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DISCUSSION PAPER

// TOMMY KRIEGER

Measuring Democracy

Measuring democracy.

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Abstract

This short article contributes to the *Elgar Encyclopedia of Public Choice* by summarizing the literature on the measurement of democracy. I proceed in two step. In the first part, I describe the classical approach for producing a measure of democracy and sketch an alternative approach. The second part provides an overview about existing democracy index.

Key words: Democracy, index numbers, measurement of democracy, political institutions, regime classification

JEL classifications: C43, O43, P00

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1 Introduction

What causes democratization and which economic consequences result from such transitions are undoubtedly among the most frequently studied questions in the applied political economy literature (for review articles, see e.g. Acemoglu et al., 2015, Colagrossi et al., 2020, Treisman, 2020). The (by far) most common way to empirically address these questions is to analyze country-level data with (panel) regression methods. A prerequisite for such an analysis is a (time-varying) index that indicates how the level of democracy varies across countries. The purpose of this chapter is to provide a brief overview of the literature that develops these indicators (for more detailed review articles, see e.g. Munck and Verkuilen, 2002, Gründler and Krieger, 2021). Thereby, I proceed as follows. Section 2 describes the classical approach for creating a measure of democracy and makes some remarks about an alternative procedure. Section 3 presents the most popular democracy indicators and discusses whether it matters which index is applied in a regression analysis. Section 4 concludes.

2 Producing a democracy indicator

2.1 Basic approach for building a measure of democracy

The standard approach for producing a measure of democracy consists of three major steps (Munck and Verkuilen, 2002). The first step is to define how a non-democratic regime differs from a democratic regime (*conceptualization*). The next step is to compile observable regime characteristics that reflect the components of the before chosen concept of democracy (*operationalization*). The final step is to select a method that transforms the regime characteristics into a uni-dimensional indicator (*aggregation*). Below, I sketch the key challenges that the providers of democracy indicators face in these three steps.

2.1.1 Conceptualization

For centuries, intellectuals have been discussing about how *democracy* should be defined (for an overview of this discussion, see Blaug and Schwarzmantel, 2016). This discussion revolves around two basic questions. The first question is which institutional features (dimensions) constitute a democracy. Broadly speaking, the literature distinguishes three types of definitions (see e.g. O'Donnell, 2001, Munck and Verkuilen, 2002). Minimalist (narrow) concepts only request that elections for political offices are public and competitive (see e.g. Przeworski, 1991). Realistic definitions additionally care about suffrage rules and basic political rights (see e.g. Dahl, 2008). Maximalist (broad) definitions also include conditions on judiciary independence, liberty rights, and inequality (see e.g. Merkel, 2004). According to Guttman (1994), all these concepts are equally valid from a conceptual point of view because no objective criteria can be developed to rank different definitions. However, from an empirical perspective, minimalist and maximalist concepts have more potential problems than realistic concepts. More specifically, while minimalist

definitions might fail to produce indices with sufficient discriminating power (see e.g. Coppedge, 2002), maximalist definitions overlap with other concepts, such as economic freedom or the rule of law (see e.g. Bjørnskov and Rode, 2020, Gutmann and Voigt, 2018).

The second conceptual question that is controversially debated in the literature concerns the relationship between the different features of democracy. Two basic views exist with regard to this question (Goertz, 2006, Teorell et al., 2019). The first is that each dimension reflects a necessary condition of democracy (*formative approach*). The alternative view is that the different dimensions of democracy are substitutes and the result of a common factor (*reflective approach*). The question which of these views is “better” cannot be objectively answered because no clear criteria exist, and both of them have their pros and cons.

2.1.2 Operationalization

The institutional features that people take into account when defining democracy are typically not directly measurable. The standard way to solve this issue is to compile various information on each dimension. Two types of information can be distinguished in this regard (Munck and Verkuilen, 2002, Gründler and Krieger, 2021). The first is subjective (expert-based) information. The main advantage of subjective information is that it can (at least in principle) be produced for every regime and any point in time. Potential problems are that experts may be biased due to personal experiences or interests and that assessments might considerably differ across experts. The second type of information is objective information. A weak spot of objective information is limited data availability. Furthermore, such information might be manipulated. Ideally, subjective and objective information should be combined.

2.1.3 Aggregation

During the aggregation process, two major decisions need to be made. The first decision concerns the scale of the index. The literature distinguishes four types of scaling: dichotomous scales, ordinal scales, graded (quasi-continuous) scales, and continuous scales. From an empirical point of view, indicators with a graded or continuous scales have the advantage that they have more discriminating power. However, from a conceptual perspective, these indicators typically perform worse than indicators with a dichotomous or ordinal scale (Gründler and Krieger, 2021, 2022).

The other major decision in the aggregation process concerns the aggregation function. Two strategies can be distinguished in this regard. The first (and more frequently applied) strategy is to make specific assumptions about the functional relationship between the regime characteristics and the level of democracy. A key objection against this strategy is that people cannot ground their functional form assumptions in theory, especially if they build indices with graded or continuous scales. Furthermore, the functional form assumptions are often very simplistic in practice and thus neglect that democracy is a highly complex concept (see e.g.

Munck and Verkuilen, 2002, Cheibub et al., 2010). The alternative strategy is to estimate the aggregation function, using a non-linear classification or regression technique. While highly complex aggregation functions can be obtained with this strategy, a potential concern is that the actual form of the aggregation function remains a black box.

2.2 Synthesized measures of democracy

Some researchers argue that the democracy indices produced with the previously described approach suffer from measurement errors and that this problem can be mitigated when combining various of such indices (see e.g. Acemoglu et al., 2019, Pemstein et al., 2010). While this strategy seems to be plausible at a first glance, three questions arise when applying it. The first is which “original” measures of democracy shall be combined. A potential answer is to take all existing measures into account. The major challenge is then that democracy indices vary widely in their coverage. Technically, this problem can be solved, but any solution produces conceptual inconsistency. In addition, Gründler and Krieger (2016) illustrate that combining indices with heterogeneous coverage can cause spurious jumps in the synthesized measure. The second question is which aggregation method shall be applied to combine the selected indices. Scholars have answered this question in multiple ways. More specifically, while some synthesized measures are based on simple heuristics, others are produced with complex statistical methods. Whether the former or the latter way is superior cannot be answered because all methods have strengths and problems, and an evaluation criterion that allows weighing the features of the different methods in an objective manner does not exist. A reason for this absence is that the idea of combining various democracy indices lacks a theoretical foundation. The last question concerns the concept of democracy that synthesized indices reflect. Obviously, a general answer to this question does not exist because it depends on the selection of the original indicators. However, for a specific choice, the union of the dimensions of the original indices determines the concept captured by the synthesized measure of democracy.

3 Popular measures of democracy

3.1 Overview

Throughout the last 50 years, researchers in political science and economics have developed an enormous number of democracy indices. For a review like mine, this plethora of measures is a great challenge because, on the one hand, it is virtually impossible to describe and discuss them all in a detailed way within a few pages. However, on the other hand, a review article on how to measure democracy that does not provide any information about existing democracy indicators is of very little practical value. To deal with this challenge, I choose a middle course. More specifically, I present an overview table that gives five pieces of information for various democracy indices (for a list, see Table 1). The first is that I state who contributed to the development of a measure, for instance by proposing it or by

producing an important update/extension. Second, I characterize the concept of democracy that an index reflects. To this end, I use a scale that ranges from 1 (narrow) to 5 (broad). Third, I indicate which scale the measure has. The fourth piece of information concerns the coverage of the indicator. Lastly, I offer some information about the update frequency. Regarding the selection of the indices, I impose two conditions. The first condition is that the indicator was proposed or updated during the last 20 years. The other condition is that the index is not a simple transformation of another measure of democracy. With the latter rule, I exclude all those approaches that dichotomize a non-binary democracy indicator with the help of a threshold value. In the literature, these approaches are heavily criticized, for example because they can hardly be grounded in theory and as the threshold values are usually arbitrarily chosen (see e.g. Bogaards, 2012, Cheibub et al., 2010, Gründler and Krieger, 2022).

3.2 Does the choice matter?

A question that naturally arises from the previous section is whether regression results vary, depending on which measure of democracy is used. On this matter, different statements can be found in the related literature. On the one hand, a number of studies have shown that estimates of the causes and consequences of democratization differ notably in their size or level of statistical significance (see Casper and Tufis, 2003, Cheibub et al., 2010, Gründler and Krieger, 2016, among others). On the other hand, a typical statement in applied studies on democratic transitions is that the empirical findings hold for different democracy indices (see e.g. Acemoglu et al., 2019, Baum and Zhukov, 2015, Dorsch and Maarek, 2019). Importantly, these conclusions do not necessarily contradict with each other as it might be that the selection of the democracy indicator only plays a role in some specific cases. However, two remarks need to be made with regard to the second type of conclusion. First, researchers typically only apply a few of the available democracy indices in their robustness checks. The result that some findings hold when using some other democracy indicators does not necessarily imply that the findings are robust to the use of all other indicators. This fact should be kept in mind since scholars have an incentive to present robustness checks that confirm their baseline regressions. Second, interpreting a robustness check is (at least to some degree) a subjective process. More specifically, some researchers consider a result as robust if the estimate of the parameter of interest barely depends on the measure of democracy, whereas others only require that the sign of the estimate remains the same and that its level of statistical significance does not vary in a notable way. Obviously, in the latter case, it is much easier to conclude that the selection of the democracy indicator does not play a big role.

Comparing the empirical performance of different measures of democracy is an inadequate procedure for getting a sound understanding of why indices perform differently in regression analyses. This approach fails because existing democracy indices differ from each other in many respects. Put differently, to figure out what causes differences in empirical findings, indicators are required that only differ in one aspect. So far, only very few studies have met this condition. Some of them

Table 1 Overview table – Measures of democracy

Name	Related work	Concept	Scale	Coverage	Updates
AF index	Anckar and Fredriksson (2019)	2	dichotomous ^(a)	1800 – 2019	irregular
ANRR index	Acemoglu et al. (2019)	5	dichotomous	1960 – 2010	none
Autocracies of the World (AoW) index	Magaloni et al. (2013)	4	dichotomous ^(a)	1945 – 2012	none
BMR index	Boix et al. (2013)	2	dichotomous	1800 – 2020	irregular
Democracy barometer	Bühlmann et al. (2012)	5	continuous	1900 – 2017	irregular
Democracy Cluster Classification (DCC) index	Gugiu and Centellas (2013)	5	ordinal	1980 – 2010	none
Democracy-Dictatorship (DD) index	Alvarez et al. (1996), Cheibub et al. (2010), Bjørnskov and Rode (2020)	1	dichotomous ^(a)	1950 – 2022	regular
EIU democracy index	Economist Intelligence Unit (2006)	5	ordinal/ continuous ^(b)	2006 – 2021	regular
Freedom House (FH) index	Freedom House (2022)	5	ordinal/ graded ^(b)	1973 – 2022	regular
GWF regime classification	Geddes et al. (2014)	2	dichotomous ^(a)	1946 – 2010	none
Kailitz's regime classification	Kailitz (2013)	4	dichotomous/ ordinal ^(a,b)	1946 – 2010	none
Lexical Index of Electoral Democracy (LIED)	Skaaning et al. (2015)	2/3 ^(b)	ordinal	1789 – 2020	regular
Polity Index	Gurr (1974), Marshall and Gurr (2020)	4	graded	1800 – 2020	regular
Regimes of the World (RoW) index	Lührmann et al. (2018), Coppedge et al. (2022)	5	ordinal	1900 – 2021	regular
SVM Democracy index	Gründler and Krieger (2016)	5	continuous	1981 – 2011	none
Revised SVM Democracy index	Gründler and Krieger (2021)	3	continuous/ dichotomous ^(b)	1919 – 2019	irregular
Svolik's regime classification	Svolik (2012)	1	ordinal	1946 – 2008	none
Ulfelder's regime classification	Ulfelder (2012), Ulfelder and Lustik (2007)	3	dichotomous	1955 – 2010	none
Unified Democracy Score (UDS)	Pemstein et al. (2010), Márquez (2018)	5	continuous	1800 – 2017	irregular
Vanhanen index	Vanhanen (2000, 2019)	2	continuous	1810 – 2018	irregular
V-Dem's Electoral democracy index	Coppedge et al. (2022, 2016), Teorell et al. (2019)	3	continuous	1789 – 2021	regular
V-Dem's Liberal Democracy index	Coppedge et al. (2022, 2016)	5	continuous	1789 – 2021	regular
V-Dem's Deliberative Democracy index	Coppedge et al. (2022, 2016)	4	continuous	1900 – 2021	regular
V-Dem's Egalitarian Democracy index	Coppedge et al. (2022, 2016), Sigman and Lindberg (2019)	5	continuous	1900 – 2021	regular
V-Dem's Participatory index	Coppedge et al. (2022, 2016)	4	continuous	1789 – 2021	regular
WHT regime classification	Hadenius and Teorell (2007), Wahman et al. (2013)	5	dichotomous ^(a)	1972 – 2014	irregular
World Governance Indicators (Voice & Accountability)	Kaufmann et al. (1999a,b)	5	continuous	1996 – 2021	regular

Notes: (a) Differentiating different types of autocracies and/or democracies is possible; (b) multiple versions of the index are available.

examine the role of conceptual aspects. The motivation for this emphasis is the growing number of studies suggesting that the different dimensions of democracy have different economic effects (see e.g. Aidt and Eterovic, 2011). Consistent with these studies, conceptual aspects have been shown to influence regression results

(see e.g. Gründler and Krieger, 2022, Knutsen and Wig, 2015). Furthermore, the literature suggests that the decisions made during the aggregation process have empirical consequences. More specifically, Elkins (2000) and Gründler and Krieger (2022) illustrate that continuous and dichotomous democracy indicators perform differently. Gründler and Krieger (2022) also study differences among continuous indices and observe that the choice of the method which transforms the regime characteristics into the uni-dimensional measure of democracy has a considerable impact on the magnitude of OLS and IV estimates. They explain their result with the fact that the index values of highly autocratic and highly democratic regimes differ greatly, depending on the aggregation method.

4 Concluding remarks

The question of how to measure democracy is the subject of extensive debate in political science and economics. This handbook article gives an overview of this long-standing debate. In particular, I sketch the conceptual and methodological challenges that arise when producing a democracy index and summarize the key features of various measures of democracy. The insights provided in the first part are (to a large extent) transferable to the measurement of other concepts in social science, including the rule of law, economic freedom, and globalization. In future research, scholars interested in the measurement of democracy may want to deal with one of the following three issues. First, much more need to be known about when and, if so, why using different democracy indices leads to different empirical findings. Especially with regard to the role of conceptual decision as well as the operationalization process, systematic analyses would be of great value. Second, existing indices are typically based on expert-based regime characteristics and/or objective data that is related to the election procedure (e.g. the share of eligible voters or the vote share of the ruling party). Finding opportunities to add other types of information (e.g. from newspapers or social media) would be useful to improve measurement quality. Finally, since measurement uncertainty cannot be fully avoided when producing democracy indicators, developing approaches that allow assessing how uncertain a particular classification is will probably be much appreciated.

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