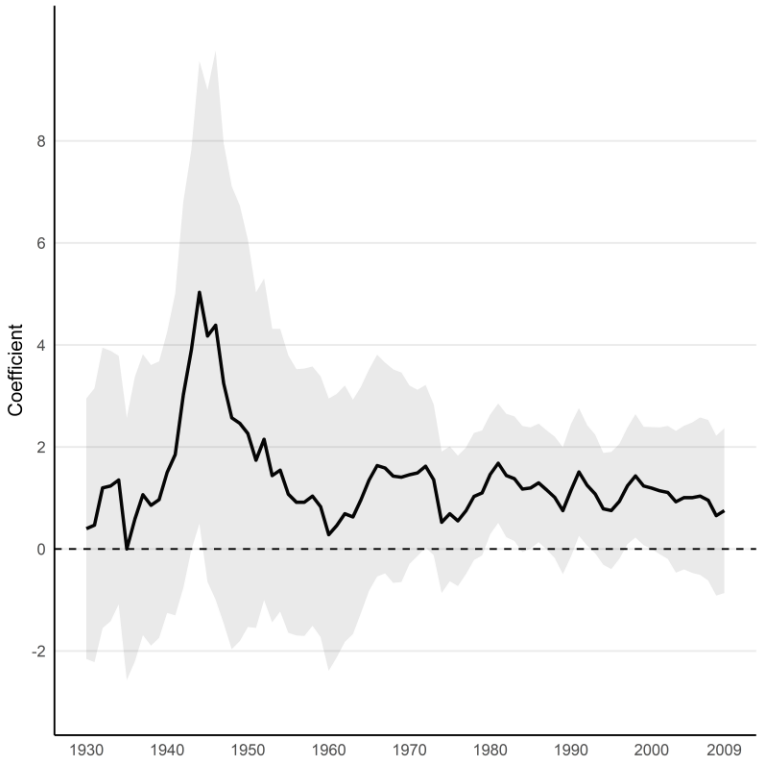


Figure G1 plots regressions coefficients for 89 regressions. Each model regresses GDP growth on Party Strength, controlling for GDP per capita using a 30-year sample of our panel. Models include country and year fixed effects and estimate standard errors clustered by countries (following the benchmark model: Table 1, Model 1). Years in the X-axis indicate the last year included in the sample (e.g., 1930 indicates the coefficient for the 1901-1930).

Table G6: Regional and Decade dummies

	1	2	3
Estimator	Fixed effects	Fixed effects	Random effects
Party Strength	1.41*** (0.37)	0.85*** (0.23)	1.08*** (0.35)
GDP per capita	-1.94*** (0.34)	-0.35 (0.27)	-1.10*** (0.42)
Constant	13.90*** (2.38)	4.15* (2.15)	10.17*** (3.33)
Annual dummies	✓		
Decade dummies		✓	✓
Region dummies			✓
Decade & Region dummy interactions			✓
Obs	10178	10178	10178
Countries	153	153	153
Max # Years	110	110	110
R-squared (within)	0.11	0.06	0.06

Dependent variable is yearly rate of economic growth. Standard errors clustered by country in parentheses.
* p<0.10, ** p<0.05, *** p<0.01

Table G7: Tests with disaggregated measures of alternative institutional features

	1	2	3	4	5	6	7	8	9	10
Party Strength	1.399***	1.420***	1.491***	1.427***	1.413***	1.413***	1.411***	1.477***	1.447***	1.432***
	(0.365)	(0.369)	(0.359)	(0.369)	(0.366)	(0.366)	(0.367)	(0.372)	(0.372)	(0.366)
GDP per capita	-2.009***	-1.977***	-1.956***	-1.957***	-1.959***	-2.005***	-1.938***	-2.004***	-1.967***	-1.962***
	(0.342)	(0.343)	(0.336)	(0.341)	(0.343)	(0.340)	(0.346)	(0.346)	(0.344)	(0.338)
Rigorous and impartial public administration	0.128									
	(0.144)									
Transparent laws with predictable enforcement		0.116								
		(0.161)								
Property rights			1.564*							
			(0.888)							
Access to justice				0.457						
				(0.777)						
Freedom from torture					0.055					
					(0.132)					
Freedom from political killings						0.126				
						(0.124)				
Freedom from forced labor							0.012			
							(0.887)			
Freedom of religion								0.186		
								(0.171)		
Freedom of foreign movement									0.101	
									(0.114)	
Freedom of domestic movement										0.620
										(0.811)
Constant	14.421***	14.215***	13.400***	13.863***	14.055***	14.356***	13.898***	14.369***	14.098***	13.780***
	(2.382)	(2.392)	(2.438)	(2.387)	(2.389)	(2.383)	(2.554)	(2.399)	(2.390)	(2.413)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Obs	10178	10178	10178	10178	10178	10178	10178	10178	10178	10178
Countries	153	153	153	153	153	153	153	153	153	153
Max # Years	110	110	110	110	110	110	110	110	110	110
R-squared (within)	0.11	0.11	0.111	0.11	0.11	0.11	0.11	0.11	0.11	0.11

Outcome: per capita GDP growth. Unit of analysis: country-year. FE: fixed effects. Countries: 153. Years: 110 (max). All right-side variables lagged by 1 year. Estimator: OLS (ordinary least squares). Standard errors clustered by country. *** p<.01 **p<.05 *p<.10.

Table G8: Interaction Tests

	Regime		Time	Region
	1	**2**	**3**	**4**
Party Strength	1.668***	1.641***	1.316***	1.722***
	(0.462)	(0.418)	(0.425)	(0.488)
GDP per capita	-2.372***	-2.323***	-1.943***	-0.944***
	(0.404)	(0.382)	(0.347)	(0.142)
Democracy (BMR)	-0.040			
	(0.319)			
PS x Democracy BMR	0.486			
	(0.484)			
Polity		-0.020		
		(0.026)		
PS x Polity		0.048		
		(0.031)		
After 1945			5.506***	
			(0.905)	
PS x After 1945			0.125	
			(0.391)	
Eastern Europe and Central Asia (post-Communist)				-1.016*
				(0.541)
Latin America				-0.607
				(0.483)
MENA				-0.241
				(0.535)
Sub-Saharan Africa				-2.326***
				(0.532)
East Asia				-0.421
				(0.752)
South-East Asia				0.106
				(0.633)
South Asia				-1.871***
				(0.703)
The Caribbean				-0.840
				(0.848)
PS x Eastern Europe and Central Asia (post-Communist)				1.019
				(0.710)
PS x Latin America				-1.367**
				(0.673)
PS x MENA				-2.020***
				(0.737)
PS x Sub-Saharan Africa				-0.800
				(0.605)
PS x East Asia				1.980**
				(0.955)
PS x South-East Asia				-0.998
				(0.760)
PS x South Asia				-0.350
				(0.814)
PS x The Caribean				1.324
				(1.184)
Constant	17.146***	16.792***	13.949***	8.228***
	(2.774)	(2.673)	(2.428)	(1.540)
Obs	8517	8884	10178	10178
Countries	145	148	153	153
Max # Years	107	110	110	110
R-squared (within)	0.120	0.126	0.110	0.110

Outcome: per capita GDP growth. Unit of analysis: country-year. FE: fixed effects. Countries: 153. Years: 110 (max). All right-side variables lagged by 1 year. Estimator: OLS (ordinary least squares). Standard errors clustered by country. *** p<.01 **p<.05 *p<.10. Reference category for Model 4: Western Europe, North America, Australia, and New Zealand.

Table G9. Benchmark reproduced for identical sample of each model in Table 2

Model nr	2	3	4	5	6
PS coeff. in Table 2	*1.772**	*1.147***	*0.803***	*1.781****	*1.603****
Party Strength	1.38***	1.30***	0.68	1.43***	1.63***
	(0.36)	(0.45)	(0.52)	(0.36)	(0.42)
GDP per capita	-1.88***	-2.43***	-2.20***	-2.41***	-2.27***
	(0.34)	(0.50)	(0.57)	(0.38)	(0.38)
Constant	18.85***	18.06***	21.41***	17.73***	16.46***
	(2.78)	(3.45)	(4.70)	(2.85)	(2.62)
Obs	10114	6862	4285	9556	8884
Countries	153	106	93	153	148
Min # Years	10	13	10	1	1
Avg # Years	66.1	64.74	46.08	62.46	60.03
Max # Years	109	107	49	110	110
R-squared (within)	0.11	0.11	0.08	0.12	0.13

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects. Life expectancy, Infant Mortality, and Inflation are logged.

* p<0.10, ** p<0.05, *** p<0.01

Table G10: Replication of Table 2 on identical sample of 3302 observations across models

	1	2	3	4	5	6
Estimator	OLS	OLS Diff	OLS	RE	OLS	OLS
Party Strength	0.398	0.479	0.870	0.629**	0.851	0.795
	(0.588)	(1.445)	(0.566)	(0.289)	(0.570)	(0.587)
GDP per capita		-1.953***	-2.193***	-0.683***	-2.076***	-2.091***
		(0.627)	(0.645)	(0.253)	(0.594)	(0.651)
Urbanization			-4.70			
			(4.093)			
Life expectancy			0.055			
			(0.066)			
Petroleum			-0.001***			
			(0.000)			
Internal Conflict			-1.750***			
			(0.430)			
International Conflict			-0.684			
			(0.543)			
Statehist5				1.561**		
				(0.770)		
Ethnic fractionalization				-0.013		
				(0.540)		
Latitude (ln)				-0.137		
				(0.138)		
Muslim				-0.002		
				(0.007)		
Protestant				-0.010		
				(0.010)		
Land area				0.000		
				(0.000)		
Polyarchy					-2.169	
					(1.541)	
Individual Liberties					0.586**	
					(0.291)	
Private Property					0.093	
					(1.839)	
Public Administration					0.278	
					(0.431)	
Judicial Constraints					-1.514	
					(1.408)	
Legislative Constraints					0.428	
					(0.878)	
Corruption					1.395	
					(1.721)	
State Ownership of Economy					0.603***	
					(0.226)	
Core Civil Society					-2.925**	
					(1.285)	
Polity2						-0.035
						(0.026)
Obs	3302	3302	3302	3302	3302	3302
Countries	76	76	76	76	76	76
Min # Years	7	7	7	7	7	7
Avg # Years	43.4	43.4	43.4	43.4	43.4	43.4
Max # Years	46	46	46	46	46	46
R-squared (within)	0.067	0.076	0.095	-	0.089	0.078

Outcome: per capita GDP growth. Unit of analysis: country-year. FE: fixed effects. All right-side variables lagged by 1 year. Estimator: OLS (ordinary least squares), Diff (Difference in Differences), RE (random effects), standard errors clustered by country. Constant, year- and country-fixed effects (region-fixed effects and legal origin dummies in Model 4) are omitted from table. *** p<.01 **p<.05 *p<.10.

Table G11: Presidential v. Parliamentary

	1	2	3	4	5	6
	Benchmark	Control	Control	Interac.	President.	Parliam.
Party Strength	4.17**	4.29**	4.17**	5.31**	2.56	7.15**
	(2.05)	(2.12)	(2.06)	(2.31)	(2.19)	(2.73)
GDP per capita	-6.99***	-7.10***	-7.00***	-7.02***	-8.06***	-6.96***
	(1.19)	(1.25)	(1.23)	(1.23)	(1.91)	(1.86)
Premier-Presidential		-1.69				
		(1.67)				
President-Parliamentary		0.01				
		(1.97)				
Presidential		-2.14				
		(2.06)				
Presidential (binary)			-0.07	0.34		
			(1.92)	(2.16)		
Presidential *				-1.58		
Party Strength				(2.68)		
Constant	65.01***	66.82***	65.10***	64.77***	73.08***	63.42***
	(10.86)	(11.82)	(11.52)	(11.51)	(16.59)	(17.43)
Obs	2409	2409	2409	2409	933	1476
Countries	79	79	79	79	38	47
Min # Years	5	5	5	5	3	2
Avg # Years	30.49	30.49	30.49	30.49	24.55	31.4
Max # Years	63	63	63	63	62	63
R-squared (within)	0.22	0.23	0.22	0.22	0.26	0.28

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects. * p<0.10, ** p<0.05, *** p<0.01
Data on government system comes from Samuels and Shugart (2010).

Table G12: Electoral Systems

	1	2	3	4	5
	Benchmark	Control	Interaction	Majoritarian	Proportional
Party Strength	1.05*	1.05*	0.73	0.51	1.84*
	(0.54)	(0.54)	(0.55)	(0.84)	(1.06)
GDP per capita	-2.35***	-2.36***	-2.40***	-2.37***	-3.69***
	(0.59)	(0.58)	(0.59)	(0.86)	(1.14)
Proportional Rep.		-0.14	-0.38		
		(0.48)	(0.52)		
Party Strength * Proportional Rep.			1.08		
			(0.68)		
Constant	19.56***	19.64***	19.99***	20.30***	26.53***
	(4.33)	(4.28)	(4.30)	(6.12)	(8.36)
Obs	2246	2246	2246	1158	884
Countries	147	147	147	117	83
Min # Years	2	2	2	1	1
Avg # Years	15.28	15.28	15.28	9.9	10.65
Max # Years	55	55	55	55	44
R-squared (within)	0.21	0.21	0.21	0.2	0.36

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects. * p<0.10, ** p<0.05, *** p<0.01

Data on electoral system type comes from V-Dem (v2elparlel) (Coppedge 2017).

Table G13: State Capacity as Public administration

	Only PS	Only SC	Both	Interaction	Democracies	Autocracies	After 1946	Not Western
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Party Strength	1.41***		1.40***	1.42***	2.95***	2.06***	0.93**	1.36***
	(0.37)		(0.37)	(0.36)	(1.02)	(0.65)	(0.46)	(0.41)
Public administration		0.14	0.13	0.11	0.50**	0.19	0.06	0.04
		(0.15)	(0.14)	(0.15)	(0.23)	(0.24)	(0.18)	(0.17)
Party Strength * Public administration				0.13				
				-0.17				
GDP per capita	-1.94***	-1.89***	-2.01***	-2.03***	-5.89***	-2.26***	-1.79***	-1.73***
	(-0.34)	(-0.33)	(-0.34)	(-0.34)	(-0.82)	(-0.60)	(-0.37)	(-0.35)
Constant	13.90***	13.34***	14.42***	14.62***	42.90***	15.96***	17.88***	12.60***
	(2.38)	(2.26)	(2.38)	(2.36)	(6.08)	(4.13)	(3.01)	(2.58)
Obs	10178	10178	10178	10178	3590	4927	8235	8033
Countries	153	153	153	153	102	123	153	133
Max # Years	110	110	110	110	107	100	64	110
R-squared (within)	0.11	0.11	0.11	0.11	0.21	0.12	0.09	0.11

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects.
* p<0.10, ** p<0.05, *** p<0.01 State capacity measured by Public administration, i.e., "rigorous and impartial public administration" (V-Dem)

Table G14. State capacity from Hanson and Sigman (2013)

	1	2	3	4	5	6	7	8
	Benchmark	Only PS	Only SC	Both	Interaction	Democracies	Autocracies	Not Western
Party Strength	1.41***	1.14*		1.01	1.26*	3.48**	1.91*	1.15*
	(0.37)	(0.63)		(0.65)	(0.68)	(1.72)	(1.01)	(0.67)
State Capacity (H/S)			0.84**	0.79**	0.73*	1.15**	0.85	0.77*
			(0.40)	(0.40)	(0.40)	(0.55)	(0.51)	(0.43)
Party Strength * State Capacity (H/S)					0.64			
					(0.48)			
GDP per capita	-1.94***	-2.48***	-2.90***	-2.94***	-2.97***	-6.13***	-2.29***	-2.80***
	(0.34)	(0.53)	(0.65)	(0.66)	(0.66)	(1.16)	(0.85)	(0.68)
Constant	13.90***	23.64***	27.11***	27.31***	27.41***	57.44***	22.32***	26.09***
	(2.38)	(4.37)	(5.31)	(5.38)	(5.41)	(10.08)	(6.77)	(5.45)
Obs	10178	6216	6216	6216	6216	2354	3417	5247
Countries	153	147	147	147	147	98	111	127
Max # Years	110	50	50	50	50	47	47	50
R-squared (within)	0.11	0.1	0.1	0.1	0.1	0.17	0.09	0.1

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects.
* p<0.10, ** p<0.05, *** p<0.01 State capacity measured with index from Hanson & Sigman (2013).

Table G15. State capacity as State History

	1	2	3	4	5	6	7	8
	Benchmark	Only PS	Only SC	Both	Interaction	Democracies	Autocracies	Not Western
Party Strength	0.803**	1.15***		0.80**	1.59***	0.65	0.48	0.94***
	(0.312)	(0.32)		(0.31)	(0.53)	(0.52)	(0.33)	(0.33)
State History	1.910**		1.91**	1.91**	2.43***	1.03	2.58**	2.67**
	(0.793)		(0.82)	(0.79)	(0.83)	(0.93)	(1.23)	(1.31)
Party Strength * State History					-2.09**			
					(0.92)			
GDP per capita	-0.656***	-0.96***	-0.50**	-0.66***	-0.66***	-0.50	-0.53**	-0.51**
	(0.229)	(0.30)	(0.24)	(0.23)	(0.23)	(0.35)	(0.25)	(0.23)
Ethnic fractionalization	-1.122*	-0.82	-1.35**	-1.12*	-1.39**	-1.23	-1.52**	-1.47*
	(0.631)	(0.67)	(0.65)	(0.63)	(0.64)	(0.76)	(0.70)	(0.81)
Latitude	-0.018	-0.02	0.01	-0.02	-0.05	0.24	-0.36***	-0.04
	(0.145)	(0.17)	(0.15)	(0.14)	(0.14)	(0.20)	(0.13)	(0.14)
Muslim	-0.006	-0.00	-0.00	-0.01	-0.01	-0.01	0.01	-0.00
	(0.007)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Protestant	-0.008	0.00	-0.01	-0.01	-0.01	-0.02	0.03	-0.01
	(0.011)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Land Area (sq.km)	0.000**	0.00	0.00*	0.00**	0.00*	0.00	0.00***	0.00*
	(0.000)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	8.981***	14.44***	7.91***	8.98***	8.86***	7.20**	0.00	8.41***
	(2.046)	(3.24)	(2.08)	(2.05)	(2.03)	(3.23)	(.)	(2.07)
Obs	4285	5929	4320	4285	4285	1957	2059	3376
Countries	93	143	93	93	93	70	67	73
Min # Years	10	10	10	10	10	2	2	32
R-squared (within)	0.077	0.09	0.08	0.08	0.08	0.12	0.07	0.07

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Random effects. Year and Regional dummies.
* p<0.10, ** p<0.05, *** p<0.01 State capacity measured as State history (Bockstette et al. 2012).

APPENDIX H: Instrumental Variable and GMM Analysis

Table H1 displays the first-stage results and relevant test-statistics for the 2SLS model from which the second-stage results are reported in Table 1 of the paper. Table H2 presents results from alternative 2SLS specifications to probe the robustness of the core result (Party Strength is estimated to have a positive effect on growth).

Regarding the first-stage specification in Table H1, we note that the implausibly large (and negative) value on the global party strength instrument in this particular specification is due to the very high correlation with the year dummies (they are not perfectly correlated because global growth is always calculated exempting country in question).

While this (a priori preferred) specification thus turns out to have some problematic features, this is not critical to the interpretation of the main result, since the estimated effect of party strength on growth is robust, for instance, to substituting the year dummies with a time trend, and to omitting the global instrument and only using the regional. This is shown in Table H2. When only employing the regional instrument and omitting the global in an otherwise similar specification, for instance, the coefficient of the regional PS instrument increases to .45 and it turns statistically significant at all conventional levels, even when employing robust errors clustered by country (the first stage regression for Model 1, Table H2). When omitting the year dummies in Model 2, Table G2, both the regional and global instruments are positive and significant at the 1 percent level. When including the linear time trend in Model 3, Table H2, the global instrument is sizeable but statistically insignificant in the first stage (.38; t=1.57), whereas the regional instrument is sizeable and significant (.57; t=3.99). Also, the instrument(s) in the first-stage regressions of these alternative specifications are always indicated by the Kleibergen-Paap F-statistics (shown in Table H2) to be (at least) moderately strong.

Turning to robustness tests of the system GMM results presented in Table 1 of the paper, we noted that many scholars studying economic growth prefer to use the log of income level rather than income growth as dependent variable. To check whether this influences results, Model 1, Table H3 displays results for a system GMM specification that uses Ln GDP per capita rather than GDP per capita growth as dependent variable, but is otherwise similar to the GMM specification used in Table 1 of the paper. While the Hansen J-test of the over-identifying restrictions and the number of instruments (relative to the number of cross-section units) are acceptable, the AR(2) test p-value for this specification does not allow us to reject the hypothesis of autocorrelation (of order 2). Yet, the Ar(2) and Ar(3) tests are acceptable once including an additional lag of the dependent variable in Model 2, and the Party Strength coefficient is highly significant also in this specification.

Table H1: 2SLS Results for Model 8, Table 1 (first stage)

	1
GDPpc (ln)	0.032***
	(0.007)
Regional growth	0.0005*
	(0.0003)
Global growth	0.004
	(0.006)
Regional PS	0.032
	(0.029)
Global PS	-139.73***
	(2.164)
Year FE	✓
Country FE	✓
Countries	153
Years (Max)	109
Obs	9940
Hansen J-test test p-value	0.059
Kleibergen-Paap Wald F-statistic	3254.05

Outcome: Party Strength. Independent variables lagged by one time-period.
FE: fixed effects. Estimator: 2SLS (two-stage least squares) with robust errors clustered by country; first-stage regression. *** p<.01 **p<.05 *p<.10

Table H2: Alternative 2SLS specifications (second stage)

	1	**2**	**3**	**4**	**5**	**6**	**7**
Estimator	FE	FE	FE	FE	RE	RE	RE
Party Strength	5.568*	6.621***	4.373***	8.001***	0.830***	1.884***	1.798***
	(3.490)	(1.765)	(1.431)	(1.875)	(0.128)	(0.480)	(0.464)
GDP per capita	-2.316***	-1.669***	-2.397***	-2.786***	-0.083	-0.428***	-0.446***
	(0.465)	(0.372)	(0.383)	(0.517)	(0.066)	(0.119)	(0.125)
Time trend			✓	✓		✓	✓
Year FE	✓				✓		
Country FE	✓	✓	✓	✓			
Instruments							
Regional party strength	✓	✓	✓	✓	✓	✓	✓
Global party strength		✓	✓	✓	✓	✓	✓
Countries	153	153	153	153	153	153	153
Years (Max)	109	109	109	110	109	109	109
Obs	9940	9940	9940	10178	9940	9940	9940
Hansen J-test p-value	-	0.145	0.872	0.916	-	-	-
Kleibergen-Paap Wald F statistic	8.78	12.95	14.02	14.99	-	-	-

Outcome: per capita GDP growth. Units of analysis: country-year. Independent variables lagged by one time-period. Estimator: two-stage least squares with FE (fixed effects) or RE (random effects), second-stage results only. FE 2SLS calculated with STATAs xtivreg2 package, and RE 2SLS calculated with the xtivreg package.Test statistics not calculated for random effects models due to software limitations, and classical errors have to be used for the same reason in these models. Robust errors clustered on country are used in the fixed effects models. *** p<.01 **p<.05 *p<.10.

Table H3: GMM specification using Ln GDP p.c. as dependent variable.

	1	2
Party Strength	0.100***	0.062***
	(0.023)	(0.020)
1st lag D.V.	1.01***	1.38***
	(0.011)	(0.069)
2nd lag D.V.		-0.390***
		(0.069)
5-year period FE	✓	✓
Countries	153	152
5-Year periods (Max)	21	20
Obs	1835	1682
Hansen J-test test p-value	0.847	0.955
Ar(2) p-value	0.00	0.948
Ar(3) p-value	-	0.745
Number of instruments	133	163

Outcome: Ln GDP p.c. Independent variables lagged by one time-period. Estimator: System GMM with robust errors. Party Strength and lagged DV(s) treated as endogenous. 2nd and 3rd lag used for instrumentation. *** p<.01 **p<.05 *p<.10

APPENDIX I: Growth Stability

In this appendix, we probe more deeply into the relationship between Party Strength and growth stability, elaborating on discussion presented in Section VI and tests reported in Table 4.

First, we examine whether Party Strength reduces the likelihood of economic crisis, understood as an episode of negative per capita GDP growth. This is variously coded as less than 0, less than -3%, or less than -5%, to generate three dependent (dummy) variables. We find that Party Strength is negatively associated with each of these outcomes when tested in our benchmark model with ordinary least squares or logistic regression estimators, as shown in Table F1. The OLS point estimate suggests that a 1-point increase in Party Strength reduces the probability of observing negative growth in the following year by 8 percentage points (29 percent of observations have negative growth).

Second, we examine whether Party Strength enhances the likelihood of periods of sustained growth, understood as consecutive years of positive growth sustained across five- or ten-year periods. Party Strength is associated with sustained growth episodes when tested in our benchmark model using both outcome intervals, and employing either ordinary least squares or logistic regression estimators, as shown in Table F2.

Finally, we examine whether Party Strength reduces growth volatility, understood as the standard deviation of growth performance over 10- and 15-year periods. Point estimates from these models, shown in Table F3, suggest that Party Strength reduces growth volatility, though these estimates are statistically significant only when country fixed-effects are removed. Note that when growth volatility is analyzed in a cross-country format the analysis typically does not include country fixed-effects.[38] It seems fair to conclude that countries with stronger parties not only have higher growth, on average, they also have less volatile growth rates.

[38] See, e.g., Easterly et al. 2001.

Table I1: Party Strength and Economic Crises

	1	2	3	4	5	6
Coding of outcome	Growth<0		Growth<-3		Growth<-5	
Estimator	OLS	Logit	OLS	Logit	OLS	Logit
Party Strength	-0.076***	-0.434***	-0.052**	-0.448**	-0.036**	-0.415
	(0.026)	(0.152)	(0.021)	(0.223)	(0.016)	(0.258)
GDP per capita	0.041**	0.204*	0.040***	0.397***	0.029**	0.429***
	(0.018)	(0.106)	(0.014)	(0.147)	(0.012)	(0.159)
Constant	0.191	-2.094**	-0.066	-4.661***	-0.130*	-6.497***
	(0.148)	(0.831)	(0.113)	(1.119)	(0.078)	(1.367)
Obs	10178	10142	10178	10057	10178	9390
Countries	153	153	153	153	153	153
Max # Years	110	110	110	110	110	110
R-squared	0.114	0.138	0.116	0.191	0.099	0.189

Outcome (Y): economic crisis, coded 1 if per capita GDP growth is below a designated value. Units of analysis: country-year. Independent variables lagged by one time-period. FE: fixed effects. Estimator: OLS (ordinary least squares), Logit (logistic regression), standard errors clustered by country. *** p<.01 **p<.05 *p<.10

Table I2: Party Strength and Sustained Growth Episodes

	1	2	3	4
Y measured across…	5 years		10 years	
Estimator	OLS	Logit	OLS	Logit
Party Strength	0.110***	0.665***	0.064**	0.873**
	(0.034)	(0.224)	(0.030)	(0.381)
GDP per capita	-0.104***	-0.715***	-0.131***	-1.793***
	(0.032)	(0.223)	(0.030)	(0.413)
Constant	0.759***	3.094*	0.977***	10.758***
	(0.224)	(1.633)	(0.211)	(2.917)
Obs	9500	9266	8655	6445
Countries	153	151	153	117
Max # Years	106	106	101	101
R-squared	0.139	0.217	0.112	0.268

Outcome (Y): a prolonged growth period, coded 1 if per capita GDP growth is positive (>0) in consecutive years for a 5- or 10-year period. Independent variables lagged by this same time interval. FE: fixed effects. Estimator: OLS (ordinary least squares), Logit (logistic regression), standard errors clustered by country. *** p<.01 **p<.05 *p<.10

Table I3: Party Strength and Growth Volatility

	1	2	3	4	5	6	7	8
Y measured across	10 yrs	15 yrs	10 yrs	15 yrs	10 yrs	15 yrs	10 yrs	15 yrs
Estimator	OLS	OLS	OLS	OLS	PCSE	PCSE	PCSE	PCSE
Party Strength	-0.414	-0.342	-0.350	-0.327	-0.572***	-0.529***	-0.582***	-0.412***
	(0.399)	(0.439)	(0.407)	(0.440)	(0.145)	(0.113)	(0.154)	(0.152)
GDP per capita	-0.438	-0.467	-0.541	-0.526	-0.100	0.260**	-0.196	-0.231
	(0.314)	(0.316)	(0.362)	(0.371)	(0.158)	(0.132)	(0.161)	(0.341)
Average Growth			-0.064	-0.028			-0.065**	-0.064
			(0.060)	(0.082)			(0.027)	(0.061)
Constant	7.936***	8.600***	7.644**	7.526**	5.015***	3.237***	5.771***	6.929***
	(2.173)	(2.221)	(3.139)	(3.188)	(1.244)	(1.035)	(1.248)	(2.395)
Obs	8655	7829	8505	7681	8655	7829	8505	7681
Countries	153	152	153	152	153	152	153	152
Max # Years	101	96	100	95	101	96	100	95
R-squared	0.249	0.288	0.254	0.290	0.183	0.257	0.209	0.292

Outcome (Y): standard deviation of per capita GDP growth rate over specified time interval. Average growth: per capita GDP growth over this interval. Independent variables lagged by one year prior to this interval. FE: fixed effects. Estimators: OLS (ordinary least squares with standard errors clustered by country), PCSE (ordinary least squares with standard errors corrected for panel-specific heteroscedasticity and panel-specific AR(1) autocorrelation). *** p<.01 **p<.05 *p<.10

APPENDIX J: Mediation Analysis

This appendix presents results from mediation analyses and regressions on alternative outcomes than growth that allow us to provide a preliminary empirical investigation of the mechanisms through which party strength may enhance growth. In our theoretical discussion, we, for instance, argued that party strength may affect growth by enhancing macroeconomic management, public services, and political stability. In this section, we provide some suggestive evidence for these channels, focusing on factors that are measurable, and hence testable.

Before beginning, it is important to acknowledge the challenges to causal inference that confront any attempt to estimate the role of causal mechanisms.[39] These challenges are magnified in a nonexperimental context where the presence of multiple potential mediators – not all of which are measurable – must be reckoned with. Mediation tests constitute the best available method for investigating causal mechanisms in a cross-country context, i.e., with data that lies at the same level of analysis as our treatment and outcome of interest. However, we regard these tests as suggestive rather than conclusive, in the spirit of most work on causal mechanisms.

In the following analyses, the quality of macroeconomic management is proxied by domestic investment and inflation (logged), the quality of public services by the infant mortality rate (logged) and life expectancy (subtracted from 85 and logged), and overall stability by measures of internal conflict and irregular leadership exits. Definitions of these variables, and their sources, are contained in Table A1. We employ policy outcomes, rather than direct measures of policy effort, because the former are generally easier to measure and less liable to systematic bias. Note that by including per capita GDP as a covariate in these models we are handicapping countries by their available resources and their overall level of modernization.

[39] Gerring 2010; Imai et al. 2010.

We perform single mediator analyses, using the package developed by Hicks, Raymond and Tingley,[40] widely regarded as the state-of-the-art procedure for causal mechanism analysis in the potential outcomes framework.[41] Specifications follow closely the benchmark model, including per capita GDP (logged) and country and year fixed effects (in this case, we estimate robust standard errors because the package does not handle clustered SEs).

Results displayed in Table J1 provide support for our hypotheses. Specifically, the estimates suggest an indirect effect of party strength on growth via greater life expectancy (4.5% of the total effect), lowered infant mortality (7.2% of the total effect), lower inflation (7.0% of the total effect), less common irregular replacements of the executive (4.0% of the total effect), and lower incidence of internal conflicts (8.5% of the total effect). The only mediator to which sensitivity analysis suggest an indirect effect (ACME) that is not clearly different from zero is Investments. Despite this, the regressions using the mediators as alternative dependent variables (instead of growth), presented in Table J2, clearly show that increased Party Strength enhances investment, and the lack of a robust ACME on growth via investment thus stems from a weak link between investment volume and growth measured (already) in the following year. Thus, we are able to corroborate hypotheses pertaining to the mediating role of policy management, public services and political stability.

Nevertheless, we regard these results as tentative rather than definitive. Alternative mediators and model specifications might produce more informative results about the mechanisms by which Party Strength affects economic growth. Additionally, single-mediator models could be subject to bias stemming from omitted mediators. However, procedures to simultaneously test for the causal effects of multiple mediators are still underdeveloped, what

[40] Hicks, Raymond, and Tingley 2011.
[41] Blackwell 2013.

limited our ability to analyze their joint effects. (We did, however, try out such analyses, employing Structural Equation Models, and results from these analyses are available on request).

In Table J2, we replicate the first stage of the mediation analysis. It reports coefficients for the effects of Party Strength on each mediator following the specifications of our benchmark model. These additional tests provide supplementary evidence on the theoretically expected relationships between party strength and the various mediators (to reiterate: due to software limitations Table J1 estimates only robust standard errors; Table J2 follows the specification of the benchmark model and estimates clustered standard errors, which typically leads to increased errors). The clearest results, in terms of statistical significance, pertain to investments (Model 3) and Irregular Leader Exits (Model 5); Party Strength enhances the former, but mitigates the latter.

Figure J1: Mediation Analysis, design

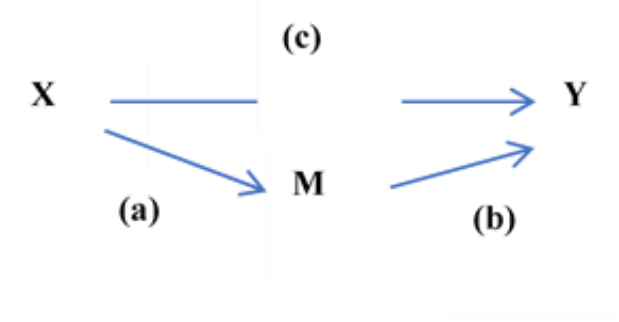


Table J1: Test of Causal Mechanisms, Mediation Analysis

	1	**2**	**3**	**4**	**5**	**6**
Mediator	Life Expectancy	Infant Mortality	Investment	Inflation	Exit, Irregular	Internal Conflict
ACME	0.067 (-0.001, 0.139)	0.105 (0.053, 0.16)	0.041 (-0.05, 0.137)	0.083 (0.027, 0.159)	0.069 (-0.003, 0.144)	0.106 (0.051, 0.17)
Direct Effect	1.421 (0.919, 1.948)	1.361 (0.839, 1.916)	0.854 (0.24, 1.488)	1.096 (0.438, 1.718)	1.654 (1.121, 2.189)	1.15 (0.636, 1.709)
Total Effect	1.488 (0.982, 1.992)	1.465 (0.935, 2.013)	0.895 (0.277, 1.54)	1.179 (0.55, 1.786)	1.722 (1.184, 2.248)	1.256 (0.746, 1.798)
Prop. Mediated	0.045 (0.034, 0.068)	0.072 (0.052, 0.112)	0.046 (0.026, 0.144)	0.070 (0.047, 0.151)	0.040 (0.031, 0.058)	0.085 (0.059, 0.142)
Obs	9669	8950	6426	6898	8588	8110
Countries	151	150	148	144	141	111
Years	109	109	60	109	109	109

ACME: Average Causal Mediation Effect. Prop. Mediated: Proportion of the Total Effect mediated by the Mediator. Mediation analysis performed using Hicks, Raymond and Tingley (2011) for Stata. Regressions are OLS with robust standard errors and country and year fixed effects. Confidence intervals for the effects estimated using sensitivity analysis (1000 simulations). Party Strength measured in t, mediators measured at t+1, and GDP per capita measured at t+2.

Table J2: Party Strength predicts mediators

	1	**2**	**3**	**4**	**5**	**6**
Mediator	Life Expectancy	Infant Mortality	Investment	Inflation	Exit, Irregular	Internal Conflict
Party Strength	0.020	-0.098	3.738***	-0.280*	-0.167***	-0.073*
	(0.020)	(0.062)	(1.311)	(0.162)	(0.050)	(0.042)
GDP per capita	-0.025	-0.497***	4.130***	-0.726***	0.070**	-0.088**
	(0.016)	(0.066)	(1.259)	(0.130)	(0.034)	(0.035)
Constant	3.684***	9.193***	-12.742	6.054***	-0.120	0.655***
	(0.115)	(0.456)	(10.677)	(0.902)	(0.234)	(0.239)
Obs	10021	9296	6615	7091	8910	8399
Countries	151	150	149	144	142	111
Min # Years	12	12	2	4	2	12
Avg # Years	66.364	61.973	44.396	49.243	62.746	75.667
Max # Years	111	111	61	100	111	111
R-squared (within)	0.802	0.874	0.098	0.22	0.09	0.077

Dependent variable is yearly rate of economic growth. Standard clustered by countries errors in parentheses. Estimator: OLS. Country and year fixed effects. Life expectancy, Infant Mortality, and Inflation are logged. * p<0.10, ** p<0.05, *** p<0.01

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