6 Appendix

6.1 Data description and sources

Table A1 provides descriptive statistics for the variables used in the analysis, as well as data source and time coverage.

6.1.1 Outcome and explanatory variables

Infant mortality is measured as the number of deaths prior to the age of 1 per 1,000 live births. We accessed the data through the V-Dem data set, which draws on Gapminder(Gapminder, 2017), with additional data imputed from Clio-Infra (Clio-Infra, 2014). Missing data within a time-series is interpolated and imputed by employing linear models.The infant mortality data stretches back to 1900 but in our analysis we only use data after 1950 due to limitations in the time coverage of the explanatory variables. In addition, Gapminder notes that historic estimates on mortality prior to 1950 are generally less accurate.

Figure A1 shows the development of our dependent variables over time in sub-Saharan Africa. The graphs depict a clear trend of improvement. Instances of infant and child deaths have been substantially reduced in recent years. Note, however, that these trends mask significant variation across countries (Chou et al., 2012). For instance, the lowest rate of infant mortality observed in our data is 11.7 deaths per 1,000 cases in Seychelles in 2015, while for the same year the highest rate is 96 per 1,000 cases in Angola. The highest rate ever seen in our data is 237.4 deaths per 1,000 cases in Mali in 1960.

We proxy for electrification with night-light data from the United States Air Force Defense Meteorological Satellite Program (DMSP) Nighttime Lights Time Series.[11] Min(Min et al., 2013) validates the measure to show that it is correlated with access to electrification – electrified villages appear brighter in satellite imagery because of the presence of streetlights, and brightness increases with the number of streetlights. Thus, we consider night lights to be a good proxy for infrastructure building. Following Alesina(Alesina et al., 2016) we use the average light values from all pixels within each spatial unit of analysis divided by the population to arrive at the measure we use in

[11] `https://ngdc.noaa.gov/eog/dmsp/downloadV4composites.html`

the regression analysis.

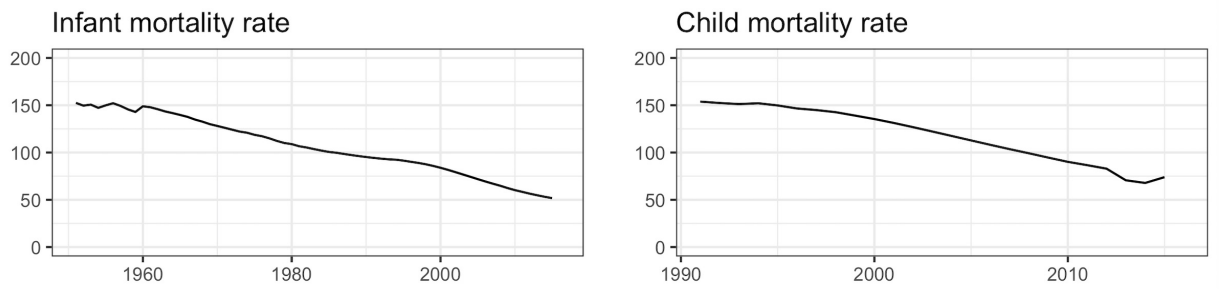

Figure A1: Trends in infant and child mortality.

We use data from the V-Dem data set for our main explanatory variables, share of women in parliament and women in civil society. Sub-Saharan Africa has experienced a dramatic increase in descriptive representation over the past two decades. However, as with progress toward our outcomes of interest, the region is also characterized by considerable variation. For instance, Rwanda leads the region with a 63.8% of women in parliament in 2015. At the lower end, the share of women in Comoros' parliament was 3% in 2015.

We incorporate data on gender quotas from V-Dem. The variable we use captures both voluntary quotas and reserved seats in the legislature.[12]

As proxy for democracy, we use V-Dem's *Clean Elections Index*, which captures the extent to which elections in a country are free and fair. We prefer this relatively narrow proxy for regime type since more comprehensive measures also capture the extent of freedom of discussion and freedom of association, aspects that are potentially correlated with the women's civil society participation index. We include the continuous version of V-Dem's *Clean Elections Index* as a confounding variable in all our models and a proxy for democracy. For the empirical tests considering democracy as institutional condition, we use V-Dem's ordinal index with 3 categories. We transform this variable to a binary one, where categories .5 and 1 are collapsed into one category.

The data on quality of elections, the political corruption index and women's civil society participation comes from the V-Dem data set, aggregating coding from more than 3,200 experts (Pemstein

[12]The variable ranges from 0-4, with the scores corresponding to the following: 0: No national level gender quota; 1: Yes, a statutory gender quota for all parties without sanctions for noncompliance; 2: Yes, statutory gender quota for all parties with weak sanctions for noncompliance; 3. Yes, statutory gender quota for all parties with strong sanctions for noncompliance; 4: Yes, there are reserved seats in the legislature for women.

et al., 2018).

6.1.2 Confounders

To capture the influence of international aid, we use a measure of the sum of commitments received from donors and international organizations. The source is AidData(Tierney et al., 2011) (accessed through QoG database). Data for donors is available since 1962, and for international organizations only since 1947, and the end of the time series is 2013.

Our data on GDP is measured on a per capita basis from the Maddison-Project(Bolt and Zanden, 2014), and was accessed through the V-Dem data set.

To account for the influence of corruption, we use V-Dem's *Political Corruption Index*, a comprehensive measure that taps into both petty and grand corruption as well as bribery and theft and practices aimed at influencing law making and that affecting implementation (Coppedge et al., 2017).

The presence of international or domestic conflict is extracted from the V-Dem data set, who draw on the Clio-Infra data set. The same source is used for the data on urban population (logged).

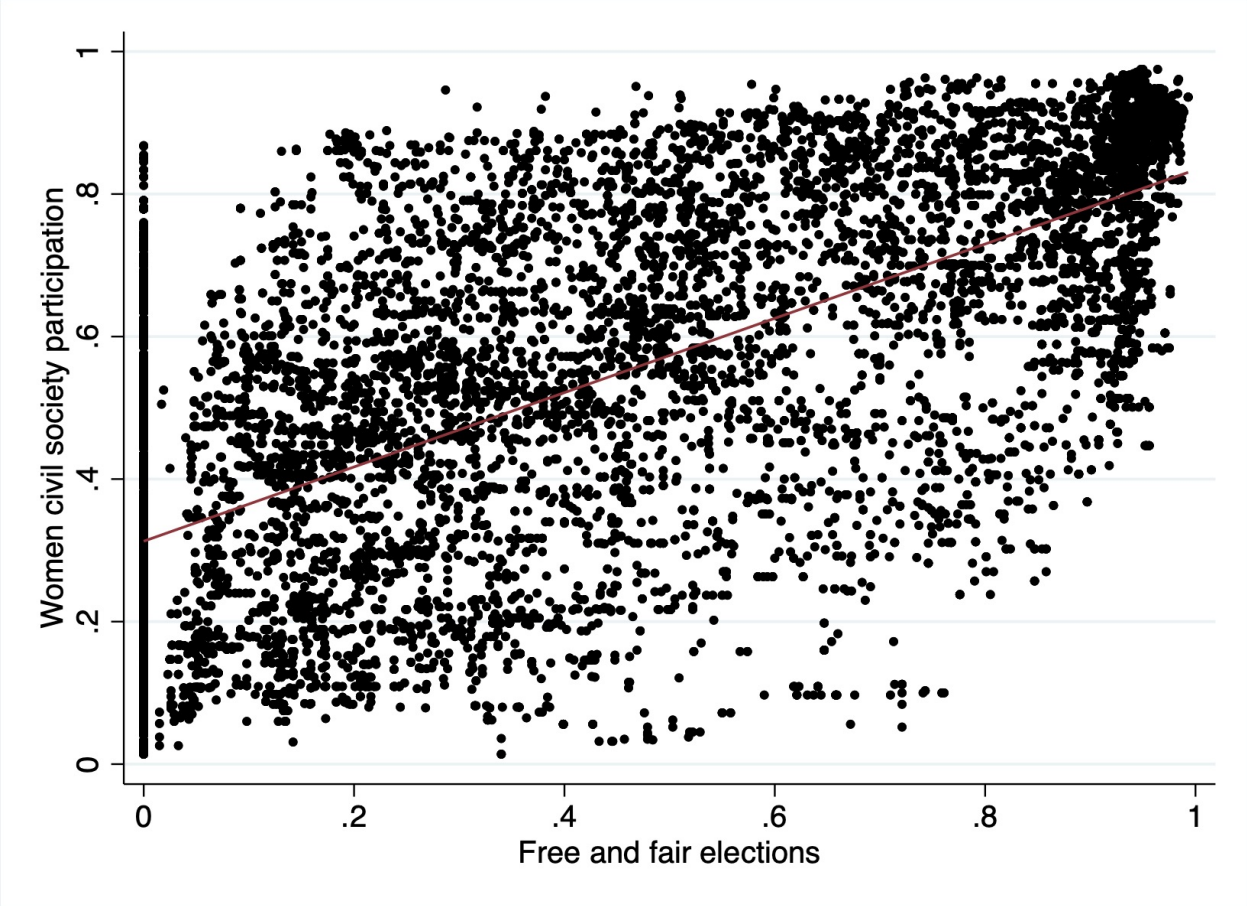

Figure A2: Correlation between Democracy and Women civil society participation.

Table A1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max	Source	Time Coverage
Dependent variables							
Infant mortality (log)	3,009	4.525	0.516	2.459	5.469	Gapminder	1950-2015
Public health expenditure	935	2.493	1.287	0.045	9.087	WDI	1995-2014
Public military expenditure	1,783	2.299	2.727	0.00003	39.607	WDI	1960-2014
Mortality rate, under 5	2,333	154.004	78.604	13.7	442.4	WDI	1960-2014
Nighttime lights	1,034	1.585	2.228	0.010	17.385	DMSP	1992-2013
Main explanatory variables							
Women in parliament	2,982	7.126	9.450	0.000	63.800	V-Dem	1900-2017
Women civil society	5,500	0.312	0.236	0.013	0.924	V-Dem	1900-2017
Intervening variables							
Gender quotas	17,391	0.164	0.715	0	4	V-Dem	1900-2017
Electoral systems	2,371	0.221	0.415	0	1	V-Dem	1900-2017
Clean elections index (binary)	5,500	0.297	0.457	0	1	V-Dem	1900-2017
Other determinants							
GDP per capita (log)	2,807	6.932	0.636	5.315	10.001	Maddison	1900-2010
Urban Population (log)	4,802	12.329	2.032	7.167	18.182	Clio-Infra	1950-2015
Free and fair elections	5,248	0.193	0.190	0.009	0.859	V-Dem	1900-2017
Foreign aid	2,069	19.396	1.438	10.069	23.404	AidData	1962-2013
Corruption	5,477	0.486	0.233	0.065	0.969	V-Dem	1900-2017
Violent conflict	5,477	0.486	0.233	0.065	0.969	V-Dem	1900-2017

6.2 Robustness checks

We estimate the following different model specifications to test the robustness of the results:

1. A parsimonious model to avoid post-treatment bias. This model explores within-country variation, accounting for country-specific omitted factors.
2. Year fixed effects added to the previous model.
3. Country fixed effects with one-year lags of the independent variables, which should be compared with the 5-year lags in our main models. The dependent variable is differenced by one year, which is a common strategy when the data is highly trended.[13]
4. Full model with all control variables, country and year fixed effects but with one year lag for the regional average in the dependent variable (as opposed to five years as in our main models).
5. Full model with all control variables but with country-fixed effects only.
6. The last model uses System-GMM estimator, which is appropriate in cases where the dependent variable is slow changing, and affected by its own past values. The system GMM estimator also mitigates problems stemming from the fact that the independent variables might not be strictly exogenous, and are therefore correlated with past or present realizations of the error term.(Arellano and Bover, 1995; Blundell and Bond, 1998) As advised by the literature, we estimate these models on five-year average panels.

[13]Dickey-Fuller tests for unit roots in panel data also suggest that all three dependent variables are stationary with a trend. The residuals in the fixed-effects models also contain unit root but not after differencing the data.

Table A2: Robustness checks for Infant mortality as outcome variable

	Dependent variable: Infant mortality					
	(1)	(2)	(3)	(4)	(5)	(6)
Women in parl.	-0.012***	-0.005*	-0.001***	-0.001***	-0.005*	-0.001*
	(0.004)	(0.003)	(0.000)	(0.000)	(0.003)	(0.001)
GDP per capita	-0.022	-0.054	0.007	0.016**	-0.035	0.003
	(0.069)	(0.047)	(0.006)	(0.008)	(0.041)	(0.009)
Urban population	-0.255***	0.066	0.005	-0.009	-0.033	0.000
	(0.023)	(0.085)	(0.004)	(0.018)	(0.069)	(0.001)
International aid			0.000	0.001	0.005	
			(0.001)	(0.001)	(0.009)	
Democracy			-0.018*	0.002	-0.136*	-0.002
			(0.011)	(0.013)	(0.078)	(0.023)
Corruption			-0.044***	-0.020	-0.259	
			(0.015)	(0.016)	(0.189)	
Regional average DV1				-46.495***		
				(0.362)		
Regional average DV5		-20.907***			0.838***	
		(7.318)			(0.152)	
LDV						0.986***
						(0.012)
N	1966	1901	1408	1411	1408	442
R^2	0.758	0.877	0.129	0.994	0.753	
Lag	5 years	5 years	1 year	5 years	5 years	5-year-panels
Model	Parsimonious	Parsimonious	Differenced DV			System-GMM
Model	Country FE	Two-way FE	Country FE	Two-way FE	Country FE	
N of instruments						65
Hansen J-test p-value						0.963
AR(2) test p-value						0.004

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Regression results accounting for dichotomous measures for women in parliament.

	(1) Infant mortality	(2) Infant mortality
Binary, Women in par.	0.0360	0.0185
	(0.0241)	(0.0261)
Women in parl.		-0.0028**
		(0.0013)
Regional Average DV	-37.2404***	-37.2905***
	(2.1805)	(2.3797)
GDP per capita	0.0567*	0.0614*
	(0.0290)	(0.0322)
International aid	-0.0037	0.0018
	(0.0054)	(0.0050)
Democracy	-0.0820*	-0.0689
	(0.0424)	(0.0524)
Urban population	-0.1019	-0.0691
	(0.0810)	(0.0848)
Corruption	-0.1679*	-0.2130**
	(0.0853)	(0.0883)
N	1457	1304
R^2	0.906	0.908
Countries	45	45

Standard errors in parentheses

Models based on data between 1958 and 2015.

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

Table A4: Regression results for Share of women in parliament and Night lights

	(1) Night lights	(2) Infant mortality
Women in parl.	0.000	-0.003**
	(0.000)	(0.001)
GDP per capita	-0.012	0.069***
	(0.008)	(0.024)
International aid	0.003**	0.011
	(0.002)	(0.007)
Democracy	0.018	0.125**
	(0.014)	(0.060)
Urban population	0.012	-0.298
	(0.007)	(0.210)
Corruption	0.000	0.057
	(0.012)	(0.116)
International conflict	-0.002	
	(0.002)	
Internal conflict	0.003	
	(0.003)	
LDV	0.420***	
	(0.059)	
Regional average DV		-37.717***
		(4.885)
N	405	361
R^2	0.310	0.895
Countries	27	27

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Models are based on data between 1994 and 2010.

Note that Model 2 in A4 estimates our main regression results for infant mortality on the same sub-sample for which data is available for the night-lights to rule out the possibility that the results are due to sample issues.

Table A5: Regression results for Share of women in parliament and control for societal changes.

	(1)	(2)	(3)	(4)
Women in parl.	-0.0052*	-0.0053*	-0.0037**	-0.0029**
	(0.0031)	(0.0031)	(0.0014)	(0.0013)
Beijing	0.0500			
	(0.0314)			
Mdg		-0.0630**		
		(0.0311)		
International conflict			-0.0919**	
			(0.0380)	
Internal conflict			0.0256	
			(0.0295)	
Gender quotas				-0.0277
				(0.0305)
GDP per capita	-0.0243	-0.0369	0.0145	0.0623*
	(0.0434)	(0.0395)	(0.0307)	(0.0327)
International aid	0.0081	0.0001	0.0126***	0.0011
	(0.0088)	(0.0097)	(0.0045)	(0.0052)
Democracy	-0.1602*	-0.1088	0.0152	-0.0564
	(0.0814)	(0.0769)	(0.0507)	(0.0524)
Urban population	-0.0663	-0.0161	-0.1025	-0.0605
	(0.0776)	(0.0677)	(0.1109)	(0.0836)
Corruption	-0.2718	-0.2240	-0.0439	-0.1911**
	(0.1858)	(0.1925)	(0.0964)	(0.0847)
Regional average	0.8508***	0.7669***	-36.3795***	-37.0970***
	(0.1515)	(0.1402)	(3.8332)	(2.3307)
N	1408	1408	773	1408
R^2	0.755	0.758	0.907	0.909

Standard errors, clustered by country, in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Models 1-3 are based on data between 1956 and 2015.
The data for model 4 starts in 1958.
Models use 5-year lags and two-way fixed effects.

Table A6: Regression results for Share of women in cabinet and infant mortality.

	(1)	(2)	(3)
Women in cabinet	-0.001	-0.002	-0.001
	(0.001)	(0.002)	(0.002)
GDP per capita	0.081*	-0.032	-0.022
	(0.044)	(0.058)	(0.044)
International aid	0.005	0.004	-0.008
	(0.007)	(0.008)	(0.013)
Democracy	-0.119**	-0.177***	-0.110
	(0.045)	(0.055)	(0.089)
Urban population	-0.109	-0.036	-0.318*
	(0.091)	(0.105)	(0.165)
Corruption	-0.227**	-0.317**	-0.061
	(0.091)	(0.135)	(0.144)
Regional average	-33.944***	0.541	
	(3.259)	(0.336)	
N	1033	1033	1033
R^2	0.736	0.514	0.631
Countries	44	44	44
Model	Two-way FE	Country FE	Two-way FE
Lag	5 years	5 years	1 year

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Models are based on data between 1982 and 2010.

Table A7: Regression results for Health and Military budgets.

	(1) Health expenditure	(2) Military expenditure
Women in parl.	0.025**	-0.030***
	(0.012)	(0.011)
GDP per capita	-0.629*	0.027
	(0.365)	(0.316)
International aid	0.171***	-0.098
	(0.059)	(0.143)
Democracy	-0.337	-2.212**
	(0.740)	(0.844)
Urban population	1.321**	0.391
	(0.620)	(0.312)
Corruption	0.344	-3.810*
	(1.119)	(2.092)
N	634	1072
R^2	0.192	0.092
Country FE	Yes	Yes
Country FE	43	43

Independent variables lagged with 1 year.
Models based on data between 1996-2011 for Model 1 and 1962-2011 for Model 2.
Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Regression results for interaction between women in parliament and women civil society participation.

	(1)	(2)
Women participation	-0.152*	0.046
	(0.083)	(0.111)
Women in parl.		0.027
		(0.022)
Women in parl. × Participation		-0.084*
		(0.047)
Regional average	-36.605***	-36.774***
	(2.137)	(2.193)
GDP per capita	0.050	0.061*
	(0.030)	(0.035)
International aid	-0.001	0.002
	(0.006)	(0.005)
Democracy	-0.054	-0.045
	(0.043)	(0.053)
Urban population	-0.100	-0.061
	(0.072)	(0.088)
Corruption	-0.144**	-0.193**
	(0.071)	(0.083)
N	1694	1408
R^2	0.909	0.910
Countries	45	45

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The models are based on data between 1956 and 2015 and two-way fixed effects.

Table A9: Regression results for Interaction terms between Share of women in parliament and Formal Representation (DV= Infant mortality)

	Dependent variable:		
	Infant mortality		
	(1)	(2)	(3)
Quotas	0.302***		
	(0.042)		
Electoral system		0.074***	
		(0.017)	
Democracy (bin.)			−0.016
			(0.011)
Women in parliament	−0.008**	−0.004	−0.005
	(0.004)	(0.004)	(0.005)
Women in parl. × Quotas	−0.124***		
	(0.015)		
Women in parl. × El. systems		−0.028***	
		(0.006)	
Women in parl. × Democracy (bin.)			−0.003
			(0.005)
Democracy	−0.064***	−0.031*	
	(0.015)	(0.018)	
GDP per capita	0.007	0.012	− 0.047
	(0.008)	(0.009)	(0.010)
Corruption	−0.085***	−0.132***	−0.124***
	(0.024)	(0.024)	(0.026)
Regional average DV	−34.702***	−30.931***	−36.188***
	(0.740)	(0.814)	(0.855)
Constant	177.775***	158.929***	186.473***
	(3.672)	(4.044)	(4.251)
Observations	1,886	1,518	1,493
R^2	0.965	0.975	0.972
Adjusted R^2	0.963	0.973	0.970
Countries	45	43	45

Note: *p<0.1; **p<0.05; ***p<0.01
Models use two-way fixed effects and five-year lags.
Data is available for years 1959-2015.