The Temporal Determinants of Democracy: Beyond Duration

Matthew Wilson
The Pennsylvania State University
matthew.wilson@psu.edu

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ABSTRACT

The question of what explains democracy is intricately connected to the question of when democracy occurs, which this paper seeks to address. Using a sample of independent regimes for the post World War II period from 1946 to 2008, I examine the emergence and consolidation of democracy lasting five consecutive years or more. I argue that along with other conventional explanations for democratization, the institutional history of a country helps to explain the emergence and consolidation of democracy. What is more, the pattern of prior regime change complements and augments models regarding the timing and duration of democracy better than a prior regime type. The preliminary analyses suggest outcome dependence by demonstrating the significance of long-term institutional patterns. Insofar as similar histories of regime change add to models of democratization, the process may be better explained by going beyond duration and focusing on other forms of time-dependence. This analysis supports democratization research by focusing on the proper way to model the impact of time on democratization. It also demonstrates the usefulness of sequence analysis for answering important questions concerning the order and sequence of political events.

INTRODUCTION

An important area of research in political science concerns the causes and consequences of democratization. The value of understanding the emergence of democracies is underscored by the observation that they are much less likely to experience international conflict. They also create better domestic situations, in terms of citizen wellbeing, by guaranteeing basic freedoms. All told, it is not clear how democratization occurs, though there are many explanations for why democracy emerges and persists. *How* factors influence the emergence and survival of democracy is largely unknown because of a lack of understanding of the role of temporal processes in democratization. Though many scholars assert that critical factors of democratization occur in a specific order, such processes are difficult to test quantitatively. Arguments about path-dependence and sequences lend themselves more easily to case studies rather than large-N comparative analyses. Methodological limitations prevent one from fully understanding the significance of historical events on the emergence and consolidation of democracy.

This paper sheds light on the effect of political sequencing--namely, prior regime histories--on the timing and success of democratization. Do the sequences of prior regimes matter for when democracy emerges and 'sticks'? The general question that I seek to address is whether democratization--like a recipe--entails a specific set of ingredients as well as a specific order to succeed. What are the effects of prior regime histories on the timing and success of democratization? Do countries with similar historical regime sequences have similar rates of democratization and consolidation?

Using a sample of independent regimes for the post World War II period from 1946 to 2008, I examine the emergence and consolidation of democracy lasting five consecutive years.

Due to the time-dependent nature of democratic transitions I use a duration approach. I compare the effects of prior regime type, gross domestic product (GDP) per capita, prior conflict, and geography. I also utilize sequence analysis to estimate the effects of *longue duree* transitions. This involves treating the history of regime types as a unique sequence for each country and comparing regime histories using a distance calculation algorithm. I include clusters based on sequence similarity, thereby including long-term institutional patterns. I use the same covariates to predict the duration of democracy once it has reached five years. The initial results suggest that accounting for long-term patterns of institutional change help to explain when democracy occurs and how long it lasts. As I demonstrate, models with sequence information outperform those without, thus accounting for a significant amount of unobserved heterogeneity over time. One must go beyond duration to explain the time-dependent nature of democracy.

This study makes several major contributions to the study of democracy and to political science more generally. First, the paper focuses on research design as part of best practice political research, and in so doing provides clear answers on the determinants of democracy. The findings highlight current debates and issues in the literature on democratization regarding the validity of modernization theory and the fragility of presidential democracy. More importantly, however, the study calls attention to temporal processes, of which duration is but one. Using an innovative technique called Sequence Analysis I attempt to separate out unordered processes that make democracy more likely from ordered processes. To this end I provide a methodological foundation from which political scientists in various sub-disciplines can benefit. Sequence Analysis may provide support for theories that were previously refuted by empirical models not designed to detect long-term outcome-dependence. It bridges qualitative and quantitative research by enabling scholars to operationalize qualitative arguments in large-N

empirical models. Sequence analysis can also support the generation of cases as part of comparative analysis.

Understanding how various factors influence the timing and pattern of democratization will shed new light on when it is likely to be successful, which is of critical concern for policy-making. "Pursuing a sequential path promises to rationalize and defang democratic change by putting the potentially volatile, unpredictable actions of newly empowered masses and emergent elected leaders into a sturdy cage built of laws and institutions" (Carothers 2007: 13). This study supports research on democratization by providing new insights into the proper way to model the impact of time on democratization. Central to this inquiry is the role of time, order, and feedback mechanisms, and how to model their impact on democratization. There is definite support for the duration approach to studying democratic transitions and the emergence of stable democracy. Nevertheless, this is a call for a renewed focus on outcome dependence in democratization. In the following section, I briefly review arguments on the determinants of democracy and democratic consolidation. I lay out a research design by which to test compare institutional variables to longer sequences of them. In so doing, I consider ways to improve upon extant models and demonstrate how to make time-dependent models of democratization more accurate. I outline sequence analysis, discuss the preliminary results, and conclude with implications for future research regarding time-dependent politics.

THEORY

There are a plethora of theories regarding the conditions that make for a successful transition to democracy. Though different notions of democracy exist, democracy is herein defined as a system of representative government in which the right to contest and participate in elections is open to virtually all members of society (Dahl 1971). Transitions to democracy—

democratization—involve the restructuring of rules, values, and leadership necessary to install democracy where it otherwise does not exist (i.e., under an autocracy). Suggested mechanisms by which democratization takes place include changes in political culture (e.g., Almond and Verba 1963; Inglehart 1990); modernization (e.g., Lipset 1959); elite unity (e.g., Higley and Burton 1989; Lijphart 1968; Brownlee 2007); socioeconomic structure (e.g., Moore 1966; O'Donnell 1973); civil society (e.g., Diamond 2002; Fox 1994; Putnam 1993); institutions (e.g., Shugart and Carey 1992; Linz and Valenzuela 1994); path dependency (e.g., Collier and Collier 1991; Schmitter and Karl 1991) and strategic choices (Acemoglu and Robinson 2005).

Theories of democratization can be broadly organized into three related avenues centered on political institutions, the economy, and bargaining. In this paper I focus primarily on institutional explanations. To be sure, different explanations for the timing of democratization are not exclusive. Wealth accumulation can be assisted by the creation of financial institutions that are extensions of political institutions (Lijphart 1999). Economic development can also change the power positions of actors in society, thereby altering their relative bargaining positions or the issues over which bargaining occurs (Moore 1966). Moreover, the disputes that arise in the bargaining process can result in the dismantling and overhaul of existing political institutions (Casper 2002). Scholars nevertheless disagree on the proximate causes of democracy--the crucial puzzle piece by which the image of democracy first comes into view and is subsequently realized.

Institutional theories of democratization explain democracy as the conception of a particular set of institutions. These are organizations that create law, mediate conflict, and provide representation. Examples include political parties, trade unions, and courts. Institutions also apply to the rules and principles under which organizations operate, including concepts such

as the right to vote, acceptable forms of expression, and government accountability. Dahl's (1971) *minimal* definition of democracy, for example, is based on contestation and participation. According to Dahl several pathways occur by way of these institutions which mark the transition of a fully closed authoritarian regime to democracy.

Democratization theorists imply that the order and simultaneity of political liberalization policies matters for successful democratization: "Movement towards more advanced forms of political democracy…is more likely to occur through a sequence of piecemeal reforms …These are not dramatic changes in themselves, but their cumulative effect can be a substantial democratization of political life" (O'Donnell et al. 1986: 43). Dahl (1971) also suggested that democratic transitions can be explained by the order in which institutions are applied. "One can conceive of historical processes as having two aspects relevant to our central question: the specific path or sequence of transformations of a regime and the way in which a new regime is inaugurated" (Dahl 1971: 33). Of course, the concern for how particular strings of institutions affect the timing of democracy extends beyond classic political science literature. This issue is perhaps best represented by the longstanding debate over whether democratic 'sequencing' matters, which has heretofore not been empirically examined (Carothers 2007; Mansfield and Snyder 2007).

Dahl (1971) asserted that political liberalization followed by inclusion was best for the establishment of successful democracy. Countries which experienced an opening of the political arena followed by a broadening of the voter base may have a different likelihood of maintaining peace than one which experiences an increase in civic participation with little room to exercise choice. A similar argument is made by Huntington (1968, 1993) the primary thesis of which is that instability is the product of the rapid mobilization of new groups coupled with the slow

development of political institutions. All the same, Dahl (1971) claims that this path is no longer a viable option for many authoritarian regimes which constitute hegemonic but broadly inclusive regimes. Conversely, the pathways left open to hegemonic authoritarian regimes are less favorable for democracy. To the extent that certain institutions can engender democracy, they can therefore halt the transition process--either by undermining democracy or by serving a different intent. Contextual factors and residual institutions from prior regimes can carry over during the democratization process and forestall a successful outcome. This expectation is validated--along with other examples--by the transitions to and from military rule in Latin America. Coups that oust poorly performing civilian governments often beget more of the same (Nordlinger 1977). It has also been argued that neopatrimonialism gives transitions in sub-Saharan Africa a unique character (Bratton and Van de Walle 1994, 1997).

The emergence of seemingly democratic institutions is not by itself indicative of a transition to democracy, as is evidenced by the proliferation of "hybrid regimes" or "electoral autocracies" (Levitsky and Way 2002). Legislatures and parties, for example, can be used to co-opt potential opponents and secure regime success, thereby lowering the probability of regime change and the potential for democracy (Gandhi 2008; Magaloni 2007; Haber 2006). Some institutions can therefore be linked to the consolidation of authoritarianism as well as democratization and democratic consolidation. Differences in the order of liberalization and reform can quell, incite, or neutralize calls for reform, changing the probability that a country democratizes.

The timing of democracy has been linked to the authoritarian context in which it emerges, a dominant view of which distinguishes between them on the basis of elite incentives (Geddes 2003; Wright and Escribá-Folch 2012). Elites are expected to structure institutions to

preserve their interests, whether they are to rule for an extended period of time or to initiate a peaceful transition. Military leaders, for example, prefer to maintain unity within the ranks rather than retain power and risk defection (Geddes 2003; Nordlinger 1977). Such leaders, who often gain power through violent means, are also likely to face a problem of succession, for which elections are a viable solution (Cox 1999). All the same, the retreat of the military is not a credible indicator of their complete resignation from politics, which in part explains the instability of democracy in Latin America (Nordlinger 1977). Conversely, dominant-party authoritarian regimes are capable of using seemingly democratic institutions to forestall the installation of real democracy (Levitsky and Way 2006; Magaloni 2007; Gandhi 2005). Once ended, however, the residual institutions--the legislature, parties, elections--create conditions for democracy that are less disruptive than other settings for its emergence.

A sequential explanation for democracy based on institutions is that the combination of military intervention and electoral opportunities creates unique legacies that make democracy more likely to survive. To the extent that institutional patterns predict democratization, countries with an extensive history of military intervention should be more likely to democratize but less likely to consolidate. Countries with a history of party-based authoritarianism should be more likely to survive, but also more likely to create durable democracies when they fall. These are but general hypotheses regarding whether the sequence of institutions that pre-dates democracy significantly predicts the likelihood (and timing) of successful democracy emerging:

H1a: *countries that have more exposure to autocratic elections and liberalization under authoritarianism are less likely to democratize.*
H1b: *countries that have more exposure to autocratic elections and liberalization under authoritarianism are more likely to consolidate if they democratize.*
H2a: *countries that have more exposure to military intervention are more likely to democratize.*
H2b: *countries that have more exposure to military intervention are less likely to consolidate if they democratize.*

Controlling for other factors, I expect to find that while some factors are accumulative, unique sequences of political development affect the timing and success of democracy. In particular, I anticipate that some regime histories contribute to successful democracy and that they may also be distinguished on the basis of the timing of democratization--or how long it takes to successfully democratize and how long they last after doing so.

RESEARCH DESIGN

Dependent Variable

The concept of interest is democratization to a successful democracy. This concerns both the time to democratization for a lasting democracy and the extent to which it consolidated (i.e., the number of consecutive years that a country remained democratic after surpassing five years). Herein, 'successful' democracies are considered to be those lasting at least five years. The five-year threshold is intended to separate semi-permanent democracies from new or unstable democracies. Notwithstanding, the length of time that a democracy must exist in order to be considered a successfully consolidated democracy can vary.

There are various ways to operationalize the concept of democracy. There are continuous measures of democracy available from sources such as Polity (Marshall and Jaggers 2008) and Freedom House (Gasiorowski et al. 1996). These data have nevertheless received substantial criticisms that render them inadequate for studying transitions (Vreeland 2008; Gleditsch and Ward 1997; Casper and Tufis 2003). I based my indicator of democracy on a discrete classification of regime type[1]. In building on the Democracy-Dictatorship (DD) data, Cheibub et al. (2010) adopted Przeworski's (1991) definition of democracy. They characterized democracies as contested elections which occur at regular intervals, the outcome of which is not

[1] It should be noted that discrete classifications of regime type are not without error, however. Hadenius and Teorell (2007), for example, denote democracies based on an average of the Polity and Freedom House scores! See Wilson (2011) for a more detailed discussion of the limitations of discrete datasets on regime type.

known prior and the winner of which actually assumes office. The authors relied on four rules: 1) the executive must be chosen by a popular election; 2) the legislature must also be popularly elected; 3) more than one party must compete in the election; and 4) alternation in power under electoral rules must occur (2010: 69). To meet the *repeatability* rule, the emergent leader must be replaced by the same rules through which he/she came to office. When a case violated the fourth rule (*repeatability*), they coded as nondemocratic all the years from the moment the leader took power. They assumed that current actions are revealing of what incumbents "would have done at different points in time" (Cheibub et al. 2010: 70). The data include all independent regimes for the post World War II period, 1946-2008.

I count democratization as the first year that a country is registered by Cheibub et al. (2010) as a democracy, following a period of non-democracy and lasting at least five years. I do not count countries that were consistently democratic from 1946 or the start of independence. What is more, I do not count as reaching the status of 'successful' democracy those states which were coded by Cheibub et al. as democratic but which did not last at least five years before the end of the temporal window. Though rather conservative, the sample of qualifying cases contains only those countries which experienced a democratizing event leading to a democracy which was observed lasting at least five years.

Figure 1 shows a sequence index plot of each country's democracy status by year. Each line in the plot represents the institutional history of one country. As the figure shows, most of the consolidated democracies that did not already enter the sample a democracy are a product of the mid-1980s and 1990s. Democracies that emerged before then were likely to last a shorter period of time than their post-1990 counterparts. Alternative visualizations of the transition rate are provided in Figure 2 and 3, which are plots of the number and percents of regime type by

year, respectively. The number of countries which enter the sample as democracies lasting at least five years increased prominently in the mid-1980s and throughout the 1990s and 2000s. The percentage of democracies that were consolidated by at least five years only faintly resemble "waves," an observation over which scholars have debated (Huntington 1993; Doorenslpeet 2000, Gates et al. 2007). It is readily apparent that autocratization in the international system occurred in one major wave which peaked just after 1980 and declined thereafter. In total, 70 of the 201 countries and territories in my sample transitioned to democracy lasting five years or more between 1946 and 2008.

[Figures 1-3 about here]

As can be counted in figure 1, there are 19 incidents of democratization in which the country regressed and democratized again later in the future. I could have treated re-democratization as different or assumed that democratization was an absorbing state. Herein, I chose to treat each episode of democratization as independent of the others. There are thus 55 incidents of democratization in my sample that yield democracy lasting five years or more. The hazards associated with transitioning to democracy are shown in figure 4. For countries that did not enter the sample already censored, the hazards increase over the first forty years, peaking at about 40 years. Alternative representations of the hazard are shown in the plot of the survival curve (figure 5). The Kaplan-Meier survival estimate looks fairly stable over time (a fairly linear mortality rate, controlling for exit), while the cumulative-hazard is exponential. Table A1 in the Appendix shows the life table for the emergence of a democracy lasting five or more years, post-WWII.

[Figures 4-5 about here]

Because of the time-dependent nature of democratic transitions, an ordinary least-squares model is incorrect for modeling the path-dependent nature of democratic emergence. The duration approach--also commonly referred to as hazard or survival models--is more appropriate for estimating the time to democratization. I omit left-censored cases--cases that entered the sample as democracies on or before 1946, and cases which were democracies when the country emerged--since it is not possible to determine when they reached the status of a consolidated democracy. To determine the appropriate functional form of the hazard I compared the Cox proportional hazards model to parametric models. The relative goodness of fit statistics for models based on the Cox, exponential, and Weibull specifications suggest that the Weibull model is the best parameterization by which to estimate the emergence of lasting democracy.

I also examine whether regime sequences explain how long democracies last once they surpass the five-year threshold. Figure 6 shows how the years of consolidation are distributed for non-left-censored democracies lasting at least five years. In the post-WWII world, half of the newly-democratized countries last fewer than 16 years (12 additional years). The longest lasting 'new' democracy in my sample is Costa Rica, which lasted 60 years after re-democratizing in 1949. To model democratic consolidation I use absorbing regression. This model is made to handle a large number of dummy-variables, or a large categorical factor. I control for (absorb) country-specific effects, which is akin to performing a time-series model with fixed effects. Using absorbing regression accounts for country-specific effects at the expense of functional form, for which a negative binomial regression might be more appropriate. Nevertheless, the results are similar for a negative binomial model.

[Figure 6 about here]

Independent Variable

The independent variable is the history of prior regime-change--the institutional legacy--that precedes democratization. To capture this, I use a discrete dataset on authoritarian regimes provided by Cheibub et al. (2010). Their dataset is designed to capture the systematic correspondence of rules and institutions. Of the regimes that do not satisfy their four criteria for a democracy, Cheibub et al. (2010) distinguished monarchial, military, or civilian regimes[2]. Monarchies are regimes based on family and kin decision-making, in which the executive bears an imperial title and legitimizes a hereditary successor or a predecessor. Military regimes are characterized by the leadership of a current or previous member of the armed forces, although they do not include regimes borne out of guerilla movements. Civilian regimes represent a "residual" dictatorship category in which the leader wields neither hereditary nor military power. Alternative datasets include Wright (2008) or Hadenius and Teorell (2007); for a more comprehensive evaluation of these datasets, see Wilson (2011).

Figure 7 shows how the density of states (regime type) changes by year over the period 1946-2008 for the 124 countries and territories that remain in my sample, omitting left-censored democracies. Among countries that were not already stable democracies, parliamentarism—the most common type of democracy in the left-censored cases--experienced a slight dip between 1965 and 1990. Presidentialism exhibited a similar pattern over the same period, but was much more dramatic. Mixed forms of democracy were almost non-existent until the 1990s, after which it became more abundant. As it regards consistently democratic countries, mixed democracy declined regularly until 1980. Among autocracies, civilian dictatorships are highly consistent, experiencing decreases in the late 1980s and less-pronounced decreases in the late 2000s.

[2] The theoretical focus of such a classification is how dictators are likely to be removed, measured "with the use of strictly observable criteria for identification" (2010: 89).

Military dictatorships occurred in two distinct waves, one in the 1950s and one between 1960 and 1990. Monarchies remained relatively stable over time, but with a slight decrease. Overall, civilian dictatorship was the most common regime type in the sample of democratizers and potential democracies. Additional descriptives regarding institutional change can be found in the Appendix (Figure A1).

[Figures 7 about here]

To account for patterns of institutional change, I treat the string of regime-types that a country has experienced as a unique sequence of events and include in the model groups of similar sequences. To accomplish this I use an approach to comparing sequences known as Sequence Analysis, which involves calculating a measure of similarity, or distance, between pairs of sequences. Though new to political science, myriad applications of Sequence Analysis can be found elsewhere. The analytic approach has its origins in the bio-computing sciences but has gained newfound attention in the social sciences by scholars applying the technique to categorical data. In sociology, Sequence Analysis has been used to identify patterns of employment and life changes among cohort members (Assave et al. 2007; Blanchard 2005; Scherer 2001)[3]. Within the field, scholars have applied sequence analysis to forecasting (Schrodt 2000, D'Orazio and Yonamine 2012). Though our agendas are complementary, my use of sequence analysis is in support of theory testing regarding patterns and empirical treatments of path-dependence (Page 2006). There are several programs and packages created for Sequence Analysis; I used the TraMineR package in R 2.13.0 (Gabadinho et al. 2011)[4].

[3] For a review of various applications of Sequence Analysis in the social sciences, see Abbott (1995). Liu et al. (1999) provide some basic insights into the methods, while at the same time demonstrating the application of Sequence Analysis in the hard sciences, from where the technique originated.
[4] For information on how to use TraMineR, see <http://mephisto.unige.ch/traminer/>.

The core of Sequence Analysis lies in the algorithm used for distance comparison. There are several common metrics by which to compute sequence similarity. Some examples include Longest Common Prefix (LCP), Longest Common Subsequence (LCS), and Optimal Matching (OM) (Gabadinho et al. 2011). The LCP metric looks for the longest substring of states that two sequences have in common. The LCS is similar to LCP; it searches for common *subsequences*, which are not necessarily constituted of adjacent symbols[5]. Optimal matching generates edit distances that are the minimal cost, in terms of insertions, deletions and substitutions, for transforming one sequence into another. This edit distance has first been proposed by Levenshtein (1966) and has been popularized in the social sciences by Abbott (Abbott and Forrest, 1986; Abbott, 2001)[6]. The insertion/deletion ('in-del') cost is a single value; the substitution cost can be a single value (a constant) or a set of weighted values. Initially, I chose an in-del cost of 1 and a constant substitution cost of 2. These are the default OM values used by TraMineR; they are also values for which the OM distance is the same as LCS distance (Gabadinho et al. 2010). The shared attribute between two sequences is defined as

$$A_l (x , y) = \max\{| u | : u \epsilon S (x , y)\},$$

where |u| is the length of the longest common subsequence for the pair of sequences and S(x,y) is the non-empty set of subsequences of x and y. The distance between them is

$$d_l (x , y) = | x | + | y | - 2A_l (x , y)$$

The optimal matching algorithm compares two sequences state-by-state and determines the set of operations that would align them at the lowest cost, producing an *n* x *n* matrix of dissimilarity, or distance between them. The matrix is symmetric around a diagonal of zeros, representing the comparison of each sequence with every other sequence, as well as itself.

[5] As an example, take two sequences: *ABCBB* and *ABBB*. Their LCP is *AB*, and their LCS is *ABBB*.
[6] The algorithm implemented in TraMineR is that of Needleman and Wunsch (1970)

Among other uses for the distances calculated by the OM algorithm, clustering can be used to aggregate the sequences into a reduced number of groups. Cluster analysis is aimed at organizing the data into subsets or "clusters", such that those within each cluster are more closely related to one another than objects assigned to different clusters. Central to these aims is the notion of dissimilarity between the objects being clustered. Given a set of N items to be clustered, and an *n* x *n* distance matrix, the basic process of hierarchical clustering is as follows: start by assigning each item to its own cluster, such that if you have N items, you have N clusters. Let the distances between clusters be a function of the distances between the items they contain. Find the closest pair of clusters and merge them into a single cluster, reducing the number of clusters by one. Recompute the distances between the remaining clusters and repeat.

The function that determines cluster distance could be, for example, the average of the dissimilarities between the points in one cluster and the points in the other cluster. Alternative ways of agglomerating clusters is to use the smallest dissimilarity or the largest dissimilarity between the points in two clusters (nearest neighbor versus farthest neighbor). Ward's (1963) method minimizes the distance between two clusters based on how much the sum of squares would increase by merging them[7]. Depending on the agglomerative method used, the resulting output of hierarchical clustering is groups of similar sequences. As nominal level data, these groups can be further analyzed through sub-sequence analysis or used in conjunction with standard regression techniques.

Beginning in 1947, for which the regime-change sequences are only two states long, I calculated the distance matrix based on OM computation and clustered the sequences into groups. With each additional year I recalculated the distances between sequences and reassigned

[7] Error sum of squares is computed as $SS_e = x^2_i - 1/n(Sx_i)^2$.
Though regarded as efficient, the Ward method can also generate clusters of small size.

them to one of the clusters. Though the number of clusters does not change, the assignment of each country to one of the clusters is time-varying. By including the time-variant clusters in a model of democratization I can estimate the ex-ante effect of institutional sequence on the emergence and success of democracy. This approach treats the clusters as latent classes. Due to uncertainty over the appropriate number of clusters and the appropriate clustering method, I compare model fit for models containing two to ten clusters for each clustering method, and show the results of the best-fitting model.

Control Variables

To capture modernization through income, I include the expanded data provided by Gledistch (2002) on GDP per Capita in US dollars at current year international prices[8]. I also controlled for prior regime type by including the Cheibub et al. (2010) measure, lagged by one year. Including lagged regime-type allows me to compare whether democratization is a simple autoregressive process (AR1), or if it is dependent on longer institutional patterns. In other words, my use of prior regime type as a control allows me to ascertain whether the independent variable--the longer sequence of institutions—is necessary. Following Acemoglu and Robinson (2005) and Boix (2003) I denote the occurrence of armed conflict incurring at least 25 battle-related fatalities. In the absence of protest data, this is meant to capture the temporary ability of citizens to secure reforms through the threat of force. I distinguish lower levels of armed conflict from intermediate and high levels of violence. Another way to describe the pressure that elites have for reform is to control for the size of the population. To quote Dahl and Tufte, "[S]ize enters into the very question of how and indeed whether democratic systems with a high degree of autonomy or sovereignty can survive in a world of great interdependence" (1973:2).

[8] In order to fill in gaps in the Penn World Table (Heston et al. 2009), Gleditsch imputed missing data using alternative data from the CIA World Fact Book and through extrapolation.

Population growth is often accompanied with demands for bringing government closer to the people, constituting a pressure from below--grassroots democracy (Dahl and Tufte 1973). In some ways, the heterogeneity of the population--and prospects for stability--is also a function of its size (Mainwaring and Shugart 1997).

I also control for education level by including the average number of years of education of men aged 25 and over, available from the Institute for Health Metrics and Evaluation (Gakidou et al. 2010). Education is expected to increase mobilization capacity and commitment to democracy (Lipset 1959). A log-rank test for equality in the survivor functions shows that the hazards of successful democratization also differ by region of the world, for which I include a control for geography. All of the control variables are lagged by one year. Table A2 in the Appendix provides descriptive statistics for the control variables.

RESULTS

Figure 8 shows how the inclusion of clusters impacts model fit for the model predicting the hazards of democratizing—denoted by the Alkaline Information Criterion (AIC). The gray dotted line is the AIC for the model without clusters, to which I compare models with between two and ten clusters. The figure shows the impact of clusters formed using four different methods. It also shows the impact of including the clusters in a model with lagged regime type, as opposed to model with the clusters only (dashed)[9]. A lower AIC indicates better model fit. A model of democratization containing between three and six clusters created using the complete (farthest neighbor) method outperforms one with lagged regime type, regardless of its inclusion in the model.

[Figure 8 about here]

[9] Figure A2 in the Appendix shows a similar plot based on Bayesian Information Criterion (BIC).

Notwithstanding, it is critical to know how the clusters are composed. Figure 9 shows the sequence index plot of regime histories, by each of the three clusters created by complete (farthest neighbor) clustering. To see regime sequences for the six clusters, refer to Figure A4 in the Appendix. Cluster 1 contains cases in which countries had a protracted history of presidential democracy, most likely broken up by military intervention. This pattern summarizes 19 of the countries in my sample[10]. The case that best represents the modal sequence in cluster 1 is the Dominican Republic. There are 44 countries that get sorted into cluster 2, which is best represented by Cuba, and 75 in cluster 3, which is best represented by El Salvador. Figure 10 shows the regime sequences associated with the closest representation of the modal sequence for each cluster. Because I recalculated distances between sequences for each additional year of information, some of the countries switch from one cluster to another over time. It is important to note that although this is a distinct possibility, it is quite rare. The Cramer's V statistic associated with clusters suggests that a country's cluster status is very highly correlated with its status for the prior year. This observation serves to support the notion that the groups created through Sequence Analysis and clustering methods can be thought of as latent classes. Thus, my use of time-varying clusters of regime sequences enables me to test the hypotheses.

[Figures 9 about here]

[Figures 10 about here]

Table 1 shows the results of a duration model predicting the time to democracy lasting five or more years. I compare the results of the baseline model (lagged regime type only) to one which includes three and six clusters created using the farthest neighbor method. I also compare the models without lagged regime type. For ease of interpretation, I report the coefficients as the log of the hazard ratios rather than the hazard ratios. A negative coefficient indicates that the

[10] To see the complete list of the cases contained in each cluster, refer to the online appendix.

effect of a variable is to make democratization less likely, while a positive coefficient denotes an increase in the hazards of emerging a democracy lasting at least five years.

According to the results, increases in the national income lower the hazards of transitioning to a lasting democracy, thus showing little support for modernization theory (Przeworski et al. 2000). Countries with larger populations are also significantly less likely to democratize in the post-WWII world. Countries with higher Polity scores have significantly higher hazards of democratizing to a democracy lasting at least five years. Compared to states with no discernible armed conflict, states experiencing domestic armed conflict are not more likely to transition to democracy lasting five years or more. Higher education is associated with higher hazards of democratizing, which is highly significant. Geographic location is also a factor in the timing of democratization. Compared to post-Soviet states, countries in North Africa and the Middle East have significantly lower hazards of democratizing. Countries in North America and Western Europe, if they had not already done so, have higher hazards of democratizing to a democracy lasting five years or more. As would be expected, countries that were civilian autocracies in the previous year have lower hazards of democratizing, which is significant below a five percent probability of error.

Adding the sequence clusters to the duration model does not dramatically affect the coefficients on the significant control variables, except for lagged regime type. The impact of institutional sequences cuts the coefficient on lagged regime type in half and diminishes its associated level of statistical significance. The results suggest that there is a statistically distinguishable difference between clusters based on different regime histories. Compared to countries in cluster 1, for example, the countries in clusters 2 and 3—and cluster 4 if comparing 6 clusters—have significantly lower hazards of transitioning to a democracy lasting five years or

more. In the model containing six clusters with regime sequences only, cluster 6 is also statistically less likely to democratize (lower hazards) than the states in cluster 1. The estimate associated with the shape of the hazard is positive and statistically significant, suggesting that the hazards of democratizing increase with time. A likelihood ratio test comparing models shows those with sequences only to outperform lagged regime type as an explanatory factor of democratization to democracy lasting five years or more.

[Table 1 about here]

Like figure 8, figure 11 shows how the inclusion of clusters impacts model fit for the model predicting consolidation. It appears that a model with any number of clusters performs as well as one with lagged regime type. For the sake of consistency I compare the results of the model which includes three clusters created using the complete (nearest neighbor) method. The optimal model of democratic consolidation might, however, contain three clusters created using the single (nearest neighbor) method. Table 2 shows the results of the consolidation model, the interpretation of which are the same as OLS. Having controlled for country-specific effects, the regional dummy variables drop out of the model. According to the model, higher national income promotes consolidation for democracies that have lasted at least five years. Consolidated democracies are also associated with larger populations, armed conflict, and higher education below a one-percent probability of error. Compared to presidential democracies, parliamentary democracies are more likely consolidate, as are mixed democracies.

The coefficient size on lagged regime type is only slightly mitigated by the inclusion of regime sequences. Compared to cluster 1, the countries in cluster 2 are not more or less likely to consolidate. Those in cluster 3 appear to be significantly less likely to consolidate than those in cluster 1. These estimates would suggest that there is no discernible impact of being in cluster 1

as opposed to cluster 2. This is only part of the story, however, considering that countries in cluster 1 are more likely to democratize. They might also be more likely to consolidate because of prior experience with democracy. If I control for the number of times that a country has democratized in the past, the countries in cluster 2 and 3 are significantly more likely to consolidate than those in cluster 1. As would be expected, an increase in the number of democratization attempts is associated with a major decrease in the number of years a country is expected to be consolidated. In combination with the duration model, the regression results suggest that patterns of regime change explain democratic consolidation as well.

[Figure 11 about here]

[Table 2 about here]

DISCUSSION

Table 3 provides a brief summary of the results, including those for the control variables and some of the robustness tests. In comparing regime sequences to lagged regime type, I found evidence to support a number of other theories regarding democratization and consolidation. For one, the finding that income growth does not make democratization more likely, but that it does support democracies once they have emerged, supports the findings of Przeworski (2000). The positive impacts of education on both democratization and consolidation support Lipset's (1959) assertion that schooling yields more democratically minded citizens. As Cheibub (2006) argues, presidential regimes are more fragile because they are more likely to follow from military dictatorships. He also claims that the fragility of presidentialism in these states is not due to features of the regime but to contextual issues. If I control for the type of democracy that follows from militarism, presidential democracies are more likely to emerge but less likely to consolidate. Interestingly, the (albeit) few parliamentary democracies that emerge from military

regimes are statistically more likely to survive than are presidential democracies. The duration of the last regime also predicts how long the next regime lasts.

The results mostly support the hypotheses. I expected that autocracies with more experience with electoral institutions would be less likely to democratize to at least five years, but more likely to consolidate if they did. Using sequence analysis, I found that clusters of countries derive somewhat naturally on the basis of regime type, exposure, and transition order. Comparing countries with different regime sequences, I found that countries with protracted experience with civilian autocracy are significantly less likely to democratize. Figure 12 shows how the survival curves for democratization to a democracy lasting five years or more differ by cluster. Short-lived military regimes are much more likely to yield democracy but are also more interruptive. The relationship between regime sequence and democratization is somewhat more tenuous, however. Controlling for the number of past democratization attempts, countries with an extensive history of civilian autocracy are more likely than militarized countries to consolidate. Figure 12 shows how the distribution of years of consolidation differ by cluster.

The overall impact of the findings presented herein, however rudimentary, establishes the importance of political sequences in the study of democratization. By several different standards, it would appear that the emergence of successful democracy (one lasting five years or more) is not a first-order process, but one which is affected by events farther back in the past. This seems true at least as far as institutional explanations for its emergence are concerned. Indeed, scholars have suggested the decision to democratize and the timing at which it occurs are path-dependent (Mahoney 1991; Yashar 1997). The results also illustrate one way in which political scientists might be able to incorporate sequence analysis in their research. In so doing,

we will be better able to understand the role that path-dependent processes play in politics (Page 2006).

In some ways, the finding that simply including clusters based on regime sequences outperforms models already accounting for time-dependence is a rather large finding. A summary of the relative goodness-of-fit for these models shows that—whether one is modeling time-to-democracy or consolidation after democracy lasting five years or more—it is improved upon by controlling for the institutional history rather than the prior regime type. In reality, the regime sequences are a better predictor of democracy than are lagged regime types. To the extent that this method can be shown to be valid, it opens the door to test a variety of arguments about political sequencing. Sequence analysis is also a simple and flexible method, and it yields output that can be used in a number of ways. In other ways, the results presents herein suggest at most that "history matters."

Sequence Analysis can also be used in conjunction with more sophisticated methods that may better enable scholars to model outcome dependence and transition probabilities. Some relevant approaches include higher order Markov and hidden Markov models, and latent transition models. The method described herein might be compared to Latent Class Analysis. Indeed, I assert that the clusters represent latent classes, which are derived from the sequence in which regimes have emerged. This notion is in line with the arguments presented by scholars such as Cheibub (2007) and Svolik (2009). Questions for which Sequence Analysis might be appropriate may also be answered using Hidden Markov Model (HMM), which tries to find the model that best predicts a sequence of events. This approach differs from Sequence Analysis, however, insofar as it uses the sequence as the dependent variable. HMM methods also do not allow one to ascertain similarities between sequences and to easily handle a large number of

varied sequences. This does not preclude the combination of their strengths, however. Future aims would be to use Sequence Analysis in tandem with a Hidden Markov Model and to use Latent Transition Analysis to derive probabilities of an observation's inclusion in a cluster.

Were sequence analysis to be improved upon, one should be reminded that there are several implicit assumptions in the technique, such as how costs should be assigned to changes between states. To determine whether switches between any two states are equally costly, one can compare models with clusters formed based on different substitution costs. The approach also allows one to specify a transition matrix that is theoretically derived. It might also behoove one to let the observed transition frequencies determine substitution costs, thus letting the data 'speak for themselves'. There are also different distance metrics by which to calculate sequence similarity, although the OM algorithm is robust to a variety of data formats. One can also change the length of time that determines cluster formation or weight older states. These assumptions are not detrimental to the use of sequence analysis but are, rather, considerations that can make it more amenable to particular research questions. Future applications of this approach to political science will hopefully contribute to a better understanding of how to optimize the method to make valid inferences regarding the impact of historical events.

As it regards the models presented herein, there are other ways that the research design can be improved upon which include trying different variables, including interaction terms, and demonstrating causality. For one, the variables that I chose to operationalize theories of democratization may not be adequate to bear out the complexities of each broad explanation. It might be better to test the impact of specific institutions, rather than use a proxy for institutions that is based on the type of leadership. The truth is, the Cheibub et al. dataset on regime type is quite broad. Though the criteria by which the authors classify democracies are strict and

institutionally-focused, the distinctions between types of autocracies are less clear and focused on the type of leader. To this end, examining the timely application of legislative openings, judicial independence, and party creation could better explain the questions raised herein. Measurement error can also render the variables that I *did* include unrepresentative of the concept of interest, although the results are robust to the exclusion of each variable. The results are also robust to heteroskedastic standard errors. Given the close association and possible interdependence between concepts, it may also be necessary to include interaction terms to create a more complete picture of how democratization occurs. All of these concerns, including concerns about omitted variable bias, should inform future iterations of this research and play a critical role in making more accurate models of time-dependent processes.

The abovementioned considerations in mind, however, this study takes a much needed first look at how sequences affect the emergence and consolidation of democracy. I am able to demonstrate that understanding institution-building as a long-term process makes an important contribution to predicting democracy. Moreover, the results suggest that unique sequences of regimes explain both the timing and successfulness of democracy. One implication is that path dependence is a worthy concept to reanimate, and that there are yet untapped approaches available to empirically test it.

CONCLUSION

The purpose of this paper is to summarize the literature on democratization for the purposes of creating a working frame by which to test different specifications based on time-dependence. A significant contribution of this research is in undertaking a serious inquiry into the time-dependent nature of democratization that goes beyond duration. Though the phenomena of democratization to a semi-permanent form may be best modeled as an accelerated

version of the Weibull functional form, its determinants may be outcome-dependent. A process is outcome-dependent if the outcome in a period depends on past outcomes or upon the time period. If the long-run distribution of past outcomes matter, the process is said to exhibit considerable path dependence (Page 2006). Many theories in political science assert that sequencing matters or the political outcomes are path dependent, but they are yet untested assertions for which methods more commonly found in sociology may be valuable. The ability to demonstrate and to separate sequential effects from accumulative effects would constitute a major step in political science towards analyses that are truly time-sensitive. Understanding the best way to model duration dependence is only the beginning.

The causes of democratic transition as well as the temporal processes by which it unfolds and impacts development are interrelated questions that must be studied together. The question of *what* explains democracy is intertwined with the question of *how* democracy occurs. This derives from the observation that almost no successful democracy spontaneously emerges, but is instead the by-product of a set of processes that operate over time. Theories of democratization can be improved upon by differentiating between the periodic and sequential impact of various factors. To this end, sequence analysis may be a critical step beyond duration into other forms of time-dependence. The unresolved debate over what affects the timing of democratization (Carothers 2007; Mansfield and Snyder 2007) represents a broader concern among scholars regarding how political processes are moderated by time. An important extension following from this analysis is to better incorporate sequence analysis into models of regime change. The approach taken in this paper to distinguishing between orders of events is one from which political scientists with many different research agendas can benefit.

In subsequent iterations of this project I aim to make the model more robust, so as to explore the ways to also account for outcome dependence as it regards democratization. Just as duration analysis expands the parameters of ordinary least-squares regression, sequence analysis may enable political scientists to advance a host of theories on outcome dependence. The long-term goal of this research agenda is to combine the strengths of survival modeling and sequence analysis to shed light on how different dimensions of time affect the likelihood of modern democracy emerging and flourishing. With hope, such an explanation contains within it a clue to more stable institutions which stems from the order in which they are applied.

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Temporal Determinants of Democracy: Beyond Duration

TABLES AND FIGURES

Figure 1. Sequence index plot: democratization lasting five years or more

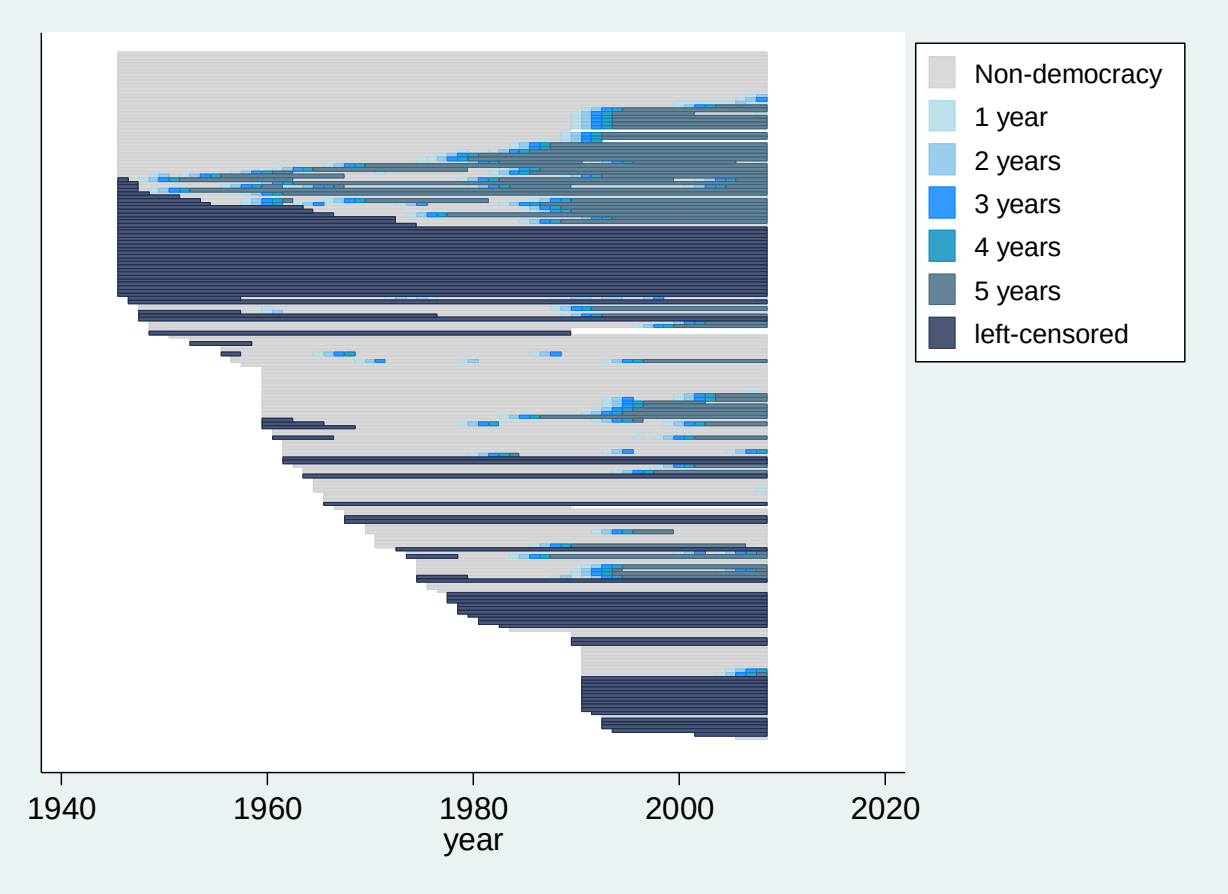

Figure 2. Number of regimes by year

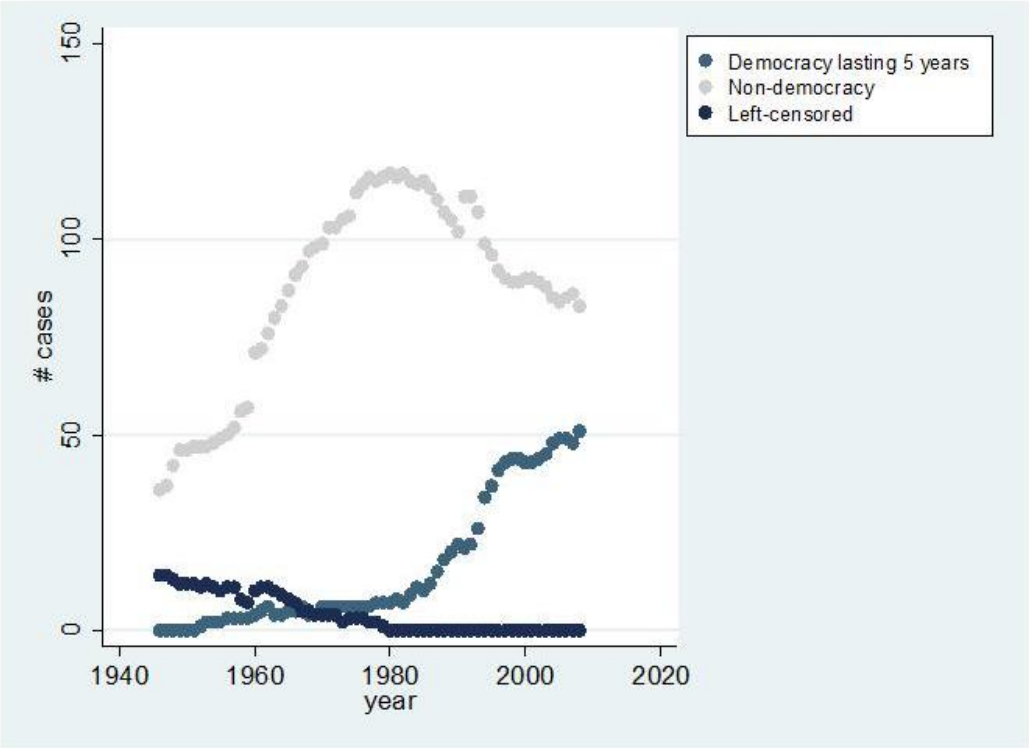

Figure 3. Percent of regimes by year

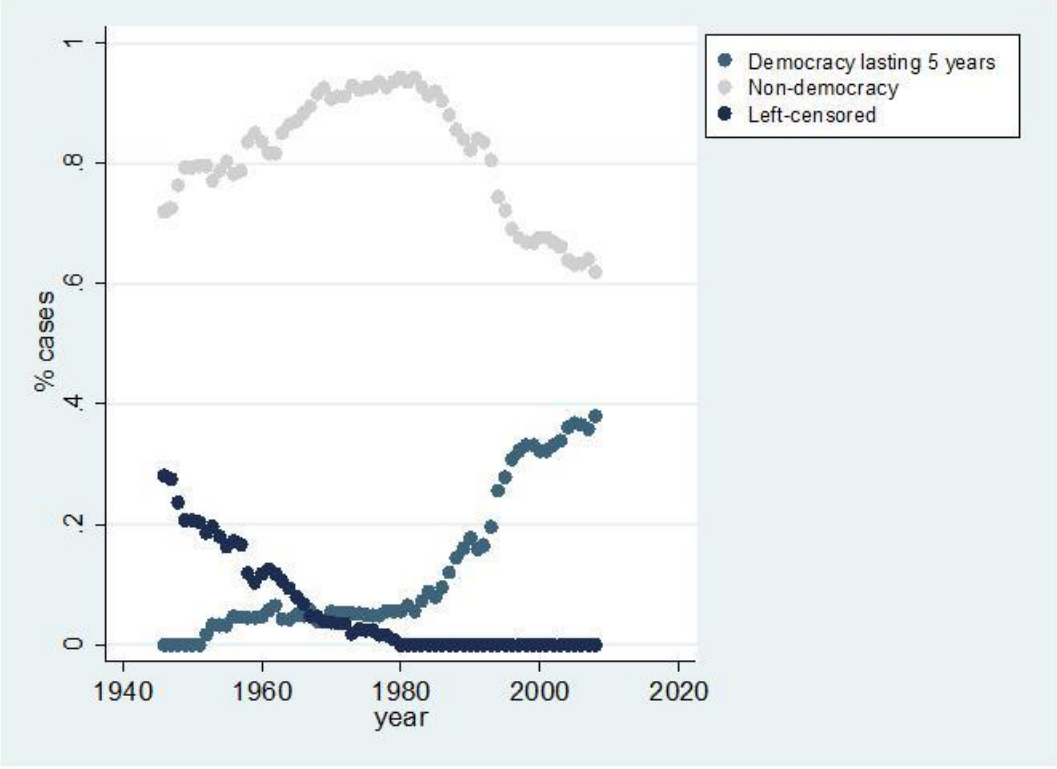

Figure 4. Hazard plot: time to democracy lasting five years or more

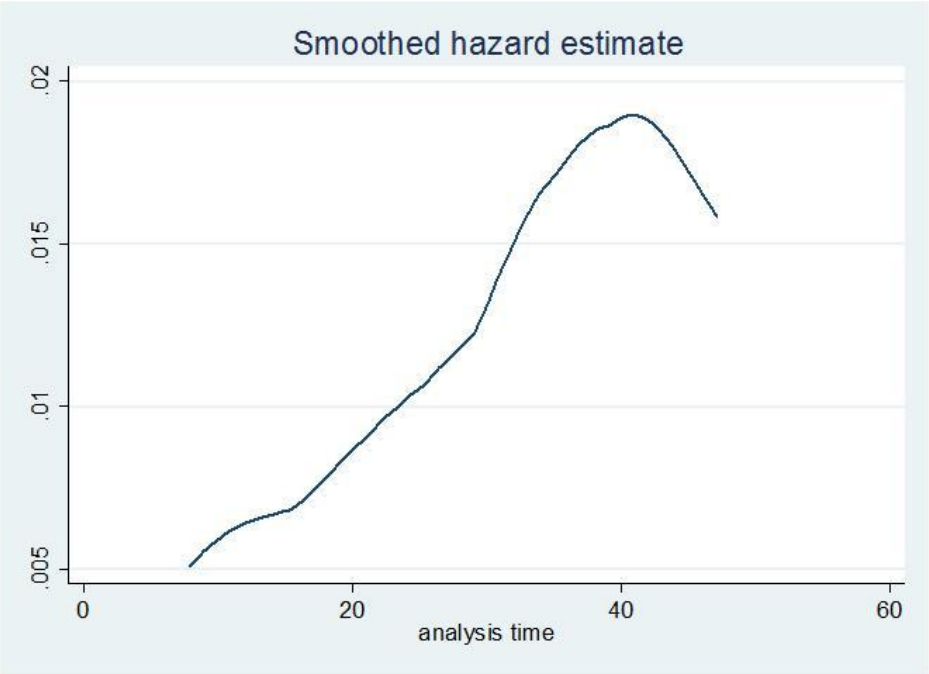

Figure 5. Survival plot: time to democracy lasting five years or more

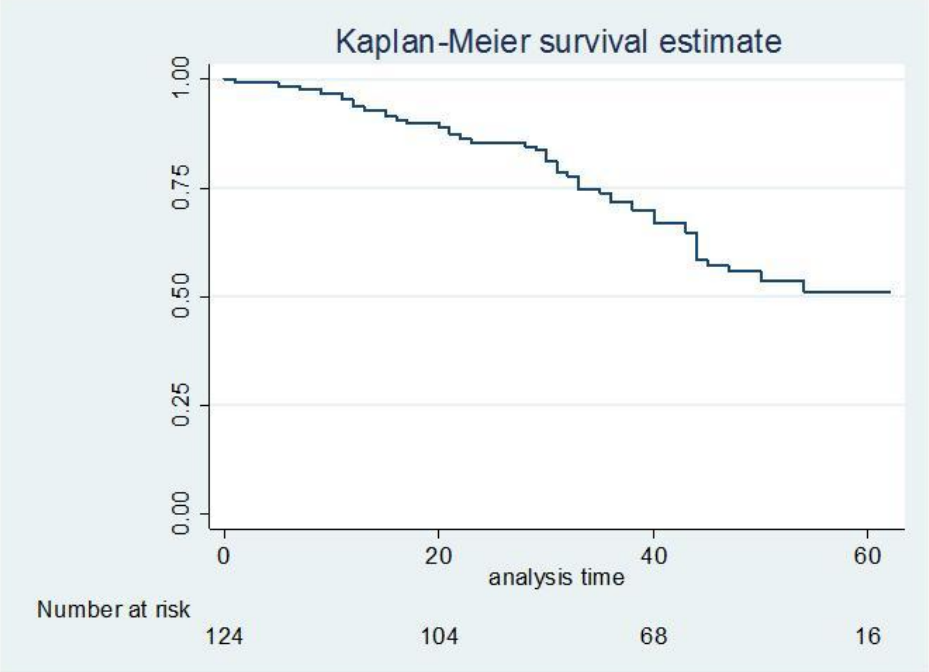

Figure 6. Histrogram: years of consolidation for democracies lasting five years or more

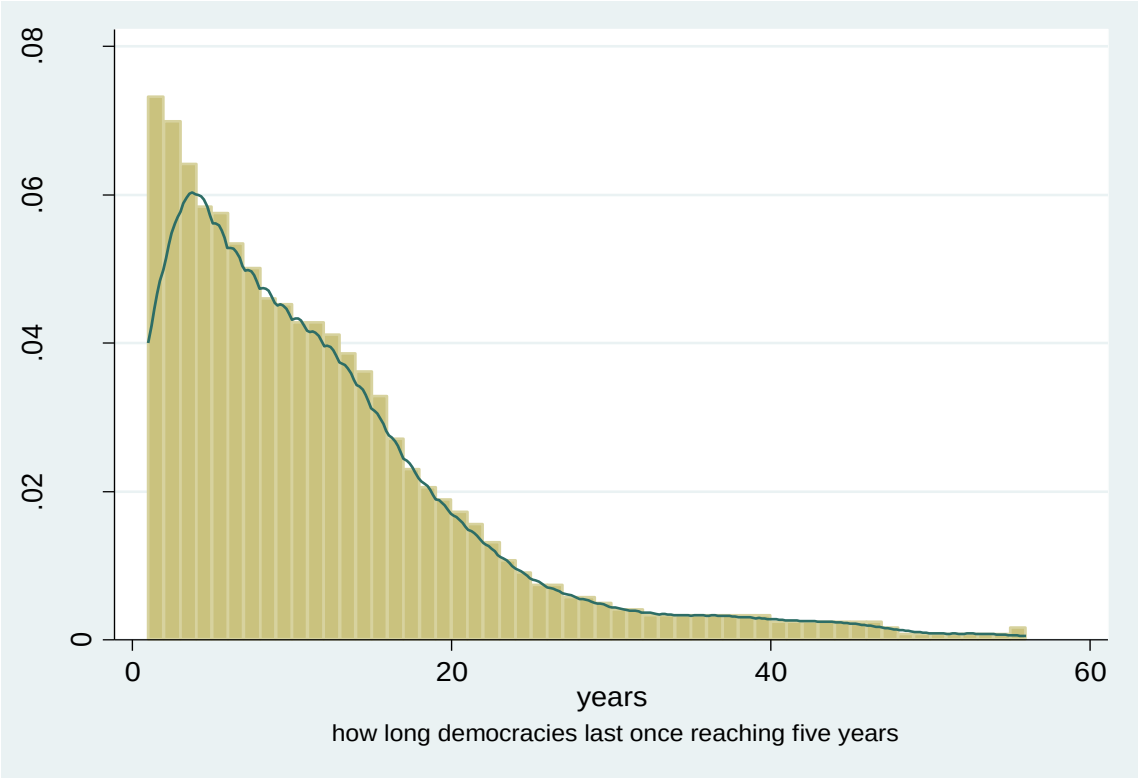

Figure 7. Density plot: regime type by year
(excluding left-censored democracies)

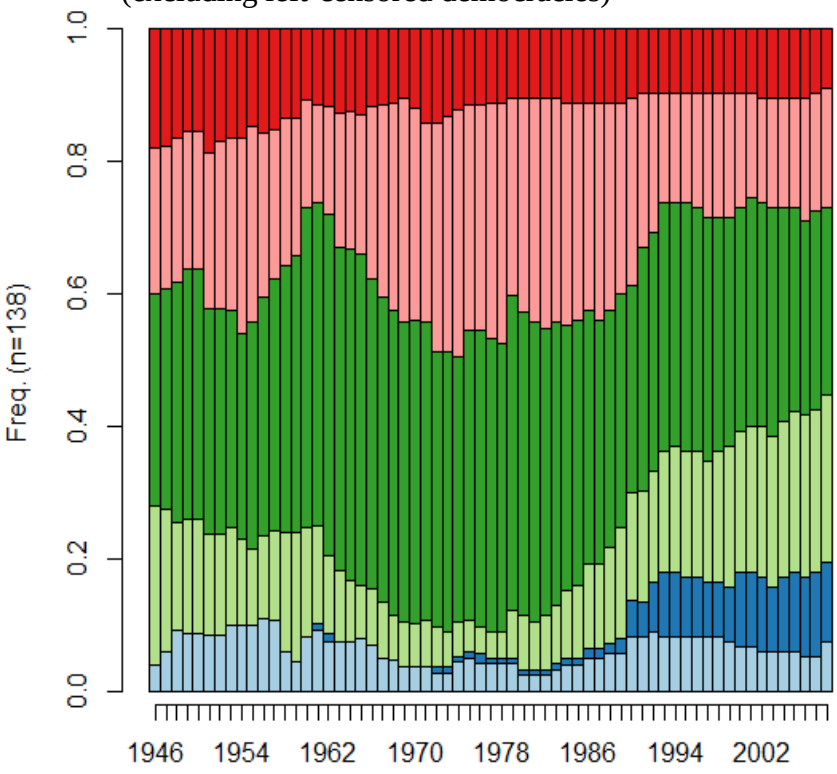

Figure 8. Model fit (duration model) by cluster type and number

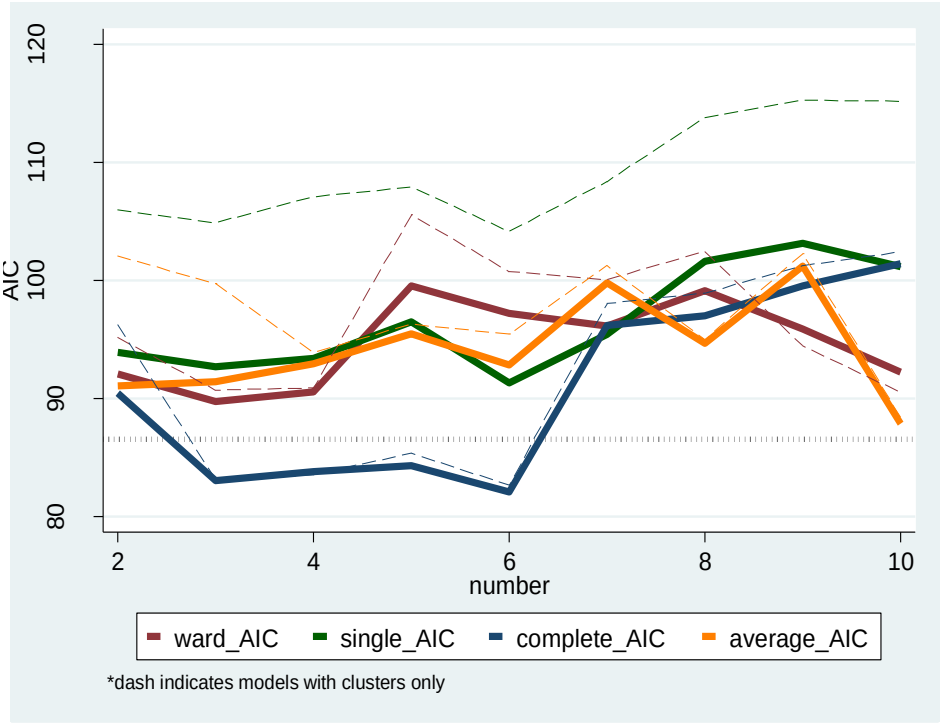

Figure 9. Sequence index plot, by cluster
(complete method, three clusters)

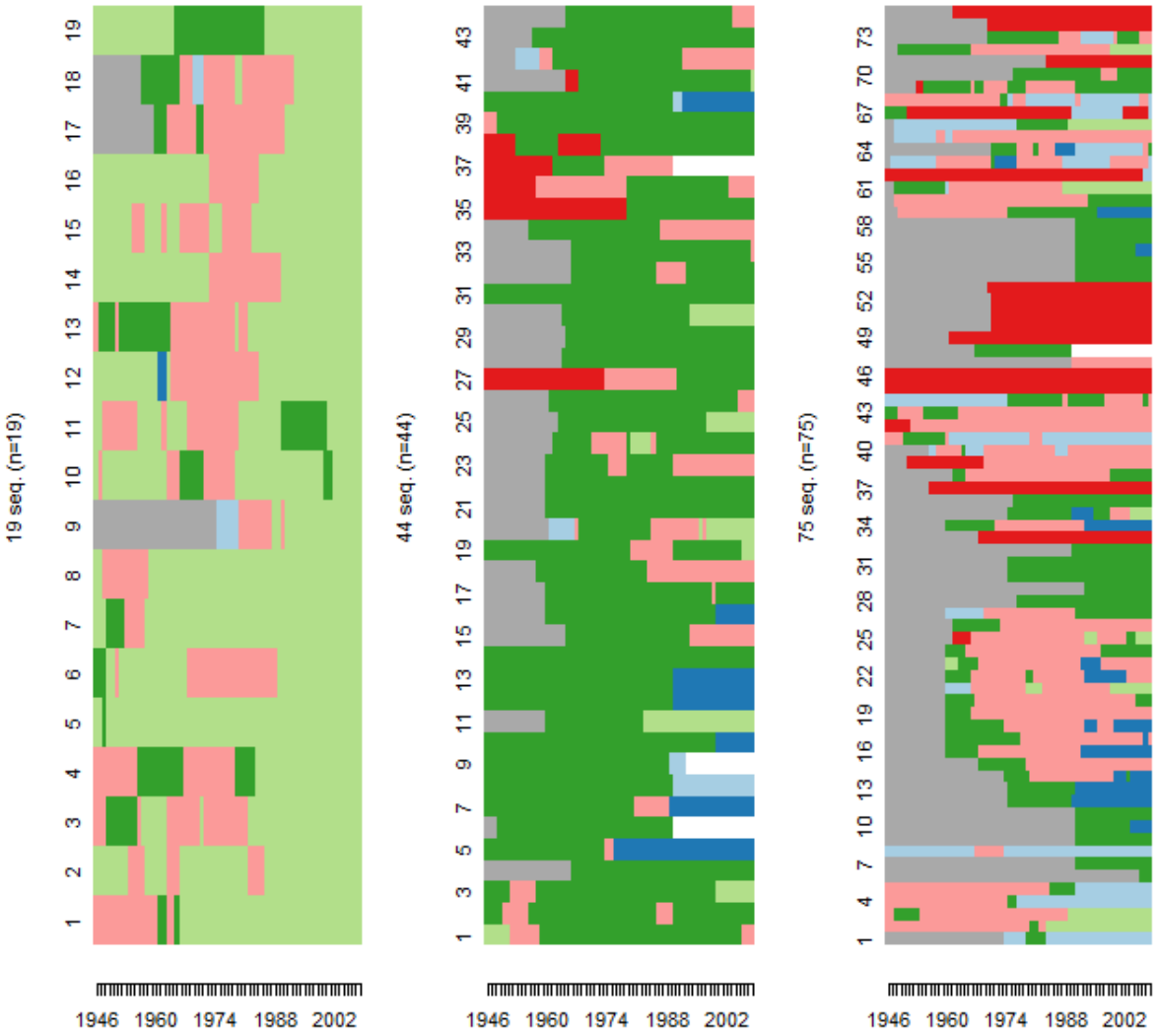

Figure 10. Representative clusters
(by method and cluster number)

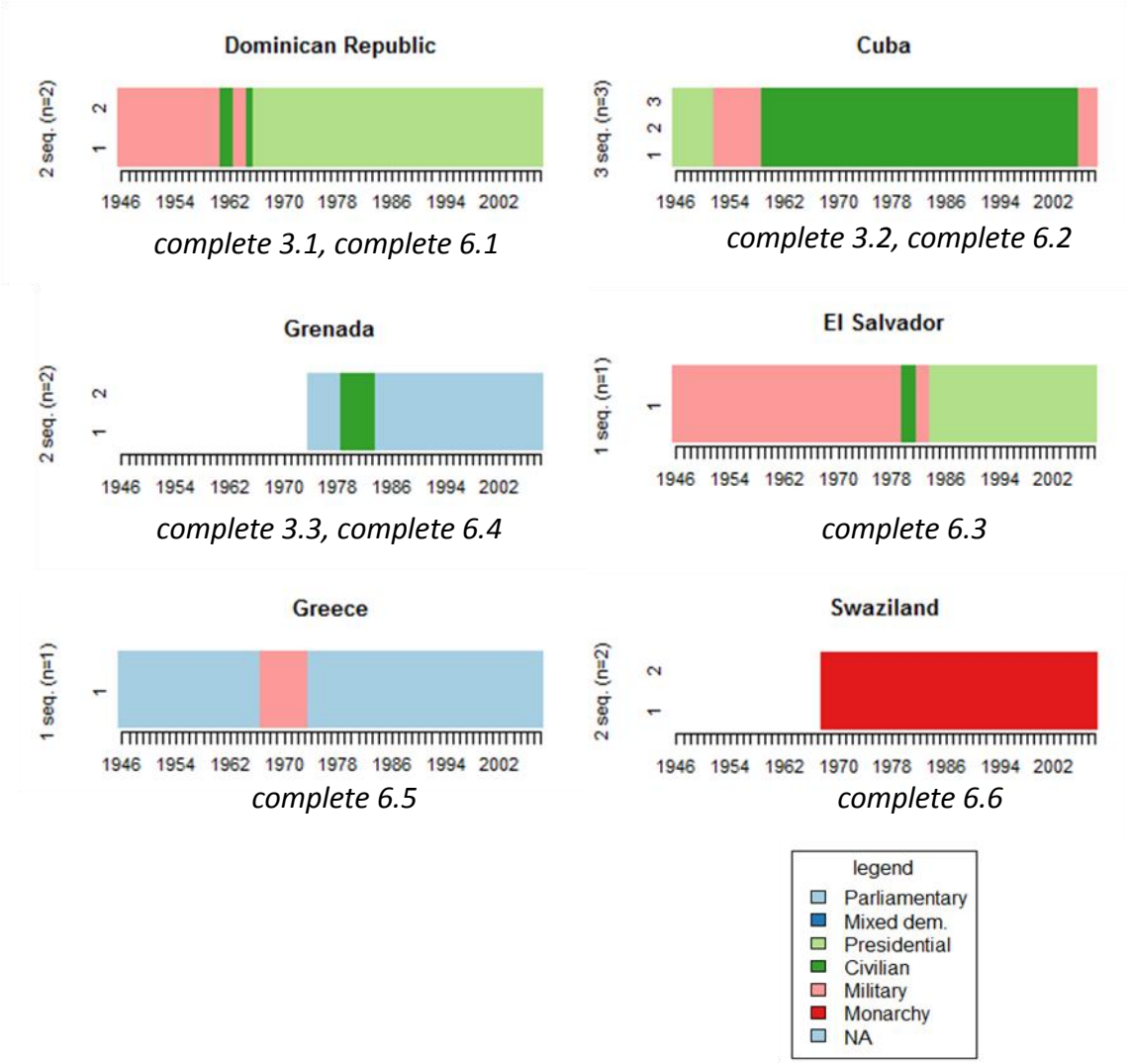

Table 1. Duration model: time to democracy lasting five years or more

Variable	regime type only	complete 3	complete 6	complete 3 only	complete 6 only
rGDPpc, lag	-0.000	-0.000*	-0.000*	-0.000**	-0.000**
log pop., lag	-0.279*	-0.350**	-0.328**	-0.326**	-0.322**
Polity, lag	0.144***	0.147***	0.153***	0.134***	0.135***
conflict, lag	-0.331	-0.268	-0.058	-0.275	-0.041
average educ. male, lag	0.381***	0.397***	0.328***	0.375***	0.315***
monarchy, lag	-0.398	-0.668	2.178		
civilian, lag	-1.456***	-0.776*	-0.802**		
L. America	1.113	0.635	0.185	0.782	0.360
M. East/N. Africa	-2.126*	-2.310*	-2.939**	-2.299**	-2.429*
S.S. Africa	-0.151	-0.247	-0.730	-0.089	-0.500
N. America/W. Europe	3.802***	4.554***	3.877***	4.729***	4.152***
E. Asia	0.211	-0.138	-0.374	-0.005	-0.292
S.E. Asia	-0.165	-0.315	-0.807	-0.317	-0.756
S. Asia	0.917	0.811	-0.215	1.013	0.152
Pacific	-0.276	0.539	0.797	0.807	1.068
Caribbean	-17.322	-15.781	-16.110	-16.041	-15.383
cluster 2 (complete 3)		-3.191***		-3.851***	
cluster 3 (complete 3)		-1.843**		-2.282***	
cluster 2 (complete 6)			-3.848***		-4.430***
cluster 3 (complete 6)			-2.589***		-3.025***
cluster 4 (complete 6)			-2.392**		-2.726***
cluster 5 (complete 6)			0.808		0.072
cluster 6 (complete 6)			-5.104		-3.509**
Intercept	-6.399***	-6.946***	-8.126***	-7.165***	-7.976***
ln_p	0.755***	1.091***	1.271***	1.100***	1.247***
N	2761	2761	2761	2761	2761
ll	-28.332	-21.521	-18.048	-23.537	-20.342
chi2	79.531	93.153	100.097	89.119	95.509
aic	92.663	83.041	82.097	83.075	82.685
bic	199.284	201.508	218.334	189.695	207.075

Figure 11. Model fit (consolidation model) by cluster type and number

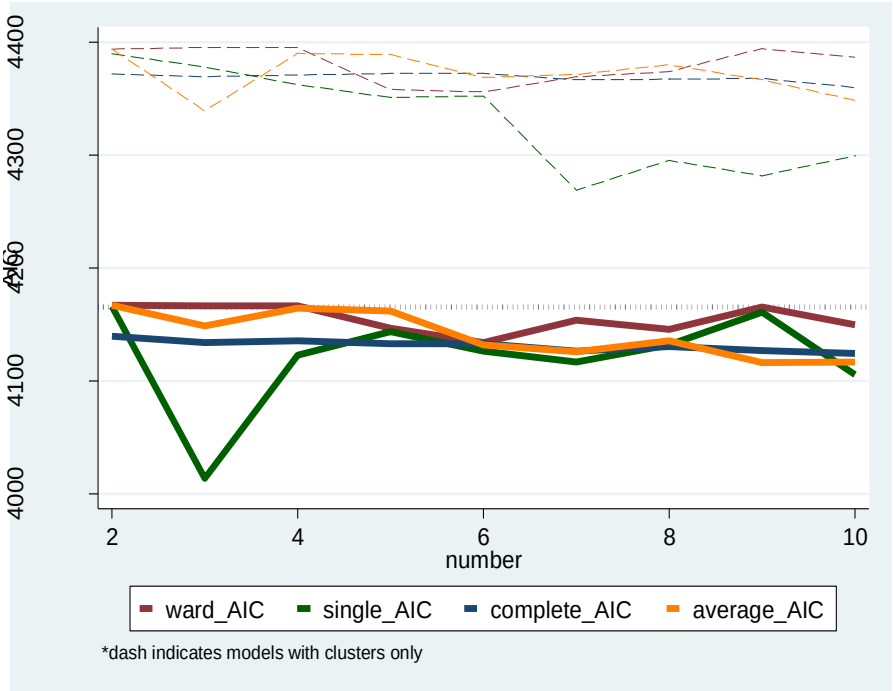

Table 2. Absorbing regression: consolidation of democracies lasting five years or more

Variable	regime type only	complete 3	complete 3, alt.	complete 3 only, alt.
rGDPpc, lag	0.001***	0.001***	0.001***	0.001***
log pop., lag	15.812***	14.598***	17.371***	18.023***
Polity, lag	-0.728***	-0.833***	0.229***	0.399***
conflict, lag	3.996***	4.091***	1.014**	1.348***
average educ. male, lag	3.395***	3.352***	4.902***	4.689***
parli. democracy, lag	31.148***	30.860***	12.367***	
mixed democracy, lag	22.179***	18.961***	11.745***	
L. America	(omitted)	(omitted)	(omitted)	(omitted)
M. East/N. Africa	(omitted)	(omitted)	(omitted)	(omitted)
S.S. Africa	(omitted)	(omitted)	(omitted)	(omitted)
N. America/W. Europe	(omitted)	(omitted)	(omitted)	(omitted)
E. Asia	(omitted)	(omitted)	(omitted)	(omitted)
S.E. Asia	(omitted)	(omitted)	(omitted)	(omitted)
S. Asia	(omitted)	(omitted)	(omitted)	(omitted)
Pacific	(omitted)	(omitted)	(omitted)	(omitted)
Caribbean	(omitted)	(omitted)	(omitted)	(omitted)
cluster 1 (complete 3)		-1.334	1.865**	2.305***
cluster 2 (complete 3)		-4.729***	0.907*	1.328**
no. democratization attempts			-22.480***	-24.834***
Intercept	-170.686***	-155.539***	-153.736***	-151.679***
N	756	756	756	756
ll	-2074.694	-2056.938	-1625.902	-1680.23
aic	4165.388	4133.875	3273.804	3378.46
bic	4202.412	4180.156	3324.713	3420.112

Table 3. Summary of main findings

	Democratization	Consolidation
GDPpc	↓	↑
Population	↓	↑
Polity	↑	↓ | ↑
Armed conflict	x	↑
Education	↑	↑
Was last a monarchy	x	n/a
Was last a civilian regime	↓	n/a
Region of the world	(sig.)	n/a
Dictatorships experienced in elections	↓	x | ↑
Dictatorships with active military	↑	x | ↓
No. of democratization attempts	↑	↓
Duration of last regime	x	↑
Presidential dem. following military	↑	↓

Figure 12. Survival plot: time to democracy lasting five years or more, by cluster

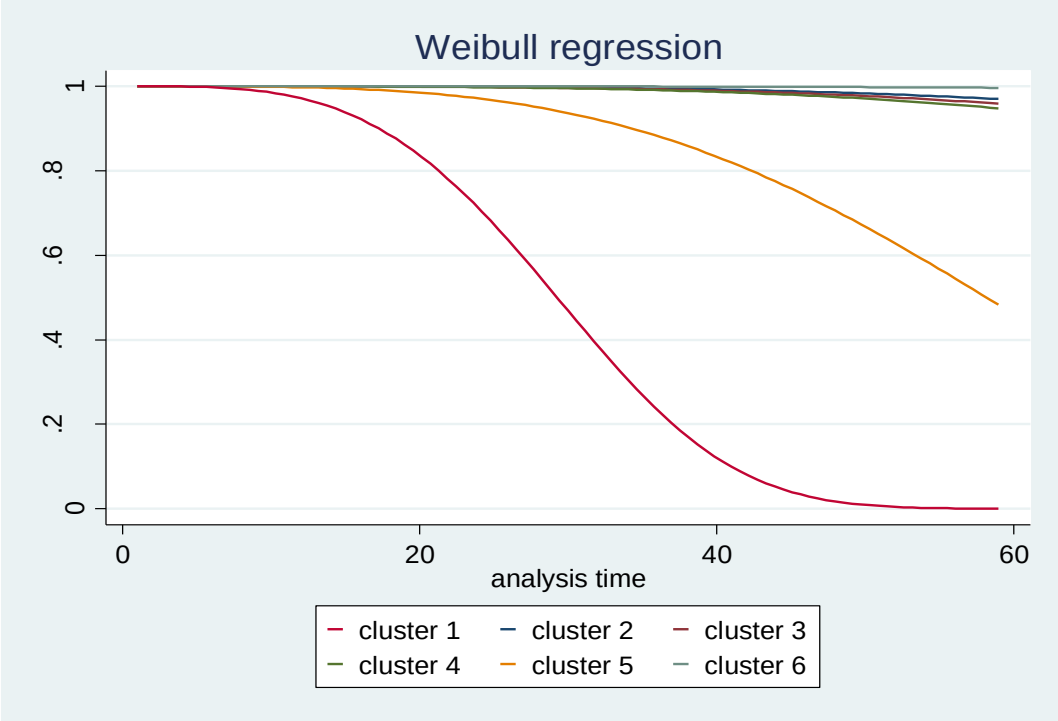

Figure 13. Kernel density plot: consolidation of democracies lasting five years or more, by cluster

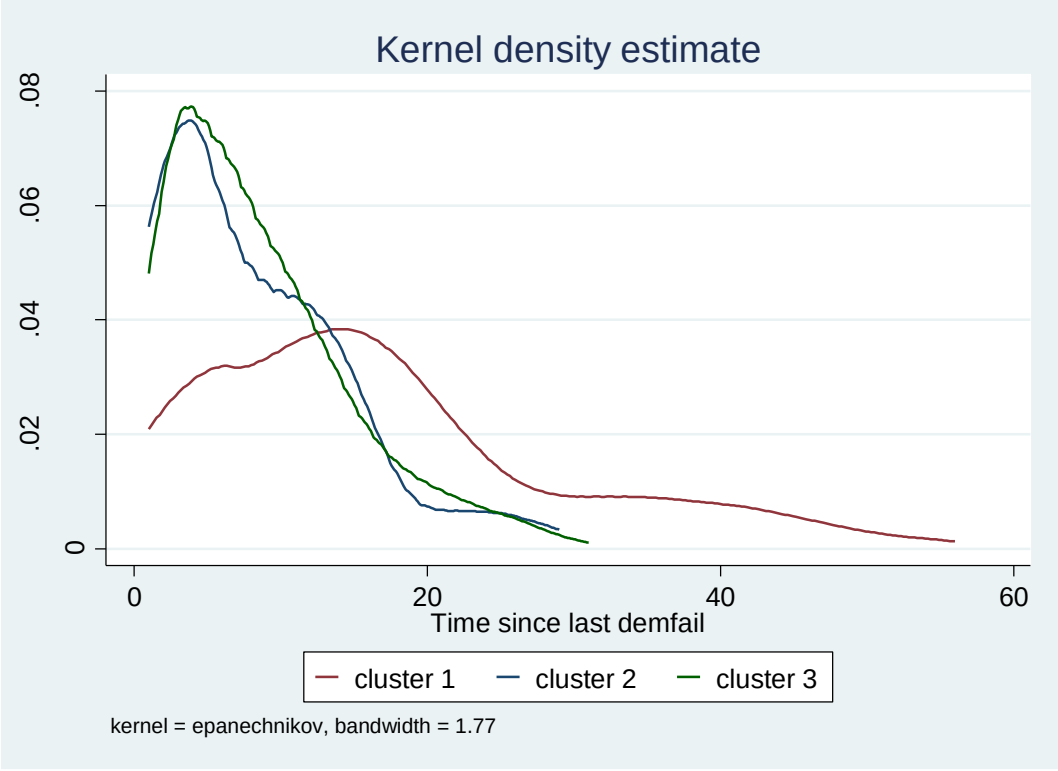

Table A1. Life table: eligible countries
[Life-table]

Figure A1. Sequence index plot: regime type, by year
(excluding left-censored democracies)

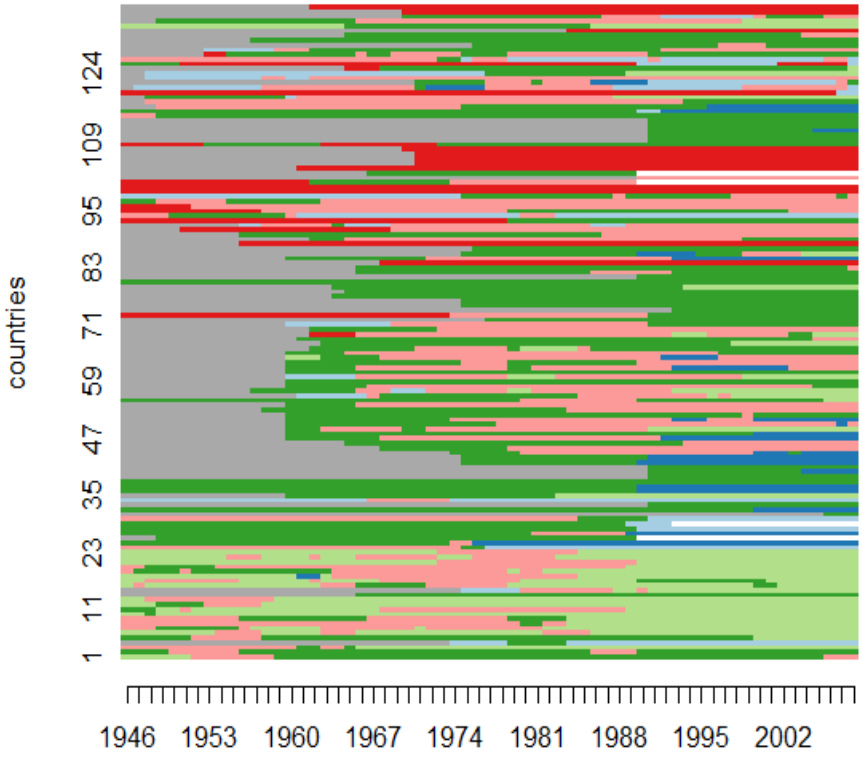

Table A2. Summary statistics

Variable	Obs	Mean	Std.	Min	Max
gle_rgdp	6005	4551.762	6482.022	170.55	84408.23
gle_pop	6216	26083.49	95623.24	61	1278018
p_polity2	6347	-2.17961	6.553848	-10	10
ucdp_type3	6046	1.288455	0.777361	1	4
ht_region	6757	3.935918	2.16952	1	10
ihme_ayem	4628	5.055704	2.772389	0.2	13

Figure A2. Alternative model fit (duration model) by cluster type and number

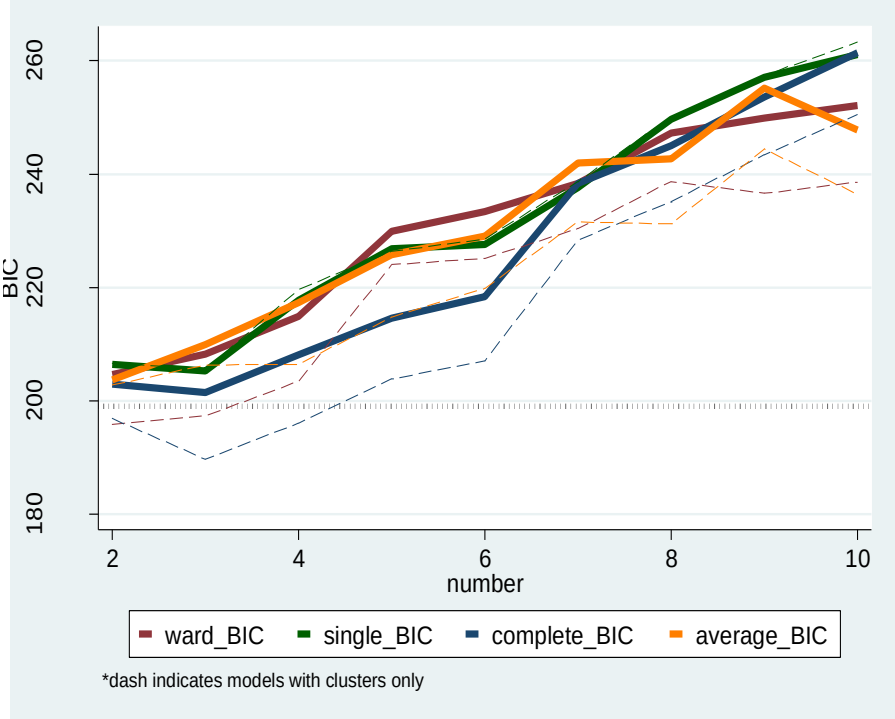

Figure A3. Alternative model fit (consolidation model) by cluster type and number

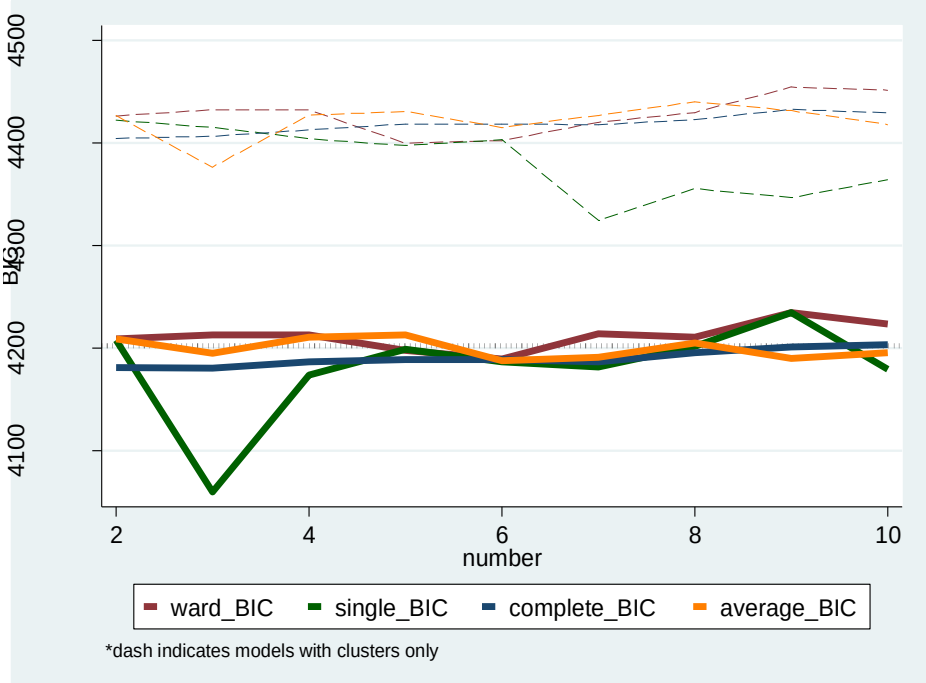

Figure A4. Sequence index plot, by cluster
(complete method, six clusters)