



# Patterns of Democracy over Space and Time


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Unidimensional measures of democracy fail to account for the complex and varied nature of political systems. This article disaggregates the concept of democracy and proposes a multidimensional conceptualization to account for this variation in institutional configurations. Three theoretically informed dimensions are featured: participation, electoral contestation, and constraints on the executive. The three dimensions constitute a cube covering all regime types, in which we place countries using V-Dem data from 1789 to 2019. This cube of democracy patterns reveals several interesting observations. We trace historical patterns of democratization and discuss how countries across the world have taken different paths at different times. Our conceptualization shows that political systems with a similar score along a unidimensional scale are often quite distinct. In addition, across the globe for 200 years, certain configurations of political institutions rarely occur. Furthermore, our approach reveals interesting patterns of regime convergence and divergence over time. Finally, we show that the typical pathways to democracy have changed since 1789. This multidimensional conceptualization ultimately opens up new avenues for research in which institutional variation and change can be studied in greater detail.

Las medidas unidimensionales de la democracia resultan insuficientes para dar cuenta de la naturaleza compleja y variada de los sistemas políticos. Este artículo segmenta el concepto de democracia y propone una conceptualización multidimensional para explicar esta variación en las configuraciones institucionales. Se presentan tres dimensiones fundamentadas teóricamente: la participación, la impugnación electoral y las restricciones al poder ejecutivo. Las tres dimensiones constituyen un cubo que contiene todos los tipos de régimen, en el que colocamos a los países utilizando los datos de V-Dem desde 1789 hasta 2019. Este cubo de patrones de democracia revela varias observaciones interesantes. Trazamos los patrones históricos de la democratización y analizamos la forma en que los países de todo el mundo han tomado diferentes caminos en distintos momentos. Nuestra conceptualización muestra que los sistemas políticos con una puntuación similar en una escala

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unidimensional son, con frecuencia, muy distintos. Además, en todo el mundo, desde hace 200 años, rara vez se dan ciertas configuraciones de instituciones políticas. Asimismo, nuestro enfoque revela interesantes patrones de convergencia y divergencia de regímenes a lo largo del tiempo. Por último, mostramos que los caminos típicos hacia la democracia han cambiado desde 1789. Esta conceptualización multidimensional abre, en última instancia, nuevas vías de investigación en las que se pueden estudiar la variación y el cambio institucionales con mayor detalle.

Les mesures unidimensionnelles de la démocratie ne permettent pas de rendre compte de la nature complexe et variée des systèmes politiques. Cet article désagrège le concept de démocratie et propose une conceptualisation multidimensionnelle pour rendre compte de cette variation des configurations institutionnelles. Trois dimensions fondées sur la théorie sont représentées : la participation, la contestation électorale et les contraintes sur l'exécutif. Ces trois dimensions constituent un cube couvrant tous les types de régime dans lequel nous plaçons les pays en nous appuyant sur les données de V-Dem sur la période 1789–2019. Ce cube de modèles de démocratie mène à plusieurs observations intéressantes. Nous retraçons les modèles historiques de démocratisation et nous abordons la manière dont des pays du monde entier ont emprunté différents chemins à différentes périodes. Notre conceptualisation montre que les systèmes politiques atteignant un score similaire sur une échelle unidimensionnelle sont souvent assez distincts. De plus, sur 200 ans et sur tout le globe, certaines configurations interviennent rarement. Notre approche révèle par ailleurs des modèles intéressants de convergence et de divergence de régimes au fil du temps. Enfin, nous montrons que les voies typiques vers la démocratie ont changé depuis 1789. Cette conceptualisation multidimensionnelle ouvre en définitive de nouvelles pistes de recherches via lesquelles la variation et l'évolution des institutions pourront être étudiées d'une manière plus détaillée.

## Introduction

Despite all the attention placed on describing democracy's evolution throughout modern history, debates persist as to when, how, and by how much democracy has developed in different regions. Centering on general conditions of democracy, these debates have often overlooked the multifaceted and complex nature of regimes. The varied institutional constellations and multiple dimensions of democracy require more attention.

Two obstacles have hindered such a more nuanced examination of democratic institutions over time. First, fine-grained cross-country indicators of several aspects of democracy have been missing from the pre-1900 period. Second, even for recent decades, it is inherently hard to describe regime developments in a manner that is *both* nuanced and easy to grasp. Researchers often construct and evaluate composite democracy indices, even when conceptually operating with multiple dimensions of democracy. Existing democracy indices typically rely on indicators tapping into different regime dimensions, but then aggregate the information from all dimensions into one composite score, thus masking the concept's multidimensionality.

We address the first issue on dearth of data for early modern history by employing the V-Dem dataset (Coppedge et al. 2020). Hence, we can leverage numerous specific indicators on different aspects of democracy from 1789 to the present. We resolve the second issue by taking a disaggregated, multidimensional approach to measuring democracy. More specifically, we draw on, and further refine, the approach to conceptualizing and describing regimes in three-dimensional space developed in Gates et al. (2006).

Instead of aggregating all democracy-relevant indicators into a one-dimensional measure, we present separate measures for three dimensions that are theoretically distinct.<sup>1</sup> We invoke two common dimensions of electoral democracy, namely contested elections to public offices and extent of political participation (e.g., Dahl 1971; Coppedge, Alvarez, and Maldonado 2008). We also measure a third dimension pertaining to constraints on executive decision-making authority to capture core features of common understandings

<sup>1</sup>Yet, other aspects could be incorporated into even broader democracy concepts and form the basis for separate dimensions. Adding a fourth or fifth dimension would allow for even more nuanced descriptions and analysis of institutional configurations but would lead to reduced parsimony and tractability. Adding more dimensions would also be incompatible with using visual presentation tools such as our three-dimensional cube.

of “liberal democracy” (e.g., Gates et al. 2006; Coppedge et al. 2011). We draw on these three dimensions to construct a cube of democracy patterns, using data back to 1789.<sup>2</sup>

The cube's main diagonal runs from a democratic to a nondemocratic corner.<sup>3</sup> In the democratic corner, countries enjoy the highest levels of participation, constraints, and contestation, whereas in the nondemocratic corner countries have very little of that. Different other parts of the cube represent quite distinct political regimes (e.g., early nineteenth-century Britain and contemporary Russia) that might receive similar scores on aggregated democracy indices such as Polity2 or V-Dem's liberal democracy index (LDI).

Our article makes three contributions. First, our multidimensional approach reveals information that a unidimensional measure inherently disguises; the latter collapses all relevant information into one-dimensional space.<sup>4</sup> While unidimensional measures have their virtues and areas of application,<sup>5</sup> our cube visualizes variation along different dimensions, which a unidimensional measure cannot show. Further, our dimensions display greater variation than comparable unidimensional indices of democracy. All areas of our cube are populated, and with our conceptualization, two “semi-democracies” scoring similarly on a unidimensional measure can be just as far apart as a very democratic and very nondemocratic country.

<sup>2</sup>Our three dimensions are positively correlated in the historical data that we draw on. Yet, since we do not rely on latent variable techniques, but rather a priori considerations to arrive at *theoretically* independent dimensions, we visually present results in a conventional cube in Euclidian space with three orthogonal axes.

<sup>3</sup>This conceptualization captures democratic institutions. Autocratic institutions are not simply “the opposite” (Goertz 2020, chapter 1, 15), as there is great institutional variation among autocracies and institutions such as parliament and parties often serve different purposes than in democracies.

<sup>4</sup>When referring to dimensionality of democracy measures, we focus on mathematical dimensionality. Most existing high-level democracy measures (e.g., Polity2) include one value for a given country  $i$  and year  $t$  implying mathematical unidimensionality,  $Dem_{i,t} \in R^1$ . This value is usually based on multiple underlying dimensions, captured by ( $n$ ) lower level indicators,  $\overline{dem}_{i,t}^n \in R^n$ . When aggregating these underlying dimensions into one value (the high-level democracy measure), the information contained in the indicators is collapsed into unidimensional space ( $R^1$ ).

<sup>5</sup>Sometimes, aggregates are desirable to reflect the overall state or direction of change in a political system in an easy-to-communicate manner. Politicians, citizens, and researchers ask questions such as “is country A more democratic than country B” or “has country C become more or less democratic over the last decade.” Composite, unidimensional democracy indices provide straightforward answers to such questions.

Second, our conceptual framework and cube of democracy patterns contribute to a better understanding of spatial and temporal evolution of regimes. Concerning spatial analysis, we systematically examine the dispersion of regime characteristics in multidimensional space. We find that while all parts of the cube are populated, some are more densely populated than others. This provides nuanced insights regarding institutional congruence and incongruence. Furthermore, there is no obvious clustering of democracies versus nondemocracies in the cube, suggesting that regime type is poorly represented by dichotomous measures. Regarding temporal analysis, we can both trace individual trajectories of countries and track the evolution of the entire system of states. The former enables us to uncover the different pathways through which countries became democracies since 1789 and the latter allows us to show how institutional heterogeneity, globally, has changed during different parts of modern history.

Third, in addition to offering new insights into democracy development worldwide, our multidimensional approach enables a more detailed identification of relationships between regime characteristics and economic, security, or environmental outcomes. Many studies provide answers to questions such as “why don’t democracies fight one another?” (Mitchell 2002), “does democracy enhance health?” (Wang, Mechkova, and Andersson 2019), or “does democracy cause economic growth?” (Acemoglu et al. 2019; Boese and Eberhardt 2021). Nevertheless, they constitute but a first step in understanding the true mechanisms, through which institutional configurations may affect real-world outcomes. Multidimensional disaggregated approaches to democracy measurement allow for studying how specific aspects of political regimes interact and influence a given outcome.<sup>6</sup> Further, as we illustrate in our online Appendix J application on institutional configurations and civil war onset, we may divide regimes into subcategories based on configurations of scores on all three dimensions, and make different comparisons and contrasts across any pair of subcategories (e.g., by including dummies for  $n - 1$  categories in a regression and comparing their respective coefficients with the reference category).

Some recent studies pursue applications with disaggregated measurement strategies to test more fine-grained hypotheses on the causal role of certain aspects of democracy. Cox and Weingast (2018) use subindices of Polity, showing that the negative impact of leader changes on economic growth is mitigated by horizontal constraints on the executive, but not vertical constraints. Others use V-Dem indices to disentangle the effects of different aspects of democracy. Gerring et al. (2020) consider regime effects on infant mortality, showing a clear, negative association with electoral contestation, but not with several other aspects of democracy. Fjelde, Knutsen, and Nygård (2021) disaggregate regimes into two dimensions, showing a complex interaction between horizontal and vertical constraints in mitigating civil war risk. We display the flexibility and usefulness of our approach and replicate Fjelde et al.’s analysis using our cube’s dimensions in online Appendix J. In sum, the range of applications for our cube of democracy patterns is ample.

In the second section, we provide a conceptual discussion of our multidimensional regime concept. Next, we describe

the V-Dem indicators used to measure attributes of the different dimensions and discuss how we aggregate them. In the third section, we present our cube of democracy patterns. We draw on selected country histories to visualize and describe regimes and regime developments. In addition, we trace global developments of democratic institutions. Furthermore, we compare spatial and temporal variation along each dimension to that of comparable unidimensional democracy measures. The fourth section presents three applications that illustrate the benefits of our multidimensional approach for studying political institutions. We first examine the spatial distribution of countries in the cube. Then, we shift from a static to a dynamic perspective and examine the pathways different countries take toward democracy. Finally, we analyze how regime heterogeneity in the full system of states has evolved over time.

### Regime Dimensions

Democracy is a contested concept and numerous definitions exist; for example, some authors conceptualize democracy as a set of institutions and others as the fulfillment of some underlying principles.<sup>7</sup> The multidimensional nature of the concept, however, transcends this debate.

We build on a long tradition for thinking about democracy in multiple dimensions. Notably, Dahl (1971) proposed that regimes could be arranged along two dimensions, contestation and participation (see also Coppedge, Alvarez, and Maldonado 2008; Boese & Wilson (forthcoming)). Contestation refers to the extent of real competition in selecting political elites to public offices, whereas participation refers to how widely distributed participation rights in determining this contest are. While being considered a democracy requires high scores on both dimensions, countries might score high on one and low on the other. The Soviet Union scored high on participation but low on contestation, and Apartheid South Africa high on contestation but low on participation; while neither is a democracy, they are clearly distinct regimes. Disaggregating into different dimensions allows for more refined categorizations and accurate descriptions of regimes. Further, Dahl hypothesized that the sequence in which countries developed on the dimensions has implications for regime stability and substantive policy outcomes. Enhanced stability and better policy outcomes supposedly follow from developing contestation prior to participation. Hence, operating with multidimensional regime concepts could allow us to better understand salient causal relationships.

While extant democracy indices often include several subindices, the norm is to use unidimensional democracy measures, such as V-Dem’s Polyarchy or Polity’s Polity2 index, in statistical analyses of determinants or effects of regimes. We argue that a fundamental change in approach would be fruitful for much empirical work: rather than thinking of democracy as a single number on one scale, it should be conceptualized as a configuration of numbers on several dimensions.<sup>8</sup>

How should these dimensions be delineated and defined? While inductive “data-mining” approaches are an option,<sup>9</sup> we follow a different approach. We define the dimensions in

<sup>7</sup>For discussions of democracy as a latent variable, for example, see Goertz (2020) or Treier and Jackman (2008).

<sup>8</sup>There are substantial differences in concepts coded by different unidimensional democracy indices (e.g., Boese 2019). We compare and contrast our three-dimensional conceptualizations to V-Dem indices that are aggregated into one dimension but constructed from similar low-level indicators.

<sup>6</sup>Such approaches also allow for making different types of comparisons. Analysts may be theoretically interested in the bivariate correlation between a particular democracy dimension and another variable or to isolate the effect of one dimension while holding other dimensions constant.



a manner consistent with the existing theory to obtain easily interpretable and useful insights. We present multidimensional results for two separate three-dimensional specifications of democracy, namely a *narrow-* and *broad-participation* model. We highlight and illustrate different insights gained through each specification, and discuss benefits relative to unidimensional measures. We first discuss the theory underlying the multidimensional conceptualizations and then describe how each dimension is operationalized.

#### *Deriving Theory-Based Dimensions*

While the definition of “democracy” constitutes a hotly debated field of research (Munck 2016), most democracy scholars agree that contested elections are core to the concept.<sup>10</sup> Modern states require elections to be democratic, but not all regimes that hold elections are democratic (Gandhi and Ong 2019). Electoral regimes may fail to be democratic because elections lack in *contestation* or *participation*. Simplified, contestation reflects the right to compete for votes for public office and participation the right to vote in this competition (although these dimensions are hard to perfectly disentangle and can be operationalized in different ways).

More specifically, contestation has at least two main components: openness and fairness. Contested elections must meet Przeworski’s criteria of fairness: “ex-ante uncertainty, ex-post irreversibility” (Przeworski 1991, 10). The rules are fixed, the result is not known in advance and cannot be overturned by any party. Regarding openness, nonincumbents must be allowed to challenge incumbents within the existing parties or by creating new parties and movements. Participation in the minimalist sense centers on the ability to vote in elections. Thus, suffrage rights are key. At present, universal adult suffrage characterizes almost all electoral regimes, but historically, limitations based on, for example, gender, income, and race were common. Below, we discuss how several other features of the political system may inhibit citizens’ ability to actively use their voting rights.

The third element, which moves us beyond a minimalist democracy definition, are *constraints* placed on the executive between elections. Eckstein (1973) and Gurr (1974) theorized that—in addition to regulation of executive recruitment (contestation) and franchise extension (participation)—the limitation of power itself is a key dimension of democracy. Such constraints are typically related to institutions that provide checks and balances on branches of government, especially the executive.

This dimension is less commonly acknowledged as a dimension of democracy than contestation and participation. There is a long history in political philosophy of considering protection of rights and constraints on executive power as something different—or even in conflict with—democracy. Liberalism and majority rule are construed as different things, and checks on executive power may hinder elected representatives from pursuing policies desired by the popular majority (see Zakaria 2003). Yet, proponents of broader (liberal) notions of democracy highlight that, absent constraints, popularly elected politicians may abuse their power to trample not only on minorities but also on the broader electorate, and rather pursue policies that are in their own, narrow self-interest. Without constraints, democratically elected incumbents can more easily under-

mine competition in the next election (see Gandhi and Ong 2019; Boese et al. 2021).

Apart from defining the concept of “democracy,” several scholars have considered placement on these three democracy dimensions as potential causes of regime stability. Dahl (1971) argued that the order in which contestation and participation develop affects democratic stability. Eckstein (1973) postulated a theory of congruence and consonance, whereby “political institutions perform better if their authority patterns are congruent with those of social institutions and, importantly, if they are internally consonant” (Knutsen and Nygård 2015, 657), and one key performance indicator was regime stability. Gates et al. (2006) also consider three dimensions: (1) *fair elections* (i.e., contestation), (2) *institutionalized and widespread participation*, and (3) *limited executive authority* (i.e., executive constraints)—and argue that regimes scoring high on all simultaneously (i.e., democracies) should constitute a re-enforcing equilibrium. Empirically, they find that such institutional configurations increase regime longevity.

This paper does not seek to establish a new universally accepted definition of democracy or categorization of regime constellations. Rather, the aim is to reveal the benefits of empirically accounting for variegated institutional configurations. Our multidimensional measurement strategy and visualization of the three theorized dimensions allow for more detailed observations and inferences concerning regime differences and developments over time than conventional unidimensional approaches.

#### *Quantifying the Dimensions*

When attempting to measure our three dimensions (*contestation*, *participation*, and *constraints*), several difficult decisions must be made, for instance, on indicator selection, which affect the distributions of scores. Take *participation*: de jure voting rights are critical to the ability of citizens to participate in elections. Hence, a possible solution is to measure *participation* using the share of population with suffrage as denoted in the constitution.

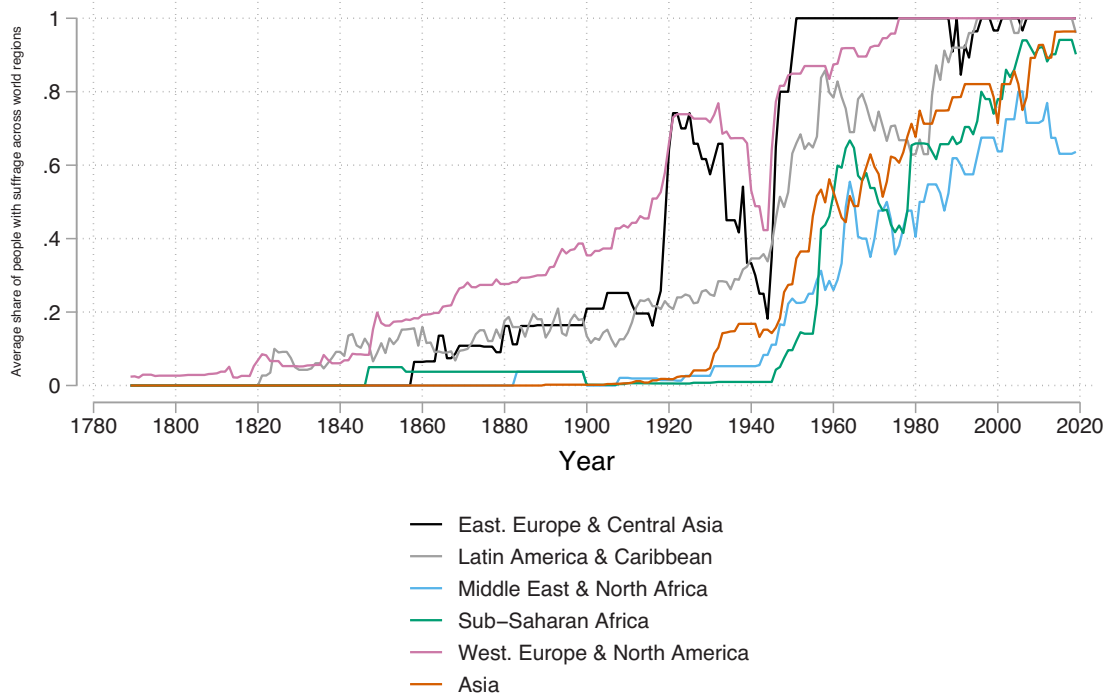
Figure 1 displays regional average shares of population with suffrage across world regions. While the extension of suffrage was critical to enhancing participation during the nineteenth and early twentieth centuries, there is currently little, if any, variation in suffrage for most world regions. The share of people allowed to vote by law does not provide very useful information distinguishing between current institutional arrangements.

Yet, a somewhat broader understanding of *participation*, may in practice also necessitate that people have the means and opportunities to freely and effectively utilize their voting rights. In most countries today, suffrage is universal. Still, common practices such as vote buying, ballot stuffing, or flawed voter registries can effectively disenfranchise many voters. Figure 2 displays regional averages of V-Dem’s voting irregularities measure (*v2elirreg*)<sup>11</sup> across world regions. It paints a different picture than figure 1: although adults in most countries today have voting rights, irregularities hinder them from fully and meaningfully participating in several countries. However, voting irregularities also influence how free and fair elections are, and thereby contestation. If we want to keep regime dimensions distinct, and avoid double-counting specific institutional and other

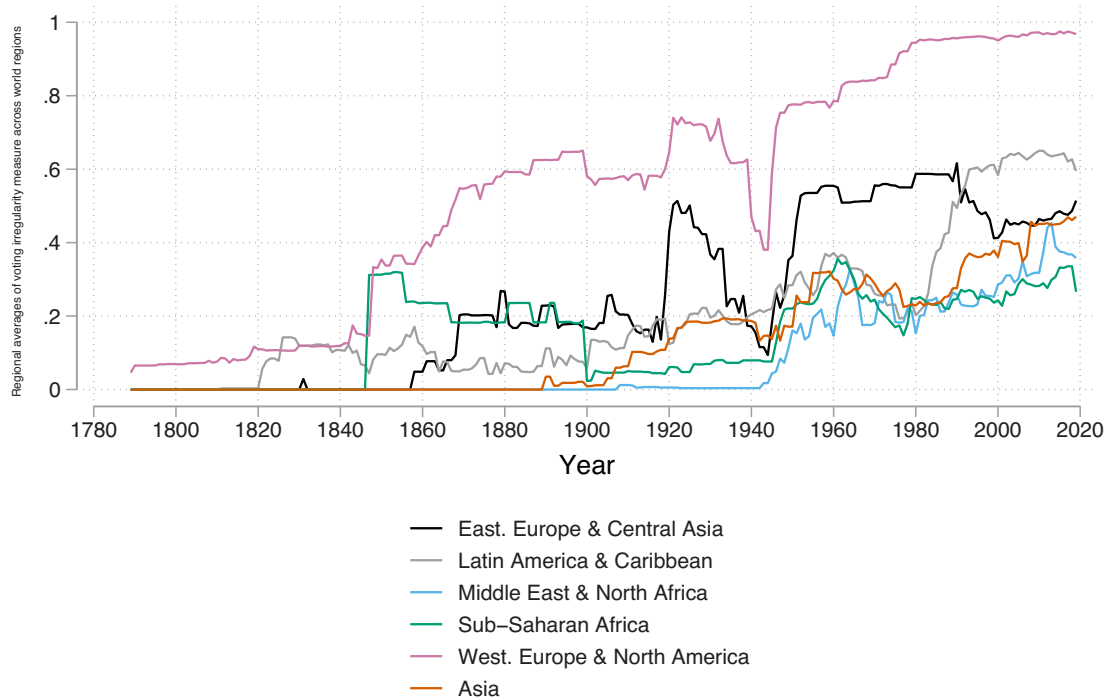
<sup>9</sup>Wilson and Boese (2020), for example, derive latent dimensions from empirical measures of electoral democracy.

<sup>10</sup>See Schumpeter (1976 [1942]) or Dahl (1971).

<sup>11</sup>The measure in figure 2 is rescaled  $\in [0, 1]$ , with low scores reflecting widespread irregularities.



**Figure 1.** Average share of population with suffrage across world regions, 1789–2018.



**Figure 2.** Regional averages of V-Dem's voting irregularities measure (*v2elirreg*) across world regions, 1789–2018.

features, opting for a broad-participation concept means a narrow contestation concept.

We provide two alternative approaches to three-dimensional democracy measurement: a *narrow-participation* and a *broad-participation* model (which we could also have labeled as, respectively, *broad contestation* and *narrow contestation*). Table 1 presents the contents of each model's dimensions. The narrow-participation model follows the "classic" definition of participation and only considers suffrage. The broad definition includes indicators of voting

irregularities in addition to suffrage to capture the actual extent to which people can meaningfully participate in the political process. The irregularities indicators (italic items in table 1) are removed from the contestation dimension in the latter model to avoid double-counting.<sup>12</sup> In the broad-participation model, we thus conceptually view voter-related election irregularities as affecting how people

<sup>12</sup>When searching for latent dimensions of electoral democracy, Wilson and Boese (2020) find precisely these voter-related election irregularities to constitute a separate, third dimension and label it "vote quality."

**Table 1.** Two conceptualizations of contestation, participation, and constraints: narrow- and broad-participation models

Narrow Participation Model		
<i>Constraints on the executive</i>	<i>Participation</i>	<i>Contestation</i>
Judicial constraints Legislative constraints	Share of population with suffrage	EMB autonomy EMB capacity Election government intimidation Elected officials index <i>Election voter registry</i> <i>Election vote buying</i> <i>Election other voting irregularities</i>
Broad Participation Model		
<i>Constraints on the executive</i>	<i>Participation</i>	<i>Contestation</i>
Judicial constraints Legislative constraints	Share of population with suffrage <i>Election voter registry</i> <i>Election vote buying</i> <i>Election other voting irregularities</i>	EMB autonomy EMB capacity Election government intimidation Elected officials index

EMB = election management body.

can participate in the system. In the narrow-participation model, we view these irregularities as part of contestation as they occur during the electoral process and inhibit free and fair electoral competition between parties or candidates. Regardless of which dimensions these irregularities are classified under, we consider them a crucial part of the political system. Let us now specify the operationalization of each dimension.

#### CONSTRAINTS ON THE EXECUTIVE

The executive constraints dimension consists of two V-Dem indices capturing judicial and legislative checks on the executive. The first index,  $v2x\_jucon$ , answers the following question: *To what extent does the executive respect the constitution and comply with court rulings, and to what extent is the judiciary able to act in an independent fashion?* (Coppedge et al. 2020, 49). Legislative constraints are captured by  $v2xlg\_legcon$ , measuring the extent to which *the legislature and government agencies, for example, comptroller general, general prosecutor, or ombudsman, (are) capable of questioning, investigating, and exercising oversight over the executive* (Coppedge et al. 2020, 49).

#### CONTESTATION

Whether the executive and legislators are recruited (directly or indirectly) by elections or otherwise appointed is fundamental to contestation. We use V-Dem's elected officials index,  $v2x\_elecoff$  (for details, see Coppedge et al. 2020, 47) to represent this de jure aspect of the contestation dimension.

However, elections are not always competitive. Therefore, we include additional measures capturing how free and fair elections are. Broadly conceived, contestation may be undermined on both the voter and the candidate side. The latter refers to competition between the candidates before votes are cast. Three V-Dem indicators capture this feature: Election management body (EMB) autonomy ( $v2elembaut$ ); EMB capacity ( $v2elembcap$ ); and election government intimidation ( $v2elintim$ ). Regarding the voter side, practices such as vote buying or voter intimidation mitigate free and fair competition. As noted, they also curtail voters' opportunity to effectively participate in and influence the election process. (Hence, we include them in the participation dimension of the broad-participation model.)

#### PARTICIPATION

For participation, we include the share of the adult population with (de jure) suffrage measured by V-Dem's  $v2x\_suffr$ . Concerning de facto provisions affecting voters' ability to exercise a free and fair vote in the broad-participation model, we include election voter registry ( $v2elrgstry$ ), election vote buying ( $v2elvotbuy$ ), and election other voting irregularities ( $v2elirreg$ ).

#### OVERVIEW OF RELEVANT INDICATORS

Table 2 displays the measurement level and scales on which all indicators are coded. We use measurement-model-adjusted versions in our analysis.<sup>13</sup> V-Dem's measurement model (Pemstein et al. 2020) translates expert codings of the ordinal indicators into latent variables measured on standardized interval scales. Specifically, the input is the evaluation of the many V-Dem country experts that code each country on an indicator. The measurement model summarizes these inputs, taking into account both measurement errors and differences in how experts interpret the concepts.

#### Constructing the Cube of Democracy Patterns

Once the relevant indicators for each dimension are chosen, appropriate aggregation procedures should be selected. Aggregation choices may strongly influence the contents, and thus interpretations, of the resulting measures.

The two subindices forming the executive constraints dimensions are on the same level of abstraction. Consequently, three possible methods of aggregation seem adequate: a multiplicative method, an additive/averaging method, or a combination of them. A multiplicative aggregation<sup>14</sup> implies complementarity between the elements, that is, if either judicial or legislative constraints on the executive are very low and the respective index approaches zero, the joint measure is very low (approaching zero) as well. Taking the average<sup>15</sup> implies (partial) substitutability between the indices: high judicial constraints can

<sup>13</sup>The indicators are included in the V-Dem dataset under the labels noted in table 2.

<sup>14</sup> $const_{mult} = v2x\_jucon \cdot v2xlg\_legcon$ .

<sup>15</sup> $const_{avg} = \frac{1}{2}v2x\_jucon + \frac{1}{2}v2xlg\_legcon$

**Table 2.** Scales of the indicators forming the dimensions

<i>Dimension</i>	<i>Index</i>	<i>Scale</i>	<i>Min</i>	<i>Max</i>
Constraints on the executive	v2x_jucon	Interval	0 (low constraints)	1 (high constraints)
	v2xlg_legcon	Interval	0 (low constraints)	1 (high constraints)
Participation	v2x_suffr	Interval	0	1
	v2elrgstry	Ordinal	0 (no registry)	4 (accurate registry)
	v2elvtobuy	Ordinal	0 (vote buying)	4 (no vote buying)
	v2elirreg	Ordinal	0 (irregularities)	4 (no irregularities)
	v2eembaut	Ordinal	0 (EMB not autonomous)	4 (EMB autonomous)
	v2eembcap	Ordinal	0 (EMB not capable)	4 (EMB capable)
Contestation	v2elintim	Ordinal	0 (strong intimidation)	4 (no intimidation)
	v2x_elecoff	Interval	0 (appointment)	1 (elections)

**Table 3.** Overview of aggregation procedures used for each dimension in the respective models

<i>Model</i>	<i>Participation</i>	<i>Contestation</i>	<i>Constraints</i>
Narrow participation	Suffrage	Elected officials index × Voter- and candidate-contestation indicator	Addition and multiplication of legislative and judicial constraints
Broad participation	Suffrage × Voter-contestation Indicator	Elected officials index × Candidate-contestation indicator	

*Notes:* Suffrage refers to v2x\_suffr and elected officials index to v2x\_elecoff. Voter-contestation combines the information from v2elrgstry, v2elvtobuy, and v2elirreg. The following indicators are constructed using factor analysis: Candidate-contestation is constructed from v2eembaut, v2eembcap, and v2elintim. The joint voter- and candidate-contestation indicator is formed using all six contestation variables mentioned above jointly. More information on the factor analyses can be found in online Appendix C.

compensate for low legislative constraints, and vice versa. We see plausible arguments for one type of institutional constraint potentially substituting for the other in checking executive behavior, but also that an independent and capable legislature may be more effective in constraining the executive present in an independent judiciary (and vice versa). Consequently, we follow V-Dem's procedure in such ambiguous cases (Coppedge et al. 2019, 7) and aggregate the *constraints on the executive* dimension by averaging the multiplicative and the additive aggregation procedures:  $\text{const} = \frac{1}{2}\text{const}_{\text{avg}} + \frac{1}{2}\text{const}_{\text{mult}}$ .

Regarding contestation, the mode of power transfer (elections) and the quality of that mode (are elections fraudulent or "clean"?) form a complementary relationship when assessing de facto contestation. Different offices need to be filled by elections (measured by v2x\_elecoff) AND<sup>16</sup> these elections should not be fraudulent (measured by the remaining contestation indicators). Regimes cannot be considered democratic if elections are absent or if elections are highly corrupted. Similarly, for the broad-participation model, suffrage and the three de facto participation variables are complements. Countries cannot score high on participation without extensive suffrage or if voting irregularities are rampant, which makes de jure voting rights ineffective in practice.

The indicators forming the participation and contestation dimensions are not on similar scales. Aggregating these dimensions therefore requires more sophisticated methods than bare multiplication or averaging. Both dimensions consist of complementary elements, and to properly join them

in a theory-consistent manner we adopt a three-step procedure.

First, all point estimates from the V-Dem measurement model are rescaled to 0–1 by employing cumulative distribution function (CDF) transformations.<sup>17</sup> We (adopt the V-Dem procedure and) assume that the realizations of an index  $X$  are normally distributed with mean  $\mu$  and variance  $\sigma^2$ . Then the standardized form of  $X$  is  $Z = \frac{(X-\mu)}{\sigma}$ . For the normalization, the CDF of  $Z$  is used. The CDF transformation, which effectively is a rank transformation, has benefits over a min–max standardization in our context, since the distribution of the V-Dem measurement model output can have very long tails. The CDF transformation handles these tails well, as tail length is unrelated to rank, whereas the min–max alternative would compress most observations toward the middle. However, if the original distances reflect real-world differences on an indicator, the CDF compression of the tails would be problematic. Hence, results using a min–max standardization are summarized in online Appendix H. These results are very similar.

Second, for each dimension, we create indices of candidate-contestation, voter-contestation, and candidate and voter contestation jointly, using factor analysis.<sup>18</sup>

Third—following the complementarities/AND logic laid out above—the relevant factor analysis output is multiplied with suffrage in the broad-participation model or with the

<sup>17</sup>The CDF transformation is applied twice: first to the indicators entering the factor analysis and a second time to the factor analysis output. Indicators only measured in election years (v2elintim, v2elrgstry, v2elvtobuy, v2elirreg.) were repeated over election periods (either until the next election or a disruption of the electoral regime [as indicated by v2x\_elecreg]).

<sup>18</sup>See online Appendix C for details on procedure and results.

<sup>16</sup>This implies multiplicative aggregation; see Goertz (2020, chapter 2).



Table 4. Summary statistics

Variable	Overall				Between	Within	
	Mean	Std. Dev.	Min	Max	Std. Dev.	Std. Dev.	
EDI	27.21	26.19	0.70	92.40	18.19	19.75	
LDI	21.79	22.81	0.30	89.10	16.18	16.28	
Narrow-participation model:	Constraints	31.93	28.33	0.25	96.65	21.10	17.96
	Contestation 1	31.02	38.68	0.00	98.11	25.49	30.99
	Participation 1	43.56	45.94	0.00	100.00	27.38	40.70
Broad-participation model	Contestation 2	31.35	39.16	0.00	97.56	25.63	31.54
	Participation 2	30.79	36.91	0.00	98.17	23.06	30.95

Notes: Summary statistics for the dimensions of the cube of democracy patterns as well as V-Dem's EDI and LDI. Between and Within Std. Dev. refers to the variation between and within panels.

elected officials index for the contestation dimension in the narrow-participation model. Table 4 provides an overview of how each dimension was aggregated in both models.

The final sample consists of 24,347 observations covering 199 countries with average time series of 122 years.<sup>19</sup>

### The Cube of Democracy Patterns

The cubes in figure 3 display global democracy patterns in 1848, 1918, and 2018, for both the narrow- and broad-participation models, along our three dimensions.<sup>20</sup> The cube revolves around an “axis of democracy” connecting the autocratic (0, 0, 0) and democratic (100, 100, 100) corners. An animated version of the cubes over time is available at <https://vanessaboese.weebly.com/patterns-of-democracy-over-space-and-time.html>.

Our first observation is that many regimes are situated far from the diagonal line running from the autocratic to the democratic corner. Hence, our three dimensions are far from perfectly correlated and less so at some time points than others. The correlations in our overall sample are 0.76 between contestation and participation (narrow), 0.76 between contestation and constraints, and 0.53 between participation (narrow) and constraints. These modest correlations are features, and not bugs, of our approach, as the dimensions are theoretically distinct and supposed to measure different facets of political regimes that are not presumed to always move in tandem. If they were perfectly correlated, all regimes would be located on the main diagonal and a three-dimensional conceptualization would offer no advantages. This is in line with the redundancy guideline proposed by Goertz (2020, 31), which often applies for multidimensional conceptualization; the defining dimensions of a concept should, in general, be independent of each other and avoid overlaps.

Second, “semi-democracy” is, at best, a heterogeneous category. In our setup, such regimes can be relatively democratic on one or two dimensions and are scattered throughout the cube. This observation is important for nuancing our understanding of the institutionally heterogeneous nature of such regimes. Later, we explore if certain such configurations of institutions are more likely to lead to democratization. Using country examples, we also illustrate how similar (intermediate) scores on unidimensional measures may mask important regime differences.

<sup>19</sup> Online Appendix E provides sample details. The full list of countries and time series used in the analysis is available at <https://vanessaboese.weebly.com/patterns-of-democracy-over-space-and-time.html>.

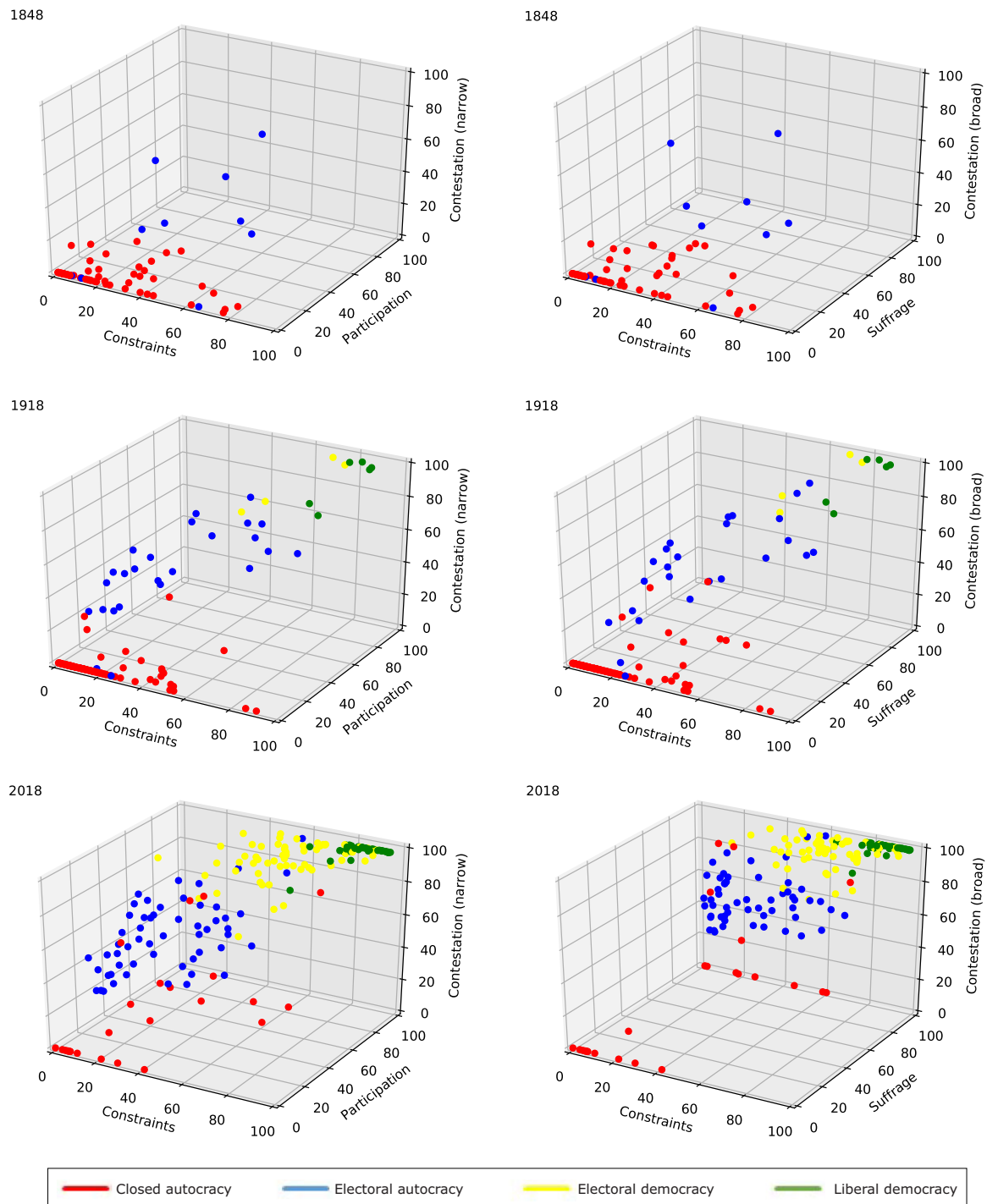
<sup>20</sup> Online Appendix A displays additional cubes.

Third, many regimes in the autocratic corner are temporally unstable—they shift positions relatively quickly—for both the narrow- and the broad-participation models. Contrary to expectations of institutional congruence and stability following from Eckstein (1973) and Gurr (1974), we do not find autocratic stability. This observation deserves more attention (see our concluding discussion), but lies beyond the scope of this paper. We surmise that especially for the most autocratic countries, other dimensions are needed to adequately characterize autocratic regimes with respect to institutional features that affect their stability. Boese (2021), for example, proposes a three-dimensional measure of authoritarianism along the dimensions' legitimization, presence and nature of elections, and power maintenance strategies.

Fourth, certain corners in the cube are underpopulated. This is not due to some conceptual flaw, but rather reflects real-world patterns we would expect from institutional congruence theory (e.g., Eckstein 1973; Gates et al. 2006). Some constellations of institutions rarely form and (when they do) survive relatively briefly. For the narrow-participation model, regimes are congregated in the autocratic or democratic corner, or along a pathway that follows the floor, left-hand wall, or back wall. For the broad-participation model, more observations occur in the cube's interior. Four corners—(low contestation, high constraints, low participation), (high contestation, high constraints, low participation), (low contestation, high constraints, low participation), and (high contestation, low constraints, low participation)—are underpopulated.

Fifth, the disaggregation in the cube allows us to visualize the historical patterns of regime transformations. Distinct changes in regime configurations occurred from 1848 to 1918 to 2018, as seen in figure 3. In 1848, no “true democracies” existed, but there was ample spatial distribution within the left side of the cube (varying constraints but limited participation) though mostly along the floor (limited contestation). Sixty years later, numerous “electoral autocracies”—as classified by Lührmann, Tanenbergh, and Lindberg (2018)—with higher participation had spread through the interior of the cube. Again, the benefit of comparing two models becomes apparent: in 1848 and 1918, little difference is evident between the broad- and the narrow-participation models. In 2018, the number of democracies had blossomed. Now the difference between broad and narrow participation is stark. For the narrow-participation model, most regimes cluster at the “back wall” due to universal suffrage. With the broad-participation dimension, more regimes lie in the interior





**Figure 3.** Cube of democracy patterns for 1848, 1918, and 2018.

Left: narrow-participation model. Right: broad-participation model. Number of countries (year): 59 (1848), 141 (1918), and 179 (2018).

*Note.* Color coding by Regimes of the World Index (Lührmann, Tannenber, and Lindberg 2018).

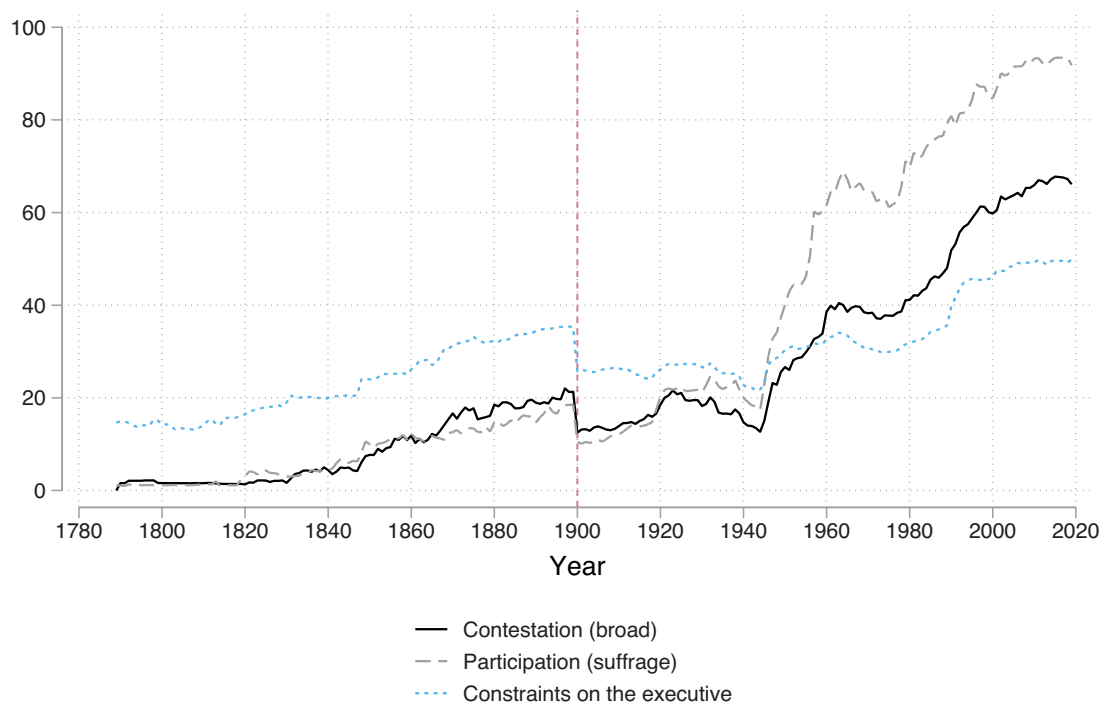
of the cube, given substantial subversions of de facto voter participation.

#### *Comparison of Uni- and Multidimensional Variation*

The cube of democracy patterns captures more variation than unidimensional democracy measures. In the following, we illustrate this fact by comparing the variation in each of the cube's dimensions with V-Dem's electoral democracy

index (EDI; see Teorell et al. 2019), also referred to as polyarchy (v2x\_polyarchy), and the liberal democracy index (LDI, v2x\_libdem). The latter contains both polyarchy and a liberal component capturing rule of law plus judicial and legislative constraints on the executive, thus using many of the same indicators as our scheme but aggregated into one measure.<sup>21</sup>

<sup>21</sup>We highlight, however, that V-Dem does provide disaggregated measures for the liberal (and other) component(s) of democracy, which could be used in



**Figure 4.** Global average participation (narrow), contestation (voters + candidates/parties), and constraints, 1789–2018. The vertical line marks the major expansion of the sample with numerous African and Asian colonies from 1899 to 1900, which explains the sudden drops (see online Appendix E).

Yet, our focus here is on our disaggregated measures of the three dimensions and comparing them to the existing, composite democracy indices, and we present summary statistics for a joint sample of 199 countries with average time series of 122 years (24,347 observations).<sup>22</sup>

Table 4 provides summary statistics for the unidimensional indices and our cube dimensions for the pooled sample under the *overall* columns. Notably, the standard deviation for each cube dimension is higher than for the unidimensional measures. Note that the constraints dimension and the LDI capture (to differing extents) institutional constraints on the executive, and display relatively low total variation.

Concerning spatial variation between countries, the *between* column of table 4 shows that country means vary more for each of the cube's dimensions than for the unidimensional indices.<sup>23</sup>

Table 4 displays the average deviations of the countries from their respective time-series means in the *within* column. It shows that panel means fluctuate more on the contestation and participation dimensions than on polyarchy. That is, countries on average deviate more from their panel mean along the dimensions of the democracy cube than in a unidimensional representation including the same indicators. Interestingly, there is less over-time variation on the constraints dimension than on contestation and participation, regardless of how the latter two are measured.

disaggregated analysis. Indeed, we use the liberal component index (LCI) for some of our figures and discussions below.

<sup>22</sup> Sample details and discussions of coding decisions leading to differential rates of missingness are in the online Appendix.

<sup>23</sup> Extended summary statistics are provided in the supplementary materials at <https://vanessaboese.weebly.com/patterns-of-democracy-over-space-and-time.html>.

#### Global Trends and Case Studies

A given value on a unidimensional democracy measure can reflect different institutional configurations. It collapses important variation. Likewise, a particular change in scores on such a measure can reflect various institutional developments. In this section, we show how our three-dimensional measure can be used to provide more nuanced descriptions of variation in institutional development. We first discuss global trends in the three dimensions from 1789 to the present, and discuss some patterns that would be hard to capture with composite, unidimensional measures. Then, we present three case studies to illustrate how our framework can reveal nuances in institutional configurations. We here use the narrow-participation model where participation is defined as suffrage.<sup>24</sup>

Figure 4 maps global averages for the three dimensions, from 1789 to 2018. We take the average across all polities—sovereign countries, semiautonomous polities (e.g., Hungary under the Dual Monarchy of Austria–Hungary), and colonies—with available data in the given year. The sample changes considerably over time, from 41 polities in 1789 to 179 polities in 2018. Most notably, the sample more than doubles from 1899 (52 polities) to 1900 (111 polities).<sup>25</sup> Thus, we demarcate 1900 with a vertical line. Participation, contestation, and constraints were typically much lower in these Asian and African colonies that enter the sample in 1900, which explains the substantial drops in global averages this year.

Nonetheless, even when disregarding changes due to sample composition, there are clear trends in the global

<sup>24</sup> See online Appendix B for results from the broad-participation model.

<sup>25</sup> The “historical” part of the V-Dem time series covers far fewer colonies in Asia and Africa than the post-1900 part (see Knutsen et al. 2019).

averages of the three dimensions.<sup>26</sup> Below, we highlight a few patterns that are hard to observe on standard, composite democracy indices.

While both the narrow- and the broad-participation models capture different, plausible notions of democracy, one interesting aspect of focusing on the narrow-participation model is the greater divergence in global (or regional) trends across the dimensions. Especially after World War Two (WWII), globally, there has been a dramatic increase in participation, far outpacing the improvement in other democracy dimensions. This increase reflects franchise expansions even in countries, from different regions, where other aspects of democracy were more or less absent (e.g., Communist countries in Eastern Europe after WWII).<sup>27</sup>

More generally, the overall expansion in democracy, globally, has been uneven across our three dimensions when we consider the entire time interval. Participation, as measured by suffrage, has witnessed a much steeper increase than contestation and, in particular, constraints. In 1789, the average participation score was close to zero whereas it was well above ninety during the 2010s. This large increase reflects a dramatic expansion in voting rights, globally, throughout modern history (see Knutsen et al. 2019), which accelerated after the end of WWII with the expansion of *de jure* voting rights also to female adults in many countries. In 1789, only a couple of countries with data (United Kingdom and Poland) provided suffrage to some portion of their adult citizens. Currently, only a few countries fail to provide *de jure* voting rights to all adults (e.g., Saudi Arabia, Somalia, United Arab Emirates).

Contestation started at a similarly low average global score as participation in 1789, and actually increased to a somewhat higher level than participation by the late nineteenth century. However, contestation started declining earlier and dropped much more markedly than participation—from similar average global scores after WWI—during Huntington's (1991) "first reverse wave of democratization." After WWII, both contestation and participation have increased rapidly, despite setbacks in the 1960s and 1970s during Huntington's second reverse wave. Yet, participation has increased even more dramatically, and from 1960 and onward, the difference between the two has consistently exceeded twenty points on the one-hundred-point scale. At present, the distance is around thirty points.

Concerning constraints, the overall change in the global average throughout modern history has been less dramatic. The modest development across time reflects that several non-electoral regimes placed extensive legislative or judicial constraints on their executive even in the late-eighteenth century (e.g., Sweden) and that several electoral regimes have weak such constraints even today (e.g., Cuba, Russia, and Turkey). Interestingly, the global average for constraints was basically flat in the two decades before 1920, when contestation and (especially) participation gained noticeably. Further, the average for constraints increased less than for the other two dimensions during the third wave of democratization (after 1974), except for a strong growth spurt in the late 1980s and early 1990s. Hence, whereas the global average for constraints started more than fifteen points above

that of contestation in 1789, it was lower by the end of the 1950s and more than fifteen points below in 2018. In sum, our multidimensional approach highlights that the global advance of democracy across modern history has been uneven across different dimensions.

We now discuss specific cases and use three country examples to illustrate how a multidimensional representation is better suited for capturing variation across institutional configurations. Hong Kong and Ecuador illustrate these benefits for cross-country comparisons, and Azerbaijan is used for development over time. We use the narrow-participation model, and results for the broad-participation model are located in online Appendix B.

### *Hong Kong and Ecuador*

In 2010, both Hong Kong and Ecuador scored 0.32 on V-Dem's LDI (see figure 5). A closer look, however, suggests that these two countries' institutions are very dissimilar. This becomes visible when dissecting the LDI into its two constituent components: LCI and EDI. Figure 6 shows all constellations of LCI and EDI in 2010. While LCI and EDI are highly correlated, figure 6 shows that they are far from perfectly correlated. The figure highlights that Ecuador and Hong Kong (marked in blue) have quite different scores on the two components. (Gray squares mark all other countries with 0.32 score on the LDI.)

Figure 7 displays values for each country on all three dimensions of our cube of democracy patterns. These measures reveal interesting political-institutional differences in these countries that unidimensional codings of Hong Kong and Ecuador (such as their joint 0.32 score on the LDI in 2010) may easily mask. Notably, the contestation dimension scores zero for Hong Kong and above ninety for Ecuador, whereas their respective constraints dimension scores are above fifty and below twenty.

Hong Kong was transferred from the United Kingdom to China in 1997 under an agreement of a permanent special political status. From 1997 to 2019, the head of Hong Kong's executive branch was appointed by the communist party, but with selection being heavily influenced by a local Executive Council. While the government was not appointed by an elected body, there were limitations on executive power from other branches of government. The elected legislature was empowered to check the executive on budgets, legislation, and protocols of impeachment. In particular, the judicial branch was considered independent, and appointment procedures more meritocratic than political (Rezvani 2012).

In contrast, the main democratic deficit of Ecuador has historically been weak separation of powers, reflected in the very low constraint scores. The executive branch dominates the other two branches, especially the judicial branch (Conaghan 2016). The new constitution of 2008 further strengthened the executive branch.<sup>28</sup> The constitution also included several provisions to strengthen individual and collective rights, but the effectiveness of these provisions is unclear. O'Donnell (1994) highlighted Ecuador as a case of "delegative democracy," where elected officials proclaim insight into "the will of the people" as a general justification of any political action. Bestowed with an assumed insight into the will of the people, any constraints on executive power

<sup>26</sup> Online Appendix E replicates results for a core sample of 72 countries with time series of at least 140 years. Our findings remain robust to the change in sample. Online Appendix K describes how our dimensions correlate with a few popular unidimensional measures over time.

<sup>27</sup> Observed trends are more similar for contestation and participation broadly construed (see figure 14 in the online appendix), as *de facto* indicators moderating the exercise of voting rights, such as accurate voting registries, move more in tandem with other aspects of free and fair elections.

<sup>28</sup> FreedomHouse (2017) maintains a fairly persistent coding of Ecuador, arguing that the new constitution only codified existing practice, and hence had limited effect. Polity (Marshall, Gurr, and Jagers 2017) codes a drop in 2008, but maintains that a significant element of legislative oversight remained.

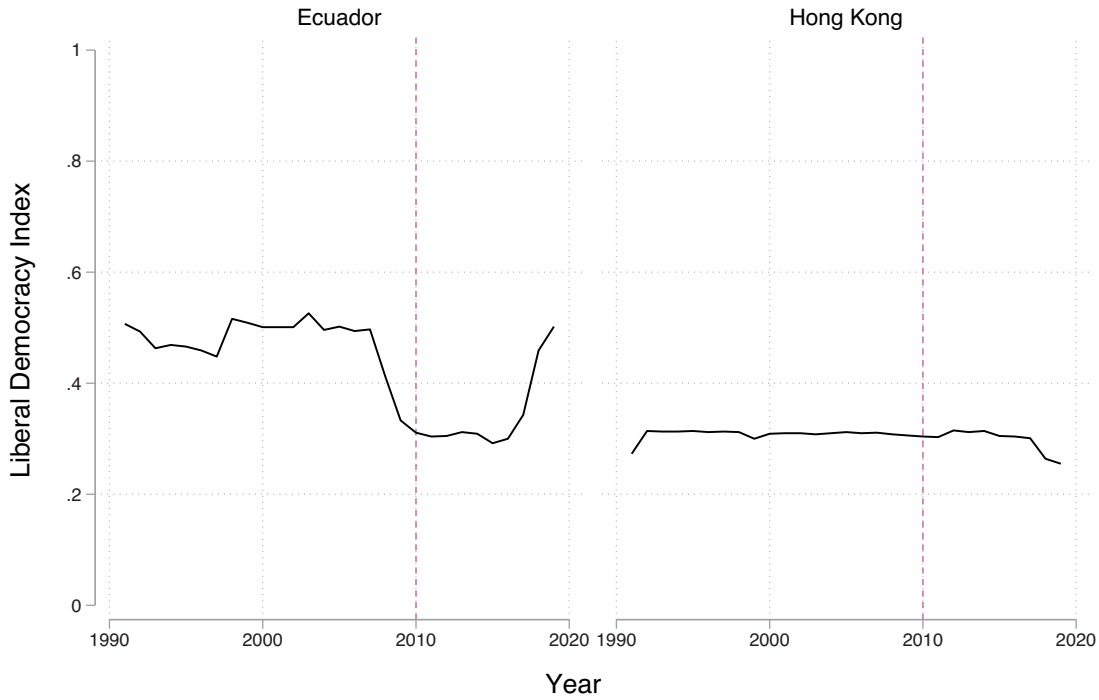


Figure 5. Liberal democracy index for Hong Kong and Ecuador.

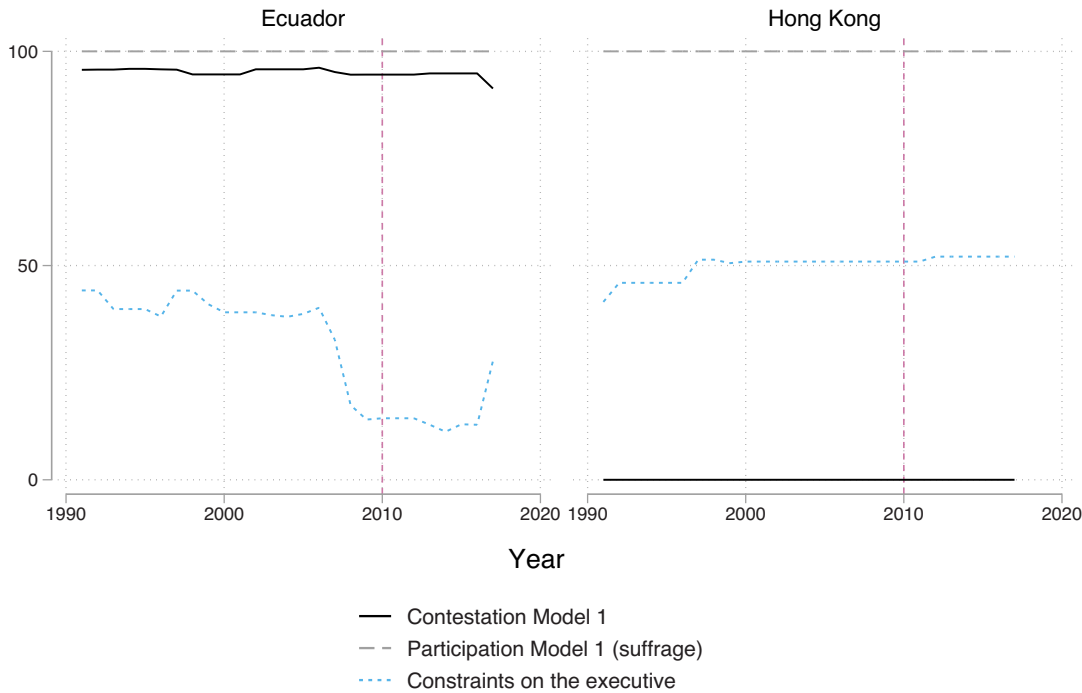


Figure 6. Liberal component index versus electoral democracy index in 2010.

are considered counterproductive, whereas the legitimacy of the electoral institutions is of utmost importance.

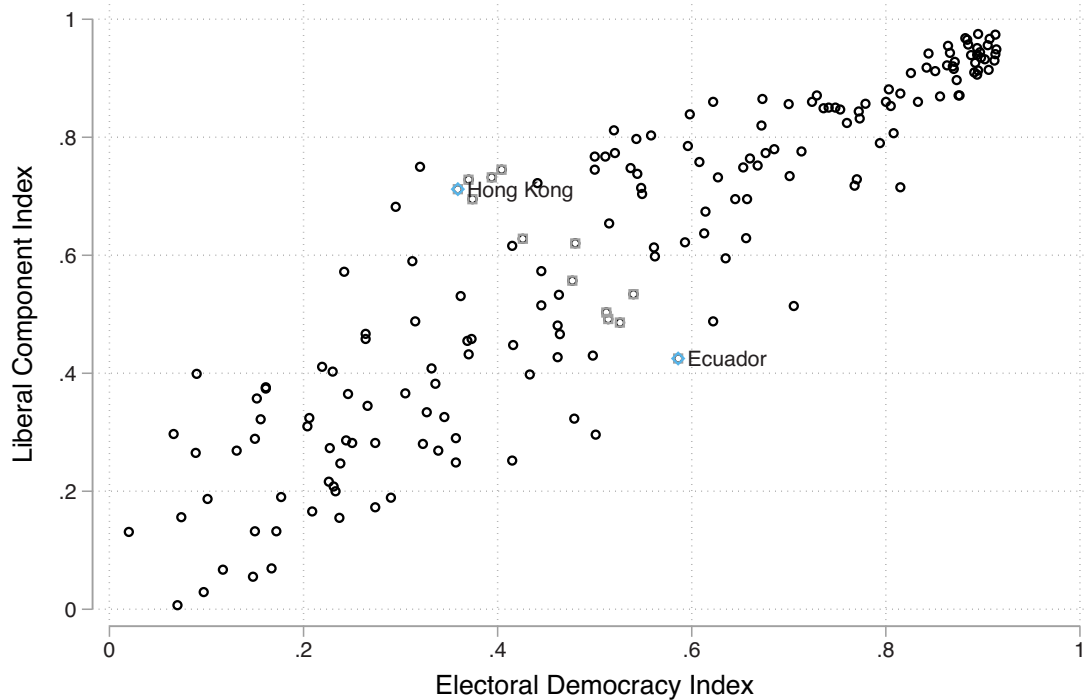
*Azerbaijan*

Unidimensional measures can also fail to capture important institutional developments over time within a country. Azerbaijan exemplifies how a country can be stable on some dimensions but not on others. Figure 8 shows the

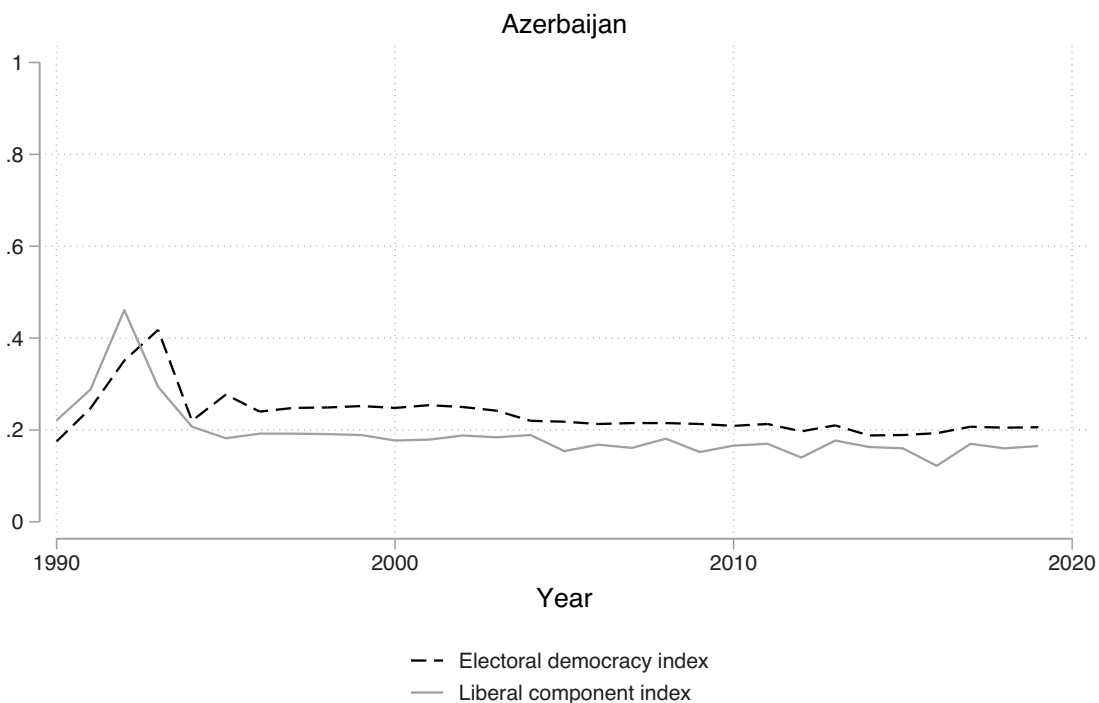
three dimensions for Azerbaijan from 1990 to 2019. Narrow participation remains stable at the maximum throughout, whereas executive constraints are virtually nonexistent after 1995. The contestation dimension, in contrast, declines over the period, with three break-points where the score drops significantly from one year to the next.

When collapsed into a single dimension (figure 9), Azerbaijan seems to be a fairly stable semi-democracy for the whole period, declining by only a few points across 1995–





**Figure 7.** Narrow-participation model: contestation, participation, and constraints for Ecuador and Hong Kong.



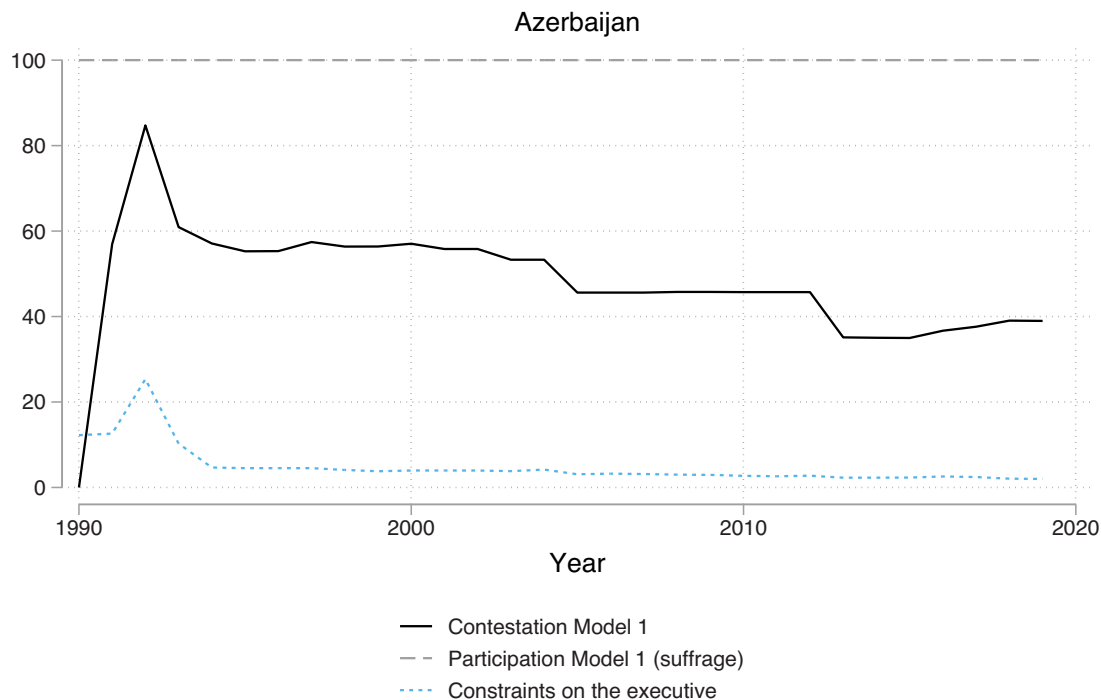
**Figure 8.** Scores on two V-Dem democracy measures for Azerbaijan.

2018. Yet, as our multidimensional approach shows, Azerbaijan has been very stable on two dimensions and unstable on one. The decline in contestation is undetectable with the aggregated, unidimensional measure, but is of considerable substantial interest.

Azerbaijan became independent after the demise of the Soviet Union, and an initial democratic experiment met an immediate security crisis over the ethnic Armenian enclave Nagorno-Karabakh. By the mid-1990s, the country was no longer democratic by any standard. The early 1990s set-

back is visible on both the contestation and the constraints dimensions. For the last twenty years, Azerbaijan has been fairly stable on constraints, but dropped on contestation.

The term “hegemonic authoritarianism” (Hyde and Marinov 2012) is relevant for this kind of development—for each election, the outcome becomes increasingly certain in advance, to the point where the incumbent is in full control. This control manifests through different mechanisms. Voters and opposition elites are coopted, for instance, through direct payments or targeted government interventions that



**Figure 9.** Narrow-participation model: contestation, participation, and constraints for Azerbaijan.

can be removed on short notice. Vote buying is expensive, but Azerbaijan receives high oil revenues. Another strategy is to ensure that the opposition is severely fragmented and that opposition parties spend as much time attacking each other as the incumbent. Azerbaijan has been highly successful in fragmenting the opposition—in 2018, no less than seven candidates shared the 14 percent of the vote not received by president Aliyev.<sup>29</sup> Fraudulent elections constitute another mechanism. Holding elections, stuffing the ballot boxes, and ignoring the consequences may even signal strength. Azerbaijan has seen a deterioration of electoral integrity with no corresponding increase in political oppression, an indication of how the Azerbaijani opposition and civil society have been rendered increasingly impotent by the regime.

### Applications of the Cube of Democracy Patterns

We now illustrate three applications of our cube and demonstrate that it provides new insights for the study of democratic institutions across time and space. We begin by considering the pooled sample of countries. We illustrate how some parts of the cube are less populated than other areas. This has important implications for understanding the configurations of institutions and their stability. Then, we leave the static perspective and examine how countries evolve, showing that different pathways to democracy exist and have varied in frequency over time. Finally, we assess global regime similarity over time and in doing so, highlight the advantages of comparing our results across the narrow- and broad-participation models.

#### *Are There Empty corners?*

An important benefit of our three-dimensional, non-aggregated approach (relative to unidimensional democ-

ocracy measures) is that we can map, in a more detailed manner, which institutional configurations have been more and less common historically, and better represent the institutional heterogeneity of political regimes. If regimes clustered along the cube's main diagonal, a parsimonious unidimensional measure would have sufficed in mapping regime variation. Yet, this is not the case. Below, we show that none of the cube's corners are empty, although some are less populated than others and their populations change over time.

To examine the spatial distribution of regimes within the cube, we subdivide it into nine pieces or sections. The cube has eight corners, namely the (consistently) autocratic and democratic ones together with six "inconsistent" corners that mix high and low scores on the three dimensions. We categorize regimes dependent on which corner they are closest to (spatially in the cube). We also include the mid-section as one category when calculating distances and categorizing regimes; observations closer to the middle of the cube than any corner are categorized as "mid-point."<sup>30</sup> Since any cutoff value along the three dimensions is, inevitably, arbitrary, we consider our nine categories merely as sorting categories for regimes with relatively similar institutional configurations; they do not represent ideal types.

The autocratic and democratic corners are both densely populated, but the six non-diagonal corners split into three where regimes are frequently observed and three far less populated ones. We examine the most populated non-diagonal corners first. In denoting them, we use the line number in [table 5](#).

The second corner is high participation combined with low constraints and contestation. When conceptualizing participation narrowly, this corner is more densely populated since universal suffrage is sufficient to achieve a maximum value regardless of the nature of the elections. Historically, many communist regimes occupied this corner, and presently North Korea has full suffrage but very low scores on the two other dimensions.

<sup>29</sup> Source: <http://www.electionguide.org/elections/id/3051/>.

<sup>30</sup> This section is about eight times as voluminous as each of the corner parts.

**Table 5.** Number and percentage of observations in each of the nine cube pieces (eight corners and one centerpiece), for both models

Cube-piece	Observations in each piece for				
	Narrow-participation model		Broad-participation model		
	Number	Percent	Number	Percent	
1	Autocracy	12,684	47.34	14,251	53.19
2	Only participation	2,756	10.29	968	3.61
3	Only contestation	137	0.51	196	0.73
4	Contestation and participation	1,668	6.23	498	1.86
5	Only constraints	534	1.99	595	2.22
6	Constraints and participation	139	0.52	74	0.28
7	Constraints and contestation	231	0.86	544	2.03
8	Mid-point	4,249	15.86	5,939	22.16
9	Democracy	4,397	16.41	3,730	13.92

The fourth corner could be labeled the “illiberal democracy corner,” with high participation and contestation but low constraints. At present, Equador resides in this corner.

The fifth corner captures strong constraints, but no participation or contestation. In some regimes, an unelected executive is constrained by other unelected bodies. One example is early modern Sweden. After the disastrous wars of Charles XII, a weak queen Ulrika Eleonora abdicated in favor of her husband Friedrich of Hessen, who, in turn, became a weak king. The Swedish nobility seized the opportunity to strictly limit the King’s powers. This system survived until the coup of King Gustav III, but was reinstated in 1809 after another disastrous involvement in continental warfare.

The three less-populated corners are not entirely empty cells, but nevertheless represent rare cases. The third corner is high contestation but low constraints and participation. One example is the unrecognized Republic of Rhodesia between 1970 and 1980. The Westminster-style parliament was contested in elections between several parties, but at the backdrop of a civil war, when few constraints were placed on the government.

The sixth corner represents high constraints and high participation, but low contestation. The primary case is postwar-occupied Japan. In 1947, a new constitution came into effect, demoting the emperor to a ceremonial figure and vesting power in a prime minister deriving his power from a bicameral parliament overseen by a constitutional court. However, since the supreme executive power was held by General MacArthur, there was no real competition for that position until after the occupation.

The seventh corner is the mix of high constraints and contestation with low participation. Historically, several countries were this category, with strong liberal democratic institutions developing prior to universal suffrage. Yet, the most recent country in this corner is Switzerland, which only in 1972 expanded the vote to include women.

There are also many observations in the middle section, partly reflecting that several regimes develop democratic institutions in a gradual manner across all three dimensions simultaneously. As table 5 shows, 22.2 percent of all observations are located in the mid-point piece in the broad-participation model, but only 15.9 percent are located there in the narrow-participation model (since several countries scoring intermediate on other aspects of democracy have universal suffrage and are thus removed from the middle section).

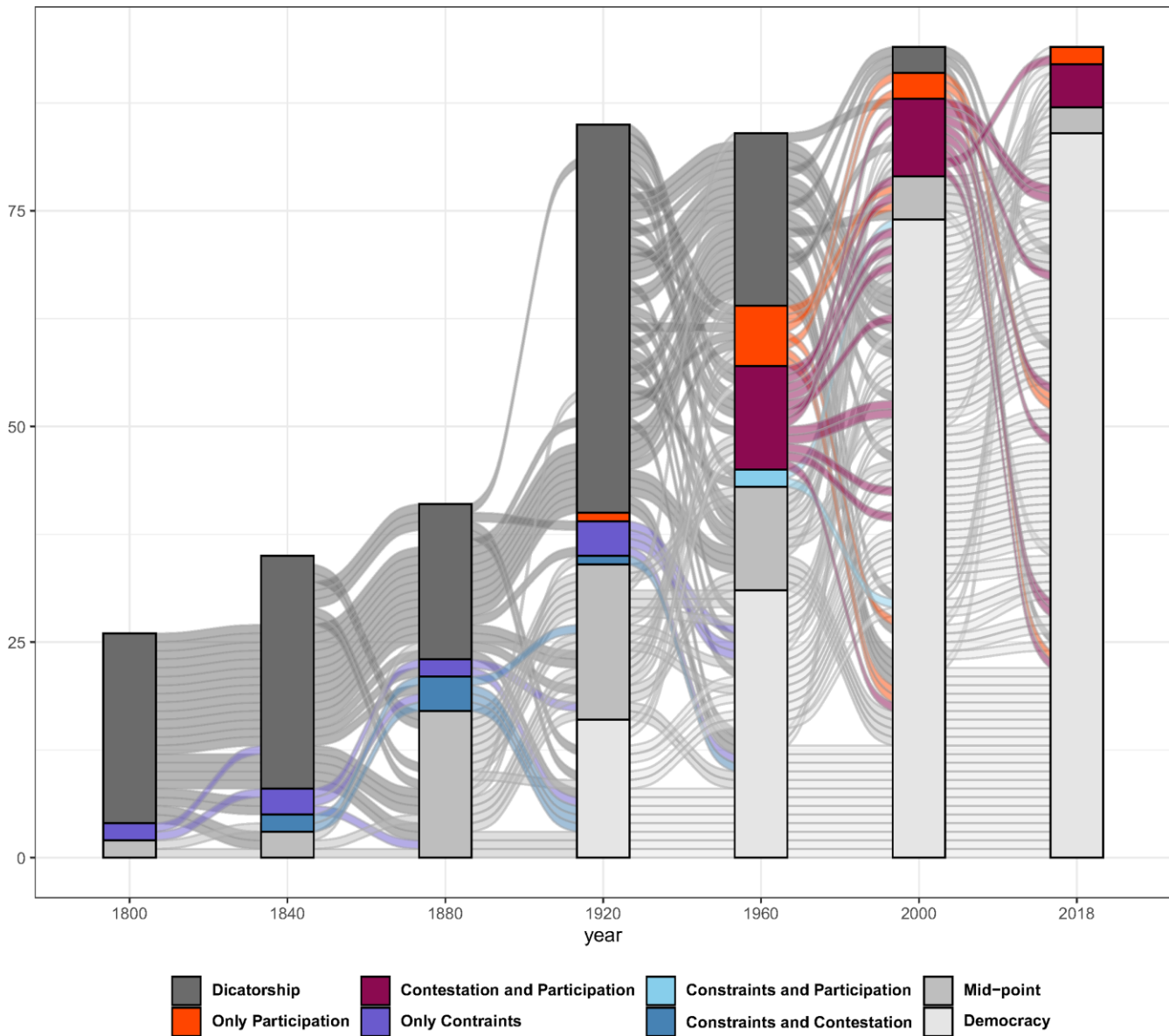
Taken together, the six inconsistent corners (those which are neither “democracy” nor “autocracy”) contain a considerable share of observations (20.4 percent/10.7 percent for the narrow-/broad-participation model). In the narrow-participation model, these six corners even include more observations than the mid-point piece. This is notable since the centerpiece is about eight times the size of each corner. This partly reflects that numerous democratizing countries have developed more rapidly along one dimension at a time, often over a quite long period. In the next section, we study the evolution of these regimes over time and the pathways toward democracy.

#### Several Paths to Democracy

Countries develop on different dimensions in different sequences, giving divergent patterns of democratization. Nevertheless, with unidimensional measures, we can only observe that democratization is taking place. With our three dimensions, we detect increases along different dimensions and capture changes that would be collapsed on a unidimensional measure. With our approach, we can also observe the sequence in which these dimensions develop.

To investigate such divergent patterns more carefully, we employ a similar strategy to that in the previous section and divide our cube into nine pieces. Each observation is assigned to the corner it is closest to or to the cube’s mid-section. Figure 10 shows the development paths over time for all countries that at one point in time were a democracy, presenting “snapshots” for seven years and tracing the evolution of regimes between these snapshot years.

With participation defined narrowly, no regime is labeled as fully democratic in the three nineteenth-century snapshot years (New Zealand was the first country to obtain universal suffrage in 1893). In 1800, most regimes were (consistently) autocratic but a few had strong constraints and two regimes were in the middle category, the United States and the United Kingdom. In 1840, there were more high-constraint regimes and a few of them also had high contestation. By 1880, the mid-point category had grown substantially (reflecting the expansion of male suffrage in many Western countries). At that time, among the countries that at some point made it to full democracy, there were more hybrid regimes (characterized by high-constraints or high-constraints–high-contestation) than pure autocracies.



**Figure 10.** Different paths to democratization, narrow-participation model.

Notably, all these regimes lack full participation. Indeed, suffrage was the last aspect of democracy that was implemented for the early democratizing countries.

All regimes with both constraints and contestation in 1880 were full democracies forty years later, whereas many mid-point regimes remained in the same category in 1920. Contrast this to the postwar period. In 1960, the number of full democracies had grown substantially to about a third of the sample, but a new type of hybrid regime had also appeared. These were regimes with high participation, and in some cases high contestation, but low levels of constraints. Almost all of the regimes in our sample with high participation and high contestation in 1960 were full democracies in 2000 and in 2018. Indeed, the pathways to democracy change over time.

Figure 10 also provides insights pertaining to studies of waves of democratization and autocratization. For example, during the third wave of democratization (after 1974) many illiberal democracies and autocracies with varying suffrage gradually moved toward democratic systems. After 2000, during what has been labeled a third wave of autocratiza-

tion (e.g., Lüthmann and Lindberg 2019), we observe the erosion of executive constraints in some previously liberal democracies such as Hungary.

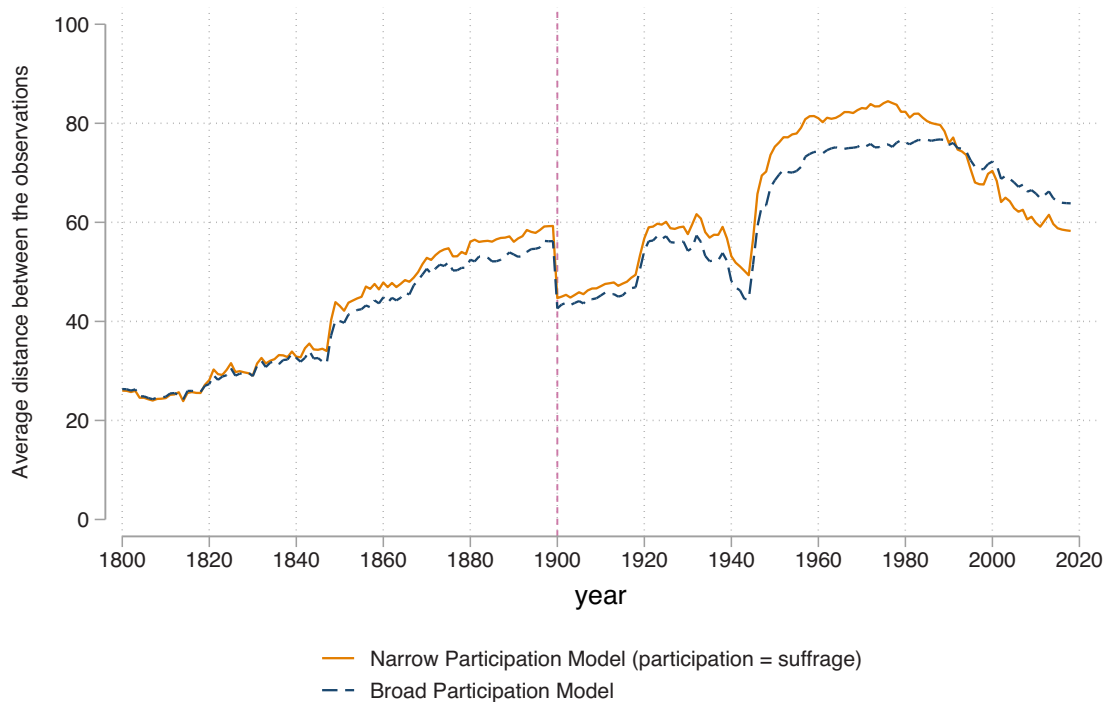
#### *Patterns of Regime Similarity over Time*

How do the patterns discussed in the prior section work together on a system level? In order to examine the institutional heterogeneity of observations more closely, we developed an animated version of the democracy cube displayed in figure 3. It shows how the distribution of regimes changes over time and reveals a much greater spread of regime dots in some years than in others.<sup>31</sup> Below, we analyze the patterns of countries being located in crowded spaces or dispersed throughout the cube to capture the degree of similarity between regimes and consider how this spread of regimes in the cube space changes over time.

To evaluate the degree of global regime similarity more precisely, we calculate the mean distance between

<sup>31</sup> See <https://vanessaboese.weebly.com/patterns-of-democracy-over-space-and-time.html>.





**Figure 11.** Average distance between all observations per year for broad- and narrow-participation models, 1900–2018.

all regimes in each year, for the broad- and narrow-participation models. The distance between two regimes is defined as the length of the vector between the two observations in the three-dimensional space. Figure 11 shows how the mean distance has evolved over time for the narrow- and broad-participation models.

Around 1820, the mean distance started gradually increasing for both models, and the trend continued throughout the nineteenth century—coinciding with the long first wave of democratization (Huntington 1991)—albeit with a sharp jump in 1848. The reductions in mean distance registered in 1900 are very visible, but only reflects the numerous, mostly autocratic, observations from African and Asian colonies entering the sample. The distance continues to increase after 1900 and experiences a large jump when WWI ends. Globally, regimes became more dissimilar throughout the first-wave democratization, as autocracies started to democratize along different paths.

The early interwar period is particularly interesting, as both old and new democracies expand the franchise under very different institutional arrangements. This period saw relatively high levels of institutional variation. The subsequent decline in the 1930s differs between the two participation models. While the right to vote (narrow participation) was largely retained, the effectiveness of this right declined rapidly toward and during WWII, giving a larger drop in similarity in the broad-participation model.

Immediately after WWII, different trends pull in different directions. The victors shaped the institutional landscape in Europe and elsewhere. Eastern Europe became Communist (low-constraints–low-contestation regimes) whereas liberal democracy prevailed in Western Europe, with a few exceptions. This reduced the distance within clusters of countries, but not necessarily between regimes in different clusters. Decolonialization in Asia and Africa coincided with the establishment of many unstable regimes of various kind that often turned more autocratic during the “second reverse wave.” On average, however, regime dissimilarity in-

creased sharply from 1945 to 1960, and continued to increase, but less sharply, after 1960.

The past thirty to forty years are associated with a strong decline in dissimilarity, especially for the narrow-participation model, as the third wave shifted regimes from all over the cube toward the democratic corner. More fully democratic regimes contribute to the decline, but so do the many non-democracies moving somewhat closer to the democratic corner. Regardless of model, global regime dissimilarity is, at present, at its lowest level since right after WWII.

Throughout this paper, we presented results for a narrow- and a broad-participation model. The differences (in measured regime heterogeneity) between them since 1990, visible in figure 11, illustrate the benefits of displaying two models. Both models contain the same set of indicators. The models only differ in *how* they assume that electoral irregularities adversely impact democracy (i.e., via contestation or participation). After 1990, the average distance between the regimes in the narrow-participation model decreases below the average distance of regimes in the broad-participation model for the first time. Universal suffrage, by then, was implemented in most countries leading to the convergence of regimes in the narrow model. Yet, if participation is viewed broadly as a de facto opportunity of the voter to engage in an election, regimes are, at present, not as similar as they appear in the narrow-participation model. While regimes in our narrow model have recently converged because, on paper, most countries today have full suffrage, this development has not been accompanied by institutional changes giving voters a fair chance to cast their votes in practice in all countries.

The distance calculations above could also be used to emphasize the advantages of our multidimensional approach relative to a unidimensional one. In the latter, distances between autocracies and democracies are relatively large, whereas differences between two semi-democracies are rather small. In our cube, however, the difference

between two regimes in the middle category, for example, a constitutional democracy with very limited participation (United Kingdom before 1830) and a one-party state with regular elections (USSR), can be just as large as the difference between a very democratic and very nondemocratic regime. This means that our approach will indicate relatively greater institutional heterogeneity in time periods such as the 1960s where there are many mixed regimes, but the institutional configurations between these regimes differ extensively.

### Conclusion

The concept of democracy is inherently multidimensional. This article presents three-dimensional conceptualizations of democracy based on V-Dem data, leading to a regime in a given year being represented by a dot in our cube of democracy patterns. Employing such a multidimensional approach and visualization provides several interesting insights.

First, our cube visually presents how these dimensions work together across space and time. We model three commonly used dimensions of democracy (participation, contestation, and constraints on the executive), while paying close attention to concept–measurement validity.

Second, unidimensional democracy measures collapse and combine “too much” relevant information. Our multidimensional setup conveys more information than a unidimensional measure. The variation along each dimension individually is higher than the variation on comparable unidimensional measures of democracy. Moreover, the multidimensional setup detects changes along different dimensions when a unidimensional measure does not display them, even if it has the same components. In addition, the cube effectively visualizes patterns of change over time, for instance, on how and in which order democratic dimensions develop. Finally, on a unidimensional measure, the distance between two semi-democracies will necessarily be smaller than the difference between perfectly democratic and autocratic countries. In contrast, our cube reflects the vast institutional differences that can exist between two such mixed regimes. It distinguishes between institutional configurations that appear similar on a unidimensional measure but are in reality quite different (as illustrated by our cases Hong Kong and Ecuador).

Third, the spatial distribution of regimes within the cube reflects strong institutional heterogeneity. The core distribution runs along an axis connecting the democratic and non-democratic corners. The most densely populated sections of the cube are along this axis. There are four other corners that contain a modest proportion of regimes (between 2 and 11 percent of all observations). The final two corners are relatively unpopulated but not completely empty (<1 percent of observations). Unidimensional measures cannot capture such heterogeneity.

Fourth, temporal variation in institutions is vast. Regime characteristics change along different dimensions during different historical periods. Participation stands out for its extensive increase over time, and especially since WWII.

Fifth, at the global level, heterogeneity in regime configurations has changed substantially across modern history. During some periods, regime configurations have tended to converge and at other times they have tended to diverge.

Sixth, different countries have followed different pathways to democracy. Early democratizers developed constraints and contestation before participation. Countries that democratized later in history began with higher levels of

participation and contestation and only later imposed constraints on the executive.

The focus of this article has been descriptive, using a multidimensional approach to shed light on cross-country differences and over-time developments in democratic institutional configurations. Yet, going forward, such a conceptualization opens up for more detailed analysis and inference on a broad range of questions pertaining to causes or effects of democratic institutions. Examples include the dynamic relationships between more specific clusters of institutions, on the one hand, and development, conflict, or trade, on the other. Another potential example would be an examination of how different institutional configurations relate to regime stability and durability. Along these lines, conceptualizing autocratic institutional heterogeneity in a similar multidimensional space may also provide important insights—autocratic regimes display vast differences in institutional makeup and differ greatly also in several other regards, such as regime durability (e.g., Geddes 1999). Hence, the kind of multidimensional conceptualization measurement strategy provided here may open up different avenues of future research.

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### Supplementary Information

Supplementary information is available at the *International Studies Quarterly* data archive.

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