

Article

# Identifying Profiles of Democracies: A Cluster Analysis Based on the Democracy Matrix Dataset from 1900 to 2017

Oliver Schlenkrich

Chair of Comparative Politics and German Government, University of Wuerzburg, 97074 Würzburg, Germany;  
E-Mail: oliver.schlenkrich@uni-wuerzburg.de

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## Abstract

This study examines types of democracies that result from trade-offs within the democratic quality. Recently, the existence and relevance of trade-offs has been widely discussed. The idea is that the functions associated with the quality of democracy cannot all be maximized simultaneously. Thus, trade-offs are expressed in distinct profiles of democracy. Different profiles of democracy favour certain democracy dimensions over others due to their institutional design. Conceptually, we differentiate between four different democracy profiles: a libertarian-majoritarian (high political freedom, lower political equality, and lower political and legal control values), an egalitarian-majoritarian (high equality combined with lower freedom and control values), as well as two control-focused democracy profiles (high control values either with high degrees of freedom or high degrees of equality). We apply a cluster analysis with a focus on cluster validation on the Democracy Matrix dataset—a customized version of the Varieties-of-Democracy dataset. To increase the robustness of the cluster results, this study uses several different cluster algorithms, multiple fit indices as well as data resampling techniques. Based on all democracies between 1900 and 2017, we find strong empirical evidence for these democracy profiles. Finally, we discuss the temporal development and spatial distribution of the democracy profiles globally across the three waves of democracy, as well as for individual countries.

## Keywords

cluster analysis; democracy; democracy profiles; quality of democracy; trade-offs

## Issue

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## 1. Introduction

How can we make sense of all the different institutional designs of democracies? Ordering the political reality is an important task of comparative politics. Therefore, typologies are a useful and necessary tool. Typologies structure the confusing political reality by reducing empirical complexity and focusing on its most relevant aspects. Various efforts have been made to capture the fundamental institutional choices in the diverse and heterogeneous world of democracies (Bogaards, 2017): For example, democracies are divided into parliamentary and presidential systems (Shugart & Carey, 1992; Steffani, 1979), collective and competitive veto points (Birchfield

& Crepez, 1998; Crepez & Moser, 2004), decentralized and centripetal democracies (Gerring & Thacker, 2008), or nation-state and state-nation institutions (Stepan, Linz, & Yadav, 2010). The most influential proposal is Lijphart’s (2012) typology of majoritarian and consensus democracy which has been much debated and considerably criticized (Bormann, 2010; Fortin, 2008; Giuliani, 2016; Kaiser, 1997; Lauth, 2010).

Recently, the quality of democracy research began to distinguish between different types or profiles of democracies, concluding that a perfect democracy does not exist. A democracy cannot perform at its best in all dimensions and functions simultaneously. Rather “every democratic country must make an inherently value-

laden choice about what *kind* of democracy it wishes to be” (Diamond & Morlino, 2004, p. 21). There are trade-offs between central dimensions and functions of democracy. Thereby, democracies emphasize some dimensions or functions, while others are necessarily neglected. Newer measurements of democracies (e.g., Democracy Barometer, V-Dem) try to explore this idea. On a preliminary basis, the Democracy Barometer (Bühlmann, Merkel, Müller, Giebler, & Weßels, 2012) identifies several different clusters of democracies. V-Dem examines the possibility of trade-offs in their conceptual papers and highlights the tension between institutions of the liberal and majoritarian conception of democracy (Coppedge et al., 2011). However, these democracy measures are not able to measure different democracy profiles (e.g., countries can have high degrees of democratic quality in each dimension).

In this article, we draw on the novel dataset of the Democracy Matrix (Lauth & Schlenkrich, 2018a) which is a customized version of the Varieties of Democracy dataset (Coppedge et al., 2018). It is a measurement instrument which is not only designed to gauge the quality of democracy, but also to capture several trade-offs between dimensions caused by specific institutional choices of the democracies. It proposes various trade-offs between three fundamental democracy dimensions, namely political freedom, political equality, and political and legal control. Conceptually, the Democracy Matrix identifies four democracy profiles: Libertarian-majoritarian democracies stress the freedom dimension over both the equality and control dimension; egalitarian-majoritarian democracies focus on the equality dimension but neglect freedom and control. In addition, it is possible that there can be a mix between high freedom and control dimensions (libertarian-control-focused democracy) as well as a mix between high equality values and high control values (egalitarian-controlled-focused democracy). This study applies a cluster analysis with validation strategies to this dataset to empirically test whether we can find these conceptually proposed democracy profiles.

This article proceeds as follows: Section 2 describes the conceptualization and measurement of the Democracy Matrix. Section 3, the methodology section, presents the multiple steps of the cluster analysis and the cluster validation strategies. Finally, the results of the cluster analysis are presented (Section 4) and discussed (Section 5), followed by a conclusion (Section 6).

## 2. The Democracy Matrix: Trade-Offs and Democracy Profiles

### 2.1. Democracy Conception

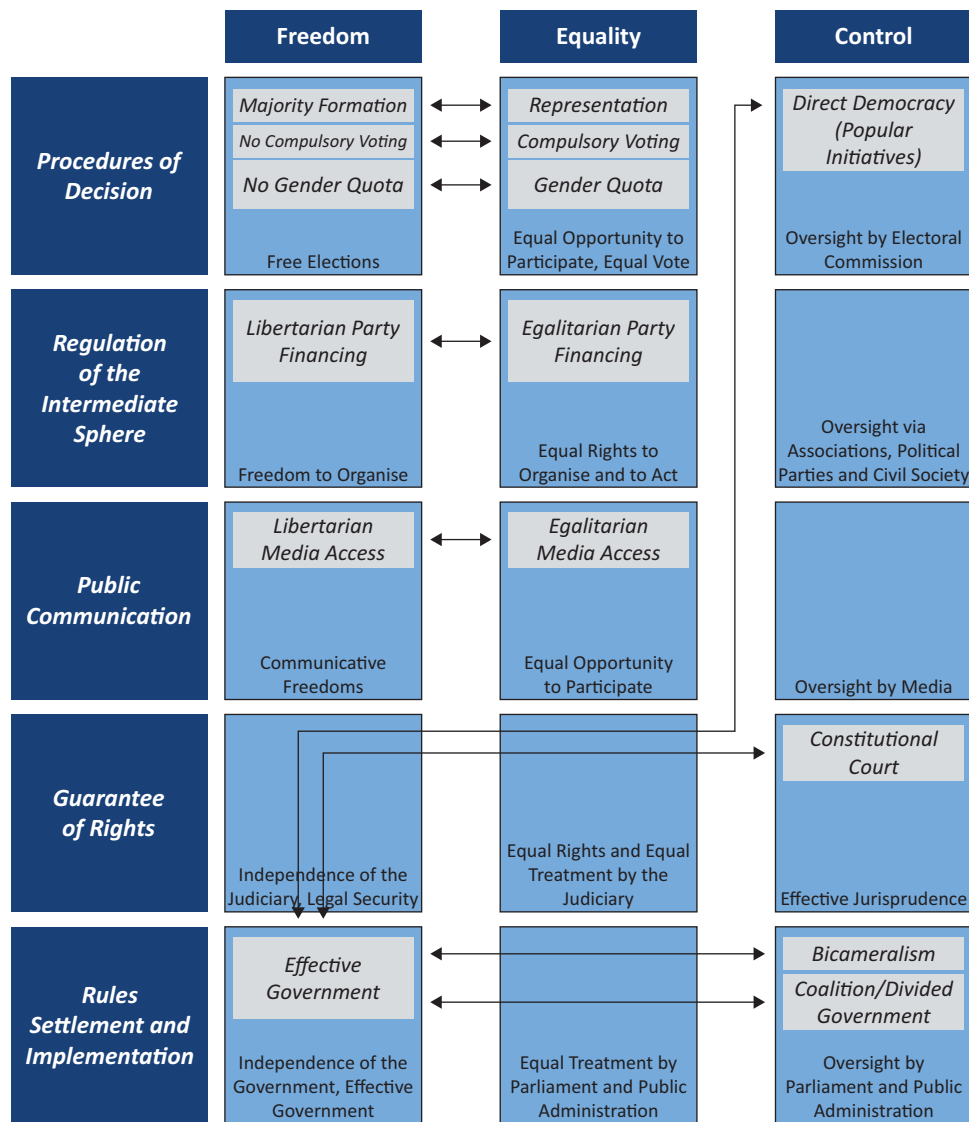
How can we reasonably define democracy? In democracy theory, three different conceptual ranges became apparent: minimal definitions, middle-range definitions, and maximal definitions. Although there is a large scien-

tific consensus on the minimal definition of democracy—the repeated holding of elections with competition and broad participation, it has become clear that a nuanced view on the quality of democracy, especially for established democracies, is not possible within the boundaries of this definition. Maximal definitions overstretch the concept of democracy by focusing on socio-economic outcomes unrelated to the democratic procedures which are the real focus of the analysis (welfare state within the social democracy concept). However, middle-range definitions supplement the minimal democracy concept only insofar as this is necessary for a differentiated analysis and thus, the definition remains within the limits of a narrow and procedural understanding of democracy. The democracy concept of the Democracy Matrix (Lauth, 2015; Lauth & Schlenkrich, 2018a) is based on such a middle-ranged understanding of democracy.

The Democracy Matrix combines three dimensions with five central democratic functions: While the dimension of freedom captures the extent of citizens’ free self-determination based on civil and political rights, the equality dimension encompasses legal egalitarianism and the actual realization of those rights (input-egalitarianism). The control dimension takes into account the protection of the two other dimensions through legal control by judiciaries and political oversight by intermediary institutions, the media, and parliament.

In addition, five key functions cut across these three dimensions specifying the concept of democracy quality. The function “procedures of decision” captures the democratic quality of representative elections and direct democracy. The “regulation of the intermediate sphere” analyzes interest aggregation and interest articulation by parties, interest organizations, and civil society. “Public Communication” evaluates the functioning of the media system and the public realm. The function “guarantee of rights” analyzes the democratic quality of the court system, whereas the last function “rules settlement/implementation” focuses on the democratic quality of the executive and legislative branches’ work. This produces 15 matrix-fields which guide and support a detailed analysis of the quality of democracy (see Figure 1). For example, the three matrix fields of the institution “Public Communication” assess whether the media system can freely operate (freedom dimension), whether interests are equally represented in the public sphere by diverse media outlets (equality dimension), and finally, whether the media system is able to criticize and control the government (control dimension).

Democracies—defined by the Democracy Matrix—preserve all dimensions of political freedom, political equality, and political and legal control, as well as maintain a democratic functional logic in all five key institutions. It may be that some of its characteristics are only partially developed as long as the central democratic functional logic is retained such as in deficient democracies in which elections occur in combination with some deficits in the rule of law.



**Figure 1.** Concept of the Democracy Matrix. Notes: The dark blue boxes represent the three dimensions and the five central institutions of the Democracy Matrix. Light blue boxes are the 15 matrix fields, each representing a combination of one dimension and one institution. The focus of the analysis of the democratic quality for each matrix field is described by the text in the light blue boxes (e.g., “communicative freedom” is the focus of the matrix field which is part of the institution “Public Communication” and the freedom dimension). The two-headed arrows represent the derived trade-offs and the text inside the grey boxes describes the components involved in the trade-off, e.g., there is a trade-off between judicial review (control dimension) and effective government (freedom dimension). Source: Lauth and Schlenkrich, 2018b.

Thereby, the democracy matrix conceptualizes the internal relationship of these central dimensions to each other (Lauth, 2016). It differentiates between complementary effects and conflicting effects of the democracy dimensions (trade-offs). On the one hand, these dimensions reciprocally support one another: Elections are only meaningful if they are not only competitive but also allow nearly universal suffrage, or more generally, freedom needs a minimum level of equality and vice-versa. On the other hand, there are tensions between the dimensions (Diamond & Morlino, 2004). This means a perfect democracy that fully realizes all democracy dimensions cannot exist. Conflicting effects (trade-offs) can also be understood as a normative dilemma for demo-

cratic societies. They give expression to a political conflict over values, on which society must take a position. Stressing one value, which might have been selected in a process of negotiation by the different social forces (Bühlmann et al., 2012, p. 123) or which reflects a specific cultural preference (Maleki & Hendriks, 2015), changes the degrees of development of the individual dimensions and their weights relative to one another. The conflicting effects of the dimensions or trade-offs allow citizens to shape their democracy according to their normative preferences. As Berlin (2000) states:

Liberty and equality, spontaneity and security, happiness and knowledge, mercy and justice—all these are

ultimate human values, sought for themselves alone; yet when they are incompatible, they cannot all be attained, choices must be made, sometimes tragic losses accepted in the pursuit of some preferred ultimate end. (p. 23)

Trade-offs arise because some democracy concepts (e.g., egalitarian vs. libertarian democracy) can be arranged as opposing pairs and prefer different institutional solutions for the same function. These conceptions have an equal normative weight and it is equally possible to justify them. In addition, they are recognized as having the same level of democracy quality, which means that the conceptions and their institutional decisions are neutral concerning the quality of democracy. Ultimately, every conception of democracy emphasizes different political values, while others are neglected (e.g., equality as opposed to freedom). This means that they exhibit a different dimensional structuring of the same democratic quality (e.g., equality dimension over the freedom dimension). Hence, due to their connection to different conceptions of democracy, institutions emphasize different democracy dimensions. The tensions between the dimensions are reflected in institutional decisions and one cannot completely realize all three dimensions of the Democracy Matrix since they are unavoidably bound to conflicting goals.

The Democracy Matrix differentiates between two opposing pairs of democracy conceptions. The first pair tackles the levels of effectiveness of the government or the conflicting relationship between the freedom and control dimension: Is the decision-making process separated between the different powers which control the government and does the government have to rely on a broad consensus? Or is there a higher level of freedom for the government through its centralized power? This follows the idea of a distinction between majoritarian and consensus democracies (Lijphart, 2012) which are opposing concepts of democracy and cannot be realized simultaneously. The former focuses on majority rule, the latter on an extended system of reciprocal mechanisms of oversight. Whereas consensus democracy emphasizes the interplay of several veto players

(Tsebelis, 2002), which restrict the action of governments (e.g., strong second chambers, coalitions, constitutional courts), the ideal-typical development of majoritarian democratic structures favours effective government, that is structures with more limited capacities for oversight. Consensus democracy can also be understood as a constitutional democracy, whose core element is a strong constitutional court. Popular legislative initiatives are included as a further trade-off element. To emphasize the dimension involved in this trade-off, we call these types majoritarian and control-focused democracy profiles.

The second opposition is the gap between libertarian and egalitarian conceptions of democracy which represent the tension between freedom and equality. This trade-off captures the inclusiveness of access to the government or political influence. Whereas egalitarian democracies underscore political equality, libertarian democracy focuses on the realization of political freedom. Egalitarian democracies emphasize inclusiveness by the introduction of equal representation and an equal chance of representation through PR-systems, egalitarian political finance, and fair media regulation. To the contrary, libertarian democracies are considered to be more exclusive with their FPTP-system and their “lack of restrictions on expenditure and contributions, market principles of access to the media [and] no public funding” (Smilov, 2008, p. 3).

Both opposing pairs can be combined and displayed in a two-by-two matrix (as seen in Table 1).

Moreover, these two opposing pairs of democracy conceptions resemble, on the one hand, the democracy models of decentralism and centripetalism (Gerring & Thacker, 2008; Gerring, Thacker, & Moreno, 2005) and, on the other hand, the distinction between collective and competitive veto points (Birchfield & Crepez, 1998). Gerring and Thacker differentiate between two fundamental aspects; authority and inclusion. While the trade-off between freedom and control encompasses the aspect of authority which “indicates the extent to which political institutions centralize constitutional sovereignty within a democratic framework” (Gerring & Thacker, 2008, p. 16), the trade-off between freedom and equal

**Table 1.** Democracy profiles.

		Effective Government (Freedom vs. Control)	
		High	Low
Inclusiveness (Freedom vs. Equality)	High	Egalitarian and majoritarian democracy (FEC)	Egalitarian and controlled-focused democracy (fEC)
	Low	Libertarian and majoritarian democracy (Fec)	Libertarian and controlled-focused democracy (Fec)

Notes: The letters in brackets represent the three central dimensions of democracy, namely freedom (F), equality (E), and control (C). An upper-case letter instead of a lower-case letter indicates that the dimension is pronounced relative to the other dimensions. For example, the abbreviation *Fec* stands for a democracy that emphasizes the freedom dimension at the expense of the equality and control dimensions.

ity is similar to the inclusion element which “indicates the extent to incorporate a diversity of interests, ideas, and identities in the process of governance” (Gerring & Thacker, 2008, p. 16). Translating our democracy profiles to the types developed by Gerring and Thacker, libertarian-majoritarian democracies correspond to the centralized democracies (high authority, low inclusion), egalitarian-majoritarian democracies resemble the centripetal model (high authority, high inclusion), and finally, the controlled-focused democracies (either in a libertarian but more in an egalitarian way) are quite similar to the decentralized democracies (low authority, high inclusion).

We can also link these considerations to the differentiation between collective and competitive veto points. Whereas collective veto points result “from institutions where the different political actors operate in the same body and whose members interact with each other on a face to face basis” (Birchfield & Crepez, 1998, p. 182), competitive veto points emerge when the power is “institutional diffused” (Crepez & Moser, 2004, p. 266) in separate institutions between different political actors. On the one hand, the trade-offs between the freedom and control dimensions, especially the components of bicameralism and the divided government, represent the competitive veto points. On the other hand, the trade-offs between the freedom and equality dimension, especially the element of the electoral system, approximate the theoretical underpinnings of the collective veto points.

Overall, the Democracy Matrix is able to incorporate and represent these diverse democracy conceptions by drawing on the idea of trade-offs between central dimensions of democracy.

## 2.2. Measurement

How is this democracy conception and its respective democracy profiles measured? We use the data from the Democracy Matrix Dataset V1.1 (see [www.democracymatrix.com](http://www.democracymatrix.com)). The Democracy Matrix is a customized version of the Varieties-of-Democracy (V-Dem) dataset (Coppedge et al., 2018). V-Dem offers over 400 key indicators for determining democracy quality, covering a period from 1900 to 2017 (as of March 2019) and including approximately 200 countries. The data is collected according to an elaborate procedure and is subject to statistical tests to increase the reliability and validity of the assessments. Calculations in this article are based on version 8 of the V-Dem dataset (as of March 2019). The development of the Democracy Matrix is designed according to the state of the art for measurement concepts, made up of three phases; conceptualization, measurement, and aggregation (Munck & Verkuilen, 2002).

Thereby, the Democracy Matrix dataset not only measures each individual matrix field but also provides data for the matrix fields aggregated into dimensions and institutions (see Figure 1). In contrast to other democracy

indices, the Democracy Matrix explicitly considers the integration of trade-offs in the measurement stage by applying a two-step measurement strategy (Lauth, 2016): Quality measuring indicators consist of the usual indicators used by various democracy measures, while trade-off measuring indicators measure the conflicting impact of the dimensions within the Democracy Matrix. The former indicators are linear in the sense that higher values indicate a higher democracy quality. The latter are bipolar which means that each end of the scalar indicates a highly developed characteristic of the profile. Therefore, maximum values are not possible simultaneously in each dimension. The conflicting effects are not characterized by generally differing degrees of democratic quality, but rather by the distribution of democracy quality in different dimensions. Trade-off indicators represent the differences in the shape of these dimensions to each other. A libertarian-majoritarian and an egalitarian-majoritarian democracy have a different profile, but they could have the same democratic quality.

For example, the freedom dimension of the institution “Public Communication” is measured as follows: The matrix field is conceptually based on the idea of communicative freedoms which is made up of the two components “freedom of the press” and “freedom of opinion.” These two elements are measured by seven V-Dem indicators in total. The first component, freedom of the press, is the average of the three indicators “Harassment of journalists” (v2meharjrn), “Government censorship effort” (v2mecenefm), and “Internet censorship effort” (v2mecenefi). The freedom of opinion component is the average of the four indicators “Freedom of discussion—women” (v2cldiscw), “Freedom of discussion—men” (v2cldiscm), “Freedom of Religion” (v2clrelig), and “Freedom of academic and cultural expression” (v2clacfree). Finally, both components are scaled between 0 and 1 and are multiplied together in the sense of necessary conditions to derive the final value for this matrix field. These values are linear in the sense that higher values indicate a higher level of quality of democracy in this matrix field. All other matrix fields are measured similarly so that the Democracy Matrix applies approximately a selection of 100 V-Dem indicators. This is the first step of the measurement strategy: These quality measuring indicators are the basis for the regime classification and the subsequent trade-off measurement if the country is classified as a democracy.

Furthermore, the Democracy Matrix locates the following trade-off between the freedom and the equality dimension in the institution “Public Communication”: Libertarian Media Access versus Egalitarian Media Access. Whereas libertarian media access is characterized by the fact that “it only provides for market access to the media” (Smilov, 2008, p. 9, emphasis in the original), the egalitarian model relies on free airtime and restrictions on the purchase of additional media airtime. This trade-off is the weighted average of the three V-Dem indicators “Election paid interest group media” (v2elpaidig),

“Election paid campaign advertisements” (v2elpdcamp), and “Election free campaign media” (v2elfrcamp). These combined indicators are then transformed in a bipolar way: If there are no restrictions, they provide higher values for the freedom dimension (up until 1) and lower values for the equality dimension (down until 0.75 which is the threshold of a working democracy). And vice-versa, the more regulation exists, the higher the value for the equality dimension (up until 1) and the lower the value for the freedom dimension (down until 0.75). Afterwards, these values are multiplied with the values for the quality measurement of the first step. This applies to all the matrix fields where a trade-off is identified. This produces the final values for the trade-off measurement stage.

### 3. Research Design: Multi-Step Cluster Analysis

Can we empirically detect these democracy profiles in the data? Do countries have similar democracy profiles? To answer these questions, we apply a cluster analysis with a strong focus on cluster validation to trade-off measurement data of the Democracy Matrix dataset. Cluster analysis classifies observations using data in form of variables (features) and different cluster algorithms (Everitt, Landau, Leese, & Stahl, 2011; Hastie, Tibshirani, & Friedman, 2009; James, Witten, Hastie, & Tibshirani, 2013; Kaufman & Rousseeuw, 2005). Cluster analysis can be seen as a form of exploratory data analysis because it reveals structures in the form of groupings within the data. Validation is an important aspect of cluster analysis, as different cluster solutions are often possible and cluster algorithms “tend to generate clusterings even for fairly homogeneous data sets” (Hennig, 2007, p. 258). Therefore, we apply several conceptual and methodological strategies to validate the cluster solution in this study:

- A conceptual and theoretical validation: Do the clusters found in the data correspond to our deductively expected democracy profiles? This ensures that the cluster solution is not just a random artefact but rather conforms to democracy theory. For example, do we find a cluster of democracies which have a higher freedom than equality or control dimension (libertarian and majoritarian democracies)?
- Examination of the internal cluster quality using fit indices: Are the clusters similar to each other and different to observations belonging to other clusters? We refer here to the Silhouette Width Criterion (Kaufman & Rousseeuw, 2005). Thereby, the “silhouette shows which objects lie well within their cluster and which ones are merely somewhere in between clusters” (Kaufman & Rousseeuw, 2005, p. 86). This fit index determines whether the clusters are internally coherent and well separated externally. It checks whether the

objects are close to their own cluster and do not overlap with observations from other clusters. In addition, the Average Silhouette Width has a clear visualization in the form of the silhouette plot. Values near 1 suggest that an observation is well clustered; values near -1 shows that the observation is misclassified;

- Evaluation of the robustness of the cluster solution using different cluster algorithms and resampling procedures: If different cluster algorithms (e.g., hierarchical vs. partitioning algorithms) identify the same cluster solution, we can be reassured that the cluster solution which was found is not random but reliable. We compare the similarity of the cluster solutions with the Adjusted Rand Index (Hubert & Arabie, 1985). It quantifies the level of agreement between the cluster solutions corrected for chance (0: no agreement; 1: perfect agreement). Furthermore, we randomly partition the data by using a nonparametric bootstrap method and randomly subsetting 50% of the data to assess the stability of the clusters over 100 resample runs (Hennig, 2007).

For the clustering process itself, we chose a multi-step clustering strategy (see Figure 2). As a result of analyzing all democracies, that is both functioning and deficient democracies at the same time, we may not only find clusters of different dimensional shapes, but we may also find that these shapes may be on overall different levels of democracy quality. There might be egalitarian democracies—democracies with a higher equality dimension relative to the freedom and control dimension—with overall low values for all dimensions compared to egalitarian democracies which exhibit higher values for all dimensions. To disentangle the effects of shapes and levels in our analysis, we use a correlation-based distance (Pearson correlation distance) in the first step. This distance classifies objects as similar whose features are correlated, even if they are at different levels (James et al., 2013, p. 396), which means it groups observations based on the similarity of their democracy profile (e.g., democracies which emphasize the freedom over the equality and control dimension regardless of the overall democratic quality of these dimensions).

One drawback is that, unfortunately, the correlation-based distance cannot determine whether the dimensional values are actually balanced in the sense that there is no difference between the dimensional values. Even if there is only a minimal difference between the dimensions, the correlation-based distance treats these observations similarly to observations with larger differences between the dimensions. Therefore, we manually extract these balanced configurations of the dimensions and assign them to their own cluster with a balanced shape (threshold for no difference between dimensions is set to 0.05 points; the entire range for democratic val-

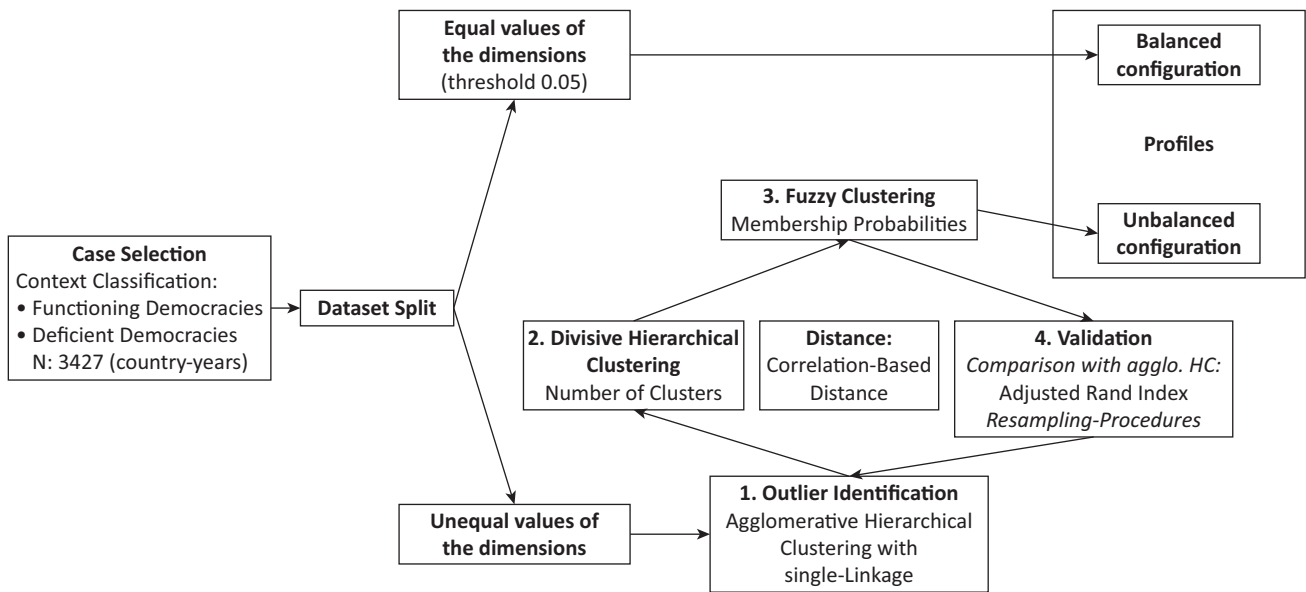


Figure 2. Overview of clustering strategy.

ues is between 0.5 and 1). This also has the effect that we only cluster those observations with a significant difference between the dimensions (greater than 0.05 points).

We use the following cluster algorithms and cluster validation strategies. Firstly, we detect and eliminate outliers which could adversely affect the clustering process. This is especially important because the Pearson correlation distance is prone to the effects of outliers. A commonly-chosen outlier detection algorithm is a hierarchical clustering algorithm with single linkage because outliers “are left as singletons if they are sufficiently far from their nearest neighbour” (Everitt et al., 2011, p. 81).

Secondly, we rely on divisive as opposed to agglomerative clustering. Divisive clustering (DIANA) groups the data in a top-down direction in contrast to the bottom-up direction of the agglomerative algorithm. This means that the whole dataset is treated as a single cluster and is split successively until each cluster contains only one observation. It has several advantages over agglomerative clustering, particularly the fact that it tends to partition the data into a smaller number of clusters (Hastie et al., 2009, p. 526). In addition, even though it shares the weakness of all hierarchical clustering algorithms in that the decision to split the data at an earlier stage cannot be reversed, divisive clustering is generally considered to be safer and more accurate (Kaufman & Rousseeuw, 2005; Sharma, López, & Tsunoda, 2017). The resulting dendrogram of the cluster solution visualizes the relationship between the clusters in a tree-like diagram and is used to identify the relevant number of clusters as a starting point for the next algorithm to be applied.

Finally, we apply a second algorithm which does not belong to the family of hierarchical clustering algorithms but instead belongs to a group of partitioning clustering algorithms. The algorithm, Fuzzy Analysis (FANNY), optimizes this solution while increasing its robustness. Due to the empirical complexity, we do not expect the

clusters to be well separated. Hence, we allow for this by using fuzzy instead of crisp clustering (D’Urso, 2015). Instead of classifying an observation uniquely to only one cluster, fuzzy clustering calculates for each observation the “strength of membership in all or some of the clusters” (Everitt et al., 2011, p. 242). The strength of the membership of an object can vary between 0 and 1 for each cluster (a high value of an object for a cluster indicates a high probability that this object belongs to that cluster). In addition, we compare the cluster solution to agglomerative hierarchical clustering with the average linkage which is a frequently chosen option in other studies.

The cluster analysis is based on country-year observations. With this setting, it is easier to track the temporal change in the democracy profile for each country. However, the analysis has to ensure that a cluster is built, not from years of a single country, but from a reasonable number of countries.

The spatio-temporal range of this study is the following: Since democracy profiles presuppose the existence of a democratic regime, the observation must be classified as a democracy in order to be included in the sample. There are 3427 observations (country-years) classified as democracies in the Democracy Matrix dataset. 2906 cases have no missing values for the trade-off indicators and can be included in the analyses. The analysis covers all years from 1900 to 2017. The number of included countries is 86 from all regions, the average of years per country is 35 with a minimum of 1 year and a maximum of 117 years (see Appendix, Section 1, for more a detailed overview).

#### 4. Results of the Cluster Analysis

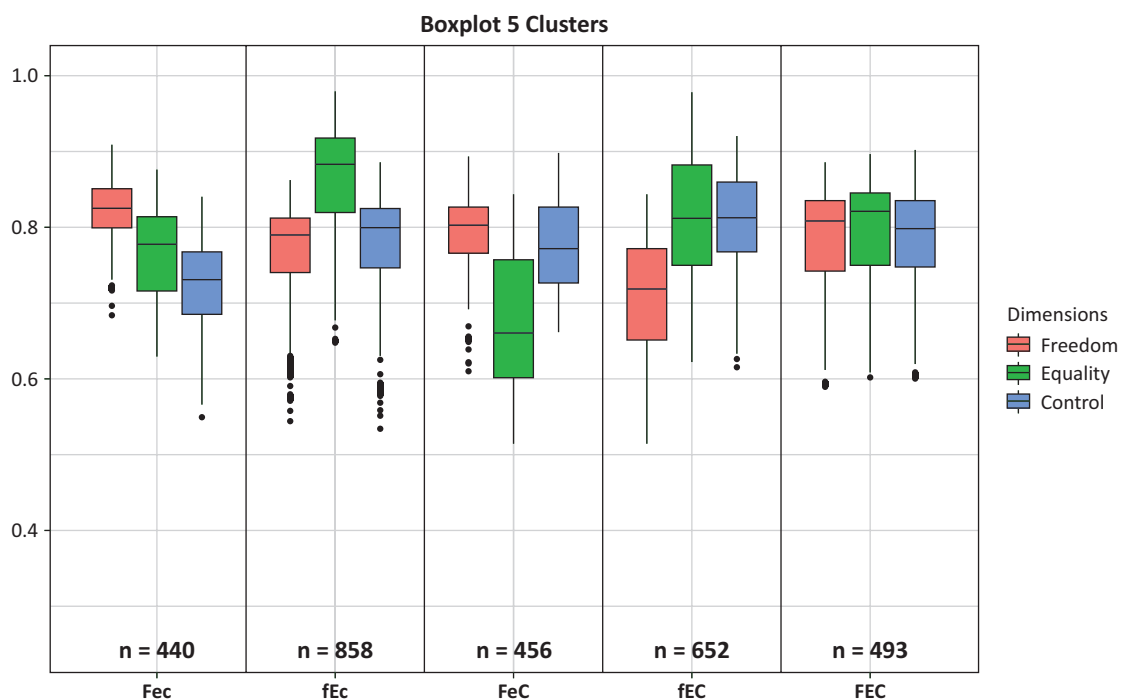
In a first step, we split the dataset into two samples: One sample with a balanced configuration of the three di-

mensions, and one sample with an unbalanced configuration. Only 493 country-years show a balanced profile meaning that they show no or almost no differences between the three dimensions (40 countries with an average of 12 years per country). This balanced cluster does not contradict the idea of trade-offs. Rather, this means that some political systems do not occupy the extreme ends of the trade-offs. The larger unbalanced sample which shows differences between the three dimensions is made up of 2413 country-years. Only these observations are subjected to cluster analysis in the next step. The outlier detection via hierarchical clustering with single linkage (see Appendix Figure A1) determines just seven outliers (Latvia from 2006–2011; USA 1972–1973). These outliers combine low freedom and low equality with somewhat higher control values. After removing those cases, divisive clustering is performed. The dendrogram (see Appendix Figure A2) shows that we can differentiate between four clusters according to the height of the branches and nodes.

These clusters correspond mostly to the conceptual and theoretical considerations above (see Figure 3): We find empirical evidence for the libertarian-majoritarian democracy profile (Fec) which emphasizes higher freedom than equality and control values (e.g., United Kingdom, Canada 1951–1973, New Zealand until 1995). In addition, the results indicate the existence of an egalitarian-majoritarian profile (e.g., Netherlands, Sweden, Spain). These democracies stress the equality dimen-

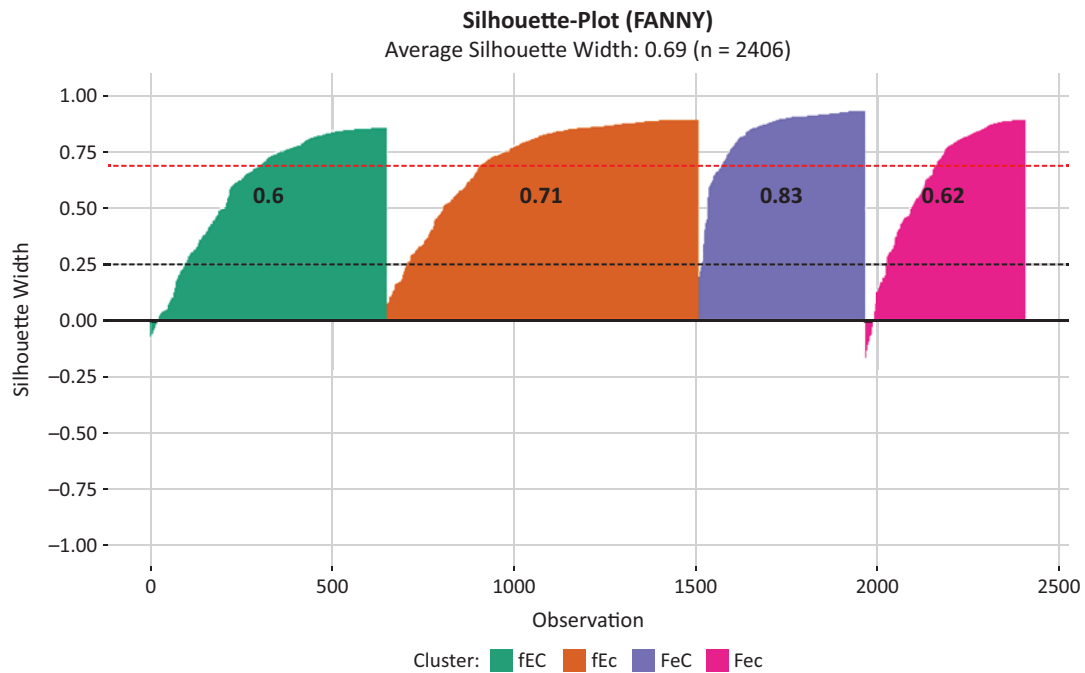
sion in contrast to the other two dimensions (fEc). We also find empirical evidence for the controlled-focused democracy profiles. High control values tend to go along with higher freedom dimension representing a mix between a libertarian and controlled-focused democracy (FeC, e.g., USA and Switzerland). In addition, high control values mix with higher egalitarian values (egalitarian-controlled focused democracy, fEC, e.g., Germany and Italy). The largest group are the egalitarian-majoritarian democracies with 858 cases (51 countries with an average of 17 years per country) and the egalitarian-control-focused countries with 652 observations (54 countries with an average of 12 years per country). Lower observations are found for the libertarian-majoritarian profile (440 cases—23 countries with 19 years on average) and the libertarian-control-focused group (456 cases—19 countries with 24 years on average).

Inspecting the internal cluster validity (see Figure 4), we see that the average silhouette width is acceptable (0.69). Each cluster has a silhouette width well above the 0.5 threshold indicating a reasonable partition. There are only a few negative silhouette widths within the egalitarian-control-focused and the libertarian-majoritarian cluster indicating a minor misfit for these observations. The fuzzy clustering algorithm accounts for those misfits by providing a lower membership probability of these observations to their clusters. Overall, this means that most of the observations are near their own cluster centre and most observations do not over-



**Figure 3.** Boxplot of the cluster solution. Notes: N = 2899 country-years. This box plot shows the democratic quality for all dimensions split by democracy profile (unbalanced and balanced configuration). Higher values indicate higher democratic quality. The cluster distribution of countries and years is as follows: Fec: 23 countries (average years: 19); fEc: 51 countries (average years: 17); FeC: 19 countries (average years: 24); fEC: 54 countries (average years: 12); FEC: 40 countries (average years: 12). Source: Author’s calculations based on the Democracy Matrix dataset V1.1.





**Figure 4.** Silhouette plots for the four cluster solution (FANNY). Notes: N = 2406 country-years. The silhouette plot shows only the four unbalanced configurations. No cluster analysis was performed on the observations with a balanced configuration. Therefore, no silhouette plot can be created for the balanced cluster. The plot shows the silhouette width (y-axis) for each observation sorted by cluster (x-axis). The average silhouette width for each cluster is shown in bold within each cluster. The overall average silhouette width is presented in the subtitle. Values near 1 indicate a very good clustering result in the sense that observations are close to their own cluster and are well-separated from objects of other clusters. Negative values signal a misfit so that the observation lies close to the observations from other cluster centres. Overall, the values can be interpreted as follows (Kaufman & Rousseeuw, 2005, p. 88):  $\leq 0.25$ : no cluster structure; 0.26–0.50: weak structure; 0.51–0.70: reasonable structure; 0.71–1.00: strong structure. Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.

lap with other clusters. Thus, the clusters are reasonably compact and reasonable separated from each other.

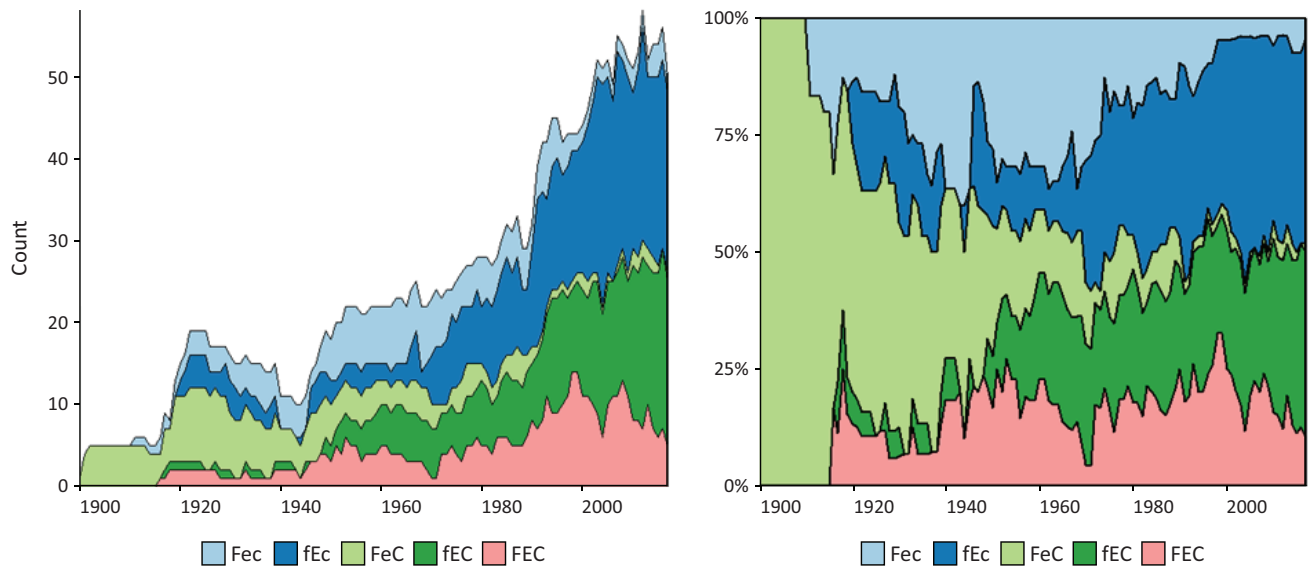
The robustness of the cluster solution is reasonable as well: The Adjusted Rand Index between the divisive algorithm and the FANNY algorithm signals an excellent agreement (Adjusted Rand Index: 0.83). However, the FANNY solution and the cluster solution of the agglomerative hierarchical clustering with average linkage is a moderate 0.65. Nevertheless, visual inspection in the form of boxplots (see Appendix Figure A3) makes it clear that the agglomerative clustering with average linkage recovers the four identical shapes, even though the assignment of the observations to their specific clusters varies. Finally, the bootstrap resampling method indicates strong stability of all four clusters (Jaccard coefficients for each cluster > 0.95). All clusters can be recovered by the cluster algorithms even if we randomly vary some of the data or randomly drop 50% of the observations.

### 5. Discussion: Temporal and Spatial Development of Democracy Profiles

The temporal development of the democracy profiles from 1900 to 2017 is shown in Figure 5. If we divide

this timeline according to the three waves of democracy (Huntington, 1993), we see that every wave of democracy has a distinct combination of democracy profiles: In the first wave of democracy (until 1926), democracy profiles emphasizing the freedom dimension (FeC or Fec) dominated. In the second wave (1945–1962), egalitarian democracies (either with a weak or strong control dimension—fEc, fEC) complement this image. During this wave, all democracy profiles coexisted at almost the same rate. However, this drastically changed with the third wave (since 1974). While libertarian democracy profiles (Fec, FeC) almost disappeared, profiles emerged which focused more on the equality dimension (fEc and fEC). Especially countries which democratized after 1990 have opted for an egalitarian democracy profile. It seems that egalitarian profiles are booming and libertarian democracy profiles have gone out of fashion.

Figure 6 shows the spatial distribution of the democracy profiles for the third wave of democracy. The countries are classified according to their longest lasting democracy profile during this period. On the one hand, the majority of democracy profiles in North America and South America are control-focused democracies. The USA combines the control-dimension with a more pronounced freedom dimension (FeC), whereas the coun-

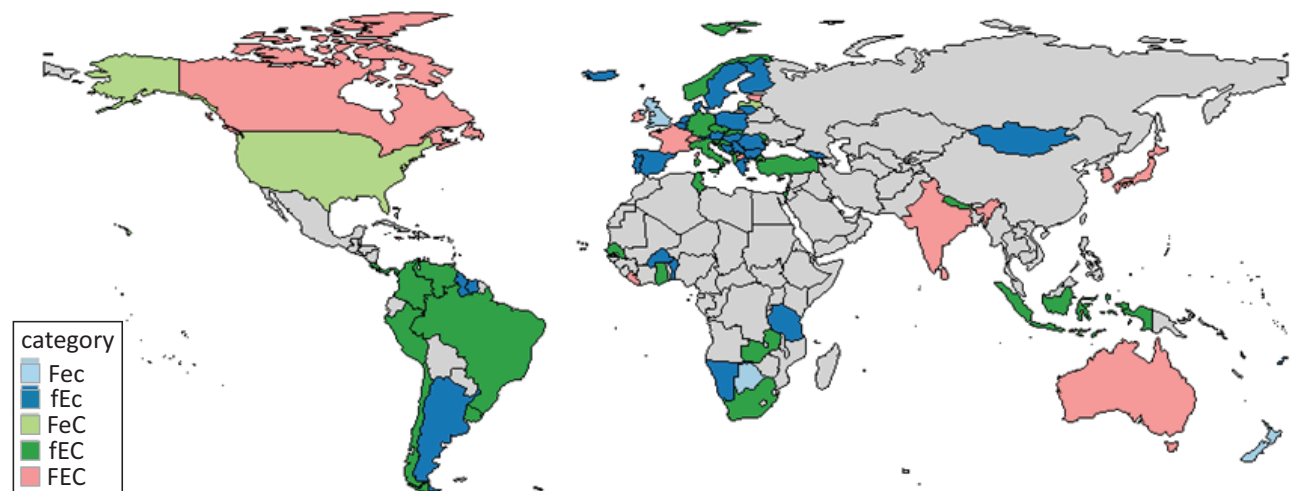


**Figure 5.** Temporal distribution of democracy profiles: count (left); percent (right). Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.

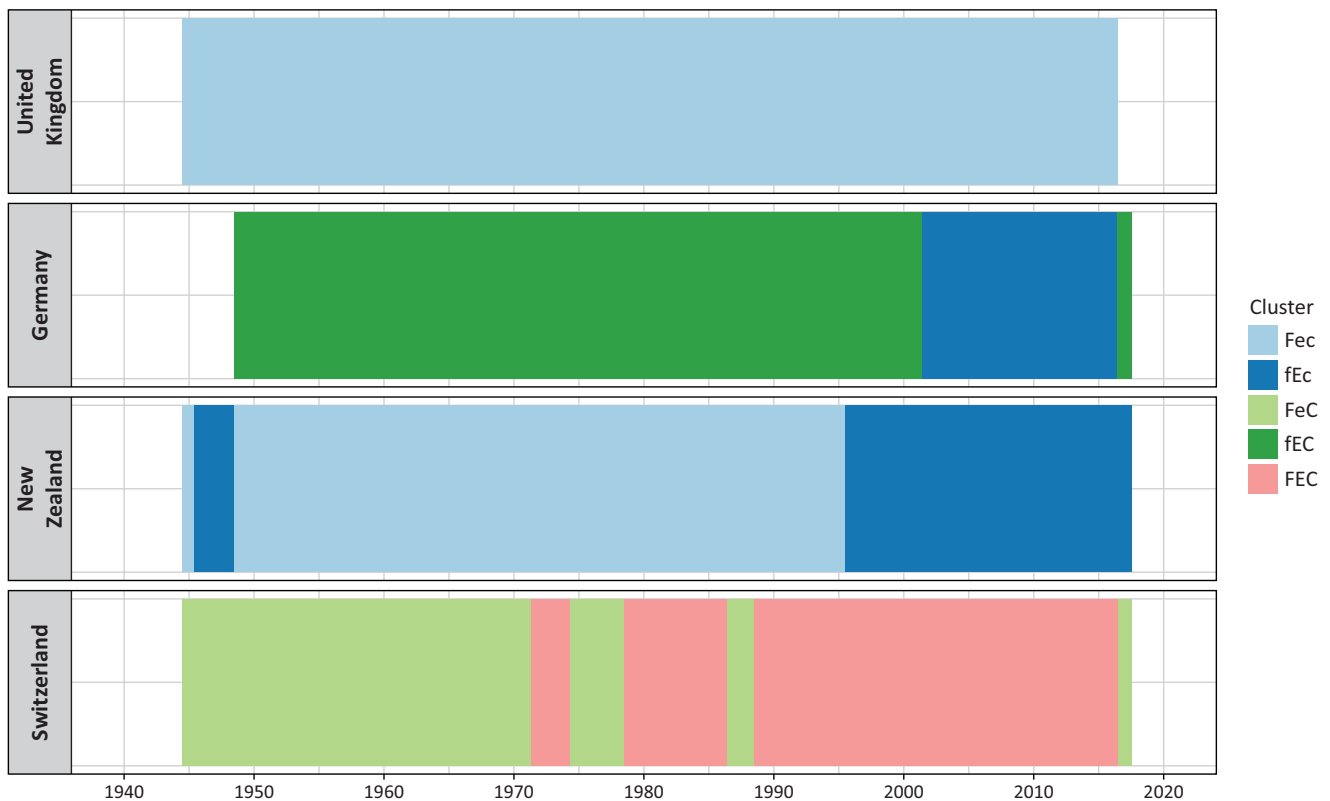
tries in South America show higher control and equality values (fEC). On the other hand, Europe has a mix of egalitarian-majoritarian (fEc) and egalitarian-control-focused democracies (fEC). The United Kingdom is the exception, as it is the only libertarian-majoritarian democracy in Europe (Fec). Similar to the finding by Lijphart, Britain seemed to have transferred its libertarian democracy profile to some of its former colonies. They either have the same profile (Fec: Botswana, New Zealand, Solomon Islands) or a very similar profile (FeC: Trinidad and Tobago, Sri Lanka, Australia). However, there are also exceptions to this rule (FEC: India).

Finally, this new typology allows the development of democracy profiles for individual countries to be tracked. Figure 7 shows this development for four selected countries after 1945. The United Kingdom is an example of a political system with a very stable democracy profile. For instance, the United Kingdom never changed its libertarian-majoritarian profile: The freedom dimensions is favoured by a highly disproportional electoral system, “no limits of the total expenditure of and donations to political parties” (Smilov, 2008, p. 14) at least until 2000, no judicial review and no divided government as well as a weak second chamber. In addition, some of those char-

### Spatial Distribution of Democracy Profiles 1974–2017



**Figure 6.** Spatial distribution of democracy profiles (1945–2017). Notes: World map shows the mode of the democracy profiles for each country in the period between 1945 and 2017. The mode is the value which appears the most in a set of values. Grey indicates that the democracy profile is not available because data is missing or the country is not classified as a democracy. Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.



**Figure 7.** Temporal development of the democracy profile for single countries after 1945. Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.

acteristics have changed partially since 2000. The cluster analysis, however, does not change its classification.

There are also countries with minor changes. Germany remains an egalitarian-control-focused democracy most of the time. It only shifts towards a more egalitarian-majoritarian democracy after the parliamentary elections in 2002. However, the membership probability shows that there is a high chance (48%) that it still belongs to the fEC cluster. Nevertheless, Germany’s democracy profile can be seen as the opposite of the United Kingdom’s democracy profile. PR (also with a 5% threshold which make it majoritarian in some cases like 2013 where two parties fell just below the 5% hurdle), an egalitarian party finance system and egalitarian media access model strengthen the equality dimension, whereas a rather strong second chamber in combination with a strong constitutional court favour the control dimension. These institutional decisions are at the expense of the freedom dimension.

Finally, there are political systems whose democracy profile has changed drastically: New Zealand was first a libertarian-majoritarian democracy and changed to an egalitarian-majoritarian profile in 1996 with the electoral reform from a First-Past-the-Post system to Proportional Representation. Switzerland established a balanced democracy profile in 1972. This was caused by a change in the quality measuring indicators rather than by trade-off indicators. Switzerland introduced woman suf-

frage in 1971 and changed from a deficient democracy to a working democracy.

## 6. Conclusion

Based on the work by Lauth and Schlenkrich (2018a), we have shown how to conceptually link trade-offs between dimensions with democracy profiles: From a democracy theory perspective, a perfect democracy seems impossible, a complete realization of all three key democracy dimensions—freedom, equality, and control—is unattainable. The tensions between dimensions manifest themselves in institutional choices and we have identified two opposing pairs of profiles: libertarian vs. egalitarian democracy, as well as majoritarian vs. control-focused democracy.

In this article, we have drawn important conclusions. A cluster analysis with a strong focus on cluster validation revealed that we can indeed find these deductively derived profiles. Based on the Democracy Matrix dataset—a customized version of the Varieties-of-Democracy dataset—we find empirical evidence for a libertarian-majoritarian democracy cluster (high political freedom values; lower values for political equality, and political and legal control) and an egalitarian-majoritarian democracy cluster (high equality, less freedom and control). In addition, we find mixed control-focused clusters: High control values are associated either with

higher freedom or higher equality levels (the libertarian-control-focused and the egalitarian-control-focused cluster respectively). Finally, there is a smaller balanced cluster whose dimensional values do not vary.

Furthermore, we have shown that each wave of democracy has its own characteristic distribution of democracy profiles. In the first wave, libertarian democracies (either with majoritarian or control-focused features) dominated. The second wave presented a mixed picture, meaning that all profiles of democracy were more or less equally represented. The third wave showed that egalitarian democracy profiles (either with majoritarian or control-focused features) gained the upper hand. Referring to the spatial distribution, there is a concentration of control-focused democracies in North and South America, whereas a stronger mix of democracy profiles exists in Europe. An exception seems to be the United Kingdom with its libertarian-majoritarian democracy profile. We also discussed cases where the democracy profile was mostly stable over the whole period from 1945 to 2017 (United Kingdom, Germany) as well as countries where there was a significant change (New Zealand and Switzerland). Further research is warranted: What are the causes for these specific democracy profiles? What causes them to change? Lastly, what are the consequences of these democracy profiles on the performance of these countries (e.g., in terms of economic development, economic inequality)?

### Acknowledgments

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### Conflict of Interests

The author declares no conflict of interests.

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#### About the Author



**Oliver Schlenkrich** is a PhD Student at the Chair of Comparative Politics and German Government, University of Würzburg. He is currently working on a DFG research project led by Prof. Dr Hans-Joachim Lauth, “Causes of Transformation and Democracy Profiles: Empirical Findings of the Democracy Matrix.” His research interests concern democracy, political culture, political participation, quality of statehood, and quantitative methods.

## Appendix

### 1. List of Countries included in the Cluster Analysis

Albania (13), Argentina (26), Australia (117), Austria (1), Belgium (107), Benin (1), Bosnia and Herzegovina (14), Botswana (52), Brazil (19), Bulgaria (19), Burkina Faso (1), Canada (97), Cape Verde (22), Chile (13), Colombia (2), Costa Rica (65), Croatia (11), Cyprus (23), Czech Republic (47), Denmark (114), Estonia (40), Fiji (6), Finland (77), France (97), Georgia (6), Germany (69), Ghana (3), Greece (43), Guyana (3), Hungary (27), Iceland (83), India (64), Indonesia (6), Ireland (29), Israel (67), Italy (70), Jamaica (25), Japan (62), Latvia (28), Liberia (1), Lithuania (17), Luxembourg (94), Macedonia (5), Mauritius (49), Moldova (6), Mongolia (7), Montenegro (5), Namibia (24), Nepal (4), Netherlands (107), New Zealand (107), Norway (24), Panama (24), Peru (10), Poland (31), Portugal (32), Romania (8), São Tomé and Príncipe (15), Senegal (28), Serbia (8), Seychelles (8), Slovakia (16), Slovenia (3), Solomon Islands (1), South Africa (19), South Korea (3), Spain (40), Sri Lanka (30), Suriname (3), Sweden (101), Switzerland (99), Tanzania (10), Timor-Leste (8), Trinidad and Tobago (52), Tunisia (4), Turkey (6), United Kingdom (98), United States of America (94), Uruguay (65), Vanuatu (34), Venezuela (36), Zambia (1).

The number in brackets is the number of years each country occurs in the sample. This shows that there are missing cases, especially for Austria and Norway. This list shows all countries that are classified as a democracy according to the context measurement of the Democracy Matrix (see Lauth & Schlenkrich, 2018a). The Democracy Matrix classifies an observation as a democracy if all institutional and dimensional values are above the threshold of 0.5.

### 2. List of Countries per Cluster

The number in the parenthesis is the number of years the country occurs in the cluster.

*Fec*: Australia (8), Belgium (18), Botswana (52), Canada (22), Czech Republic (13), Denmark (2), Guyana (1), Iceland (49), India (23), Ireland (6), Jamaica (2), Japan (13), Latvia (4), Luxembourg (1), Namibia (4), Netherlands (4), New Zealand (82), São Tomé and Príncipe (3), Solomon Islands (1), Sri Lanka (10), Sweden (28), Trinidad and Tobago (7), United Kingdom (87).

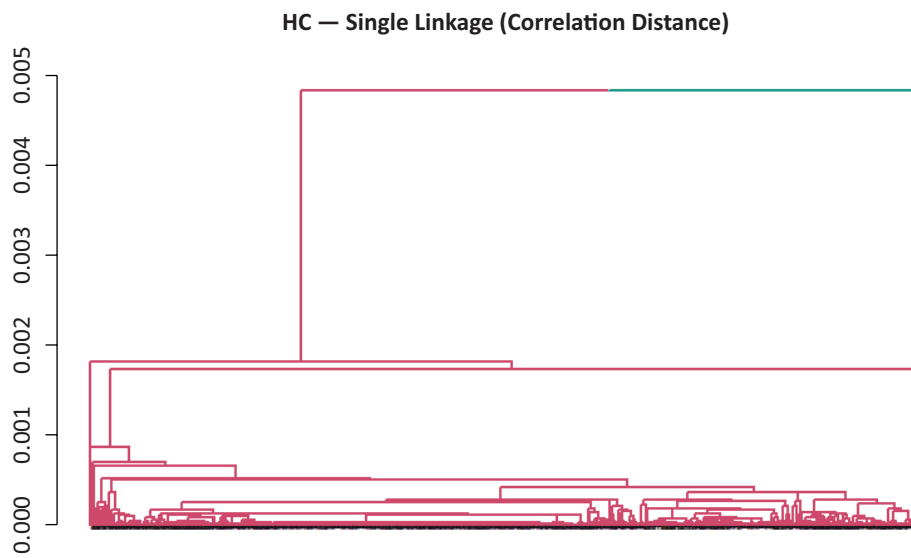
*fEc*: Albania (1), Argentina (14), Australia (12), Austria (1), Belgium (51), Benin (1), Bosnia and Herzegovina (14), Bulgaria (13), Burkina Faso (1), Canada (18), Cape Verde (20), Costa Rica (8), Croatia (3), Cyprus (15), Czech Republic (18), Denmark (33), Estonia (17), Fiji (6), Finland (37), France (23), Georgia (5), Germany (15), Greece (35), Guyana (2), Hungary (14), Iceland (29), Ireland (3), Japan (12), Lithuania (10), Luxembourg (92), Mongolia (5), Montenegro (1), Namibia (20), Netherlands (85), New Zealand (25), Norway (6), Panama (5), Poland (19), Portugal (25), Romania (6), São Tomé and Príncipe (3), Senegal (6), Serbia (8), Slovakia (6), South Africa (2), Spain (38), Suriname (3), Sweden (51), Tanzania (9), Timor-Leste (8), Vanuatu (3).

*FeC*: Argentina (11), Australia (73), Belgium (38), Canada (30), Chile (4), Denmark (15), France (38), Iceland (2), India (3), Jamaica (7), Latvia (10), Netherlands (17), Sri Lanka (12), Sweden (20), Switzerland (60), Trinidad and Tobago (33), United Kingdom (11), United States of America (69), Uruguay (3).

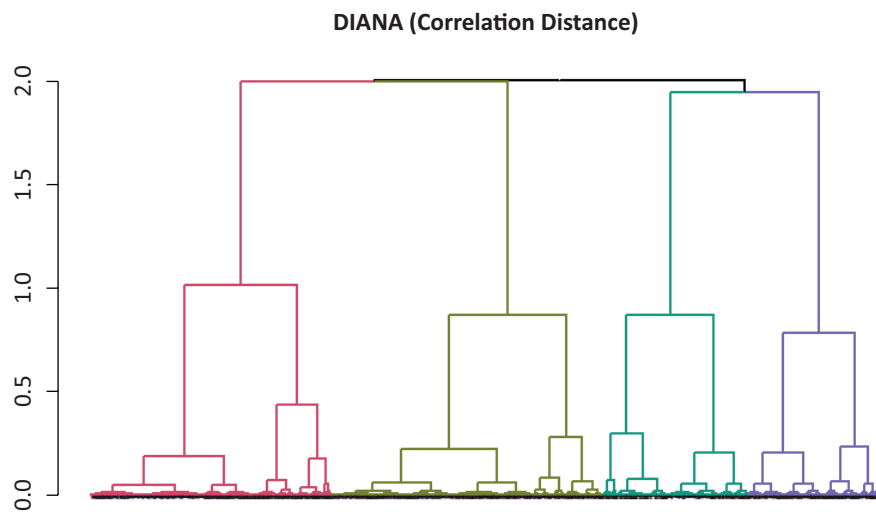
*fEC*: Albania (11), Argentina (1), Australia (5), Brazil (19), Bulgaria (6), Canada (1), Chile (7), Colombia (2), Costa Rica (43), Croatia (6), Cyprus (3), Czech Republic (16), Denmark (16), Estonia (8), Finland (17), France (7), Georgia (1), Germany (54), Ghana (3), Greece (2), India (15), Indonesia (6), Israel (67), Italy (55), Jamaica (1), Japan (1), Latvia (6), Lithuania (4), Luxembourg (1), Mauritius (21), Moldova (6), Mongolia (2), Montenegro (4), Nepal (4), Netherlands (1), Norway (18), Panama (15), Peru (7), Portugal (7), Senegal (22), Slovakia (10), Slovenia (3), South Africa (17), South Korea (1), Spain (2), Sri Lanka (1), Tanzania (1), Tunisia (4), Turkey (4), United States of America (17), Uruguay (46), Vanuatu (18), Venezuela (36), Zambia (1).

*FEC*: Albania (1), Australia (19), Canada (26), Cape Verde (2), Chile (2), Costa Rica (14), Croatia (2), Cyprus (5), Denmark (48), Estonia (15), Finland (23), France (29), Greece (6), Hungary (13), Iceland (3), India (23), Ireland (20), Italy (15), Jamaica (15), Japan (36), Latvia (3), Liberia (1), Lithuania (3), Macedonia (5), Mauritius (28), Panama (4), Peru (3), Poland (12), Romania (2), São Tomé and Príncipe (8), Seychelles (8), South Korea (2), Sri Lanka (7), Sweden (2), Switzerland (39), Trinidad and Tobago (12), Turkey (2), United States of America (6), Uruguay (16), Vanuatu (13).

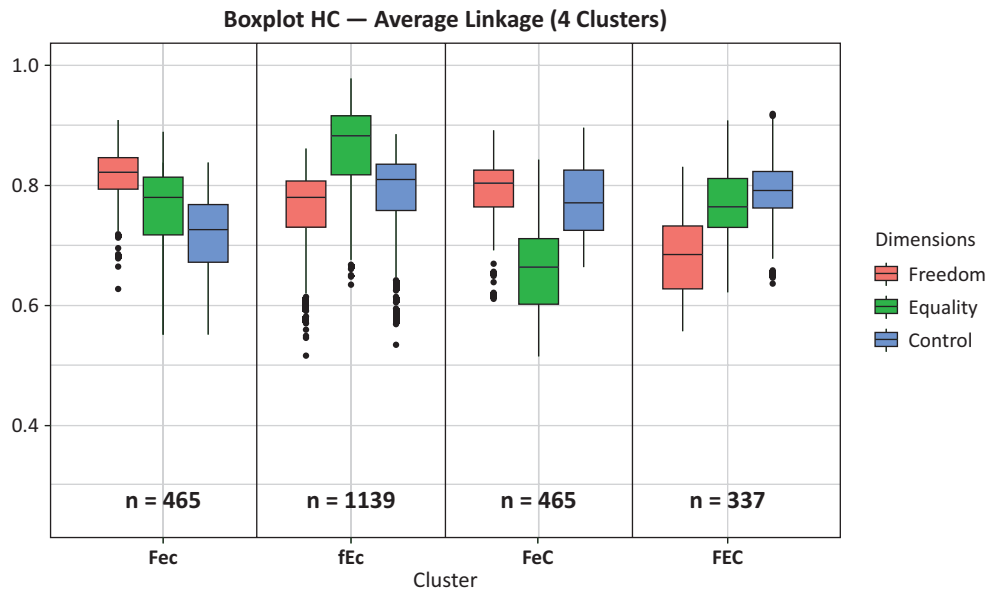
3. Figures



**Figure A1.** Hierarchical clustering with single linkage. Note: N = 2413 country-years. Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.



**Figure A2.** Dendrogram of the divisive clustering. Note: N = 2406 country-years. Source: Author’s calculations with the dataset of the Democracy Matrix V1.1.



**Figure A3.** Boxplot of the agglomerative hierarchical clustering with average linkage. Notes: N = 2406 country-years. This box plot shows the democratic quality for all dimensions split by democracy profile. The balanced configuration is not included because these observations are not subjected to the cluster analysis. Higher values indicate higher democratic quality. Author’s calculations with the dataset of the Democracy Matrix V1.1.

**Reference**

Lauth, H.-J., & Schlenkrich, O. (2018a). Making trade-offs visible: Theoretical and methodological considerations about the relationship between dimensions and institutions of democracy and empirical findings. *Politics and Governance*, 6(1), 78. <https://doi.org/10.17645/pag.v6i1.1200>