Constraining Governments
Online Appendix

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A Methodological note

To develop accountability subtypes representing vertical, horizontal and diagonal accountability we employ Bayesian hierarchical models that include structural modeling components; we estimate overall accountability using a hierarchical model that incorporates the sub-type indices.

We construct all indices using indicators from the V-Dem dataset v7.1 (Coppedge, Gerring, Lindberg, Skaaning, Teorell, Altman, Bernhard, Fish, Glynn, Hicken, Knutsen, Lührmann, Marquardt, Mechkova, McMann, Olin, Paxton, Pemstein, Pernes, Sanhueza Petrarca, von Römer, Saxer, Seim, Sigman, Staton, Stepanova & Wilson 2017).[1] Continuous indicators are aggregations of expert-coded data (Pemstein, Marquardt, Tzelgov, Wang, Krusell & Miri 2017). We use the statistical software JAGS (Plummer 2012), implemented in R with *runjags* (Denwood 2016), to estimate all quantities.

A.1 Subtypes

We conceptualize accountability as being an aggregation of three conceptually-distinct forms of accountability: vertical, horizontal, and diagonal. Each of these forms of accountability are themselves functions of multiple indicators, which are often hierarchically clustered about concepts and contingent upon the presence of institutions. As a result, we cannot measure any of these latent variables using a standard factor analysis (as described, for example, in Jackman (2009, Chapter 9)). This section provides a detailed description of the construction of the accountability sub-indices.

A.1.1 Vertical accountability

Measuring vertical accountability in our framework presents five main conceptual concerns. First, citizens living in a country which does not have an electoral regime have no opportunity—even in theory—to hold their leadership accountable through the practice of elections. As a result, non-electoral country-years should have a much lower level of vertical accountability than country-years in an electoral regime. Second, the quality of elections is of clear importance to vertical accountability, with the caveat that even the worst elections are better than none. Third, the percentage of a country's population which has the franchise is of clear relevance to its degree of vertical accountability: a government that is only accountable to 10 percent of its population is not accountable to 90 percent of its population, regardless of how free and fair its elections are for the chosen 10 percent. Fourth, vertical accountability is strongest in a political regime where the head of executive is elected, since such a structure allows citizens to hold even the most powerful official accountable. Fifth, parties provide structure by which citizens can hold political officials accountable within a regime, in both the presence and absence of elections.

As a result, an accurate measure of vertical accountability would take into account 1) the effect of being an electoral regime, 2) the quality of elections, 3) the percentage of the population to which the franchise has been extended, 4) whether or not the executive is elected and 5) the ability of opposition parties to challenge a regime.

Our measure of vertical accountability incorporates each of these five elements into its estimation procedure. We estimate vertical accountability as directly being a function of

[1] For details on individual indicators, see Appendix B.

1) having an electoral regime (i.e. elections), 2) the proportion of the population that has suffrage, 3) whether or not the head of executive is elected. We measure the influence of quality of elections and parties indirectly: quality of elections is a function of electoral regime (i.e. we assume non-electoral regimes have lower vertical accountability) and the activity of opposition parties is hierarchically nested within the overall measure of vertical accountability. We discuss each of these procedures in turn.

First, the equation for the estimated probability of having an electoral regime is $\Pr(y_i) = \phi(\zeta_i)$, where $\zeta_i = \beta_1 + \beta_2 \xi_i^{Vertical}$. In this equation, ϕ is the CDF of a normal distribution, $\xi^{Vertical}$ the estimated level of vertical accountability for country-year i, which we assume to be distributed $N(0, 1)$. Accordingly, y is distributed according to a Bernoulli distribution. We model the seven indicators of election quality—the degree to which elections actually facilitate vertical accountability—as a function of the linear predictor for having elections.[2] In mathematical form $z_{ij} \sim N(\gamma_{ij}, \omega_j)$, where $\gamma_{ij} = \kappa_{j1} + \kappa_{j2}\zeta_i$, where ζ_i is the linear predictor of being a electoral regime (the CDF-transformed probability of having elections).[3]

This parameterization essentially restricts estimates of non-electoral regimes to having a lower level of vertical accountability than electoral regimes, while allowing election quality to determine the level of vertical accountability within electoral regimes (conditional on the other nodes in the model, such as percent suffrage).

We model the enfranchised proportion of population as being a direct function of $\xi^{Vertical}$. More precisely, it follows a beta distribution, where $y_i \sim B(\mu_i\tau, [1 - \mu_i]\tau)$, where $\mu_i = \alpha_1 + \alpha_2 \xi_i^{Vertical}$ and τ a variance parameter with a vague $\Gamma(1, 1)$ prior. Since beta distributions are bounded (0,1), we set country-years with 100 percent suffrage at 0.999 and country-years without electoral regimes at 0.001. In effect, this procedure serves to further decrease the level of vertical accountability of countries with low suffrage by positioning them in relative proximity to countries without elections. At the same time, the often-weak correlation between suffrage and measures of election quality and party strength means that this variable does not overwhelm the other data in the model in practice.

We directly link the presence of an elected head of executive to $\xi^{Vertical}$. Given that there are unclear cases where an unelected official shares power with an elected head of executive—and such regimes generally have lower levels of vertical accountability than those in which an elected head of executive has unambiguous power—we incorporate this variable using a probit model with the manifest variable representing whether or not the head of executive is elected. The linear predictor is thus $\phi(\theta_i) = \lambda_1 + \lambda_2 \xi_i^{Vertical}$, where $\lambda_1 \sim N(0, 1)$ and $\lambda_2 \sim N(1, 1)$; though both priors are vague, the positive prior on Slope represents our

[2] We use the V–Dem clean elections index as the basis for determining indicators of election quality in this model, though we remove two indicators (Vote Buying, *v2elvotbuy* and Electoral Violence *v2elpeace*) for the sake of parsimony: they evinced low correlation with the underlying concept in earlier iterations of the project.

[3] We interpolate the values of election-quality variables from the previous election for years in which no election was held. Non-electoral regimes receive NAs for all election-quality variables, as there is no information about the quality of their (non-existent) elections, save that it is lower than those of electoral regimes. Due to the the high degree of missingness in variables of election quality, the priors on both β and κ are strong: $\beta_1 \sim N(6, .32)$ and $\beta_2 \sim N(11.5, 1)$; $\kappa_1 \sim N(-2, .71)$ and $\kappa_2 \sim N(.15, .22)$. Though we determined these prior values using trial and error, they also serve a theoretical purpose: we expect countries without an electoral regime to receive much lower scores on vertical accountability than a country with electoral regimes.

belief that this variable should have a positive relationship with vertical accountability.

Finally, we model the presence and capabilities of political parties as a separate latent variable that is nested within vertical accountability. This approach means that individual measures of party activities impact vertical accountability in aggregate (though the hierarchical parameterization privileges indicators with higher correlation with the underlying concept), preventing individual measures from overwhelming suffrage, elections and elected head of state in determining the value of a country-year's vertical accountability score. In practice, this strategy means that non-electoral regimes have lower estimated levels of vertical accountability than electoral regimes, regardless of the activities of parties.[4] More precisely, we model the $J = 3$ party variables as being distributed $N(\chi_{ij}, \sigma_j)$, where $\chi_{ij} = \pi_{j1} + \pi_{j2}\eta_i^{Parties}$ and $\eta_i^{Parties} \sim N(\xi_i^{Vertical}, \delta)$. Here δ allows the model to determine the degree to which the aggregate party index correlates with $\xi^{Vertical}$. All values of π have a vague $N(0, 1)$ prior.

Figure A.1 presents a path diagram for this index; Table A.1 relevant statistics. Note that the variance and correlation statistics in the table indicate that indicators related to clean elections tend to have a stronger influence on the index than those related to parties or the other election-related indicators of suffrage and elected executive (an unsurprising result given the prior on electoral regime), though the overall party index shows a strong relationship with the overall index as well. Also note that, among clean election indicators, EMB autonomy, election intimidation and free and fair elections show the strongest relationship with the overall vertical accountability index.

[4]In principle, if there were many non-electoral regimes that allowed opposition parties to form and operate freely, then there would be more overlap between electoral and non-electoral regimes in their vertical accountability scores.

Figure A.1: Vertical accountability

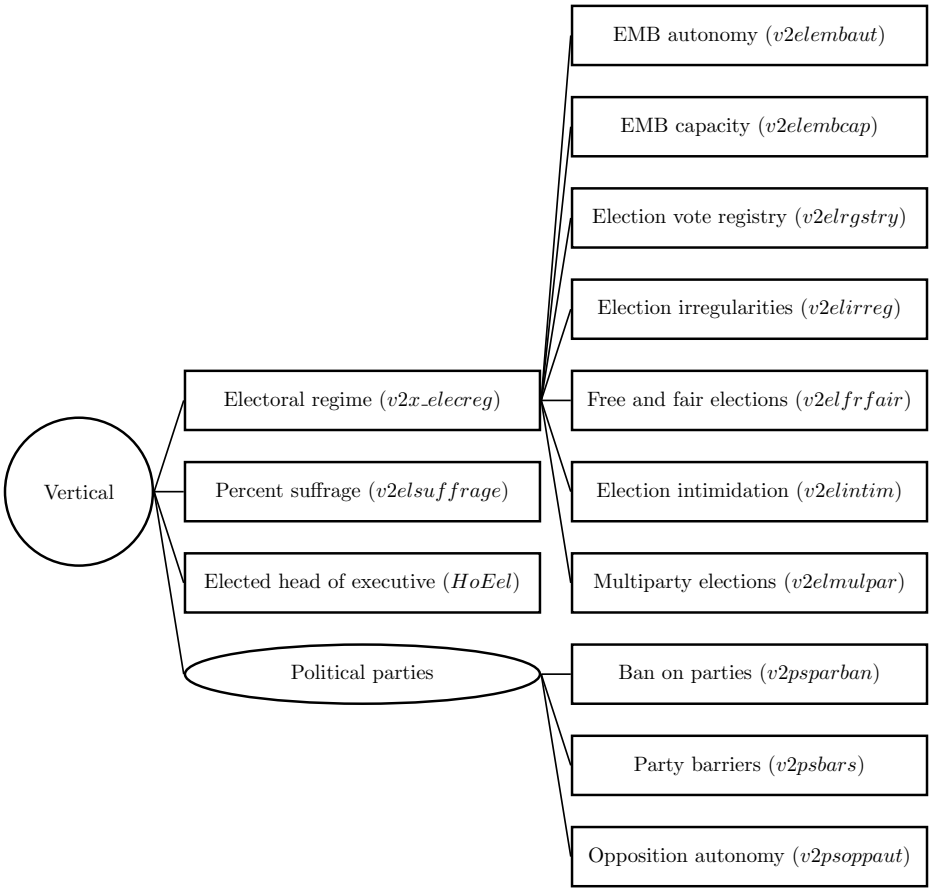


Table A.1: Vertical accountability statistics

	Intercept	Slope	Variance	ρ_1	ρ_2
Percent suffrage	(0.10, 0.13)	(0.62, 0.65)	(0.59, 0.61)[a]	0.78	
Elected executive	(0.13, 0.20)	(1.56, 1.65)	[b]	0.75	
Electoral regime	(5.40, 6.83)	(10.88, 13.67)	[b]	0.83	
EMB autonomy	(-2.22, -2.15)	(0.17, 0.21)	(0.38, 0.41)	0.94	
EMB capacity	(-1.29. -1.21)	(0.11, 0.14)	(0.93, 0.98)	0.74	
Election voter registry	(-1.55, -1.48)	(0.11, 0.14)	(0.76, 0.80)	0.77	
Election irregularities	(-1.63, -1.56)	(0.12, 0.14)	(0.85, 0.90)	0.76	
Election intimidation	(-2.19, -2.13)	(0.14, 0.18)	(0.44, 0.47)	0.90	
Election free and fair	(-2.36, -2.30)	(0.16, 0.20)	(0.30, 0.32)	0.95	
Election multiparty	(-2.03, -1.96)	(0.14, 0.17)	(0.66, 0.70)	0.85	
Parties			(0.43, 0.47)	0.88	
Party ban	(-0.10, -0.05)	(1.22, 1.26)	(0.43, 0.56)	0.73	0.92
Barriers to parties	(-0.02, 0.03)	(1.31, 1.35)	(0.35, 0.38)	0.84	0.96
Opposition autonomy	(0.01, 0.06)	(1.32, 1.37)	(0.46, 0.49)	0.77	0.94

Italics represent manifest variables that are conditional on higher-level manifest variables. [a]Variance parameter for a beta-distributed manifest variable. [b]Probit models without variance parameter. ρ_1 represents the correlation coefficient between the manifest variable and point estimate of vertical accountability. ρ_2 the equivalent statistic for a manifest variable and relevant lower-level index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 500 draws from 100,000 iterations (10,000 iteration burn-in).

A.1.2 Horizontal accountability

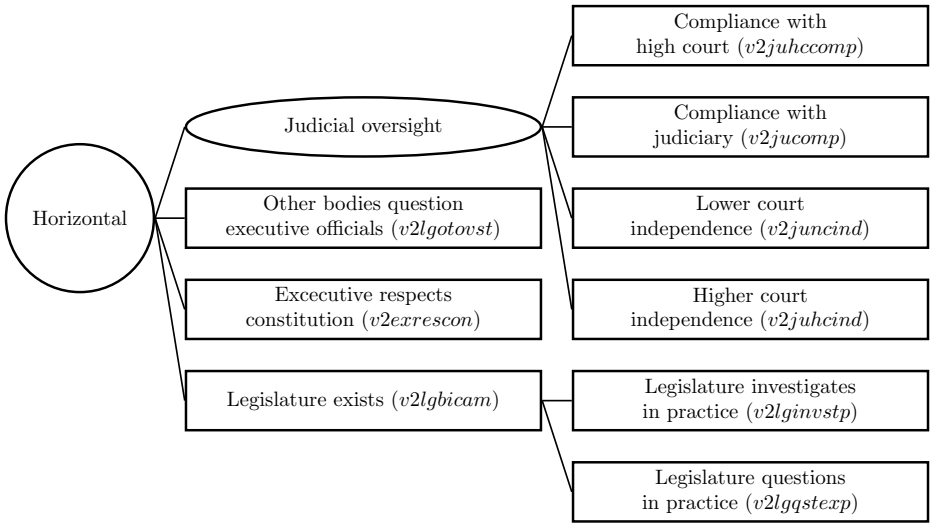
We conceptualize horizontal accountability as a function of four institutions: an independent investigative body, an executive who respects the constitutions, an independent judiciary, and a legislature that can counter the executive. We model both the activities of the independent investigative body and the degree to which an executive respects the constitution as directly influencing horizontal accountability; the activities of a legislature is a function of the presence of a legislature. the activities of the judiciary are a nested latent variable.

We use standard models to parameterize the indicators that directly load into horizonal accountability (an executive who respects the constitution and an independent investigating body): $y_{ij} \sim N(\mu_{ij}, \tau_j)$, where $\mu_{ij} = \epsilon_{j1} + \epsilon_{j2}\xi_i^{Horizontal}$. Here $\xi^{Horizontal}$ represents horizontal accountability in country-year i; and τ and ϵ are loading and precision parameters, respectively, for $j = 2$ manifest variables.[5] Note that, given this parameterization, the assumption is that a country that does not have an external investigative body is exchangeable with countries that do–that is, any countries with missing values for this variable will have values imputed based on the degree to which they have independent courts, active legislatures and executives who respect the constitution.

We use a model for the activities of a legislature that is similar to the quality of elections indicators in the vertical accountability index. More precisely, we model the degree to which a

[5]For identification purposes, we set the prior on the slope parameters regarding these variables to $N(1, 1)$ and restrict them to positive values. All other intercept parameters have values distributed according to an $N(0, 1)$ distribution.

Figure A.2: Horizontal accountability



legislature 1) investigates in practice and 2) questions the executive as functions of the linear predictor for the presence of a legislature. This parameterization implies that countries that do not have legislatures have lower values of horizontal accountability than countries that do, though the other elements of this model could overwhelm this prior belief. In mathematical form, $Pr(y_i) = \phi(\zeta_i)$, where $\zeta_i = \beta_1 + \beta_2 \xi_i^{Horizontal}$. In this equation, ϕ is the CDF of a normal distribution, $\xi^{Horizontal}$ the $N(0,1)$ estimated level of horizontal accountability for country-year i, and y is distributed according to a Bernoulli distribution. In turn, the degree to which a legislature investigates the executive is $z_{ij} \sim N(\gamma_{ij}, \omega_j)$, where $\gamma_{ij} = \kappa_{j1} + \kappa_{j2}\zeta_i$, where ζ_i in the linear predictor of a legislature existing and $j = 2$ κ and ω parameters for both variables reflecting the activities of a legislature.[6]

Finally, we model judicial accountability as being a latent variable $\eta_i^{Judiciary} \sim N(\xi_i^{Horizontal}, o)$, with its variables following a standard latent variable form, i.e. $y_{ij} \sim N(\xi_{ij}, \sigma_j)$, where $\xi_{ij} = \pi_{j1} + \pi_{j2}\eta_i^{Judiciary}$. As with parties in vertical accountability, this approach treats judiciary variables as having a largely cumulative impact on horizontal accountability, though the model weights individual judiciary variables with regard to the overall horizontal measure. All slope and intercept values are distributed according to an $N(0,1)$ distribution.

Figure A.2 presents the path diagram for horizontal accountability and A.2 relevant statistics. Note that the variance and correlation statistics indicate that degree to which other bodies question the executive and the legislature investigates in practice show the strongest relationship with the overall index of horizontal accountability.

[6]For identification purposes, we set the prior on the slope parameter on the existence of a legislature to $N(1,1)$ and restrict it to positive values. All other intercept and slope parameters related to the activities of a legislature have values distributed according to an $N(0,1)$ distribution.

Table A.2: Horizontal accountability statistics

	Intercept	Slope	Variance	ρ_1	ρ_2
Executive respects constitution	(0.16, 0.20)	(1.09, 1.13)	(0.71, 0.75)	0.84	
Other bodies question	(-0.16, -0.12)	(1.21, 1.25)	(0.36, 0.39)	0.92	
Judiciary			(0.48, 0.53)	0.88	
Compliance with judiciary	(0.16, 0.20)	(0.98, 1.01)	(0.38, 0.42)	0.77	0.92
Compliance with high court	(0.24, 0.28)	(0.96, 1.00)	(0.48, 0.53)	0.72	0.89
Higher court independence	(-0.00, 0.04)	(0.91, 0.95)	(0.50, 0.54)	0.74	0.88
Lower court independence	(0.18, 0.22)	(0.93, 0.97)	(0.56, 0.62)	0.72	0.87
Legislature exists	(0.73, 0.78)	(0.41, 0.47)	[a]	0.30	
Legislature investigates	(-2.62, -2.35)	(2.90, 3.27)	(0.25, 0.27)	0.96	
Legislature questions	(-1.95, -1.73)	(2.40, 2.71)	(0.58, 0.62)	0.85	

Italics represent manifest variables that are conditional on higher-level manifest variables. [a]Probit models without variance parameter. ρ_1 represents the correlation coefficient between the manifest variable and point estimate of horizontal accountability. ρ_2 the equivalent statistic for a manifest variable and relevant lower-level index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 1,000 draws from 50,000 iterations (5,000 iteration burn-in).

A.1.3 Diagonal accountability

We conceptualize diagonal accountability as a hierarchical latent variable model. Specifically, we argue that diagonal accountability is a function of four institutions: media freedom, freedom of expression, civil society organizations, and an engaged society. All of these institutions, save an engaged society, are themselves latent variables that manifest in 3-6 variables each. More precisely, $y_{ijk} \sim N(\xi_{ijk}, \sigma_{jk})$, where $\xi_{ijk} = \pi_{jk1} + \pi_{jk2}\eta_i^j$. Here, y represents the manifest variable for country-year i, institution j (j representing civil society, freedom of expression or media freedom) and institution-variable k ($k = 1, 2, 3$ for civil society, $k = 1, ..., 4$ for freedom of expression, and $k = 1, ..., 6$ and media freedom), and σ precision parameters for each manifest variable with a vague prior distribution. Each η for country-year i and institution j is distributed $N(\xi_i^{Diagonal}, o_j)$, where $\xi^{Diagonal}$ is the degree of diagonal accountability in country-year i and o an institution-specific precision parameter. Engaged society is the only institution with a single manifest variable, and we therefore model it as a standard latent variable manifest variable, i.e. $y_i \sim (\mu_i, \tau)$ where $y_i = \eta_1 + \eta_2\xi_i^{Diagonal}$ and τ a precision parameter with a vague prior distribution. For identification purposes, we set the prior on the slope parameter for engaged society to $N(1, 1)$ and restrict it to positive values; all other slope and intercept parameters are distributed according to an $N(0, 1)$ distribution.

Figure A.3 presents the path diagram for this latent variable, and Table A.3 the relevant statistics. Note that the indices for freedom of discussion, media freedom and civil society have the highest correlations with the diagonal accountability index; within these indices freedom of discussion for both men and women, media bias, critical media, government repression of civil society, and openness to entry and exit for civil society organizations have the highest correlation with diagonal accountability.

Figure A.3: Diagonal accountability

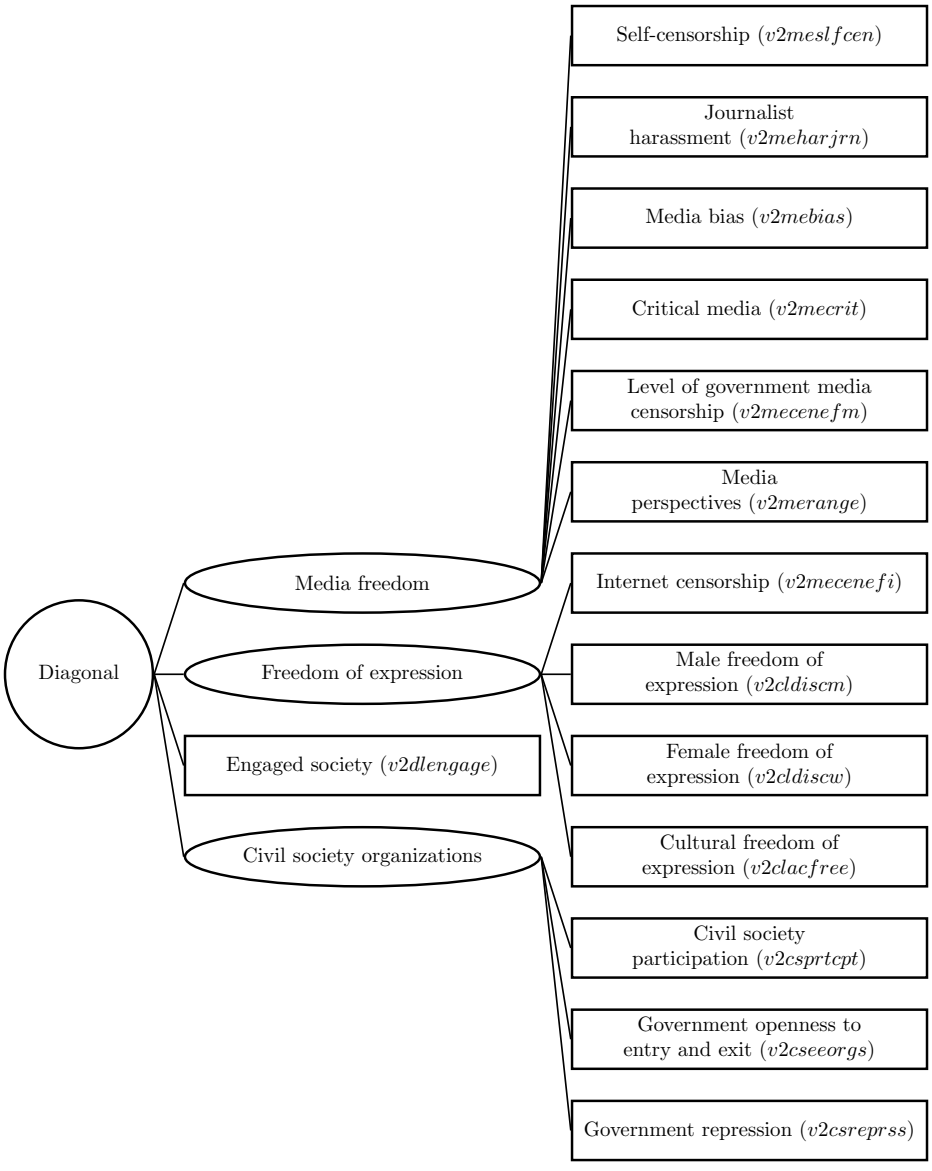


Table A.3: Diagonal accountability statistics

	Intercept	Slope	Variance	ρ_1	ρ_2
Engaged society	(-0.20, -0.16)	(1.24, 1.28)	(0.50, 0.52)	0.88	
Freedom of discussion			(0.10, 0.11)	0.97	
Freedom of discussion (men)	(0.02, 0.06)	(1.45, 1.48)	(0.14, 0.15)	0.94	0.98
Freedom of discussion (women)	(-0.07, -0.03)	(1.37, 1.41)	(0.24, 0.26)	0.91	0.96
Academic and cultural expression	(0.05, 0.10)	(1.33, 1.36)	(0.43, 0.45)	0.89	0.92
Internet censorship	(-0.66, -0.59)	(1.22, 1.28)	(0.44, 0.49)	0.87	0.88
Media freedom			(0.08, 0.09)	0.98	
Media bias	(-0.25, -0.20)	(1.45, 1.48)	(0.35, 0.37)	0.91	0.94
Critical media	(-0.14, -0.09)	(1.44, 1.47)	(0.32, 0.34)	0.91	0.95
Media perspectives	(-0.21, -0.17)	(1.37, 1.40)	(0.32, 0.34)	0.90	0.94
Media censorship	(-0.15, -0.10)	(1.30, 1.33)	(0.41, 0.43)	0.90	0.91
Journalist harassment	(-0.11, -0.06)	(1.32, 1.35)	(0.50, 0.53)	0.88	0.90
Media self-censorship	(-0.15, -0.11)	(1.23, 1.26)	(0.44, 0.46)	0.87	0.90
Civil society			(0.03, 0.04)	1.00	
Government repression	(0.09, 0.13)	(1.31, 1.35)	(0.34, 0.36)	0.92	0.93
Popular participation in civil society	(-0.06, -0.02)	(1.18, 1.21)	(0.56, 0.59)	0.85	0.86
Openness to entry and exit	(-0.03, 0.01)	(1.42, 1.45)	(0.23, 0.25)	0.95	0.97

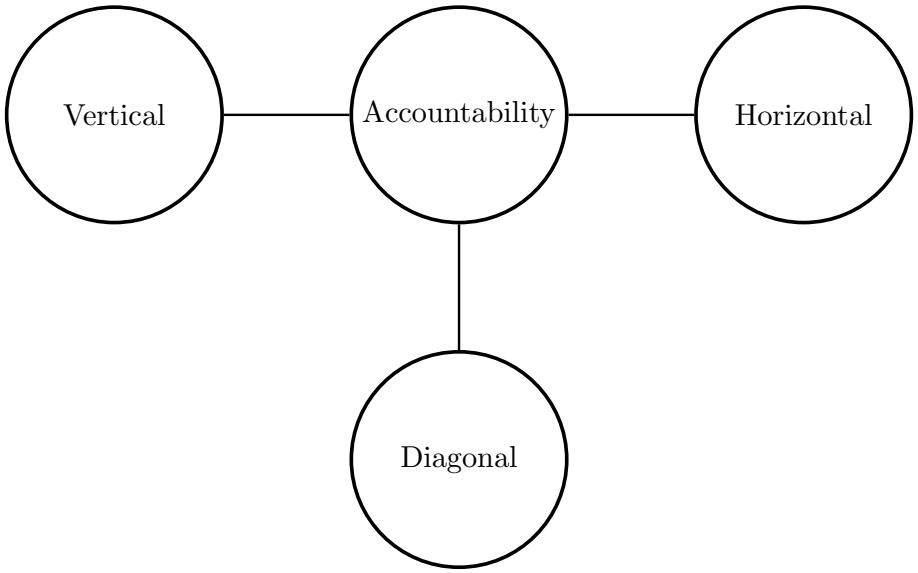
ρ_1 represents the correlation coefficient between the manifest variable and point estimate of diagonal accountability. ρ_2 the equivalent statistic for a manifest variable and relevant lower-level index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 1,000 draws from 50,000 iterations (5,000 iteration burn-in).

A.2 Aggregate indices

To create an aggregate measure of accountability, we conduct a hierarchical analysis using the sub-index models from the preceding section.[7] This model simply involves estimating $\xi_i^j \sim N(\iota_i, \rho_j)$, where ξ represents sub-index $j = Vertical, Horizontal, Diagonal$ and observation i, ι representing the measure of overall accountability (distributed according to a $N(0, 1)$ distribution), and ρ a sub-index-specific measure of precision. This strategy assumes that overall accountability is a function of all variables included in the model, though the sub-indices structure this relationship. Figure A.4 illustrates this conceptualization, truncated to not include the individual components of each node for ease of presentation. Table A.4 presents relevant statistics.

Note that the relative contribution of individual indicators to their respective sub-indices diverges from that in the models in which the sub-indices were estimated independently, reflecting the the fact that overall estimate of accountability influences the estimation of the sub-indices in this model. Also note that the relative contribution of the Vertical and Diagonal Accountability indices to this model is greater than that of Horizontal Accountability. Accordingly, individual indicators from these types of accountability tend to have a stronger relationship with the overall measure of accountability. In particular, EMB autonomy, free and fair elections, freedom of discussion (men) and government openness to civil society entry and exit show particularly high correlations with the overall accountability index.

Figure A.4: Accountability



[7] Note that we relax the priors on election-related variables in vertical accountability in this model, since there is greater information available for identification.

Table A.4: Hierarchical accountability statistics

	Intercept	Slope	Variance	ρ_1	ρ_2
Vertical			(0.06, 0.07)	0.99	
Percent suffrage	(0.07, 0.10)	(0.42, 0.45)	(0.46, 0.48)[a]	0.59	0.63
Elected head of executive	(0.20, 0.25)	(1.09, 1.15)	[b]	0.62	0.65
Electoral regime	(0.74, 0.82)	(1.28, 1.38)	[b]	0.58	0.63
EMB autonomy	(-1.43, -1.36)	(1.21, 1.30)	(0.35, 0.37)	0.93	0.95
EMB capacity	(-0.71, -0.63)	(0.79, 0.85)	(0.99, 1.04)	0.68	0.71
Election voter registry	(-0.98, -0.92)	(0.78, 0.84)	(0.81, 0.86)	0.71	0.74
Election irregularities	(-1.02, -0.95)	(0.78, 0.84)	(0.95, 1.00)	0.67	0.72
Election intimidation	(-1.51, -1.44)	(1.01, 1.08)	(0.46, 0.49)	0.87	0.89
Election free and fair	(-1.61, -1.54)	(1.09, 1.17)	(0.34, 0.37)	0.90	0.93
Election multiparty	(-1.43, -1.36)	(1.00, 1.07)	(0.57, 0.61)	0.85	0.87
Parties			(0.17, 0.19)		
Party ban	(-0.10, -0.05)	(1.31, 1.35)	(0.53, 0.56)	0.82	0.82
Barriers to parties	(-0.02, 0.03)	(1.40, 1.45)	(0.39, 0.42)	0.88	0.89
Opposition autonomy	(0.01, 0.07)	(1.43, 1.48)	(0.42, 0.45)	0.87	0.87
Horizontal			(0.14, 0.16)	0.97	
Executive respects constitution	(0.15, 0.19)	(0.97, 1.01)	(0.92, 0.86)	0.73	0.78
Other bodies question	(-0.28, -0.24)	(1.13, 1.17)	(0.43, 0.46)	0.81	0.90
Judiciary			(0.54, 0.59)		
Compliance with judiciary	(0.16, 0.20)	(0.89, 0.93)	(0.44, 0.48)	0.70	0.74
Compliance with high court	(0.24, 0.28)	(0.88, 0.92)	(0.53, 0.58)	0.67	0.70
Higher court independence	(-0.00, 0.04)	(0.86, 0.90)	(0.45, 0.49)	0.70	0.73
Lower court independence	(0.18, 0.22)	(0.89, 0.92)	(0.51, 0.55)	0.70	0.72
Legislature exists	(0.92, 0.99)	(0.79, 0.86)	[b]	0.49	0.46
Legislature investigates	(-1.82, -1.73)	(1.49, 1.62)	(0.28, 0.30)	0.87	0.95
Legislature questions	(-1.35, -1.26)	(1.27, 1.39)	(0.53, 0.57)	0.82	0.86
Diagonal			(0.07, 0.09)	0.99	
Engaged society	(-0.20, -0.16)	(1.21, 1.24)	(0.47, 0.49)	0.88	0.89
Freedom of discussion			(0.11, 0.12)		
Freedom of discussion (men)	(0.01, 0.06)	(1.39, 1.43)	(0.14, 0.15)	0.91	0.93
Freedom of discussion (women)	(-0.07, -0.03)	(1.32, 1.36)	(0.24, 0.25)	0.89	0.91
Academic and cultural expression	(0.05, 0.10)	(1.28, 1.32)	(0.43, 0.45)	0.86	0.89
Internet censorship	(-0.66, -0.59)	(1.17, 1.23)	(0.45, 0.49)	0.83	0.86
Media freedom			(0.08, 0.09)		
Media bias	(-0.25, -0.20)	(1.40, 1.44)	(0.35, 0.37)	0.89	0.91
Critical media	(-0.14, -0.09)	(1.39, 1.42)	(0.32, 0.33)	0.89	0.91
Media perspectives	(-0.21, -0.17)	(1.32, 1.35)	(0.32, 0.34)	0.88	0.90
Media censorship	(-0.14, -0.10)	(1.25, 1.28)	(0.41, 0.43)	0.88	0.90
Journalist harassment	(-0.11, -0.06)	(1.27, 1.31)	(0.50, 0.52)	0.86	0.88
Media self-censorship	(-0.15, -0.11)	(1.18, 1.22)	(0.45, 0.47)	0.82	0.86
Civil society			(0.04, 0.05)		
Government repression	(0.09, 0.13)	(1.26, 1.29)	(0.34, 0.36)	0.88	0.91
Popular participation in civil society	(-0.06, -0.02)	(1.13, 1.17)	(0.55, 0.58)	0.83	0.84
Openness to entry and exit	(-0.03, 0.01)	(1.36, 1.39)	(0.23, 0.25)	0.91	0.94

Italics represent manifest variables that are conditional on higher-level manifest variables. [a]Variance parameter for a beta-distributed manifest variable. [b]Probit models without variance parameter. ρ_1 represents the correlation coefficient between the manifest variable and point estimate of accountability. ρ_2 the equivalent statistic for a manifest variable and relevant accountability sub-index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 1,000 draws from 50,000 iterations (5,000 iteration burn-in).

A.3 Robustness checks

To examine the effect of the modeling strategy on the estimate of overall accountability, we also create two alternative indices of overall accountability. In the first, we treat the sub-indices of accountability as manifest variables, and use a standard Bayesian factor analysis to estimate accountability. Figure A.5 presents a path diagram for this model, and Table A.5 presents relevant statistics. Note that this modeling strategy results in Diagonal Accountability overwhelming the other types of accountability in the estimation procedure, showing an almost perfect correlation with the point estimate of the resulting aggregated accountability index.

Second, we estimate an overall accountability index using a standard Bayesian factor analysis model that uses as manifest variables the individual components of each type of accountability. For example, we include point estimates from latent variables of party quality and electoral accountability as indicators that directly load into the concept of accountability, without mediation by a Vertical Accountability Index. With the exception of electoral accountability, all manifest variables in this analysis correspond to nodes in the path diagrams in Figures A.1, A.2 and A.3. We combined the indicators related to elections into an overall index, illustrated in Figure A.6, because they are related to a single, coherent concept. Statistics related to the nodes estimated as nested latent variable models in their respective accountability type indices are reported in Section A.4.

Figure A.7 presents a path diagram of this model and Table A.6 relevant statistics. Note that, as with previous model, the variance and correlation statistics in the table clearly indicate that indicators related to diagonal accountability are driving the estimation of the overall accountability index, with indicators related to freedom of expression, media freedom and civil society showing a relationship with the overall accountability index that is much stronger than that of other indicators.

Given that our conceptual framework holds that accountability is a function of all three types, the fact that the hierarchical model of accountability affords vertical and horizontal accountability greater weight in the estimation procedure is strong evidence that this model is preferable. However, we further compare point estimates from the three models, with Table A.7 presenting a table of correlations (including the independently-estimated models of Vertical, Horizontal and Diagonal Accountability) and Figure A.8 providing a graphical representation of the relationship between different estimation strategies for overall accountability. The output from all three measures of accountability are highly correlated, though Figure A.8 indicates that, especially in the case of the hierarchical accountability model (accountability), this high correlation belies a great deal of variation between models in their

Table A.5: Aggregated accountability index statistics

	Intercept	Slope	Variance	ρ
Vertical	(-0.00, 0.03)	(0.80, 0.83)	(0.24, 0.25)	0.88
Horizontal	(-0.01, 0.01)	(0.79, 0.81)	(0.25, 0.26)	0.87
Diagonal	(-0.01, 0.01)	(0.94, 0.96)	(0.06, 0.07)	0.99

ρ represents the correlation coefficient between the manifest variable and point estimate of aggregated accountability index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 1,000 draws from 50,000 iterations (5,000 iteration burn-in).

Figure A.5: Aggregated accountability

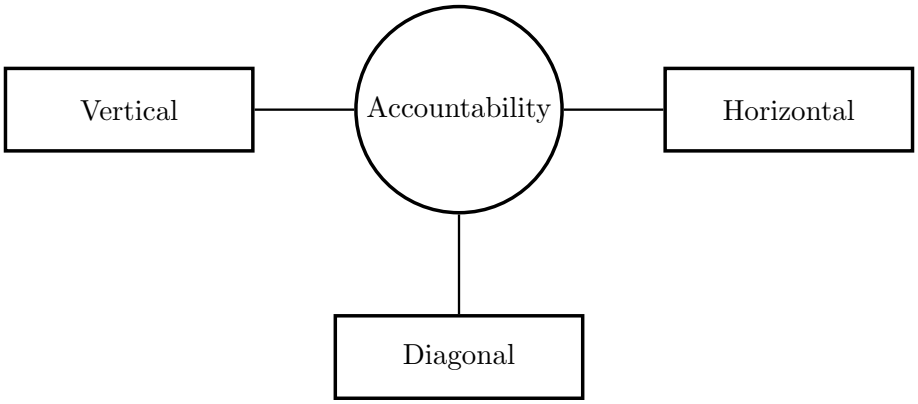


Figure A.6: Electoral accountability

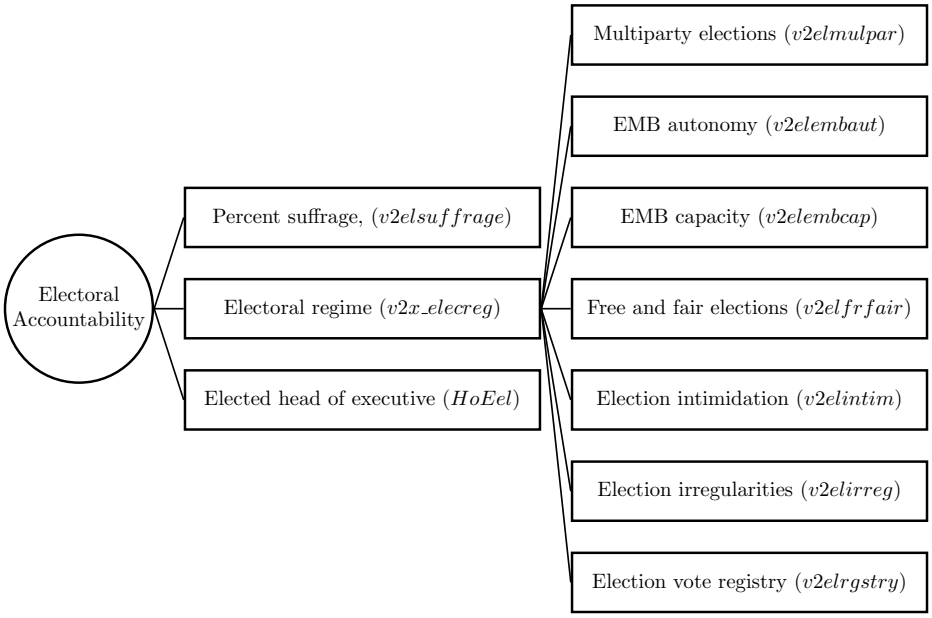


Figure A.7: Directly-estimated accountability path diagram

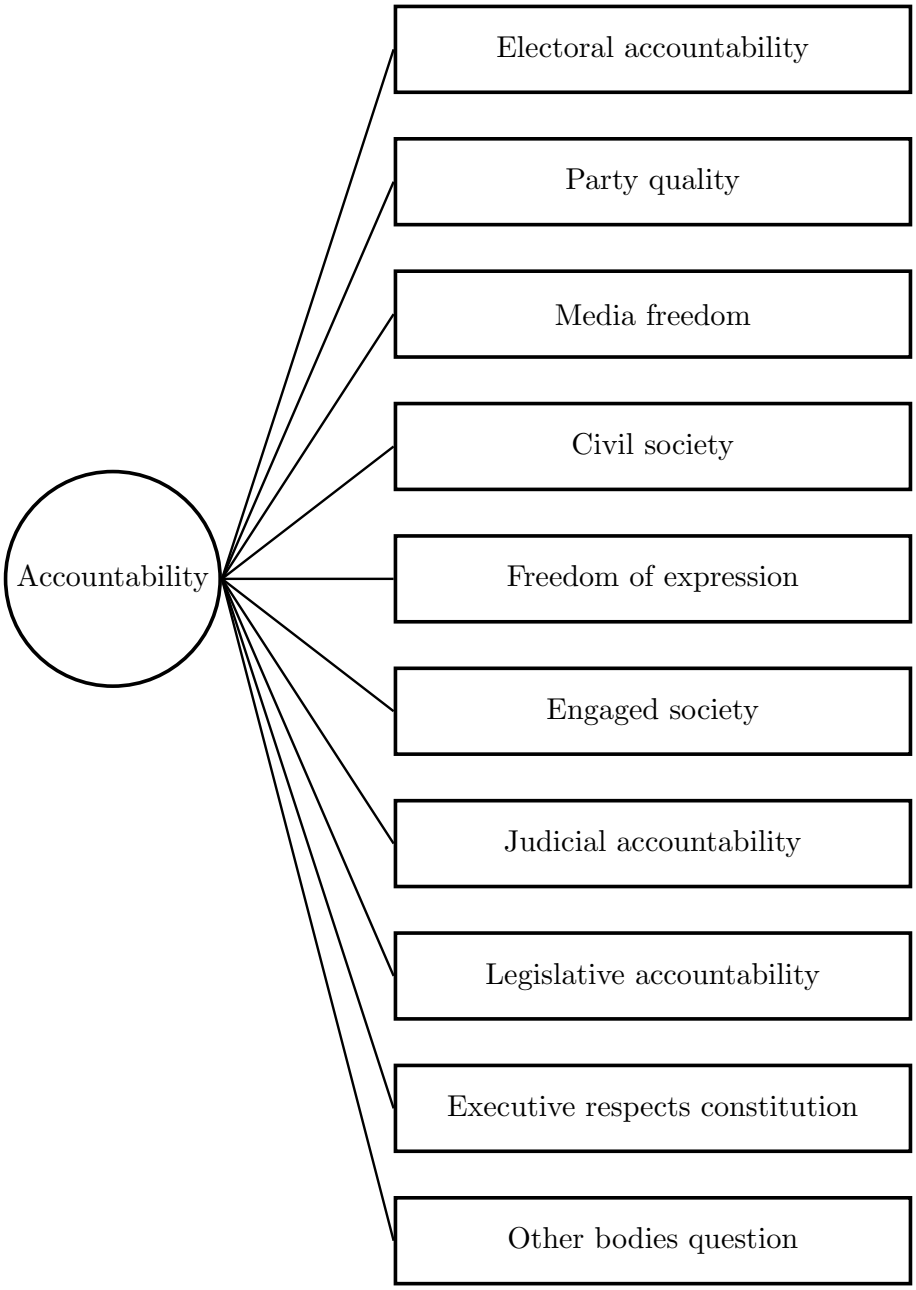


Table A.6: Directly-estimated accountability index statistics

	Intercept	Slope	Variance	ρ
Electoral accountability	(0.01, 0.04)	(0.74, 0.76)	(0.18, 0.19)	0.82
Party quality	(-0.01, 0.01)	(0.86, 0.88)	(0.28, 0.29)	0.91
Executive respects constitution	(0.16, 0.20)	(0.96, 1.00)	(0.99, 1.02)	0.71
Other bodies question	(-0.24, -0.20)	(1.03, 1.07)	(0.80, 0.84)	0.76
Judicial accountability	(-0.02, 0.01)	(0.71, 0.73)	(0.38, 0.40)	0.77
Legislative accountability	(-0.01, 0.01)	(0.74, 0.76)	(0.42, 0.44)	0.76
Engaged society	(-0.20, -0.16)	(1.25, 1.29)	(0.47, 0.50)	0.89
Freedom of expression	(-0.01, 0.01)	(0.91, 0.93)	(0.12, 0.13)	0.95
Media freedom	(-0.01, 0.01)	(0.92, 0.94)	(0.10, 0.11)	0.96
Civil society	(-0.02, 0.01)	(0.91, 0.93)	(0.11, 0.11)	0.95

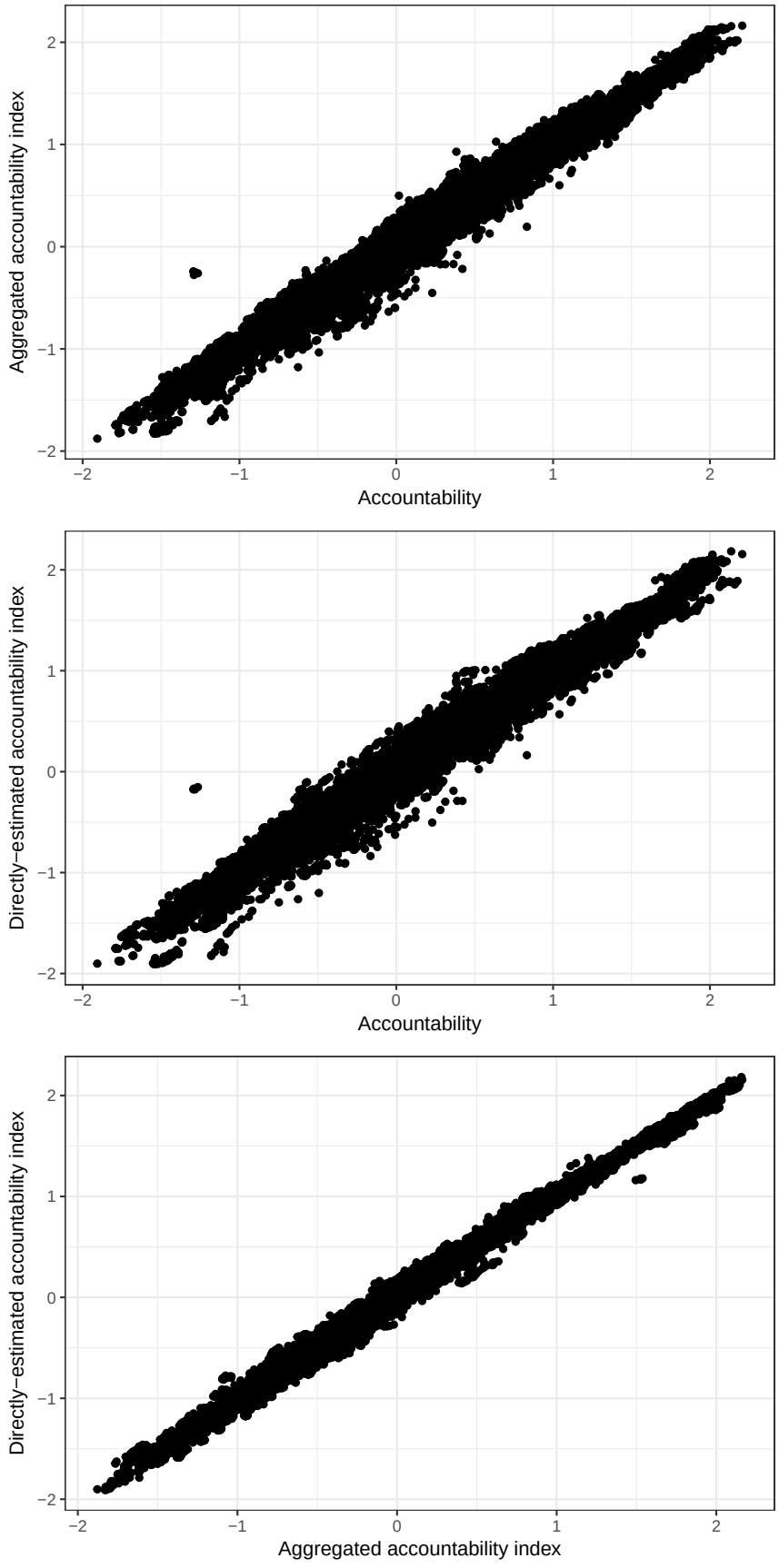
ρ represents the correlation coefficient between the manifest variable and point estimate of directly-estimated accountability index. Loadings and uniqueness values represent 95 percent HPD intervals across 8 MCMC chains, each with 500 draws from 50,000 iterations (5,000 iteration burn-in).

Table A.7: Correlation between point estimates of different accountability indices

	Accountability	Aggregated accountability	Directly-estimated accountability
Aggregated accountability	0.99		
Directly-estimated accountability	0.99	1.00	
Vertical accountability	0.91	0.88	0.87
Diagonal accountability	0.97	0.99	0.99
Horizontal accountability	0.88	0.87	0.85

precise estimates of accountability. It is also worth noting that, while Diagonal Accountability has the highest correlation with the output of all three models of accountability relative to other types of accountability, the relative relationship between Diagonal Accountability and overall accountability is the lowest in the hierarchical model.

Figure A.8: Relationship between point estimates of accountability indices



A.4 Statistics for directly-estimated accountability nodes

Table A.8: Electoral accountability index statistics

	Intercept	Slope	Variance	ρ
Percent suffrage	(0.11, 0.14)	(0.65, 0.68)	(0.62 0.64)[a]	0.80
Elected head of executive	(0.05, 0.12)	(1.62, 1.72)	[b]	0.77
Electoral regime	(5.18, 6.33)	(12.71, 15.26)	[b]	0.87
EMB autonomy	(-2.36, -2.29)	(0.17, 0.21)	(0.41, 0.44)	0.93
EMB capacity	(-1.40, -1.32)	(0.12, 0.14)	(0.91, 0.96)	0.74
Election voter registry	(-1.68, -1.60)	(0.12, 0.14)	(0.74, 0.78)	0.78
Election irregularities	(-1.78, -1.70)	(0.12, 0.14)	(0.81, 0.86)	0.77
Election intimidation	(-2.34, -2.27)	(0.15, 0.18)	(0.43, 0.46)	0.91
Election free and fair	(-2.52, -2.44)	(0.16, 0.19)	(0.30, 0.32)	0.95
Election multiparty	(-2.13, -2.05)	(0.14, 0.16)	(0.71, 0.75)	0.83

Italics represent manifest variables that are conditional on higher-level manifest variables. [a]Variance parameter for a beta-distributed manifest variable. [b]Probit models without variance parameter. ρ represents the correlation coefficient between the manifest variable and point estimate of electoral accountability index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 500 draws from 500,000 iterations (50,000 iteration burn-in).

Table A.9: Party quality index statistics

	Intercept	Slope	Variance	ρ
Party ban	(-0.10, -0.05)	(1.50, 1.54)	(0.43, 0.46)	0.95
Barriers to parties	(-0.02, 0.03)	(1.54, 1.58)	(0.48, 0.52)	0.94
Opposition autonomy	(0.02, 0.07)	(1.60, 1.64)	(0.41, 0.44)	0.96

ρ represents the correlation coefficient between the manifest variable and point estimate of party quality index. Loadings and uniqueness values represent 95 percent HPD intervals across eight MCMC chains, each with 500 draws from 5,000 iterations (500 iteration burn-in).

Table A.10: Legislative accountability index statistics

	Intercept	Slope	Variance	ρ
Legislature exists	(0.72, 0.83)	(0.37, 0.68)	[a]	0.86
Legislature investigates	(-2.87, -2.13)	(2.20, 3.70)	(0.00, 0.81)	1.00
Legislature questions	(-2.05, -1.36)	(1.62, 2.93)	(0.57, 0.75)	0.79

Italics represent manifest variables that are conditional on higher-level manifest variables. [a]Probit models without variance parameter. ρ represents the correlation coefficient between the manifest variable and point estimate of legislative accountability index. Loadings and uniqueness values represent 95 percent HPD intervals across 16 MCMC chains, each with 250 draws from one million iterations (100,000 iteration burn-in). Note that information provided to dichotomous indicator of legislature existence insufficient to weight observations without legislatures. In dataset, point estimates for observations without legislatures set to the negative equivalent of the maximum value across point estimates, then normalized.

Table A.11: Judicial accountability index statistics

	Intercept	Slope	Variance	ρ
Compliance with judiciary	(0.16, 0.20)	(1.09, 1.27)	(0.29, 0.68)	0.89
Compliance with high court	(0.24, 0.28)	(1.08, 1.26)	(0.36, 0.76)	0.86
Higher court independence	(-0.00, 0.04)	(1.05, 1.24)	(0.31, 0.69)	0.92
Lower court independence	(0.18, 0.22)	(1.08, 1.27)	(0.36, 0.76)	0.91

ρ represents the correlation coefficient between the manifest variable and point estimate of judicial accountability index. Loadings and uniqueness values represent 95 percent HPD intervals across 8 MCMC chains, each with 500 draws from one million iterations (100,000 iteration burn-in). Note that model did not converge due to clear bimodality in the latent variable distribution.

Table A.12: Civil society index statistics

	Intercept	Slope	Variance	ρ
Government repression	(0.09, 0.13)	(1.31, 1.34)	(0.40, 0.43)	0.92
Popular participation in civil society	(-0.06, -0.02)	(1.18, 1.22)	(0.60, 0.64)	0.85
Openness to entry and exit	(-0.04, 0.01)	(1.48, 1.51)	(0.12, 0.15)	0.99

ρ represents the correlation coefficient between the manifest variable and point estimate of civil society index. Loadings and uniqueness values represent 95 percent HPD intervals across 8 MCMC chains, each with 500 draws from one million iterations (100,000 iteration burn-in).

Table A.13: Freedom of expression index statistics

	Intercept	Slope	Variance	ρ
Freedom of discussion (men)	(0.01, 0.06)	(1.53, 1.57)	(0.11, 0.13)	0.99
Freedom of discussion (women)	(-0.07, -0.03)	(1.45, 1.48)	(0.23, 0.25)	0.96
Academic and cultural expression	(0.05, 0.10)	(1.38, 1.42)	(0.47, 0.49)	0.91
Internet censorship	(-0.61, -0.54)	(1.25, 1.31)	(0.49, 0.54)	0.86

ρ represents the correlation coefficient between the manifest variable and point estimate of freedom of expression index. Loadings and uniqueness values represent 95 percent HPD intervals across 8 MCMC chains, each with 500 draws from 5,000 iterations (500 iteration burn-in).

Table A.14: Media freedom index statistics

	Intercept	Slope	Variance	ρ
Media bias	(-0.25, -0.20)	(1.51, 1.55)	(0.34, 0.36)	0.95
Critical media	(-0.14, -0.09)	(1.50, 1.54)	(0.30, 0.32)	0.95
Media perspectives	(-0.21, -0.17)	(1.43, 1.46)	(0.30, 0.32)	0.95
Media censorship	(-0.14, -0.10)	(1.33, 1.37)	(0.44, 0.47)	0.91
Journalist harassment	(-0.11, -0.06)	(1.37, 1.40)	(0.53, 0.55)	0.90
Media self-censorship	(-0.15, -0.11)	(1.28, 1.31)	(0.43, 0.45)	0.90

ρ represents the correlation coefficient between the manifest variable and point estimate of media freedom index. Loadings and uniqueness values represent 95 percent HPD intervals across 8 MCMC chains, each with 500 draws from 5,000 iterations (500 iteration burn-in).

B Accountability indicators

All variable descriptions from Coppedge, Gerring, Lindberg, Skaaning, Teorell, Altman, Bernhard, Fish, Glynn, Hicken, Knutsen, Marquardt, Mechkova, McMann, Paxton, Pem-

stein, Saxer, Staton, Seim, Sigman & Staton (2017).

B.1 Vertical accountability indicators

Indicator	Question text	Answer categories
Elected executive (HoEel)	Is the chief executive (Head of State or Head of Government) directly elected in multi-party elections, or by directly elected parliament?	0: No. 1: Yes.
Percent Suffrage (v2elsuffrage)	What percentage of adult citizens (as defined by statute) has the legal right to vote in national elections?	Percent.
	Clean elections	
Electoral regime index (v2x_elecreg)	At this time, are regularly scheduled national elections on course, as stipulated by election law or well-established precedent?	0: No. 1: Yes.
EMB autonomy (v2elembaut)	Does the Election Management Body (EMB) have autonomy from government to apply election laws and administrative rules impartially in national elections?	0: No. The EMB is controlled by the incumbent government, the military, or other de facto ruling body. 1: Somewhat. The EMB has some autonomy on some issues but on critical issues that influence the outcome of elections, the EMB is partial to the de facto ruling body. 2: Ambiguous. The EMB has some autonomy but is also partial, and it is unclear to what extent this influences the outcome of the election. 3: Almost. The EMB has autonomy and acts impartially almost all the time. It may be influenced by the de facto ruling body in some minor ways that do not influence the outcome of elections. 4: Yes. The EMB is autonomous and impartially applies elections laws and administrative rules.

EMB capacity (v2elembcap)	Does the Election Management Body (EMB) have autonomy from government to apply election laws and administrative rules impartially in national elections?	0: No. There are glaring deficits in staff, financial, or other resources affecting the organization across the territory. 1: Not really. Deficits are not glaring but they nonetheless seriously compromised the organization of administratively well-run elections in many parts of the country. 2: Ambiguous. There might be serious deficiencies compromising the organization of the election but it could also be a product of human errors and co-incidence or other factors outside the control of the EMB. 3: Mostly. There are partial deficits in resources but these are neither serious nor widespread. 4: Yes. The EMB has adequate staff and other resources to administer a well-run election.
Election voter registry (v2elrgstry)	In this national election, was there a reasonably accurate voter registry in place and was it used?	0: No. There was no registry, or the registry was not used. 1: No. There was a registry but it was fundamentally flawed (meaning 20% or more of eligible voters could have been disenfranchised or the outcome could have been affected significantly by double-voting and impersonation). 2: Uncertain. There was a registry but it is unclear whether potential flaws in the registry had much impact on electoral outcomes. 3: Yes, somewhat. The registry was imperfect but less than 10% of eligible voters may have been disenfranchised, and double-voting and impersonation could not have affected the results significantly. 4: Yes. The voter registry was reasonably accurate (less than 1% of voters were affected by any flaws) and it was applied in a reasonable fashion.

Election other voting irregularities (v2elirreg)	In this national election, was there evidence of other intentional irregularities by incumbent and/or opposition parties, and/or vote fraud?	0: Yes. There were systematic and almost nationwide other irregularities. 1: Yes, some. There were non-systematic, but rather common other irregularities, even if only in some parts of the country. 2: Sporadic. There were a limited number of sporadic other irregularities, and it is not clear whether they were intentional or disfavored particular groups. 3: Almost none. There were only a limited number of irregularities, and many were probably unintentional or did not disfavor particular groups' access to participation. 4: None. There was no evidence of intentional other irregularities. Unintentional irregularities resulting from human error and/or natural conditions may still have occurred.
Election government intimidation (v2elintim)	In this national election, were opposition candidates/parties/campaign workers subjected to repression, intimidation, violence, or harassment by the government, the ruling party, or their agents?	0: Yes. The repression and intimidation by the government or its agents was so strong that the entire period was quiet. 1: Yes, frequent: There was systematic, frequent and violent harassment and intimidation of the opposition by the government or its agents during the election period. 2: Yes, some. There was periodic, not systematic, but possibly centrally coordinated – harassment and intimidation of the opposition by the government or its agents. 3: Restrained. There were sporadic instances of violent harassment and intimidation by the government or its agents, in at least one part of the country, and directed at only one or two local branches of opposition groups. 4: None. There was no harassment or intimidation of opposition by the government or its agents, during the election campaign period and polling day.

Election free and fair (v2elfrfair)	Taking all aspects of the pre-election period, election day, and the post-election process into account, would you consider this national election to be free and fair?	0: No, not at all. The elections were fundamentally flawed and the official results had little if anything to do with the 'will of the people' (i.e., who became president; or who won the legislative majority). 1: Not really. While the elections allowed for some competition, the irregularities in the end affected the outcome of the election (i.e., who became president; or who won the legislative majority). 2: Ambiguous. There was substantial competition and freedom of participation but there were also significant irregularities. It is hard to determine whether the irregularities affected the outcome or not (as defined above). 3: Yes, somewhat. There were deficiencies and some degree of fraud and irregularities but these did not in the end affect the outcome (as defined above). 4: Yes. There was some amount of human error and logistical restrictions but these were largely unintentional and without significant consequences.

Elections multiparty (v2elmulpar)	Was this national election multiparty?	0: No. No-party or single-party and there is no meaningful competition (includes situations where a few parties are legal but they are all de facto controlled by the dominant party). 1: Not really. No-party or single-party (defined as above) but multiple candidates from the same party and/or independents contest legislative seats or the presidency. 2: Constrained. At least one real opposition party is allowed to contest but competition is highly constrained – legally or informally. 3: Almost. Elections are multiparty in principle but either one main opposition party is prevented (de jure or de facto) from contesting, or conditions such as civil unrest (excluding natural disasters) prevent competition in a portion of the territory. 4: Yes. Elections are multiparty, even though a few marginal parties may not be permitted to contest (e.g. far-right/left extremist parties, anti-democratic religious or ethnic parties).
Political parties		
Party ban (v2psparban)	Are any parties banned?	0: Yes. All parties except the state-sponsored party (and closely allied parties) are banned. 1: Yes. Elections are non-partisan or there are no officially recognized parties. 2: Yes. Many parties are banned. 3: Yes. But only a few parties are banned. 4: No. No parties are officially banned.

Barriers to parties (v2psbars)	How restrictive are the barriers to forming a party?	0: Parties are not allowed. 1: It is impossible, or virtually impossible, for parties not affiliated with the government to form (legally). 2: There are significant obstacles (e.g. party leaders face high levels of regular political harassment by authorities). 3: There are modest barriers (e.g. party leaders face occasional political harassment by authorities). 4: There are no substantial barriers.
Opposition parties autonomy (v2psoppaut)	Are opposition parties independent and autonomous of the ruling regime?	0: Opposition parties are not allowed. 1: There are no autonomous, independent opposition parties. Opposition parties are either selected or co-opted by the ruling regime. 2: At least some opposition parties are autonomous and independent of the rulin gregime. 3: Most significant opposition parties are autonomous and independent of the ruling regime. 4: All opposition parties are autonomous and independent of the ruling regime.

B.2 Horizontal accountability indicators

Indicator	Question text	Answer categories
Executive oversight (v2lgotovst)	If executive branch officials were engaged in unconstitutional, illegal, or unethical activity, how likely is it that a body other than the legislature, such as a comptroller general, general prosecutor, or ombudsman, would question or investigate them and issue an unfavorable decision or report?	0: Extremely unlikely. 1: Unlikely. 2: As likely as not. 3: Likely. 4: Certain or nearly certain.

Executive respects constitution (v2exrescon)	Do members of the executive (the head of state, the head of government, and cabinet ministers) respect the constitution?	0: Members of the executive violate the constitution whenever they want to, without legal consequences. 1: Members of the executive violate most provisions of the constitution without legal consequences, but still must respect certain provisions. 2: Somewhere in between (1) and (3). Members of the executive would face legal consequences for violating most provisions of the constitution, but can disregard some provisions without any legal consequences. 3: Members of the executive rarely violate the constitution, and when it happens they face legal charges. 4: Members of the executive never violate the constitution.
	Judicial oversight	
Compliance with judiciary (v2jucomp)	How often would you say the government complies with important decisions by other courts with which it disagrees?	0: Never. 1: Seldom. 2: About half of the time. 3: Usually. 4: Always.
Compliance with high court (v2juhccomp)	How often would you say the government complies with important decisions of the high court with which it disagrees?	0: Never. 1: Seldom. 2: About half of the time. 3: Usually. 4: Always.
High court independence (v2juhcind)	When the high court in the judicial system is ruling in cases that are salient to the government, how often would you say that it makes decisions that merely reflect government wishes regardless of its sincere view of the legal record?	0: Always. 1: Usually. 2: About half of the time. 3: Seldom. 4: Never.

Lower court independence (v2juncind)	When judges not on the high court are ruling in cases that are salient to the government, how often would you say that their decisions merely reflect government wishes regardless of their sincere view of the legal record?	0: Always. 1: Usually. 2: About half of the time. 3: Seldom. 4: Never.
	Legislature	
Legislature bicameral (v2lgbicam)	How many chambers does the legislature contain?	0: 0 chambers. 1: 1 or more chambers.
Legislature questions officials in practice (v2lgqstexp)	In practice, does the legislature routinely question executive branch officials?	0: No - never or very rarely. 1: Yes - routinely.
Legislature investigates in practice (v2lginvstp)	If the executive were engaged in unconstitutional, illegal, or unethical activity, how likely is it that a legislative body (perhaps a whole chamber, perhaps a committee, whether aligned with government or opposition) would conduct an investigation that would result in a decision or report that is unfavorable to the executive?	0: Extremely unlikely. 1: Unlikely. 2: As likely as not. 3: Likely. 4: Certain or nearly certain.

B.3 Diagonal accountability indicators

Indicator	Question text	Answer categories
Engaged society (v2dlengage)	When important policy changes are being considered, how wide and how independent are public deliberations?	0: Public deliberation is never, or almost never allowed. 1: Some limited public deliberations are allowed but the public below the elite levels is almost always either unaware of major policy debates or unable to take part in them. 2: Public deliberation is not repressed but nevertheless infrequent and non-elite actors are typically controlled and/or constrained by the elites. 3: Public deliberation is actively encouraged and some autonomous non-elite groups participate, but it is confined to a small slice of specialized groups that tends to be the same across issue-areas. 4: Public deliberation is actively encouraged and a relatively broad segment of non-elite groups often participate and vary with different issue-areas. 5: Large numbers of non-elite groups as well as ordinary people tend to discuss major policies among themselves, in the media, in associations or neighborhoods, or in the streets. Grass-roots deliberation is common and unconstrained.
	Civil society	
CSO entry and exit (v2cseeorgs)	To what extent does the government achieve control over entry and exit by civil society organizations (CSOs) into public life?	0: Monopolistic control. 1: Substantial control. 2: Moderate control. 3: Minimal control. 4: Unconstrained.
CSO repression (v2csreprss)	Does the government attempt to repress civil society organizations (CSOs)?	0:Severely. 1:Substantially. 2:Moderately. 3:Weakly. 4: No.

CSO participatory environment (v2csprtcpt)	Which of these best describes the involvement of people in civil society organizations (CSOs)?	0: Most associations are state-sponsored, and although a large number of people may be active in them, their participation is not purely voluntary. 1: Voluntary CSOs exist but few people are active in them. 2: There are many diverse CSOs, but popular involvement is minimal. 3: There are many diverse CSOs and it is considered normal for people to be at least occasionally active in at least one of them.
	Media freedom	
Media bias (v2mebias)	Is there media bias against opposition parties or candidates?	0: The print and broadcast media cover only the official party or candidates, or have no political coverage, or there are no opposition parties or candidates to cover. 1: The print and broadcast media cover more than just the official party or candidates but all the opposition parties or candidates receive only negative coverage. 2: The print and broadcast media cover some opposition parties or candidates more or less impartially, but they give only negative or no coverage to at least one newsworthy party or candidate. 3: The print and broadcast media cover opposition parties or candidates more or less impartially, but they give an exaggerated amount of coverage to the governing party or candidates. 4: The print and broadcast media cover all newsworthy parties and candidates more or less impartially and in proportion to their newsworthiness.
Print/broadcast media critical (v2mecrit)	Of the major print and broadcast outlets, how many routinely criticize the government?	0: None. 1: Only a few marginal outlets. 2: Some important outlets routinely criticize the government but there are other important outlets that never do. 3: All major media outlets criticize the government at least occasionally.

Print/broadcast media perspectives (v2merange)	Do the major print and broadcast media represent a wide range of political perspectives?	0: The major media represent only the government's perspective. 1: The major media represent only the perspectives of the government and a government-approved, semi-official opposition party. 2: The major media represent a variety of political perspectives but they systematically ignore at least one political perspective that is important in this society. 3: All perspectives that are important in this society are represented in at least one of the major media.
Government censorship effort - Media (v2mecenefm)	Does the government directly or indirectly attempt to censor the print or broadcast media?	0: Attempts to censor are direct and routine. 1: Attempts to censor are indirect but nevertheless routine. 2: Attempts to censor are direct but limited to especially sensitive issues. 3: Attempts to censor are indirect and limited to especially sensitive issues. 4: The government rarely attempts to censor major media in any way, and when such exceptional attempts are discovered, the responsible officials are usually punished.

Harassment of journalists (v2meharjrn)	Are individual journalists harassed - i.e., threatened with libel, arrested, imprisoned, beaten, or killed – by governmental or powerful nongovernmental actors while engaged in legitimate journalistic activities?	0: No journalists dare to engage in journalistic activities that would offend powerful actors because harassment or worse would be certain to occur. 1: Some journalists occasionally offend powerful actors but they are almost always harassed or worse and eventually are forced to stop. 2: Some journalists who offend powerful actors are forced to stop but others manage to continue practicing journalism freely for long periods of time. 3: It is rare for any journalist to be harassed for offending powerful actors, and if this were to happen, those responsible for the harassment would be identified and punished. 4: Journalists are never harassed by governmental or powerful nongovernmental actors while engaged in legitimate journalistic activities.
Media self-censorship (v2meslfcen)	Is there self-censorship among journalists when reporting on issues that the government considers politically sensitive?	0: Self-censorship is complete and thorough. 1: Self-censorship is common but incomplete. 2: There is self-censorship on a few highly sensitive political issues but not on moderately sensitive issues. 3: There is little or no self-censorship among journalists.

Internet censorship (v2mecenefi)	Does the government attempt to censor information (text, audio, or visuals) on the Internet?	0: This country has no Internet access at all. [This value is excluded from datasets. Values of 0 are set to missing before this variable is estimated by the measurement model so that the remaining 1-4 values form an ordinal scale.] 1: The government successfully blocks Internet access except to sites that are pro-government or devoid of political content. 2: The government attempts to block Internet access except to sites that are pro-government or devoid of political content, but many users are able to circumvent such controls. 3: The government allows Internet access, including to some sites that are critical of the government, but blocks selected sites that deal with especially politically sensitive issues. 4: The government allows Internet access that is unrestricted, with the exceptions mentioned above.
Freedom of expression		
Freedom of discussion for men (v2cldiscm)	Are men able to openly discuss political issues in private homes and in public spaces?	0: Not respected. Hardly any freedom of expression exists for men. Men are subject to immediate and harsh intervention and harassment for expression of political opinion. 1: Weakly respected. Expressions of political opinions by men are frequently exposed to intervention and harassment. 2: Somewhat respected. Expressions of political opinions by men are occasionally exposed to intervention and harassment. 3: Mostly respected. There are minor restraints on the freedom of expression in the private sphere, predominantly limited to a few isolated cases or only linked to soft sanctions. But as a rule there is no intervention or harassment if men make political statements. 4: Fully respected. Freedom of speech for men in their homes and in public spaces is not restricted.

Freedom of discussion for women (v2cldiscw)	Are women able to openly discuss political issues in private homes and in public spaces?	0: Not respected. Hardly any freedom of expression exists for women. Women are subject to immediate and harsh intervention and harassment for expression of political opinion. 1: Weakly respected. Expressions of political opinions by women are frequently exposed to intervention and harassment. 2: Somewhat respected. Expressions of political opinions by women are occasionally exposed to intervention and harassment. 3: Mostly respected. There are minor restraints on the freedom of expression in the private sphere, predominantly limited to a few isolated cases or only linked to soft sanctions. But as a rule there is no intervention or harassment if women make political statements. 4: Fully respected. Freedom of speech by women in their homes and in public spaces is not restricted.
Freedom of academic and cultural expression (v2clacfree)	Is there academic freedom and freedom of cultural expression related to political issues?	0: Not respected by public authorities. Censorship and intimidation are frequent. Academic activities and cultural expressions are severely restricted or controlled by the government. 1: Weakly respected by public authorities. Academic freedom and freedom of cultural expression are practiced occasionally, but direct criticism of the government is mostly met with repression. 2: Somewhat respected by public authorities. Academic freedom and freedom of cultural expression are practiced routinely, but strong criticism of the government is sometimes met with repression. 3: Mostly respected by public authorities. There are few limitations on academic freedom and freedom of cultural expression, and resulting sanctions tend to be infrequent and soft. 4: Fully respected by public authorities. There are no restrictions on academic freedom or cultural expression.

Government censorship effort - Media (v2mecenefm)	Does the government directly or indirectly attempt to censor the print or broadcast media?	0: Attempts to censor are direct and routine. 1: Attempts to censor are indirect but nevertheless routine. 2: Attempts to censor are direct but limited to especially sensitive issues. 3: Attempts to censor are indirect and limited to especially sensitive issues. 4: The government rarely attempts to censor major media in any way, and when such exceptional attempts are discovered, the responsible officials are usually punished.
Harassment of journalists (v2meharjrn)	Are individual journalists harassed - i.e., threatened with libel, arrested, imprisoned, beaten, or killed – by governmental or powerful nongovernmental actors while engaged in legitimate journalistic activities?	0: No journalists dare to engage in journalistic activities that would offend powerful actors because harassment or worse would be certain to occur. 1: Some journalists occasionally offend powerful actors but they are almost always harassed or worse and eventually are forced to stop. 2: Some journalists who offend powerful actors are forced to stop but others manage to continue practicing journalism freely for long periods of time. 3: It is rare for any journalist to be harassed for offending powerful actors, and if this were to happen, those responsible for the harassment would be identified and punished. 4: Journalists are never harassed by governmental or powerful nongovernmental actors while engaged in legitimate journalistic activities.
Media self-censorship (v2meslfcen)	Is there self-censorship among journalists when reporting on issues that the government considers politically sensitive?	0: Self-censorship is complete and thorough. 1: Self-censorship is common but incomplete. 2: There is self-censorship on a few highly sensitive political issues but not on moderately sensitive issues. 3: There is little or no self-censorship among journalists.

Internet censorship (v2mecenefi)	Does the government attempt to censor information (text, audio, or visuals) on the Internet?	0: This country has no Internet access at all. [This value is excluded from datasets. Values of 0 are set to missing before this variable is estimated by the measurement model so that the remaining 1-4 values form an ordinal scale.] 1: The government successfully blocks Internet access except to sites that are pro-government or devoid of political content. 2: The government attempts to block Internet access except to sites that are pro-government or devoid of political content, but many users are able to circumvent such controls. 3: The government allows Internet access, including to some sites that are critical of the government, but blocks selected sites that deal with especially politically sensitive issues. 4: The government allows Internet access that is unrestricted, with the exceptions mentioned above.

C Accountability Ratings in 2016

Figure C.1: Estimates of accountability and its sub-types in countries with high accountability in 2016

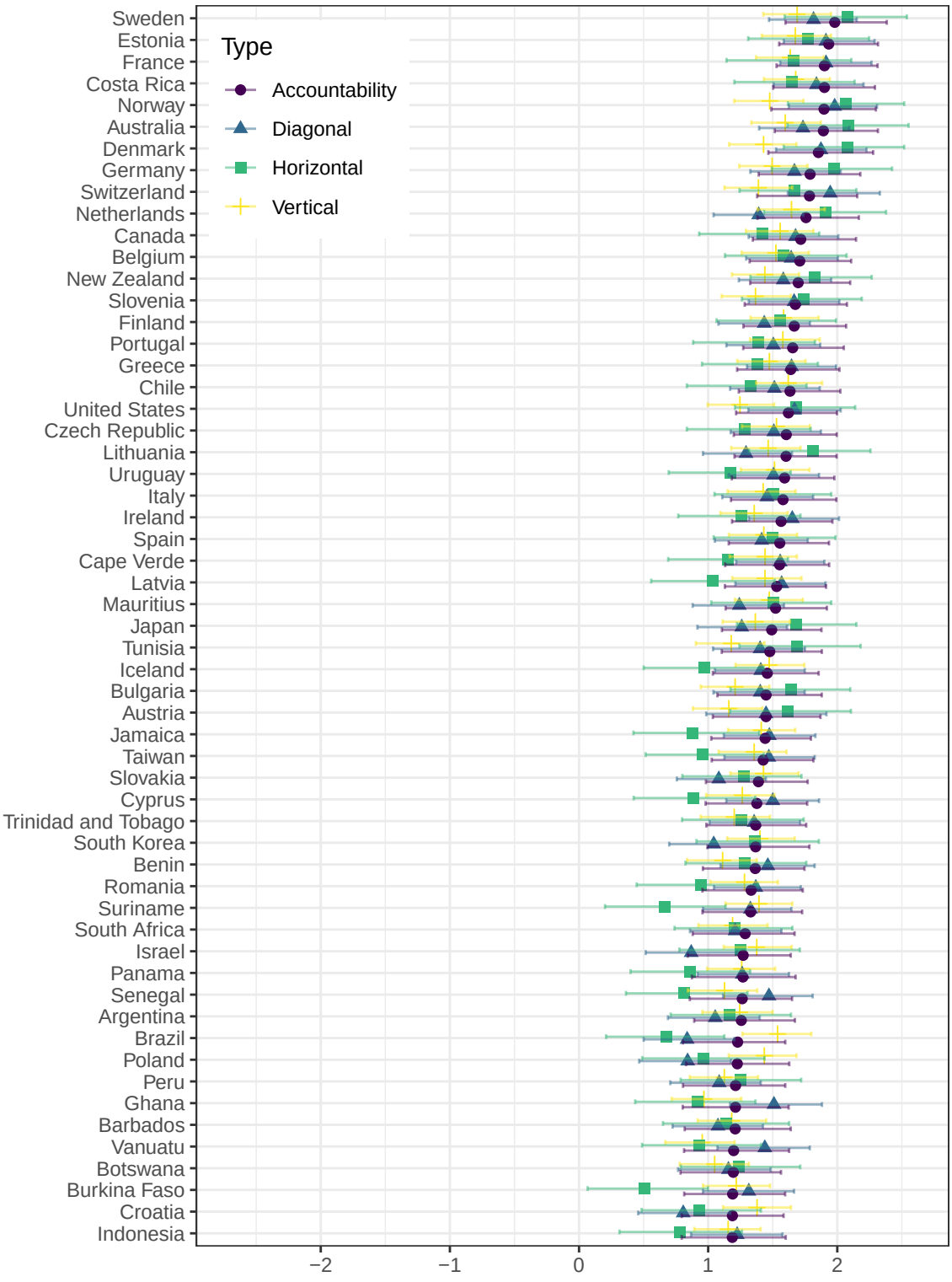


Figure C.2: Estimates of accountability and its sub-types in countries with intermediate accountability in 2016

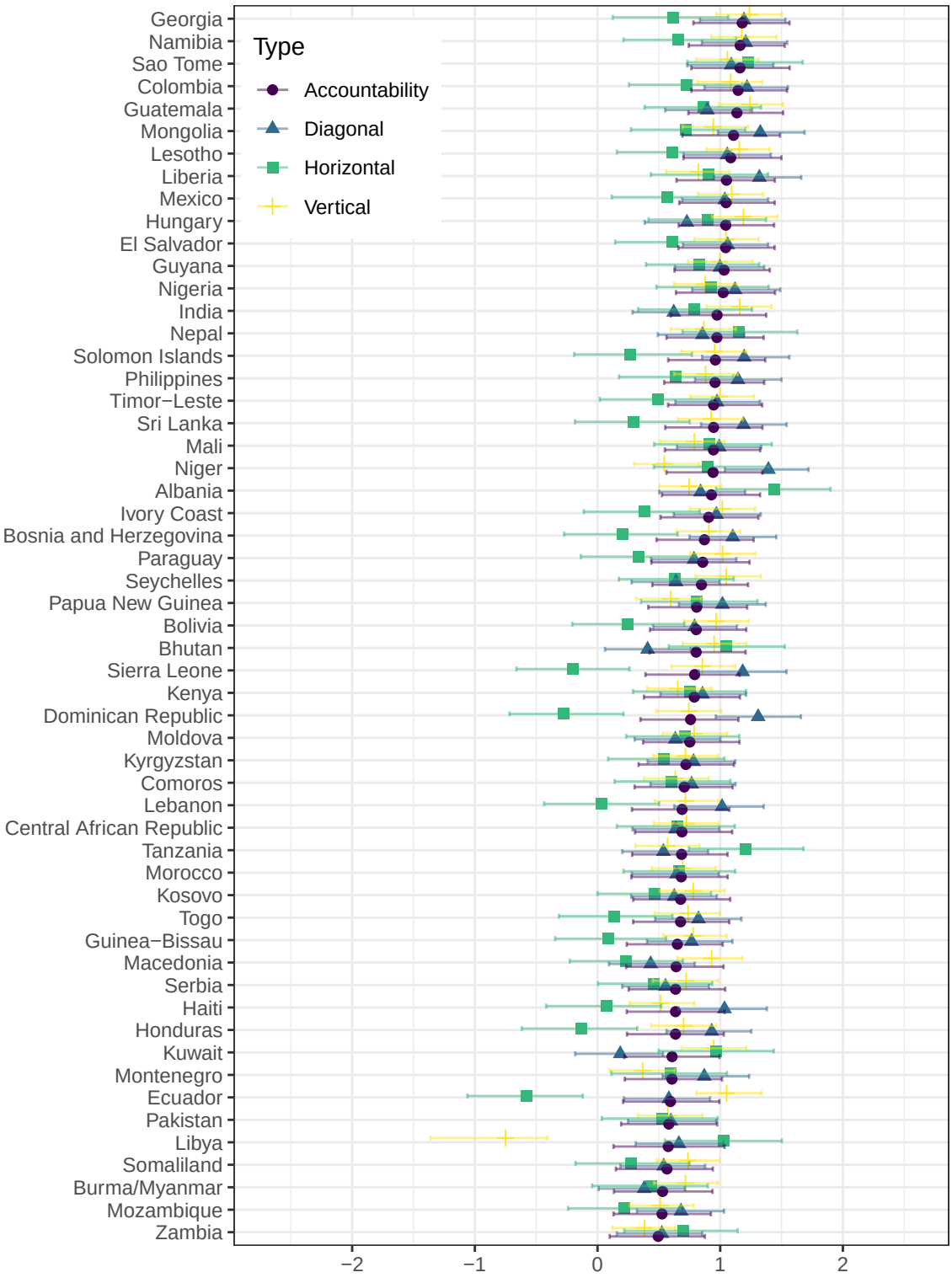
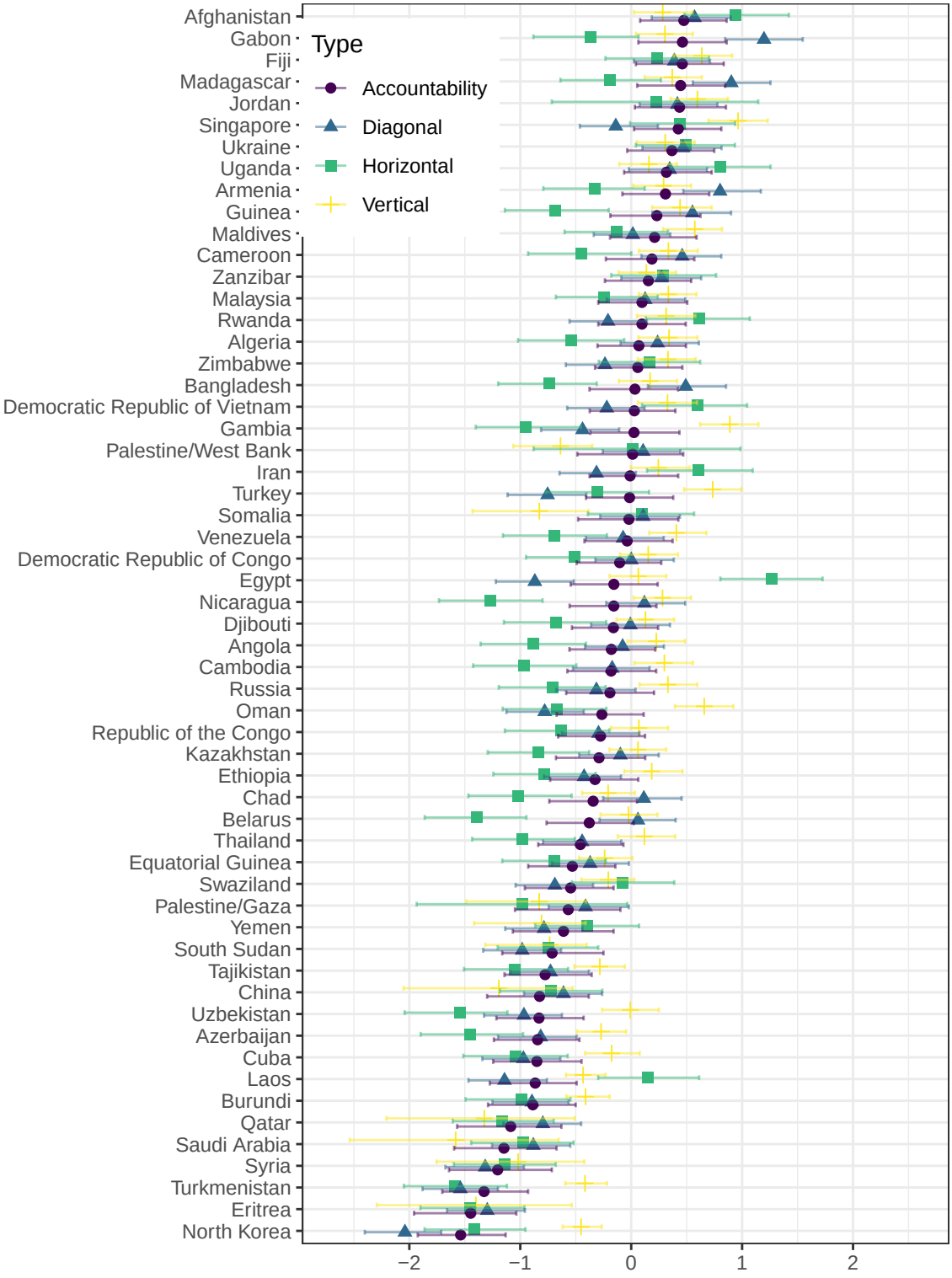


Figure C.3: Estimates of accountability and its sub-types in countries with low accountability in 2016



D Descriptive statistics

	N	Mean	SD	Min	Max
Vertical	17,309	0.01	0.95	-1.62	1.93
Diagonal	17,309	0.00	0.98	-2.12	2.18
Horizontal	17,309	0.00	0.95	-2.36	2.38
Accountability	17,309	0.00	0.98	-1.91	2.21

E Relationship between accountability sub-types

E.1 Relationship between accountability sub-types, conditional on hierarchically-estimated overall accountability

Table E.1 presents the relationship between accountability sub-types, conditional upon hierarchically-estimated overall accountability. Note that all estimated relationships are negative and, although all estimated relationships are statistically-significant, the addition of accountability sub-types to the analysis only marginally increases model fit vs. models that only include overall accountability.

Table E.1: Relationship between accountability types

	Accountability sub-type:				
	Vertical			Horizontal	
Accountability	0.89	1.76	1.18	0.85	1.41
	(0.88, 0.89)	(1.74, 1.79)	(1.17, 1.19)	(0.85, 0.86)	(1.39, 1.44)
Diagonal		-0.90			-0.57
		(-0.92, -0.88)			(-0.60, -0.55)
Horizontal			-0.34		
			(-0.35, -0.33)		
Constant	0.01	0.01	0.01	-0.00	-0.00
	(0.01, 0.02)	(0.01, 0.02)	(0.01, 0.02)	(-0.01, 0.01)	(-0.01, 0.01)
Observations	17,309	17,309	17,309	17,309	17,309
R^2	0.83	0.88	0.85	0.77	0.79

Note: Statistics represent point estimate of relationship and 95% confidence interval about this estimate. Analyses use posterior median of estimates.

E.2 Implications of disagreeing principals and the strength of principals

We argue that the consequences of competing incentives for accountability lies in two factors: (A) the content of the incentive a principal provides their agent and (B) the power of the incentives and relatedly the power of the principal over the agent. We believe that our measures reflect both aspects well.

(A) Regarding the content of the incentives, our definition of accountability holds that is "de facto constraints on the government's use of political power through requirements for justification of its actions and potential sanctions by both citizens and oversight institutions." Principals constrain governments even if they do so with divergent strategic objectives or policy preferences, because they can pose requirements for justification and even sanctions from different directions. Consider two opposition parties that are at opposing ends of the political spectrum. For example, opposition party A denies climate change and opposition party B would like the government to increase its activities combating climate change. Both parties use parliamentary oversight mechanisms (e.g. question time, commissions of inquiry), but party A aims to find misconduct (e.g. misuse of funds) in current government activities against climate change whereas party B would like to sanction the government for not doing enough to combat climate change. In this example, both parties send competing incentives but still constrain the government, which our measures would reflect in higher accountability scores.

If disagreements between principals undermine their power and thus lead to weakening their collective hold on the agent, this should also be reflected in our measures of de facto accountability. The case of Brazil provides an illustrative example of actors with competing incentives, where these competing incentives weaken—as opposed to strengthen—horizontal accountability). After 2016, principals sent competing signals on how to deal with the alleged corruption of then-president Rousseff and former president Lula. Eventually, Rousseff was impeached and Lula arrested (in 2017). Both processes sparked fierce debates and mass protests - both in favour and against Rousseff/Lula.[8] Critics claimed that corruption charges against Rousseff were minor and did not warrant an impeachment process.[9] In subsequent years, impeachment due to corruption charges against then-president Temer were blocked by "his political allies" in the legislature.[10] This inability to effectively constrain the executive is reflected in a decline of our horizontal accountability index score from 1.5 in 2015 to 0.6 in 2018. Similarly, mass protests against Temer's policies and in favour of his impeachment took place, but were faced in parts with violence by the military police.[11] This is reflected in a decline of the diagonal accountability score from 1.6 in 2015 to 1.0 in 2018. Consequently, our overall accountability index reflects the recent challenges and contestedness of accountability in Brazil by showing a decline from 1.7 in 2015 to 1.1 in 2018.

(B) Our operationalization strategy takes variation in the power and strength of principals into account, as well as the degree to which they engage in oversight. Perhaps most importantly, they focus on the de facto implementation of accountability and not on the de

[8] https://www.vox.com/2016/8/31/18089340/dilma-rousseff-impeachment-suspension

[9] https://www.nytimes.com/2016/09/01/world/americas/brazil-impeachment-coup.html

[10] https://www.bbc.com/news/world-latin-america-47657159

[11] https://www.theguardian.com/world/2016/nov/16/brazil-rio-de-janeiro-police-pepper-spray-protest-oly
https://amerika21.de/2017/05/176947/gewaltsamer-zusammenstoss

jure potential (see Appendix B). For instance, the indicators comprising the vertical accountability index have lower values in cases where the power of citizens to sanction the executive is limited due to electoral manipulation. Likewise, the indicators on horizontal accountability take into account both the de facto compliance of the executive with decisions of the legislature, judiciary or other oversight bodies as well as how engaged the principals are in scrutinizing the executive.[12] Similarly, the indicators on diagonal accountability reflect the extent to which the media "represent[s] a wide range of perspectives" and "routinely criticizes the government" and operates in an environment without censorship or harassment (Appendix B). Thus, scores decline if the media becomes less capable or willing to hold the government to account – regardless of whether this is because multiple principals disagree and outweigh each other or because one principal (such as the media) operates at the behest of the agent (the government).[13]

E.3 Accountability sub-types and economic development

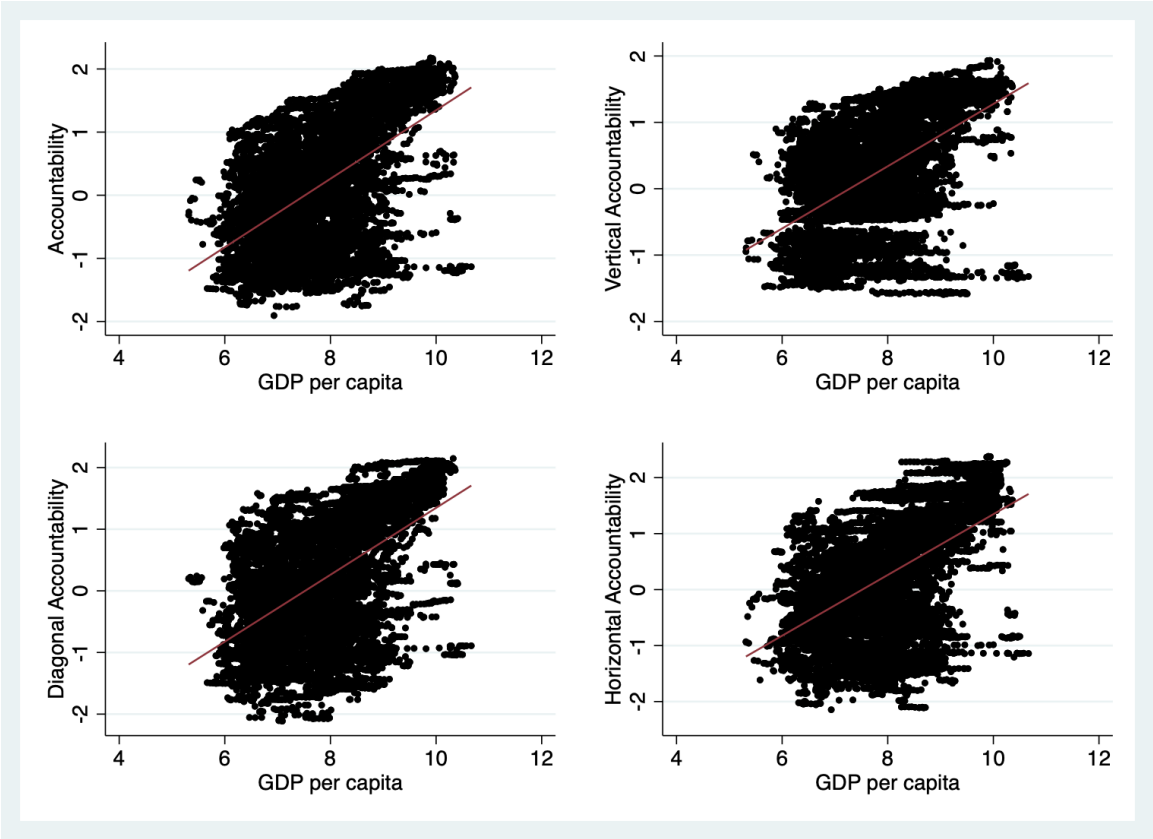
Though Table E.1 illustrates that there is no clear relationship between accountability subtypes after accounting for overall accountability, it is still possible that a factor like economic development account for a great deal of the variation across accountability indices. We therefore examine the relationship between the accountability subtypes and the natural logarithm of GDP per capita as a proxy for economic development.

The correlation between accountability and GDP is moderate across accountability indices, around 0.52 for diagonal and horizontal accountability, and 0.54 for vertical accountability. Figure E.1 illustrates these correlations by presenting scatterplots of the relationship. While countries with a high GDP per capita also tend to have higher accountability scores, there remains a great deal of unexplained variation. As an example, there are a large number of country-years which have very low GDP and very high scores on all accountability metrics (around values of 1). Similarly, some of the richest countries in the world also have some of the lowest accountability scores (around -1). As a result, we see little evidence that economic development explains variation across accountability subtypes.

[12]The V-Dem data we use are based on expert-codings that assess the de facto activity of accountability-related institutions. For example, to measure the degree of horizontal accountability in a country we include measures that assesses not only the extent to which a legislature engages in oversight ("How often would you say the government complies with important decisions by other courts with which it disagrees?") but also the extent to which the government actually respects such constitutional rules of the game ("In practice, does the legislature routinely question executive branch officials?").

[13]For instance, the scores on the range of perspective in the media in Hungary have declined from 2.9 in 2009 to 1.9 in 2018, which reflects that major media outlets are now concentrated in the hands of actors loyal to the Fidesz government and the working conditions for journalists critical to the Fidesz government have worsened. See e.g. `https://apnews.com/39028d9c44b64e08a6609b60a8bf7a13`

Figure E.1: Scatterplot of relationship between GDP per capita and both the accountability index and accountability sub-types



F Additional validation analyses

F.1 Content analysis

F.1.1 BRICS and France

We investigate trends over time in six individual countries in order to assess how well our data mirrors historical developments (Figure F.1). More specifically, we focus on five major emerging national economies, grouped as BRICS (Brazil, Russia, India, China and South Africa), since they are a diverse set of important countries. We further analyze France since it is a liberal democracy, and thus a prime example of a country that should have high accountability scores in recent years.

Figure F.1: Accountability indices in BRICS and France

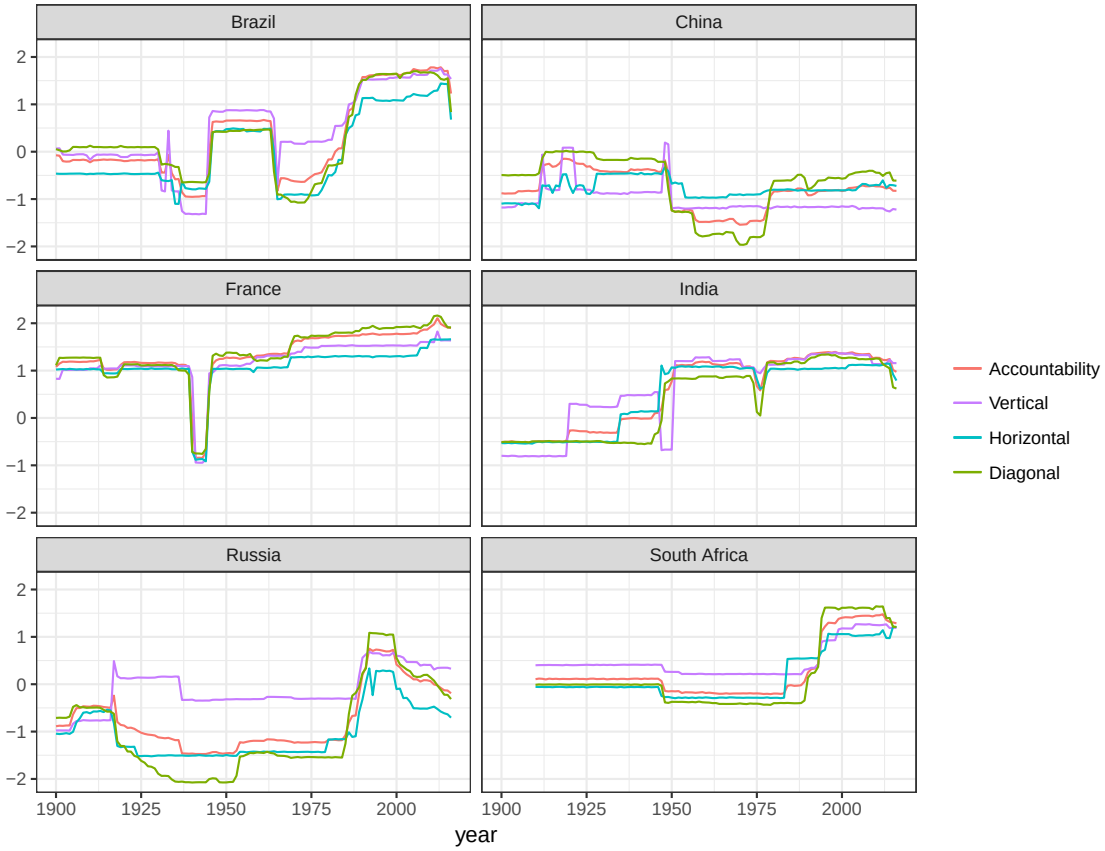


Figure F.1 illustrates that the sub-types of accountability tend to develop together. However, there are some important variations in trajectories. For example, Brazil sees a dramatic increase in vertical accountability (purple line) in 1933 reflecting an "unprecedented expansion of rights for political participation" following the 1930 revolution (Lamounier & Amorim Neto 2005, p.165). However, both horizontal and diagonal accountability (blue and green lines respectively) remain at relatively low levels, which signals that the expansion of political rights was limited to the electoral realm.

In both Stalinist Russia (1924-1953) and Maoist China (1945-1976), diagonal accountability shows great declines, reflecting that repression of civil society intensified during these periods. In contrast, vertical and horizontal accountability stay at more or less the same low level during these periods, reflecting these leaders' consolidated control over mechanisms of horizontal and vertical accountability. Another trend worth noting is in China after Mao's death in 1976, when the Communist Party lessened its control over some aspects of civil life. A gradual improvement of diagonal accountability scores reflects this change, while vertical and horizontal accountability have remained at similarly low levels. The sub-types of accountability also show different trends during democratization episodes, for instance during the complicated transition from apartheid in South Africa. Here, scores for horizontal accountability improved in 1984, reflecting the attempt of reform from above with a new constitution (Engel 1999, p.819). However, diagonal accountability only began to improve in 1990 after the release of political prisoners – such as Nelson Mandela – and the beginning of negotiations about a new constitution between government and opposition parties. In turn, the constitutional changes provided the basis for free and fair multiparty elections in 1994, which the higher vertical accountability score reflect.

India starts the time series with comparatively low scores on all accountability indices, but sees improvement over time on all of them. A main exception to this trend is the time period from 1947 to 1950, when the electoral regime was suspended during the India-Pakistani war. This suspension results in lower vertical accountability scores. Similarly, in 1975 there is a decline on all indices, capturing the autogolpe by President Indira Gandhi, during which period she used emergency law to govern without accountability constraints (Enskat, Mitra & Bahadur Singh 2001, p.559). In particular, she suspended many civil liberties, which the steep decline in diagonal accountability captures most closely.

France scores high on all accountability indices since the beginning of the time series. However, all forms of accountability have gradually improved over time, interrupted only by the German occupation from 1940 to 1944.

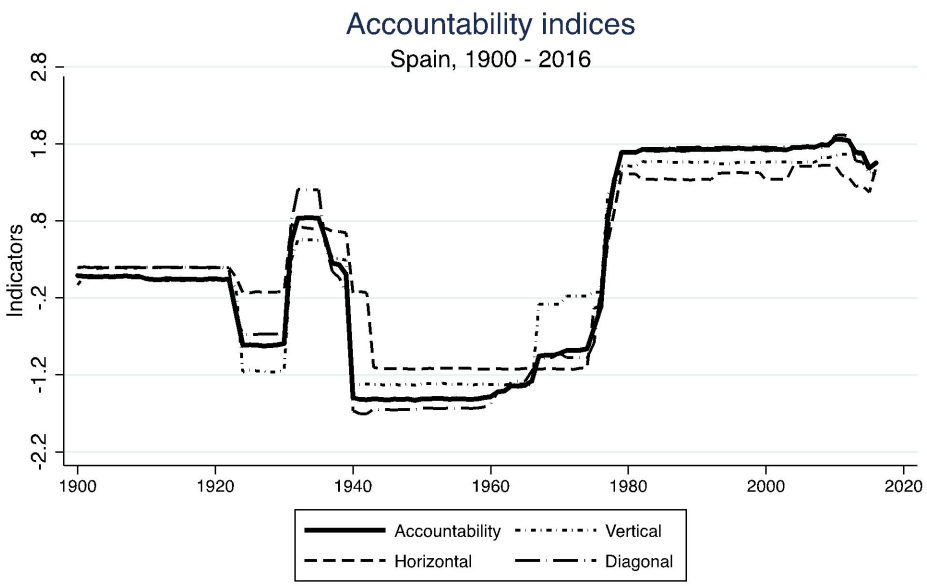
F.1.2 Uganda and Spain

We examine an additional two countries, Uganda and Spain, that illustrate the differences between the indices.

Figure F.2 shows our accountability indices for Spain. All indices have extremely low scores during the dictatorship of Francisco Franco (1936-1975). Vertical accountability increases in 1967, when the first Franco-era elections were held. With the democratization of Spain in the late 1970s, the scores for all accountability indices rise significantly.

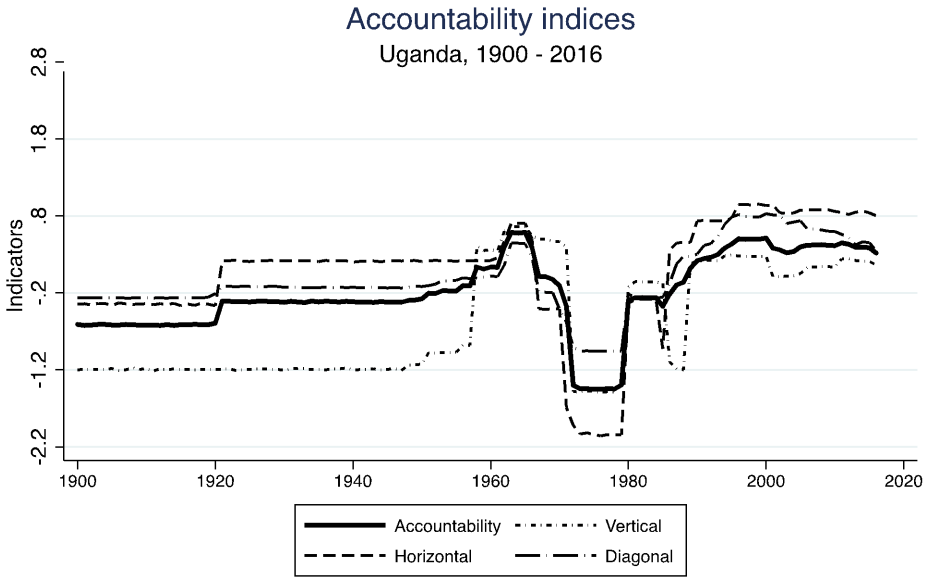
Figure F.3 compares the types of accountability over time in Uganda. The data indicate the lowest levels of horizontal and diagonal accountability during Idi Amin's military dictatorship (1971-79). In the decades afterward there is an upward trend across all indices apart from vertical accountability, which spikes downward after the coup in 1985 and remains low until parliamentary elections took place in 1989. The space for accountability has remained quite limited in country. Starting in 2006, diagonal accountability declines in conjunction with decreasing space for civil society organizations and media freedom. On the other hand, levels of horizontal accountability have remained relatively high after the 1980s. This relatively high score reflects the fact that, although the Ugandan parliament is not very independent of the executive, the ombudsman institution has a relatively strong position.

Figure F.2: Accountability indices in Spain



For example, in Uganda there is a separate institution ombudsmen on the anti-corruption and leadership code, which have coercive powers and have the legal right to prosecute officials for corruption and abuse of public office (Kuye & Kakumba 2008, p. 160).

Figure F.3: Accountability indices in Uganda



F.2 Convergent validation

As discussed in the main text of the article, convergent validation strategies assess correlation with other indices that measure similar concepts. We expect our indices to correlate highly with existing measures of accountability, since our conceptualization of accountability is different, but not conceptually orthogonal to that of previous work. Similarly, since democracy is a concept closely linked theoretically to accountability, we expect there to be a high correlation between our measures and operationalizations of democracy. Specifically, we expect the different sub-types of accountability to correlate more highly with measures of related democracy sub-types than others, in line with particular democracy concepts these measures estimate.

Figure F.4 presents descriptive statistics that compare the accountability indices to 1) World Bank's Voice and Accountability from the World Governance Indicator data set (WBGI VA), 2) Freedom House/Polity measure (Hadenius & Teorell 2005), 3) the V-Dem Electoral Democracy Index (EDI), and 4) the V-Dem Liberal Component Index (LCI).[14] The figure shows a correlation matrix and a scatterplot for each pair of indices, as well as a histogram. We discuss patterns of correlation in turn.

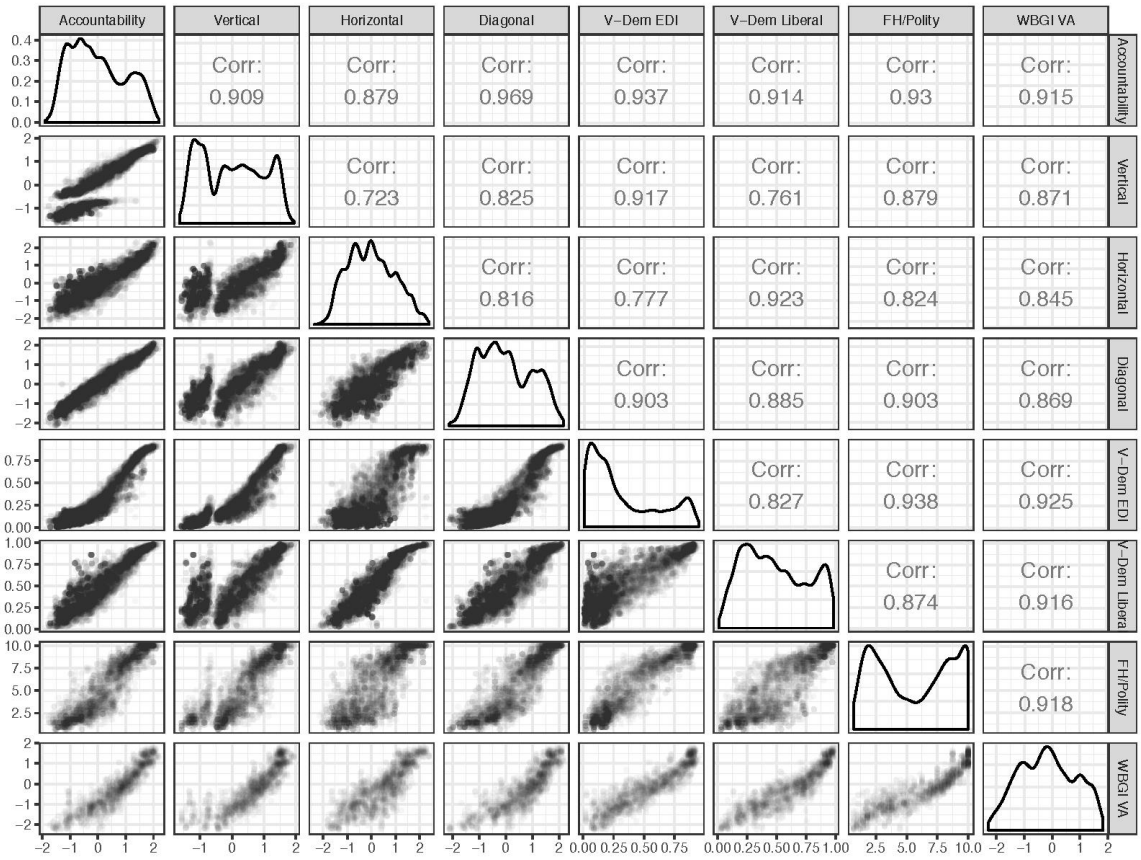
In theory, the WBGI VA measures the same concept as our overall accountability index, though for reasons discussed in the text there is concern about its content validity. Indeed, this index correlates strongly with our accountability measure. A perhaps more interesting finding regards the correlation structure of the WBGI VA and the sub-types of accountability. The correlation is stronger for the vertical and diagonal accountability sub-indices than for horizontal. This finding enhances the convergent validity of our sub-indices, because the WBGI VA is composed of indicators that cover the realms of election quality, media freedom and civil and political rights, which are the aspects of accountability that vertical and diagonal accountability capture. In other words, the empirical analysis indicates that our measure of accountability incorporates aspects of horizontal accountability that the WBGI VA does not, which is in line with our broader conceptualization of accountability.

The other indices included in the figure are commonly used measures for democracy, a concept similar to accountability. The combined Freedom House/Polity measure correlates strongly with our accountability index and the index of diagonal and vertical accountability, whereas the correlation with horizontal accountability is somewhat weaker. This correlation structure reflects the fact that Freedom House and Polity focus mainly on electoral principles of democracy and freedom of expression and association, rather than constraints on governments. As with the WBGI VA, this finding indicates that our accountability measure incorporates concepts that are not reflected in these measures of democracy.

[14]There is direct overlap between the indicators included in the EDI and LCI and the accountability indices. The EDI includes V–Dem variables related to media freedom and freedom of expression which we include in the diagonal accountability index; as well as variables related to clean elections, suffrage and party activity which we include in the vertical accountability index. The LCI includes V–Dem variables related to legislative, judicial and other constraints on the executive which we include in the horizontal accountability index. Despite this overlap, the aggregation strategies for the EDI and LCI diverge substantially from those which we employ here; and there is no case of perfect overlap in included indicators. As a result, while we are comfortable using the LCI and EDI for convergent validation of the accountability indices, points of divergence are of equal—if not greater—interest, since they illustrate that, despite the overlap in indicators the indices are measuring different concepts.

The EDI has strongest correlation with the overall accountability measure and vertical accountability, which makes sense as both the EDI and vertical accountability focus on electoral aspects of democracy and, indeed, include many of the same indicators. Conversely, the LCI correlates strongest with the horizontal accountability index, reflecting that both indices capture checks and balances between institutions and, as with the EDI, there is overlap in indicators between these two indices.

Figure F.4: Correlation matrix, scatterplots and density plots of accountability indices and related measures.



Note: The WGI Voice and Accountability covers 1996-2014, the FH/Polity 1972-2015, V-Dem EDI and Liberal Component 1900-2016.

However, despite the high correlation with measures of democracy, the scatterplots in Figure F.4 illustrate that there are many observations that diverge in the different indices. This is in particular the case in the lower ranges of the scale, whereas country-years that score highly on one index tend also tend to have high scores on others.

A relationship that is of particular importance is visible in the scatterplots that present EDI and FH/Polity scores relative to the accountability and vertical accountability indices. In these cases, there is a wider spread of observations in the lower end and middle of the graphs, which cover countries without elections and hybrid regimes. This trend is even more pronounced when comparing vertical accountability to the FH/Polity measure. This likely

reflects that the vertical accountability index includes data on political parties, which raises the score of countries that hold low quality elections but have active political parties (e.g. in former Communist countries).

Another comparison of interest is between horizontal accountability and the LCI, which measures concepts related to horizontal accountability. There is higher convergence between the two measures at the highest and lowest ranges of the scale than in the middle, where we see more divergence. The differences tend to be a function of LCI giving some hybrid regimes a lower score than the horizontal index. The V-Dem LCI includes measures for restrictions on civil liberties, whereas the horizontal accountability index focuses specifically on checks and balances between institutions. Thus, countries that severely restrict civil liberties can have somewhat higher scores on horizontal accountability. One such example is South Africa during the apartheid era, when the government consistently infringed on the civil liberties of a large proportion of its population but occasionally faced legal setbacks at the hands of its judiciary, which indicates that other institutions could check the power of the executive.

F.3 Construct validation

Here we present both full regression tables and additional regression analyses, which we discuss in the main text of the article in the section Construct validation.

Table F.1 shows the regression table from which we draw the results presented in Figure 8 in the manuscript. Table F.2 shows the results from the regression analysis when we use the accountability sub-indices as explanatory variables. Table F.3 uses democracy indices (the V–Dem EDI and LCI indices and the Freedom House/Polity measure) as main explanatory variables. Finally, Tables F.4, F.5 and F.6 present the regression results when we include as control variables the different democracy indices in addition to the accountability measures.

Several results are of particular note. First, all accountability sub-types and the three democracy indices (the EDI, LCI and FH/Polity) have the expected negative relationship with infant mortality when included individually in the model. Second, the relationship between the accountability indices and infant mortality is generally robust to the inclusion of any of the three democracy indices. The main exception to this general pattern is that the relationship between vertical accountability and infant mortality is greatly attenuated in models that include either the FH/Polity or EDI indices. This result is perhaps unsurprising given the high correlation between vertical accountability and EDI,[15] but perhaps also indicates that some of the relationship between vertical accountability and infant mortality is due to a more general relationship between electoral democracy and this outcome.

Also note that, across different models, several control variables tend to be statistically significant predictors of infant mortality (in particular, Model 1 in Table F.1, and the models in Table F.2). Examples include several economic variables (e.g. GDP per capita, resource dependence, economic inequality and amount of received foreign aid). Similarly, the size of

[15]Given the conceptual and empirical overlap between the EDI and both vertical accountability and diagonal accountability, as well as between horizontal accountability and the LCI, it is unsurprising that models that include both the relevant accountability and democracy index yield attenuated results for one of the two indices. However, with the exception of vertical accountability in models with the EDI, it is the democracy index coefficients that are attenuated. Specifically, the relationship between the LCI and infant mortality is attenuated in models that include either horizontal accountability or overall accountability (Table F.5), while the relationship between the EDI and infant mortality is attenuated in models that include overall accountability (Table F.6).

the total population, the percentage of urban population, history of political violence and the levels of corruption are robustly associated with changes in infant mortality trends.[16] However, even in the presence of these potential confounding variables, accountability indices remain statistically significant. We take this as evidence that the accountability metrics explain significant variation in the trends of infant mortality, independently of the effect of these control variables.

[16]The results for economic growth and whether a country is a Communist state are less clear.

Table F.1: OLS regressions of infant mortality on Accountability, WBGI VA and Freedom House/Polity

	(1)	(2)	(3)	(4)
Accountability	-4.339***		-0.529	-1.610***
	(0.350)		(0.847)	(0.558)
WB Voice and Accountability		0.0896	0.285	
		(0.568)	(0.648)	
Freedom House/Polity				-0.341**
				(0.158)
Foreign aid	-0.0481	-0.0335	-0.0322	-0.0596**
	(0.0308)	(0.0269)	(0.0270)	(0.0261)
GDP/capita (ln)	-10.55***	-5.038***	-5.104***	-5.018***
	(0.771)	(1.329)	(1.334)	(0.764)
Economic growth	0.0355	-0.0245	-0.0249	0.0430**
	(0.0235)	(0.0241)	(0.0241)	(0.0216)
Resource dependence	0.0404*	0.00909	0.00782	0.0693***
	(0.0215)	(0.0341)	(0.0341)	(0.0203)
Economic inequality	-0.0718**	-0.116**	-0.116**	0.0253
	(0.0308)	(0.0459)	(0.0459)	(0.0290)
Population (ln)	-17.74***	-34.88***	-34.66***	-6.280***
	(1.606)	(3.748)	(3.766)	(1.700)
Urbanization	-0.125***	0.0762**	0.0771**	-0.0612**
	(0.0280)	(0.0358)	(0.0358)	(0.0297)
Political violence	0.332***	0.577***	0.576***	1.000***
	(0.128)	(0.207)	(0.207)	(0.118)
Communist	0.387			-2.696*
	(1.620)			(1.484)
Infant mortality, regional average	0.646***	0.337***	0.341***	0.792***
	(0.0200)	(0.0928)	(0.0930)	(0.0256)
Political corruption index	-3.400*	4.889**	4.238*	-4.711***
	(1.902)	(2.162)	(2.401)	(1.766)
Constant	277.3***	400.0***	399.0***	116.3***
	(17.98)	(42.18)	(42.23)	(19.15)
R-squared	0.815	0.687	0.688	0.781
Adjusted R-squared	0.806	0.620	0.620	0.769
N	4,355	879	879	3,679
Countries	147	139	139	146

Table F.2: OLS regressions of infant mortality on different accountability sub-types

	(1)	(2)	(3)	(4)	(5)
Electoral regime					8.620***
					(0.920)
Vertical accountability	-2.871***			-0.377	-7.402***
	(0.320)			(0.430)	(0.578)
Horizontal accountability		-4.079***		-2.921***	
		(0.331)		(0.555)	
Diagonal accountability			-3.775***	-1.187**	
			(0.340)	(0.567)	
Foreign aid	-0.0719**	-0.0568*	-0.0514*	-0.0515*	-0.0482
	(0.0309)	(0.0307)	(0.0309)	(0.0308)	(0.0307)
GDP/capita (ln)	-10.12***	-10.66***	-10.54***	-10.61***	-10.66***
	(0.778)	(0.772)	(0.774)	(0.773)	(0.772)
Economic growth	0.0386	0.0390*	0.0344	0.0375	0.0373
	(0.0237)	(0.0235)	(0.0235)	(0.0235)	(0.0234)
Resource dependence	0.0414*	0.0389*	0.0459**	0.0409*	0.0268
	(0.0217)	(0.0215)	(0.0216)	(0.0216)	(0.0216)
Economic inequality	-0.0663**	-0.0734**	-0.0746**	-0.0750**	-0.0494
	(0.0310)	(0.0308)	(0.0309)	(0.0308)	(0.0308)
Population (ln)	-18.49***	-18.56***	-17.83***	-18.02***	-18.77***
	(1.619)	(1.599)	(1.614)	(1.611)	(1.603)
Urbanization	-0.114***	-0.120***	-0.135***	-0.123***	-0.122***
	(0.0282)	(0.0280)	(0.0281)	(0.0281)	(0.0279)
Political violence	0.384***	0.396***	0.279**	0.344***	0.429***
	(0.129)	(0.128)	(0.129)	(0.129)	(0.128)
Communist	4.838***	1.373	0.956	0.528	-0.545
	(1.550)	(1.592)	(1.636)	(1.632)	(1.638)
Infant mortality, regional average	0.634***	0.644***	0.655***	0.647***	-5.972***
	(0.0201)	(0.0200)	(0.0201)	(0.0201)	(1.975)
Political corruption index	1.257	-4.234**	-0.998	-4.178**	0.634***
	(1.837)	(1.933)	(1.860)	(1.933)	(0.0199)
Constant	279.0***	285.2***	276.0***	280.1***	282.9***
	(18.16)	(17.95)	(18.06)	(18.05)	(17.97)
R-squared	0.812	0.815	0.814	0.816	0.816
Adjusted R-squared	0.803	0.806	0.805	0.807	0.807
N			4,354		
Countries			147		

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note that in Model 5 we also add a dichotomous indicator of electoral regimes (i.e. did the regime hold elections), in order to account for the argument that elections in their own right might be associated with human development. Holding elections is associated with higher mortality rates at a statistically significant level. The sign and direction for vertical accountability stay unchanged. Thus, simply introducing elections does not seem to be correlated with better development outcomes, but an increase in de facto vertical accountability is.

Table F.3: OLS regression of infant mortality on measures for democracy

	(8)	(9)	(10)
Electoral democracy index	-13.74***		
	(1.268)		
Liberal component index		-15.95***	
		(1.393)	
Freedom House/ Polity			-0.709***
			(0.0932)
Foreign aid	-0.0657**	-0.0443	-0.0653**
	(0.0308)	(0.0310)	(0.0260)
GDP/capita (ln)	-10.18***	-10.10***	-4.811***
	(0.774)	(0.773)	(0.761)
Economic growth	0.0364	0.0393*	0.0432**
	(0.0236)	(0.0235)	(0.0216)
Resource dependence	0.0412*	0.0331	0.0687***
	(0.0216)	(0.0216)	(0.0203)
Economic inequality	-0.0590*	-0.0662**	0.0266
	(0.0309)	(0.0308)	(0.0290)
Population (ln)	-18.11***	-18.52***	-6.733***
	(1.612)	(1.604)	(1.695)
Urbanization	-0.125***	-0.120***	-0.0648**
	(0.0281)	(0.0280)	(0.0297)
Political violence	0.355***	0.299**	1.033***
	(0.128)	(0.129)	(0.118)
Communist	2.231	0.627	-1.873
	(1.597)	(1.638)	(1.458)
Infant mortality, regional average	0.640***	0.641***	0.798***
	(0.0200)	(0.0200)	(0.0256)
Political corruption index	-2.685	-4.212**	-3.344**
	(1.928)	(1.965)	(1.703)
Constant	282.0***	289.0***	119.4***
	(18.04)	(17.98)	(19.14)
R-squared	0.814	0.815	0.780
Adjusted R-squared	0.805	0.805	0.768
Observations	4,354	4,354	3,679
Number of countries	147	147	146

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table F.4: OLS regressions of infant mortality on different types of accountability, controlling for Freedom House/Polity.

	(11)	(12)	(13)	(14)	(15)
Vertical	-0.507				-0.0385
	(0.403)				(0.427)
Horizontal		-1.628***			-1.630***
		(0.433)			(0.527)
Diagonal			-0.953**		0.0303
			(0.481)		(0.573)
Accountability				-1.610***	
				(0.558)	
Freedom House/Imputed Polity	-0.604***	-0.354***	-0.498***	-0.341**	-0.353**
	(0.125)	(0.132)	(0.141)	(0.158)	(0.156)
Foreign aid	-0.0647**	-0.0624**	-0.0610**	-0.0596**	-0.0625**
	(0.0260)	(0.0260)	(0.0261)	(0.0261)	(0.0261)
GDP/capita (ln)	-4.795***	-5.041***	-4.932***	-5.018***	-5.037***
	(0.761)	(0.762)	(0.763)	(0.764)	(0.764)
Economic growth	0.0433**	0.0450**	0.0426**	0.0430**	0.0450**
	(0.0216)	(0.0216)	(0.0216)	(0.0216)	(0.0216)
Resource dependence	0.0682***	0.0677***	0.0718***	0.0693***	0.0675***
	(0.0203)	(0.0203)	(0.0204)	(0.0203)	(0.0204)
Economic inequality	0.0257	0.0265	0.0250	0.0253	0.0265
	(0.0290)	(0.0289)	(0.0290)	(0.0290)	(0.0290)
Population (ln)	-6.509***	-6.341***	-6.394***	-6.280***	-6.334***
	(1.704)	(1.695)	(1.703)	(1.700)	(1.706)
Urbanization	-0.0634**	-0.0623**	-0.0631**	-0.0612**	-0.0622**
	(0.0297)	(0.0296)	(0.0297)	(0.0297)	(0.0296)
Political violence	1.023***	1.023***	0.991***	1.000***	1.024***
	(0.118)	(0.118)	(0.120)	(0.118)	(0.120)
Communist	-1.914	-2.642*	-2.534*	-2.696*	-2.625*
	(1.458)	(1.469)	(1.495)	(1.484)	(1.495)
Infant mortality, regional average	0.796***	0.796***	0.796***	0.792***	0.796***
	(0.0256)	(0.0255)	(0.0256)	(0.0256)	(0.0256)
Political corruption index	-3.634**	-5.555***	-3.826**	-4.711***	-5.564***
	(1.718)	(1.798)	(1.719)	(1.766)	(1.802)
Constant	117.1***	116.9***	116.7***	116.3***	116.8***
	(19.22)	(19.11)	(19.18)	(19.15)	(19.22)
R-squared	0.781	0.781	0.781	0.781	0.781
Adjusted R-squared	0.768	0.769	0.769	0.769	0.769
Observations	3,679	3,679	3,679	3,679	3,679
Number of countries	146	146	146	146	146

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table F.5: OLS regressions of infant mortality on different types of accountability, controlling for V–Dem Liberal Component Index.

	(16)	(17)	(18)	(19)	(20)
Vertical	-1.070***				-0.353
	(0.398)				(0.434)
Horizontal		-3.393***			-3.177***
		(0.744)			(0.777)
Diagonal			-1.627**		-1.392*
			(0.684)		(0.716)
Accountability				-3.559***	
				(0.733)	
Liberal component index	-13.15***	-3.215	-10.15***	-3.524	1.857
	(1.738)	(3.117)	(2.806)	(2.911)	(3.948)
Foreign aid	-0.0452	-0.0531*	-0.0441	-0.0454	-0.0528*
	(0.0309)	(0.0309)	(0.0309)	(0.0309)	(0.0309)
GDP/capita (ln)	-10.07***	-10.56***	-10.27***	-10.46***	-10.67***
	(0.773)	(0.778)	(0.776)	(0.775)	(0.784)
Economic growth	0.0390*	0.0390*	0.0372	0.0361	0.0372
	(0.0235)	(0.0235)	(0.0235)	(0.0235)	(0.0235)
Resource dependence	0.0344	0.0376*	0.0380*	0.0387*	0.0420*
	(0.0216)	(0.0216)	(0.0217)	(0.0216)	(0.0217)
Economic inequality	-0.0674**	-0.0724**	-0.0702**	-0.0710**	-0.0759**
	(0.0308)	(0.0308)	(0.0309)	(0.0308)	(0.0308)
Population (ln)	-18.14***	-18.49***	-18.10***	-17.81***	-18.00***
	(1.609)	(1.600)	(1.613)	(1.606)	(1.612)
Urbanization	-0.118***	-0.120***	-0.127***	-0.124***	-0.124***
	(0.0280)	(0.0280)	(0.0281)	(0.0280)	(0.0281)
Political violence	0.295**	0.374***	0.278**	0.319**	0.350***
	(0.129)	(0.129)	(0.129)	(0.128)	(0.130)
Communist	0.626	0.982	0.230	0.101	0.620
	(1.637)	(1.636)	(1.646)	(1.637)	(1.644)
Infant mortality, regional average	0.639***	0.644***	0.647***	0.645***	0.648***
	(0.0200)	(0.0200)	(0.0202)	(0.0200)	(0.0202)
Political corruption index	-4.219**	-4.576**	-3.528*	-3.974**	-3.970**
	(1.963)	(1.962)	(1.985)	(1.960)	(1.983)
Constant	284.4***	285.7***	283.1***	279.2***	279.3***
	(18.05)	(17.95)	(18.14)	(18.04)	(18.13)
R-squared	0.815	0.815	0.815	0.816	0.816
Adjusted R-squared	0.806	0.806	0.806	0.806	0.807
Number of countries	147	147	147	147	147
Observations	4,354	4,354	4,354	4,354	4,354

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table F.6: OLS regressions of infant mortality on different types of accountability, controlling for V–Dem Electoral Democracy Index.

	(21)	(22)	(23)	(24)	(25)
Vertical	-0.124				0.0795
	(0.556)				(0.570)
Horizontal		-3.111***			-2.884***
		(0.488)			(0.555)
Diagonal			-2.315***		-0.661
			(0.622)		(0.711)
Accountability				-4.795***	
				(0.799)	
Electoral democracy index	-13.33***	-5.026***	-6.500***	1.831	-3.853
	(2.210)	(1.861)	(2.320)	(2.886)	(3.150)
Foreign aid	-0.0656**	-0.0556*	-0.0547*	-0.0469	-0.0532*
	(0.0308)	(0.0307)	(0.0309)	(0.0308)	(0.0308)
GDP/capita (ln)	-10.18***	-10.53***	-10.39***	-10.59***	-10.57***
	(0.775)	(0.773)	(0.775)	(0.774)	(0.774)
Economic growth	0.0364	0.0380	0.0349	0.0354	0.0374
	(0.0236)	(0.0234)	(0.0235)	(0.0235)	(0.0235)
Resource dependence	0.0412*	0.0393*	0.0440**	0.0403*	0.0402*
	(0.0216)	(0.0215)	(0.0216)	(0.0215)	(0.0216)
Economic inequality	-0.0593*	-0.0698**	-0.0685**	-0.0732**	-0.0716**
	(0.0309)	(0.0308)	(0.0310)	(0.0309)	(0.0309)
Population (ln)	-18.09***	-18.16***	-17.74***	-17.77***	-18.06***
	(1.614)	(1.604)	(1.613)	(1.606)	(1.612)
Urbanization	-0.125***	-0.121***	-0.132***	-0.125***	-0.124***
	(0.0281)	(0.0279)	(0.0281)	(0.0280)	(0.0281)
Political violence	0.354***	0.370***	0.298**	0.333***	0.353***
	(0.128)	(0.128)	(0.129)	(0.128)	(0.129)
Communist	2.255	0.760	0.899	0.373	0.471
	(1.601)	(1.607)	(1.635)	(1.621)	(1.633)
Infant mortality, regional average	0.639***	0.643***	0.649***	0.646***	0.646***
	(0.0201)	(0.0199)	(0.0202)	(0.0200)	(0.0201)
Political corruption index	-2.637	-5.002**	-2.416	-3.225*	-4.787**
	(1.940)	(1.953)	(1.926)	(1.922)	(1.996)
	(2.636)	(2.616)	(2.635)	(2.618)	(2.634)
Constant	281.7***	282.9***	277.3***	277.1***	281.7***
	(18.08)	(17.95)	(18.05)	(17.98)	(18.09)
R-squared	0.814	0.816	0.815	0.816	0.816
Adjusted R-squared	0.805	0.807	0.805	0.806	0.807
Observations	4,354	4,354	4,354	4,354	4,354
Number of countries	147	147	147	147	147

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

G JAGS code for accountability index

Note that the variables representing the different sub-types of accountability are estimated in an identical manner as they are in the accountability index presented here, but with independent $N(0,1)$ priors.

```
model{

####Diagonal accountability
###Civil society index
  for(i in 1:N){
    for(j in 1:3){
      muCS[i,j] <- betaCS[j,1] + betaCS[j,2]*xiC[i]
      yCS[i,j] ~ dnorm(muCS[i,j],tauCS[j])
    }
  }

  for(j in 1:3){
    betaCS[j,1:2]  ~ dmnorm(b0,B0)
    sigmaCS[j] ~ dunif(.1,10)
    tauCS[j] <- pow(sigmaCS[j],-2)
  }

  for(i in 1:N){
    xiC[i] ~ dnorm(xiS[i],tauC)
  }

    sigmaC ~ dunif(.1,10)
    tauC <- pow(sigmaC,-2)

####Media index
  for(i in 1:N){
    for(j in 1:6){
      muMV[i,j] <- betaMV[j,1] + betaMV[j,2]*xiM[i]
      yMV[i,j] ~ dnorm(muMV[i,j],tauMV[j])
    }
  }

  for(j in 1:6){
    betaMV[j,1:2]  ~ dmnorm(b0,B0)
    sigmaMV[j] ~ dunif(.1,10)
    tauMV[j] <- pow(sigmaMV[j],-2)
  }

  for(i in 1:N){
    xiM[i] ~ dnorm(xiS[i],tauM)
```

```
  }

    sigmaM ~ dunif(.1,10)
    tauM <- pow(sigmaM,-2)

####Expression index
  for(i in 1:N){
    for(j in 1:4){
      muFE[i,j] <- betaFE[j,1] + betaFE[j,2]*xiF[i]
      yFE[i,j] ~ dnorm(muFE[i,j],tauFE[j])
    }
  }

  for(j in 1:4){
    betaFE[j,1:2]  ~ dmnorm(b0,B0)
    sigmaFE[j] ~ dunif(.1,10)
    tauFE[j] <- pow(sigmaFE[j],-2)
  }

  for(i in 1:N){
    xiF[i] ~ dnorm(xiS[i],tauF)
  }

    sigmaF ~ dunif(.1,10)
    tauF <- pow(sigmaF,-2)

####Engaged society
  for(i in 1:N){
    muES[i] <- betaES[1] + betaES[2]*xiS[i]
    yES[i] ~ dnorm(muES[i],tauES)
  }

    betaES[1]  ~ dnorm(0,1)
    betaES[2]  ~ dnorm(1,1)T(0,)
  sigmaES ~ dunif(.1,10)
  tauES <- pow(sigmaES,-2)


#######Diagonal accountability priors
  for(i in 1:N){
    xiS[i] ~ dnorm(xi[i],tauSocial)
  }

  sigmaSocial ~ dunif(.1,10)
  tauSocial <- pow(sigmaSocial,-2)
```

```
######Horizontal accountability
#####Legislature
###Legislature variables
  for(i in 1:N){
    for(j in 1:2){
      muLC[i,j] <- betaLC[j,1] + betaLC[j,2]*(betaL[1] + betaL[2]*xiH[i])
      yLC[i,j] ~ dnorm(muLC[i,j],tauLC[j])
    }
  }

for(j in 1:2){
  sigmaLC[j] ~ dunif(.1,10)
  tauLC[j] <- pow(sigmaLC[j],-2)
  betaLC[j,1:2] ~ dmnorm(b0,B0)
}

###Legislature exists
 for(i in 1:N){
    probit(pL[i]) <- betaL[1] + betaL[2]*xiH[i]
    yL[i] ~ dbern(pL[i])
  }

 betaL[1] ~ dnorm(0,1)
 betaL[2] ~ dnorm(1,1)T(0,)

####Judiciary index
  for(i in 1:N){
    for(j in 1:4){
      muJC[i,j] <- betaJC[j,1] + betaJC[j,2]*xiJ[i]
      yJC[i,j] ~ dnorm(muJC[i,j],tauJC[j])
    }
  }

  for(j in 1:4){
    betaJC[j,1:2]  ~ dmnorm(b0,B0)
    sigmaJC[j] ~ dunif(.1,10)
    tauJC[j] <- pow(sigmaJC[j],-2)
  }

  for(i in 1:N){
    xiJ[i] ~ dnorm(xiH[i],tauJ)
  }
```

```
  sigmaJ ~ dunif(.1,10)
  tauJ <- pow(sigmaJ,-2)

####Other investigative body
  for(i in 1:N){
      muIB[i] <- betaIB[1] + betaIB[2]*xiH[i]
      yIB[i] ~ dnorm(muIB[i],tauIB)
  }

  betaIB[1:2]  ~ dmnorm(b0,B0)
  sigmaIB ~ dunif(.1,10)
  tauIB <- pow(sigmaIB,-2)

####Executive respects constitution
  for(i in 1:N){
      muEC[i] <- betaEC[1] + betaEC[2]*xiH[i]
      yEC[i] ~ dnorm(muEC[i],tauEC)
  }

  betaEC[1]  ~ dnorm(0,1)
  betaEC[2]  ~ dnorm(1,1)T(0,)
  sigmaEC ~ dunif(.1,10)
  tauEC <- pow(sigmaEC,-2)

#######Horizontal accountability priors
  for(i in 1:N){
    xiH[i] ~ dnorm(xi[i],tauHorizontal)
  }

  sigmaHorizontal ~ dunif(.1,10)
  tauHorizontal <- pow(sigmaHorizontal,-2)


#######Vertical accountability
###Clean elections variables
for(i in 1:N){
  for(j in 1:7) {
    muEV[i,j] <- betaEV[j,1] + betaEV[j,2]*(betaER[1] + betaER[2]*xiV[i])
    yEV[i,j] ~ dnorm(muEV[i,j],tauEV[j])
  }
}
for(j in 1:7){
  betaEV[j,1:2] ~ dmnorm(b0,B0)
  sigmaEV[j] ~ dunif(.1,10)
  tauEV[j] <- pow(sigmaEV[j],-2)
```

```
}

###Elections dichotomous
for(i in 1:N){
  probit(pER[i]) <- betaER[1] + betaER[2]*xiV[i]
  yER[i] ~ dbern(pER[i])
}

betaER[1] ~ dnorm(0,1)
betaER[2] ~ dnorm(1,1)T(0,)

###Suffrage
for(i in 1:N){
  probit(muPE[i]) <- betaPE[1] + betaPE[2]*xiV[i]
  yPE[i] ~ dbeta(muPE[i]*tauPE, (1-muPE[i])*tauPE)
}

tauPE ~ dgamma(1,1)
betaPE[1:2] ~ dmnorm(b0,B0)


###Head of executive elected
for(i in 1:N){
  probit(pO3[i])<-betaO3[1] + betaO3[2]*xiV[i]
  yO3[i] ~ dbern(pO3[i])
}

betaO3[1] ~ dnorm(0,1)
betaO3[2] ~ dnorm(1,1)T(0,)

############Parties index
for(i in 1:N){
  for(j in 1:3) {
    muP[i,j] <- betaP[j,1] + betaP[j,2]*xiP[i]
    yP[i,j] ~ dnorm(muP[i,j],tauPP[j])
  }
}
for(j in 1:3){
  betaP[j,1:2] ~ dmnorm(b0,B0)
  sigmaPP[j] ~ dunif(.1,10)
  tauPP[j] <- pow(sigmaPP[j],-2)
}

  for(i in 1:N){
     xiP[i] ~ dnorm(xiV[i],tauP)
```

```
  }

  sigmaP ~ dunif(.1,10)
  tauP <- pow(sigmaP,-2)

#######vertical accountability priors
  for(i in 1:N){
     xiV[i] ~ dnorm(xi[i],tauVertical)
  }
  sigmaVertical ~ dunif(.1,10)
  tauVertical <- pow(sigmaVertical,-2)


#############Accountability priors
  for(i in 1:N){
    xi[i] ~ dnorm(0,1)
  }

}
```

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