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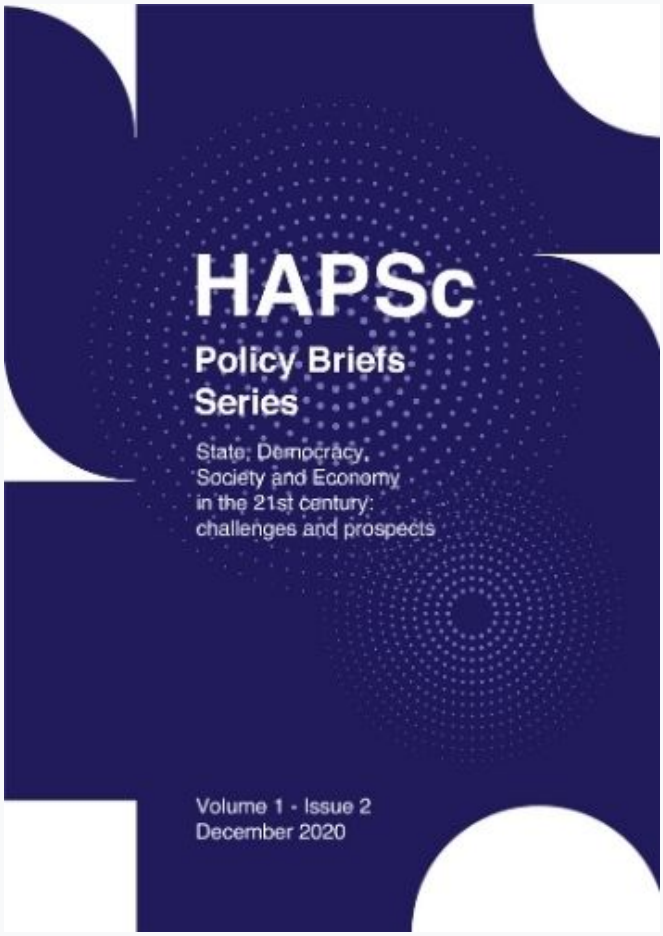

Measuring Democratization and Detecting State Transitions

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Measuring Democratization and Detecting State Transitions[1]

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Abstract

In the proposed research, an in-depth analysis of the features presented in six representative international organizations measuring democracy worldwide revealed a sizeable set of significant and complementary indicators that provided the basis for the construction of a common conceptual framework for democratization. The size and variety of the examined datasets overcomes any possible skepticism for data biasing. We also propose a method of combining such complementary or competing indicators using Multi-objective Optimization, in order to increase objectivity. The periodic monitoring of the proposed indicators allows for the detection of State Transitions, especially under alarming conditions. Our aim is to propose an objective tool for policy makers that would eliminate selective interpretation of democracy and its transitions, by allowing political change to be meaningfully understood in its proper perspective using facts and data.

Keywords: Democratization; State Transition; Multi-objective Optimization.

Introduction

Democracy is based on a set of independent and functioning institutions that, in order to ensure the legitimacy and efficiency of democratic operation should inspire confidence to the people (Sarris, 2015) and advocate respect for human freedom, social and individual autonomy. Key elements such as: *trust in the institutions*, *the participation of all 'citizens' in public and electoral processes*, *protecting the secrecy of the vote* and the *protection of freedom of expression and personal freedoms,* the *clear distinction between legislative, judiciary and executive bodies* and the *efficiency of public administration* (Coppedge et al., 2020; Skaaning, 2018) are critical characteristics that contribute to

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the objective determination of what is meant by a democratic constitution of a society, something that is independent of the varying social practices.

Based on these theoretical concepts of democracy, it is feasible to measure a country's quality of democratization for a given point in time (Campbell, 2019), especially by using big data, algorithms and artificial intelligence [e.g. in *computational sociology* (Redden, 2018)]. This provides a new approach to conceptualizing and measuring democratization. Multidimensional and disaggregated datasets that reflect the complexity of democracy as a system of rule that goes beyond the simple presence of elections, are available. And they span all high-level principles of democracy such as the electoral, liberal, participatory, deliberative, and egalitarian. In this sense, large datasets may capture diverse experiences of democracy worldwide, allowing us to assess their potential relevance across countries and to incorporate them into an expanding body of comparative knowledge on democracy (Blackwell et al. 2018). On the other hand, they allow us to explore the challenges to democratization by conducting research in areas that are highly relevant for policymaking or reform processes (e.g. *'State Transitions'*).

However, one should be careful in choosing the sources of the data since a certain degree of criticism has been exerted to possibly biased datasets concerning social phenomena [e.g. discrimination, civil rights (Shorey et al., 2016)]. Attempting to combine information from multiple datasets can overcome this skepticism, as indeed is the novelty in the proposed research work.

International specialized organizations have as their main objective the systematic creation and support of specialized, time-spanning databases using variables, indices and indicators and composing global reports that record and highlight the quality characteristics of democracy, both locally and globally, thus, constructing its regulatory conceptual framework. In this way, they contribute to the establishment of the objective and true essence of the concept of *'Democracy'* as this is constituted by facts and data. Thus, the difficulties arising by the possible subjective ways of perceiving and interpreting it by the citizens are overcome, while at the same time, the diversity, variety and pluralism of these databases eliminate the risk of selective interpretation of data, a criticism often exercised on them (Bush, 2017).

Organizations measuring Democracy

Varieties for Democracy (V-Dem)

This database defines five fundamental types of Democracy, which are also the main variables measuring its quality: *Electoral, Liberal, Participatory, Deliberative and Equalitarian Democracy*.

Data from 202 countries in the world were collected and studied for the period from 1879 to 2019 (Coppedge et al., 2020). It uses more than 250 indicators measuring Democracy, as well as its additional institutional features. Data comes from official national documents as well as from social scientists' evaluations, regarding formal political practices and *de jure* compliance to rules.

V-Dem is distinct in several regards in addition to its unique level of disaggregation, by the combination of: historical data extending back to 1900; use of multiple, independent coders for each evaluative question; multiple indices reflecting varying theories of democracy; fully transparent aggregation procedures; and that all data are made freely available.

The International Institute for Democracy and Electoral Assistance (International IDEA)

This is a transnational organization involving 158 countries. Published reports, called the *'Global State of Democracy Indices'*, portray the democratic tendencies of a country both at regional and global level, covering a wide range of different qualitative characteristics of Democracy, over the period from 1975 to 2018, for 158 countries. The data underlying the indices is based on 97 indicators developed by various scholars and organizations (Skaaning, 2018).

The fundamental features of Democracy studied by this organization are five: *Representative Government, Fundamental Rights, Checks on Government, Impartial Administration and Participatory Engagement*.

Center for Systemic Peace

The research center 'Center for Systemic Peace' has been recording elements of political behavior in countries with a population of more than 500,000, since 1997. In the context of the *'Polity'* program a database of codified information was created, based on scientific research with respect to the collection and quantitative analysis of data, in many thematic areas related to the fundamental issues of *Political Violence*, the *Fragility of Governance* and their impact on the social development of these countries.

The uniqueness of its conceptual framework lies in the fact that it examines, concurrently, multiple qualitative features of Democracy, focusing mainly on formal governmental institutions rather than on informal expressions of government (Center for systemic peace, n.d.).

Freedom House

The non-governmental organization Freedom House publishes an annual survey entitled *'Freedom in the world',* since 1973 (Bradley, 2015). In this report an evaluation on the state of freedom, as it is being experienced by people in different countries is attempted (195 countries and 14 territories are included in the 2019 report). Freedom House criteria for an electoral democracy include: *a multiparty political system, universal suffrage, regularly contested elections in the absence of voter fraud, public access of political parties to the electorate*.

Two main numerical ratings about political rights and civil liberties are used to determine whether the country or the territory has an overall status of *Free, Partly Free* or *not Free* and, thus, the level of its Democracy. The political rights questions are grouped into three subcategories: *Electoral Process, Political Pluralism and Participation,* and *Functioning of Government*. The civil liberties questions are grouped into four subcategories: *Freedom of Expression and Belief, Associational and Organizational Rights, Rule of Law and Personal Autonomy* and *Individual Rights*.

Democracy Barometer

It has developed a theoretical framework for this assessment of Democracy Quality, in 52 countries with democratic government, measuring and recording the subtle differences that exist between them. It allows comparative assessment and provides a critical follow-up of the democratic evolution of these countries over time (Engler et al., 2020). The Democracy Barometer embraces liberal as well as participatory ideas of democracy, illuminating the phenomenon from different perspectives. In order to guarantee the quality of democracy, nine democratic functions need to be fulfilled. Every function is further disaggregated into two components each, which finally, are measured by several sub-components and indicators. The fundamental principles of Democracy explored by the barometer focus on the central concepts of *Freedom, Equality* and *Control*.

Economist Intelligence Unit (EIU)

The Economist Intelligence Unit's index advocates that measures of democracy that reflect the state of political freedoms and civil liberties are not thick enough. In existing measures, the elements of political participation and functioning of government are taken into account only in a marginal way.

It has compiled since 2006 an index called *The Democracy index* (Kekic, 2007), with updates for 2008, 2010 and the following years since then. The latest edition is called: *'Democracy Index 2019.A year of democratic setbacks and popular protest'.* The report states that the index of Democracy on

a 0 to 10 scale is based on the ratings for 60 indicators, grouped into five categories: *electoral process and pluralism; civil liberties; the functioning of government; political participation;* and *political culture*. Each category has a rating on a 0 to 10 scale, and the overall Index is the simple average of the five category indices.

Combining Indicators and Detecting Transitions

The basic conceptual characteristic features of democracy presented in all databases systems are shown on Table 1, providing a theoretical framework, constructed in the context of this paper, that allows for direct comparisons**.** Each system provides a unique road map with a distinctive conceptual range at a global level and a large time span, the core of which is the understanding, interpretation and measurement of Democracy. Moreover, in all six systems, crucial concepts are: the *political identity of the individual* with respect to the *participation in the public sphere*, the *protection of the fundamental freedoms of individuals*, the *exercise of control* over the forms of governance and the effective *exercise of power in the interest of the citizens*. The *participatory component* is also fundamental in all databases, with only subtle differences in quality among them. The size and variety of the examined datasets overcomes any possible skepticism for data biasing.

More than 500 indicators are shared among the databases, covering almost any measurable aspect of democracy. Some indicators from different databases can be complementary to each other (e.g. measuring *Civil Liberties* in different but complementary manner in *Freedom House* and in *Democracy Barometer,* Table 1) whereas, other indicators may measure competing notions of democracy (e.g. indicators from *Functioning of Government* in the *EIU* versus *Checks on Government* in *IDEA*, where one feature may be increased at the expense of the other, e.g. leading to an unconstrained Presidency in USA by limiting such checks). The following methodology based on *Multi-objective Optimization Theory* (Emmerich et. al., 2018), is proposed for decision-making based on multiple indicators:

i) Weighted Sum Model of complementary indicators between Transition States

Assuming complementary indicators from different datasets (indicators increasing or decreasing in the same direction), a *Weighted Sum Model* could be used. In general, for a given problem defined on *m* alternatives (different *Democracy States* in our case) and *n* decision criteria (*Indicators*, evaluated through the different *Transition States*):

Suppose that w_j denotes the relative weight of importance of the criterion (*Indicator*) C_j and a_{ij} is the performance value of alternative A_i (the *State of Democracy*) when it is evaluated in terms of criterion

C_j. Then, the total (i.e., when all the criteria are considered simultaneously) importance of alternative *State of Democracy* A_i, denoted as $A_i^{WSM\text{-}score}$, is defined as follows:

$$A_i^{\text{WSM-score}} = \sum_{j=1}^{n} w_j a_{ij}, \text{ for } i = 1, 2, 3, \ldots, m.$$

For the maximization case, the best Democracy State out of the possible Transition States is the one that yields the maximum total performance value.

ii) Pareto Optimization of competing indicators

If the final Democracy State cannot be improved in any of the indicators without degrading at least one of the other indicators (competing indicators), a Pareto Optimal Solution should be sought for decision-making (Emmerich et. al., 2018).

In mathematical terms, such a multi-objective optimization problem can be formulated as where the integer $k \geq 2$ is the number of objectives (Indicators in our case) and the set X is the feasible set of decision vectors (States of Democracy in the present work).

$$\begin{aligned} &\min(f_1(x), f_2(x), \ldots, f_k(x)) \\ &\text{s.t. } x \in X, \end{aligned}$$

The feasible set is typically defined by some constraint functions. In addition, the vector-valued objective function (the set of *Indices values* for the specific state in our case) is often defined as $f:X \rightarrow \mathbb{R}k$, $f(x)=(f_1(x),\ldots,f_k(x))^T$. An element $x^* \in X$ is a feasible solution; a feasible solution $x^1 \in X$ is said to (Pareto) dominate another solution $x^2 \in X$, if

- $f_i(x^1) \leq f_i(x^2)$ for all indices $i \in \{1, 2, \ldots, k\}$ and
- $f_j(x^1) < f_j(x^2)$ for at least one index $j \in \{1, 2, \ldots, k\}$.

iii) State Transition detection

Finally, the periodic monitoring of the proposed indicators $f(x)=(f1(x),\ldots,fk(x))T$ would provide clear alarming signals for State Transitions in X (feasible States of Democracy). By combining the power of multiple indicators policy makers can obtain a clear view on the actual state of democracy, based on facts and data.

Conclusion

The size and variety of the examined datasets on Democracy overcomes any possible skepticism for data biasing and selective interpretation. Additionally, the proposed approach for combining

complementary and competing indicators from different data sets avoids subjectivity, filtering, generalization and distortion of concepts. Constant monitoring and updating of the values of the proposed indicators provides an efficient way to detect possible State Transitions and to produce strong alarm signals to the influential policy makers.

Table 1: Principles components of the distinctive Perspectives on Democratization

Databases measuring Democracy	Varieties of Democracy (V-Dem)	International Institute for Democracy and Electoral Assistance	Economist Intelligence Unit (EIU)	Freedom House	Democracy Barometer	Center for Systemic Peace
Principle components of each database	Electoral component	Representative Government	Electoral process and pluralism	Political Rights 1. Electoral Process 2. Political Pluralism and Participation 3. Functioning of Government	Equality 1. Transparency 2. Participation 3. Representation	Fragility Index is measured by: A. Effectiveness 1. Security 2. Political 3. Economic 4. Social
	Deliberative component	Impartial Administration	Political Culture			
	Liberal component	Fundamental Rights	Civil liberties	Civil Liberties 1. Freedom of Expression and Belief 2. Associational and Organizational Rights 3. Rule of Law 4. Personal Autonomy and Individual Rights	Freedom 1. Individual liberties 2. Rule of Law 3. Public sphere	B. Legitimacy 1. Security 2. Political 3. Economic 4. Social
	Participatory component	Participatory engagement	Political Participation			
	Egalitarian component	Checks on Government	Functioning of Government		Control 1. Completion 2. Governmental capability 3. Mutual Constraints	

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