A Continuous Schumpeterian Conception of Democracy

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Comments Appreciated.

Abstract

Political scientists often require a continuous conception of democracy to test hypotheses about the effects of political regime. Yet, the so-called continuous measures we use in large-n studies are either highly subjective (e.g., Freedom House), or not really continuous (as Gleditsch and Ward 1997 argue about Polity). The first step in developing a continuous measure of democracy is to answer the question: What does it mean to be more or less democratic? Przeworski et al. (2000) follow a minimalist, Schumpeterian conception of democracy, where regimes are classified as to whether key government offices are filled through contested elections. Their dichotomous measure has clear meaning. The problem for some is that this classification does not appeal to their intuitive sense that some countries are more democratic than others. In this paper, I suggest a continuous conception of democracy that is consistent with the minimalist conception offered by Schumpeter (1942). I define democracy as *the probability* that key government offices are filled through contested elections. While such probability cannot be directly observed, I use the Przeworski et al. data to estimate probabilities and apply the new conception to the Hegre et al. (2001) study of the effect of political regime on the incidence of civil war.

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1. Introduction

Political scientists often require a continuous conception of democracy to test hypotheses about the effects of political regime. Yet, the so-called continuous measures of democracy we use in large-n studies are either highly subjective (e.g., Freedom House), or not really continuous (as Gleditsch and Ward 1997 argue about Polity). It is often not obvious how to interpret the effect of "democracy," either because change in democracy can result from changes in any of several dimensions, or simply because no interpretation is offered.

Przeworski et al. (2000) propose a minimalist, Schumpeterian conception of democracy: regimes are classified as to whether key public offices are filled through contested elections. Their dichotomous coding of democracy has clear meaning. The problem for many, however, is that this classification does not appeal to their intuitive sense that some countries are more democratic than others. Many would argue, for example, that a country like the United Kingdom is more democratic than a country like Ecuador. But both countries currently get the same score of 1 in this traditional Schumpeterian conception of democracy. Furthermore, this dichotomous measure precludes testing whether level of democracy has nonlinear effects on other variables, such as economic growth (Barro 1997) or civil conflict (Sambanis 2001, Hegre et al. 2001). In this paper, I offer a continuous conception of democracy that is consistent with the minimalist conception offered by Schumpeter (1942).

The first step in developing a continuous measure of democracy is to answer the question: What does it mean to be more or less democratic? If we had a thermometer to measure democracy in a country, what would the units of measurement be?

I define democracy as *the probability* that key government offices are filled through contested elections. This conception has two advantages: It maintains the minimalist quality of Schumpeter's original conception, but it also allows us to conceive of varying degrees of democracy. It allows us to say that the United Kingdom was more democratic than Ecuador in the 1990s, even though key offices were filled by contested elections in both countries. According to my conception, United Kingdom gets a higher score because there is a higher probability that the democratic rules of the game will be followed there. In Ecuador, there is a higher probability that the rules will be subverted.

The obvious disadvantage of my conception is that we cannot observe probability. But we can estimate it. As in all estimations, specific estimates will not be certain. So, for example, reporting democracy scores of 0.60 for Ecuador and 0.90 for United Kingdom in 1990 is not very useful because there is error associated with each estimate.[1] I do not propose to report a new series of numbers to assign to each of thousands of country-years as previous measures do. Rather, my conception will be useful for *estimating* the effects of democracy. Specific point predictions may be uncertain, but taken together they can be

[1] Even though in these cases, the estimates – derived from the work below – make intuitive sense relative to one another.

used to estimate the effects of democracy on other variables of interest, such as civil conflict.

The goal of the paper is to introduce this new continuous conception of democracy based on Schumpeter's definition and show that it can be used to estimate the effects of democracy. The paper is organized as follows: First, I present some background on alternative measures of democracy that are available for large-n research. Next, I propose an alternative conception and provide estimates of the probability of democracy for 5,564 country-year observations of 157 countries from 1951 or date of independence to 1999. Finally, I apply the new conception to the Hegre et al. (2001) study of the effect of regime on the incidence of civil war.

2. Background

Schumpeter (1942) argued that the hallmark of modern day democracy is elections.[2] He observed that the crucial feature distinguishing the political systems of the United States and Western Europe from any other political system that had previously existed was that important government offices are filled by "competition" for the people's vote: "the democratic method is that institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of a competitive struggle for the people's vote" (Schumpeter 1942: 269).

Przeworski, Alvarez, Cheibub and Limongi (2000) have produced a dichotomous measure of democracy, which follows Schumpeter's idea: democracy is the political system in which key government offices are filled through contested elections. The definition has two parts: "key government office," which they define as the executive and the legislature; and "contested," which implies that more than one party has some

[2] Different classification systems of regimes have been offered throughout history. The ancient Greeks, for example, distinguished regime according to the number of rulers. So Aristotle argued that monarchy was rule of one, aristocracy was rule of the few, and democracy was rule of the many. Bueno de Mesquita, Smith, Siverson, and Morrow (2003) have recently proposed two continuous measures – the "selectorate" and the "winning coalition" – that follow this Aristotelian conception of regime by asking what proportion of the population has a voice in political decisions. The "selectorate" is the proportion of the population who can choose the political leaders, and the "winning coalition" is the minimal proportion of the selectorate whose support is required for the leaders to rule. In principal, these measures can vary from nearly 0 to 1. The authors, however, are clear that this measure does not track democracy. The hallmark of modern democracy – elections – is not an explicit component of the measure. Moreover, the authors have not actually measured these proportions, but rather transformed the Polity measure into 5-point proxy indices. Nevertheless, the conception is a useful approach to measuring important regime features.

probability of winning office through election.[3] The original dataset (Przeworski et al. 1996) covered 141 countries from 1950 (or date of independence) to 1990. Cheibub and Gandhi (2003) have updated the dataset so that it now covers 199 countries from 1946 (or date of independence) up to 2000 for a total of 7,500 country-year observations.

Many have taken issue with Schumpeter's minimalist view, the most famous being Dahl (1971), who introduced the concept of "polyarchy." Dahl had two fundamental criticisms of the minimalist conception: (1) Regimes vary in "the extent of…public contestation" (Dahl 1971: 4). (2) The contestation dimension alone is not sufficient to define democracy. Below, I address the first critique, proposing a conception that allows for different grades along the contestation scale based on a probabilistic notion of Schumpeter's definition. Regarding Dahl's second critique, however, I will argue that introducing additional dimensions conflates analytically distinct concepts and precludes important analysis.

For Dahl (1971: 1), "the key characteristic of a democracy is the continuing responsiveness of the government to the preferences of its citizens, considered as political equals." For there to be "responsiveness," Dahl assumed three conditions are necessary (Dahl 1971: 2): (1) the ability of citizens to formulate preferences, (2) the ability of citizens to signify preferences by individual or collective action, and (3) to have their preferences weighed equally. And for these three necessary conditions of democracy to hold, Dahl proposed that eight guarantees were required through the institutions of society: freedom to form organizations, freedom of expression, the right to vote, citizen eligibility for public office, the right of political leaders to compete for support/votes, alternative sources of information, free and fair elections, institutions to make policy depend on support/votes.

The spirit of Dahl's idea that several dimensions should be combined into one measure of democracy has persisted in the two most pervasively employed measures of democracy used in large-n analysis: Freedom House (formerly collected by Gastil 1987) – which has been used in prominent studies by economists – and Polity – which is the most commonly used measure in political science.[4] Interestingly, the lists of concepts that

[3] Sometimes this is obvious, such as when incumbents lose elections and relinquish power (Przeworski 1991). Sometimes it is not, such as when incumbents successively win contested elections. While this introduces measurement error, it does so in an observable way. We know when we are in the latter situation, and can introduce a second variable to make sure results do not depend on these ambiguous cases. Przeworski et al. have made this variable – TYPEII – available with the rest of their data at: http://pantheon.yale.edu/~jac236/Research.htm.

[4] The first to quantify democracy continuously by conflating different characteristics was Bollen (1980). For a measure that reflects Dahl's list, see Coppege and Reinicke (1991). These approaches did not develop large-n datasets, however, and generated democracy scores for a handful of years. Consequently, the measures are not used to test hypotheses about the effects of democracy in most recent large-n studies.

each of these measures uses are actually quite different from one another, and have departed from Dahl's original list of dimensions.

The Freedom House measure seems almost to be a caricature of Dahl's list. To be fair, Freedom House is an institution that advocates human rights, claiming that the findings of its survey "should be regarded as a means to encourage improvements in the political rights and civil liberties conditions in all countries" (Freedom House 2003). Thus, perhaps it is not meant to be used as a measure to test hypotheses about democracy. But this is how it is used (e.g., Barro 1997). And the following inspection of the measure reveals that it should not be used as such.

The Freedom House definition starts out sounding a lot like Schumpeter's minimalist conception: "democracy is a political system in which the people choose their authoritative leaders freely from among competing groups and individuals" (Freedom House 2003). But the way the measure is actually coded involves a plethora of other factors.

Countries are classified as either "free," "partly free," or "not free," based on the average scores on scales of political rights and civil liberties. Countries are assigned a score on each of these scales – which tend to be correlated ($r \approx 0.93$) – by country experts who consider a checklist of factors.

For "political rights" the checklist includes:

1. Is the head of state and/or head of government or other chief authority elected through free and fair elections?
2. Are the legislative representatives elected through free and fair elections?
3. Are there fair electoral laws, equal campaigning opportunities, fair polling, and honest tabulation of ballots?
4. Are the voters able to endow their freely elected representatives with real power?
5. Do the people have the right to organize in different political parties or other competitive political groupings of their choice, and is the system open to the rise and fall of these competing parties or groupings?
6. Is there a significant opposition vote, de facto opposition power, and a realistic possibility for the opposition to increase its support or gain power through elections?
7. Are the people free from domination by the military, foreign powers, totalitarian parties, religious hierarchies, economic oligarchies, or any other powerful group?
8. Do cultural, ethnic, religious, and other minority groups have reasonable self-determination, self-government, autonomy, or participation through informal consensus in the decision-making process?
9. For traditional monarchies that have no parties or electoral process, does the system provide for consultation with the people, encourage discussion of policy, and allow the right to petition the ruler?
10. Is the government or occupying power deliberately changing the ethnic composition of a country or territory so as to destroy a culture or tip the political balance in favor of another group?

The "civil liberties" checklist includes:

1. Are there free and independent media and other forms of cultural expression?
2. Are there free religious institutions and is there free private and public religious expression?

3. Is there freedom of assembly, demonstration, and open public discussion?
4. Is there freedom of political or quasi-political organization?
5. Are there free trade unions and peasant organizations or equivalents, and is there effective collective bargaining?
6. Are there free professional and other private organizations?
7. Is there an independent judiciary?
8. Does the rule of law prevail in civil and criminal matters?
9. Is the population treated equally under the law?
10. Are police under direct civilian control?
11. Is there protection from political terror, unjustified imprisonment, exile, or torture, whether by groups that support or oppose the system?
12. Is there freedom from war and insurgencies?
13. Is there freedom from extreme government indifference and corruption?
14. Is there open and free private discussion?
15. Is there personal autonomy?
16. Does the state control travel, choice of residence, or choice of employment?
17. Is there freedom from indoctrination and excessive dependency on the state?
18. Are property rights secure?
19. Do citizens have the right to establish private businesses?
20. Is private business activity unduly influenced by government officials, the security forces, or organized crime?
21. Are there personal social freedoms, including gender equality, choice of marriage partners, and size of family?
22. Is there equality of opportunity, including freedom from exploitation by or dependency on landlords, employers, union leaders, bureaucrats, or other types of obstacles to a share of legitimate economic gains?

Actually, many of these questions are grouped together, so that the checklist contains a total of 8 items plus 2 discretionary items for the political rights scale and 14 items for the civil rights scale. The authors assign ratings from 0 to 4 for each checklist item. So there are 5^{10}=9,765,625 possible combinations that lead to the 7-point political rights scale, and there are 5^{14}=6,103,515,625 possible combinations that lead to the 7-point civil liberties scales. Then these scales are averaged together, and the average scores are finally divided into 3 categories: free, partly free, and not free.

Data on any one of the questions listed above might be useful to analysts, but Freedom House does not provide the data as such. Instead, it conflates the scores, providing only the political rights, civil liberties, and democracy variables. Adding to the ambiguity, "the survey team makes minor adjustments to account for factors such as extreme violence, the intensity of which may not be reflected in answering the checklist questions" (Freedom House 2003). The scale is at best an ordinal ranking of regime, where the scores can be arrived at through literally *billions* of possible combinations of characteristics plus "minor adjustments." As Munck and Verkuilen (2002: 28) put it, Freedom House is an index "which [exemplifies] problems in all areas of conceptualization, measurement, and aggregation."

The Polity measure of democracy is much less opaque.[5] This measure approaches regime as the aggregation of "authority patterns" (Marshall et al. 2002). Data on each of

[5] For a history of the Polity measure, see Jaggers and Gurr (1995). Also see Kristian Gleditsch's Polity Data Archive (http://weber.ucsd.edu/~kgledits/Polity.html).

its components are provided, and there are only 5: (1) Competitiveness of political participation, (2) Regulation of political participation, (3) Competitiveness of executive recruitment, (4) Openness of executive recruitment, and (5) Constraints on chief executive. Countries are scored on each of these dimensions and then the scores are typically combined into a 21 point overall scale of democracy. The scores can be summarized as in Table 1.[6]

Table 1: Components of the Polity index

Competitiveness of Political Participation (Parcomp)	**Polity**
(a) Competitive	3
(b) Transitional	2
(c) Factional	1
(d) Restricted	-1
(e) Suppressed	-2
(f) Not applicable	0
Regulation of Political Participation (Parreg)	
(a) Regulated	0
(b) Factional or transitional	0
(c) Factional/ Restricted	-1
(d) Restricted	-2
(e) Unregulated	0
Competitiveness of Executive Recruitment (Xrcomp)	
(a) Election	2
(b) Transitional	1
(c) Selection	-2
Openness of Executive Recruitment (Xropen)	
(a) Election	1
(b) Dual: Hereditary/Election	1
(c) Dual: Hereditary/Designation	-1
(d) Closed	-1
Constraints on Chief Executive (Xconst)	
(a) Executive Parity or Subordination	4
(b) Intermediate Category 1	3
(c) Substantial Limitations	2
(d) Intermediate Category 2	1
(e) Slight to Moderate Limitations	-1
(f) Intermediate Category 3	-2
(g) Unlimited Power of Executive	-3

[6] In fact, the Polity measure provides two variables, democracy and autocracy, which are typically combined into one "Polity" measure. For the Democracy scores, simply replace all of the negative numbers in Table 1 with 0 and leave the positive numbers. For the Autocracy scores, replace all of the positive numbers with 0 and multiply the negative numbers by -1. Polity is formed by subtracting Autocracy from Democracy, which produces the scores I have listed above.

The first thing to point out about the Polity measure is that it is not a "continuous" measure of democracy in the true sense of "continuous."[7] It is not even a cardinal ranking. Is it an ordinal ranking? In an excellent analysis and critique of the Polity measure, Gleditsch and Ward (1997) show that the data are really "categorical," and the categories are not precise. Scores can be arrived at through numerous different combinations. There are 6 possible scores on the first dimension, 3 on the second, 3 on the third, 2 on the fourth, and 7 on the fifth, for a grand total of $6\times3^2\times2\times7=756$ possible combinations. In their analysis, Gleditsch and Ward show that only a small portion of these combinations is actually employed in the data. Factor analysis of the measure shows that most of the variation in Polity is driven by changes in the Chief Executive Constraints dimension. As Treier and Jackman (2003: 8) note, a "fundamental deficiency of Polity is the arbitrariness of the aggregation or data reduction rule." This is particularly disappointing because "what many would promote as a hallmark of democratic societies, namely the extent and character of popular participation in selection of leaders, is either totally absent or relatively unimportant in determining the degree of democracy" (Gleditsch and Ward 1997: 376).

In general, there are at least two problems with conflating different dimensions into one measure of democracy. First of all, there is no consensus about what should be included. The dimensions of Polity and Freedom House have little overlap with each other or with Dahl's original eight dimensions. There are no objective criteria by which dimensions are included or excluded. As Przeworski et al. (2000: 14) note, democracy "has become an altar upon which everyone hangs his or her favorite *ex voto*."

Secondly, conflating several analytically distinct concepts into one measure precludes important questions. These measures assume – rather than test – that changes in the various dimensions are equivalent. So a one-point change in one dimension is assumed to be equivalent to a one-point change in another dimension. This is particularly problematic when one is testing hypotheses about the effects of democracy. Why should we assume *a priori* that a change in Chief Executive Constraints is equivalent to a change in the Competitiveness of Political Participation? Indeed, by using the conflated measures, we not only assume that these changes are equivalent in one particular study, but that these changes are *always* equivalent, whether the dependent variable is ethnic conflict, economic growth, or income distribution.

The Polity data are superior to the Freedom House data in this respect, because data on each individual component are provided. The analyst need not use the conflated measure, but can test hypotheses using the different dimensions provided.

Note, however, that even within one dimension of Polity the ordinal ranking of features is problematic. Most statistical techniques we use to test hypotheses handle continuous and dichotomous variables well. Even cardinal measures produce meaningful results. But using ordinal measures is misleading because our techniques assume that a

[7] This criticism, and those that follow, also apply to the Freedom House measure.

change from 0 to 1 is equivalent to a change from 1 to 2, when really the changes are of unmeasured magnitude.

Treating as continuous an ordinal scale with unmeasured distances between categories is always problematic. It is particularly confounding with this scale since changes sometimes result in a 1-point change and sometimes a 2-point change. For example, as the Chief Executive Constraints dimension of the Polity measure goes from "Unlimited Power" to "Intermediate Category 3" and then to "Slight to Moderate Limitations," each change involves a 1-point difference. A change from "Slight to Moderate Limitations" to "Intermediate Category 2," however, yields a 2-point change.

A new factor analysis of the Polity measure by Treier and Jackman (2003) shows indeed that "skepticism as to the precision of the Polity democracy scale is well founded." Using an ordinal items-response-model to analyze the relationships among the components of the Polity scale, Treier and Jackman (2003: 8) test the extent to which the data reduction rule employed by Polity is supported by the data. Their approach goes beyond previous factor analyses by estimating the latent value of democracy for each observation. Because they rely on the relationships among the components of Polity to guide their estimation of the latent value of democracy, their aggregation rule is not arbitrary. Rather, it is informed by the patterns among the Polity components. One weakness of the approach that the authors point out is that it relies on the components of Polity and they stand. Treier and Jackman call for "more and/or better indicators of democracy" so that they can avoid relying only on the five indicators in the Polity dataset. Note, however, that the question of what indicators to combine into the overall latent value of democracy is really a question of what "democracy" means. Treier and Jackman have developed an excellent approach to "continuize" Polity, but the process takes for granted which concepts should be conflated into the one overall measure of democracy, with no explicit story of what being more or less democratic means. Why these particular concepts, or any other concepts, should be the ones combined – or why concepts should be combined at all – is not substantively addressed.

The Polity data are useful in that they contain a great deal of information, but I do not see the advantage of conflating all of this information into one measure. I would suggest, rather, that the various dimensions of polity be broken up into series of dichotomous variables when used to test hypotheses. Indeed, some scholars routinely break up the 21-point Polity scale into a dichotomous measure. The cutoff point is, of course, arbitrary. So if one plans to use a dichotomous measure of democracy, I would suggest using the more clearly coded Przeworski et al. (2000) measure.

This, however, brings us back to a dichotomous measure of democracy. Such a measure does not address Dahl's contention that even within one dimension there are varying degrees. Furthermore, a continuous measure of democracy may be required to test hypotheses about the effect of political regime. Elkins (2000: 294-8) shows that a dichotomous measure of democracy may fail to detect a significant relationship between democracy and a dependent variable where a continuous measure may reveal one.

Indeed, for some kinds hypothesis testing, we require a continuous conception of democracy.

For example, Hegre, Ellingsen, Gates and Gleditsch (2001) propose an inverted U-shaped relationship between democracy and civil war.[8] They argue (2001: 33) that "coherent democracies and harshly authoritarian states" have few civil wars, but "intermediate regimes" are the most conflict-prone.

Before proceeding to test such a hypothesis, we must first ask: What is an "intermediate regime"? Do we want a measure that defines an "intermediate regime" by combinations of characteristics that number in the hundreds (Polity) or even *billions* (Freedom House)? In the following section I propose a conception of democracy that provides intermediate scores of democracy that have clear meaning.

3. A continuous minimalist conception of democracy

If we had a thermometer of democracy, what would it look like? Can we imagine degrees of democracy that do not involve adding on new characteristics for every change? What does it mean to have gradations of democracy? And can we have a continuous conception that relies only on the minimalist definition of democracy?

The conception I propose follows Schumpeter's idea that democracy is the political system in which key offices are filled by contested elections. Rather than conceive of this as a dichotomous measure, I propose conceiving of the *probability* that key offices are filled by contested elections. Thus, "democracy" can take on continuous values from 0 to 1. In any country at any time, there is some probability that democracy can be in place. In many places, this probability is near 0. In others, it is near 1. In still others, it is at some mid-level. In this way, we can conceive of Western Europe as more democratic than Latin America and Latin America as more democratic than Africa without introducing any other dimensions than the minimalist standards.

This conception has been implied elsewhere. For example, Mani and Mukand (2000: 7) hint at it in a paper on the importance of visible issues under democracy: "The government's ability to stay in power is a function of…the extent of democratization, D_m … we assume that D_m *equals the probability that elections will be held* where $D_m \in [0, 1]$" [emphasis added]. Mansfield, Milner and Rosendorff (2000: 13) have a similar conception in a paper on democracy and trade agreements: "The variable, σ [where $\sigma \in [0, 1]$], indicates a country's regime type and takes on higher values in more democratic polities. In a pure democracy, $\sigma = 1$. *Only the choice made by the voting public determines whether a leader retains office*. In a pure autocracy, by contrast, $\sigma = 0$" [emphasis added].

[8] Also see Sambanis (2001).

Both studies, in their theoretical sections, conceive of "democracy" as the probability that key offices are filled by election. Unfortunately, neither study pursues this line of thinking in their empirical tests. Economists Mani and Mukand go on to use the Freedom House measure, while Political Scientists Mansfield et al. employ the Polity index in their study:

> our formal model treats regime type as a continuous variable, with the competitiveness of elections ranging from perfectly competitive to completely uncompetitive. …*the [Polity] index developed by Jaggers and Gurr is also continuous, unlike some other measures of regime type* (Mansfield et al. 2000: 25; emphasis added).

As shown in the previous section, however, neither Freedom House nor Polity is actually continuous. The conception I propose, however, is truly continuous and consistent with the way these studies conceive of democracy.

The problem with conceiving of democracy as the probability that key offices are filled through contested elections is that we never observe probability. We can, however, estimate probability.

Consider, for example, using a simple probit model to estimate the probability that a regime is a democracy using the Przeworski et al. (2000) dichotomous variable. Recall that Przeworski et al. define democracy precisely as the system where key offices are filled by contested elections, and they have coded their dichotomous measure for 199 countries from 1946 (or independence date) to 2000 (Cheibub and Gandhi 2003). Thus, the probability that $\text{DEMOCRACY}_{i,t}=1$ is the probability that key offices are filled by contested elections in country i during year t:

$$\Pr(\text{DEMOCRACY}_{i,t}=1)= F\left(b' x_{i,t}\right),$$

where $F(\cdot)$ represents some functional form. There is some debate as to which functional form to use. In recent work, Przeworski (2003) has explored dynamic versions of probit, survival models, and nonparametric estimation techniques. As the purpose of this paper is illustrative, I employ a simple standard model: probit. So, for the purposes of this paper, $F(\cdot)$ represents the cumulative distribution function of the standard normal distribution, $x_{i,t}$ represents a vector of variables that influence the probability that $\text{DEMOCRACY}_{i,t}=1$, and b is a vector of parameters that captures this influence. This simple approach allows me to illustrate in a suggestive manner that estimates of the probability of democracy can be used to test hypotheses about the effects of democracy. Other researchers should choose the functional form appropriate to their research question.

I employ this basic probit model to analyze 5,564 country-year observations of regime as coded by Przeworski et al. (2000).[9] In the specifications presented below, I include determinants of democracy from Przeworski et al. (2000), as well as regional dummy variables. To ensure that my results (both here and below) do not depend on the specific set of variables employed, I present various specifications. Because my purpose is to predict rather than explain democracy, however, I have excluded variables that are not statistically significant. Table 2 presents the results from various specifications of this probit model:

[9] In their data dictatorships are coded 1. I switched this so that democracies are coded 1 and dictatorships 0.

Table 2: Determinants of Democracy Using the Probit Model

	Specification					
Explanatory variables	**1**	**2**	**3**	**4**	**5**	**6**
Constant	-5.49	-3.14	-3.51	-2.09	-1.11	-0.52
	(0.26)	(0.37)	(0.30)	(0.13)	(0.14)	(0.08)
ln(Level)	0.50	0.21	0.35			
	(0.03)	(0.04)	(0.03)			
Sum of transitions	0.23	0.30	0.12	0.25	0.32	0.16
	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)
Other democracies	3.22	3.35	3.57	2.49	2.88	3.28
	(0.26)	(0.27)	(0.22)	(0.23)	(0.24)	(0.19)
Executive is a military officer	-1.10	-1.27		-1.11	-1.21	
	(0.07)	(0.07)		(0.06)	(0.06)	
Rate of turnover of chief executive	1.30	1.24		1.29	1.37	
	(0.11)	(0.11)		(0.09)	(0.09)	
British colonial legacy	0.15	-0.36		0.35	-0.25	
	(0.06)	(0.06)		(0.05)	(0.05)	
Religious fractionalization	-0.64	1.84		-0.33	1.89	
	(0.14)	(0.16)		(0.11)	(0.14)	
Ethnic fractionalization	0.41	0.49		0.65	0.26	
	(0.09)	(0.11)		(0.08)	(0.10)	
Primary comodity exporter	-0.15	-0.11		-0.61	-0.17	
	(0.06)	(0.07)		(0.05)	(0.06)	
%Protestant	0.81			1.66		
	(0.13)			(0.11)		
%Catholic	0.22			0.82		
	(0.09)			(0.07)		
%Muslim	-1.33			-0.91		
	(0.10)			(0.09)		
Africa		-1.84	-1.63		-2.21	-2.13
		(0.12)	(0.09)		(0.09)	(0.06)
South Asia		0.02	-0.33		-0.53	-0.96
		(0.14)	(0.11)		(0.10)	(0.08)
East Asia		-1.40	-1.70		-1.85	-2.21
		(0.19)	(0.15)		(0.15)	(0.12)
S. E. Asia		-1.11	-1.40		-1.60	-1.92
		(0.13)	(0.11)		(0.10)	(0.09)
Oceania		-0.63	-0.46		-0.99	-0.70
		(0.15)	(0.13)		(0.13)	(0.11)
Middle East		-0.96	-1.53		-1.22	-1.65
		(0.11)	(0.09)		(0.09)	(0.07)
Latin America		-0.37	-0.56		-0.61	-0.86
		(0.09)	(0.07)		(0.07)	(0.06)
Caribbean		-0.49	0.19		-0.71	-0.02
		(0.13)	(0.10)		(0.11)	(0.08)
Eastern Europe		-2.27	-1.58		-2.60	-1.79
		(0.13)	(0.11)		(0.11)	(0.07)
All variables lagged one year						
Number of observations:	5003	5003	5564	6026	6026	6999
Log likelihood:	-2035.875	-1916.28	-2471.221	-2672.6538	-2361.3688	-3308.714
Pseudo R2:	0.40	0.44	0.35	0.33	0.41	0.30
% democracy:	41%	41%	43%	35%	37%	39%
% correctly predicted:	83%	83%	80%	80%	82%	78%

(Standard errors in parentheses.)

Specifications 1 through 3 of Table 2 show the well-known finding that high per capita income (**Level**[10]) is correlated with democracy. (I dropped **Level** in specifications 4 through 6 to ensure that my results using the estimated probability of democracy (below) do not depend on per capita income.) Table 2 also shows that democracy is more likely in countries with past experiences of democracy (**Sum of transitions**[11]). Democracy is more likely when there are other democracies in the world (**Other democracies**[12]). Democracy is not likely in countries headed by the military the previous year. Democracy is likely when there are more turnovers of executives. A British colonial legacy has an ambiguous effect, depending on whether one controls for regional effects. Ethnic and religious diversity appear to make democracy more likely (if one controls for regional effects). Relying on primary products as exports is not conducive to democracy. Countries with more Protestant and Catholic populations are more likely to have democracy. Muslim populations are not – although this should not be taken as an indication of cultural incompatibility with democracy, but rather as a problem with some of the institutions associated with Islam (see the work of Kalyvas (1998, 2000) for this argument). Finally, specifications 2, 3, 5 and 6 control for region. Democracy is less likely in non-industrialized regions of the world (except in South Asia according to Specification 2 and the Caribbean according to Specification 3). Different regions have different probabilities of democracy, which may be the result of "diffusion" (see Gleditsch 2002).

Volumes have been written on the covariates of democracy. I have taken my variables from the Przeworski et al. (2000) study. For more discussion of the interpretation of these variables, I refer readers to the Przeworski et al. study. The purpose of this paper is to show how these well-known covariates can be used to generate estimates of the probability of democracy. The coefficients from Table 2 can be used to generate estimated probabilities of democracy for each country-year observation. The models perform well, predicting about 80% of the country-year observations.

Because each point estimate is uncertain, listing the exact predicted probabilities in country-year format is not particularly useful, even though on average the predictions make sense. But if this conception of democracy is not useful for point predictions, what should it be used for? I propose to use this conception to test hypotheses about the effects of democracy. The predicted probability of democracy can be used as a continuous variable to estimate the effects of democracy.

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[10] The natural logarithm of this variable is used to account for diminishing returns from income. Data are measured as 1985 PPP data from Heston and Summers (1995) study along with a modified version of World Bank (2001) PPP data for the years 1994-1999.

[11] This is the STRA variable from Przeworski et al. (2000).

[12] Measured as the annual proportion of democracies in the world out of the total number of countries in the world (ODWP in Przeworski et al. 2000).

Note that many hypotheses involve monotonic linear relationships between democracy and a dependent variable. A dichotomous variable may be well suited to test such hypotheses. So, in the Mansfield et al. (2000) study discussed above, in addition to testing whether democracies are more likely to enter into trade agreements than non-democracies using the Polity measure, the authors also used the Przeworski et al. (2000) measure. The Mani and Mukand (2000) study, which posits that the visibility of an issue is more salient in democracies than non-democracies, could also employ a dichotomous indicator of democracy.[13]

What if the hypothesis is curvilinear? In particular, suppose that the effect of democracy is positive over one range of democracy, but negative over another range. A dichotomous measure will be useless to test such a hypothesis, because the story requires a middle level of democracy, which by definition is absent from any dichotomous measure.

Consider the hypothesis of Hegre et al. (2001). They argue that extreme autocracies repress civil conflict, and extreme democracies accommodate peaceful conflict, so middle level democracies are the most susceptible to violent civil war. Because their proposed inverted-U relationship requires a measure of democracy with a middle level, they cannot use a dichotomous variable for democracy. They employ the Polity measure.

To test their hypothesis, Hegre et al. consider the determinants of the onset of civil war. Because this is essentially a problem of duration, they use a Cox regression model, the details of which can be found in their article (2001: 35-6). The control variables they include in their analysis are: **Proximity of regime change**,[14] **Proximity of civil war**, **Proximity of independence**, **International war** (dummy variable), **Neighboring civil war** (dummy variable), **Development** (measured as energy consumption), and **Ethnic heterogeneity**. The details of how these variables are measured, as well as why they are included in the specification, and the implications of their effects are described in Hegre et al. (2001). In this paper, I restrict my attention to the effects of democracy.

Column 1 of Table 3 (Labeled "**Polity**") reproduces the results of Hegre et al., showing that level of democracy has a positive effect on the onset of civil war for low levels of democracy and a negative effect for high levels of democracy.[15] Recall that the

[13] Although, as mentioned above, Elkins (2000) shows that a dichotomous measure may fail to detect a significant relationship where a continuous measure succeeds.

[14] This variable – **Proximity of regime change** – is problematic for me since Hegre et al. follow the Polity coding of regime change. However, in the interest of reproducing their results (varying only the measure of democracy in different specifications presented below), I decided to include their variable as originally used. Interestingly, when I re-ran the analyses presented in Tables 3 and 4 (below), all of the substantive results regarding the various measures of democracy held.

[15] I am grateful to the authors for making their data and statistical routines readily available on the Internet.

Polity measure runs from –10 to +10, so the insignificant coefficient on democracy coupled with the significant negative effect on the quadratic term (democracy-squared), indicates that the inverted-U relationship is symmetric around the 0-level of democracy.

Table 3: Risk of Civil War using different conceptions of Democracy

	Conception of Democracy					
Explanatory variables	**1 Polity**	**2 Parcomp**	**3 Parreg**	**4 Xrcomp**	**5 Xropen**	**6 Xconst**
Proximity of regime change	1.27** (0.47)	1.17** (0.51)	1.16** (0.51)	1.30** (0.59)	1.31** (0.59)	1.37** (0.49)
Democracy	**-0.002 (0.021)**	**0.061 (0.090)**	**-1.25* (0.64)**	**0.09 (0.08)**	**0.17 (0.36)**	**-0.04 (0.07)**
Democracy squared	**-0.012** (0.005)**	**-0.128* (0.071)**	**-0.66** (0.30)**	**0.38 (0.33)**		**0.03 (0.03)**
Proximity of civil war	1.16** (0.35)	1.43** (0.35)	1.40** (0.36)	1.77** (0.46)	1.74** (0.44)	1.55** (0.33)
Proximity of independence	1.51 (0.97)	1.63 (1.20)	1.84 (1.18)	2.15* (1.20)	2.28** (1.12)	1.66 (1.26)
International war in country	0.86 (0.59)	1.49** (0.44)	1.62** (0.40)	1.61** (0.38)	1.61** (0.38)	1.57** (0.40)
Neighboring civil war	0.10 (0.33)	0.24 (0.32)	0.26 (0.33)	0.29 (0.36)	0.24 (0.38)	0.25 (0.32)
Ln(Energy consumption)	-0.48** (0.16)	-0.75** (0.18)	-0.81** (0.17)	-0.68** (0.20)	-0.65** (0.21)	-0.79** (0.18)
Energy consumption squared	-0.07* (0.04)	-0.11** (0.05)	-0.12** (0.04)	-0.11 (0.07)	-0.10 (0.08)	-0.13** (0.05)
Ethnic heterogeneity	0.80** (0.39)	0.84* (0.45)	0.86* (0.45)	0.86 (0.54)	0.85 (0.52)	1.01** (0.48)
	Standard errors in parentheses					
Log likelihood:	-254.76	-209.80	-209.31	-143.44	-144.55	-211.22
Number of countries:	152	151	151	150	150	151
Number of events:	63	54	54	39	39	54
Time at risk:	8262	8104	8104	7179	7179	8104

** Indicates significance at the 95% confidence level. * Indicates significance at the 90% confidence level.

Measure of Democracy:

Parcomp:	Competitiveness of Political Participation
Parreg:	Regulation of Political Participation
Xrcomp:	Competitiveness of Executive Recruitment
Xropen:	Openness of Executive Recruitment
Xconst:	Constraints on Chief Executive

The 5 components of the polity measure were transformed from the original data to reflect the codes listed in Table 1 because this is how they are included in the combined Polity index.

The problem with the Polity result is that it is devoid of meaning. What is a mid-level of democracy according the Polity index? As shown above, there are literally hundreds of different combinations that can lead to a "middle-level." By conflating all of these combinations into one measure, we assume that they are all equivalent.

Suppose one were to give policy advice to avoid civil war based on this finding about a high-risk, mid-level democracy. Could one suggest policies to increase democracy beyond the dangerous mid-level? What would have to change? Well, policy should be taken to increase – according to arbitrary ordinal scales – either the competitiveness of political participation, or the regulation of political participation, or the competitiveness of executive recruitment, or the openness of executive recruitment, or the constraints on chief executive. Improvements in any of these areas have been assumed *a priori* to be equivalent.

This is not exactly precise policy advice. And it is wrong. Not all of the Polity components can produce the inverted-U shaped relationship. The relationship only holds at the 95% level of significance when the components are arbitrarily combined into the Polity index. Columns 2 through 6 in Table 3 test to see if the inverted-U shaped relationship holds for any of the 5 components of the Polity measure. It turns out that the measure only holds for one of the 5 dimensions: **Competitiveness of Political Participation** (**Parcomp**), and the relationship is significant only at the 90% confidence level. For **Regulation of Political Participation** (**Parreg**) there is a significant, monotonically *negative* relationship. For **Competitiveness of Executive Recruitment** (**Xrcomp**) the relationship is not statistically significant. For **Openness of Executive Recruitment** (**Xropen**) there cannot be an inverted-U relationship because the variable only takes on 2 values; and it is not significantly correlated to civil war onset. For **Constraints on Chief Executive** (**Xconst**), the relationship is not significant, but the signs of the coefficients indicate a U-relationship – the mid-level on this variable is the *least* likely to experience civil war![16]

It is interesting that the inverted-U relationship holds (barely) only with the contestation dimension (**Competitiveness of Political Participation – Parcomp**). Note that this is the Schumpeterian dimension of this variable. This indicates that the following story is plausible:

- Where there is no probability of contestation through election, civil conflict is repressed and civil war is unlikely.

[16] For presentation purposes, I report only specifications with each individual component of Polity separately. The qualitative patterns hold when various combinations of the components are included. Note that when all components are included together, only **Parreg squared** is significant, with a negative coefficient. This could indicate that this dimension drives the inverted-U relationship. But the sign on **Parreg** is also negative indicating a monotonically negative relationship as in Table 3. This would be significant, as presented in Table 3, except the standard error is increased by the inefficiency of including all of the other insignificant variables.

- Where there is a high probability of contestation through elections – and the results of elections are likely to be upheld – civil conflict is accommodated through peaceful means and civil war is unlikely.
- Civil war is most likely to occur in political systems where there is a mid-level probability of contestation through elections, and the same mid-level probability that the results of elections will be subverted. Under these uncertain conditions, civil war is likely to erupt.

The ideal measure to test this story is the estimated probability that key offices will be filled through contested elections – the continuous Schumpeterian conception of democracy. Table 4 presents these results using the six specifications of the probability of democracy from Table 2. Note that with my conception of democracy, I employ estimates – not measurements – as a variable. Recall that this is because probability of democracy cannot be observed, only estimated. While both estimates and measurements involve error, the errors are of a different nature. Along with each estimate is a degree of uncertainty, captured by the standard errors in Table 2.

To account for this, I employed the following method.[17] First, using Clarify software (King et al. 2000), I sampled from the distribution of coefficients from the Table 2 probit estimates of the determinants of democracy. I did so 10 times to generate 10 different estimates of the probability of democracy (for each of the six specifications). Next, I included alternatively the 10 different estimates of the probability of democracy in the estimation of incidence of civil war. The coefficients for the 10 different trials were then averaged to produced the coefficients reported in Table 4. The standard errors were also averaged and then adjusted for the fact that the coefficients from different trials have different standard errors.[18] This procedure was repeated separately for each of the six specifications of democracy from Table 2.

[17] The method follows King et al. (2001). I am grateful to Ken Scheve and Mike Tomz for their help in explaining the procedure.

[18] The formula for the adjustment is found in King et al. (2001), p53, equation 3.

Table 4: Risk of Civil War using different the Continuous Minimalist Conception of Democracy

Explanatory variables	Specification of Democracy from Table 2					
	1	**2**	**3**	**4**	**5**	**6**
Proximity of regime change	1.31**	1.36**	1.29**	1.37**	1.35**	1.15**
	0.50	0.49	0.50	0.47	0.47	0.48
Democracy	9.29**	5.69*	12.94**	3.58	7.28**	15.52**
	4.60	3.43	6.48	3.04	3.10	4.88
Democracy squared	-6.82**	-4.38*	-9.87**	-2.69	-5.47**	-11.68**
	3.18	2.40	4.35	2.35	2.38	3.60
Proximity of civil war	1.29**	1.30**	1.26**	1.39**	1.39**	1.31**
	0.36	0.36	0.38	0.35	0.35	0.34
Proximity of independence	0.29	0.58	1.47	1.36	1.17	1.68
	3.09	3.06	2.99	1.80	1.81	1.42
International war in country	1.48**	1.45**	1.50**	1.46**	1.38**	1.34**
	0.32	0.34	0.37	0.41	0.39	0.42
Neighboring civil war	0.15	0.18	0.20	0.01	0.01	0.08
	0.41	0.40	0.39	0.36	0.34	0.32
Ln(Energy consumption)	-0.62**	-0.68**	-0.63**	-0.71**	-0.66**	-0.64**
	0.28	0.30	0.30	0.20	0.21	0.20
Energy consumption squared	-0.11	-0.13	-0.10	-0.11**	-0.10**	-0.10**
	0.09	0.09	0.09	0.05	0.05	0.05
Ethnic heterogeneity	0.99**	0.92*	0.74	1.05**	0.99**	0.75*
	0.50	0.50	0.50	0.44	0.42	0.42
	Standard errors in parentheses					
** Indicates significance at the 95% confidence level. * Indicates significance at the 90% confidence level.						
Number of countries:	124	124	129	130	130	150
Number of events:	41	41	41	53	53	56
Time at risk:	6437	6437	6701	7570	7570	8044
Civil war is most likely when the probability of democracy is:	0.68	0.65	0.66	0.66	0.67	0.66

Table 4 presents these results using the six specifications of the probability of democracy from Table 2. All specifications lead to the same qualitative conclusion: The positive significant coefficient for the probability of democracy coupled with the negative

significant coefficient for the probability of democracy squared indicates that civil war is most likely to occur in mid-level democracies. Precisely, civil war is most likely to occur when $\Pr(\text{DEMOCRACY}_{i,t}=1) \approx 0.66$, holding other variables constant. The basic story of Hegre et al. (2001) is upheld when one employs the appropriate conception of democracy. All six specifications show the same pattern. The pattern is statistically significant at the 90% confidence level in all but one of the 6 specifications, and significant at the 95% confidence level in four of the specifications.

Now suppose one were to give policy advice to avoid civil war based on this finding about a high-risk, mid-level democracy. One would suggest that policies be undertaken to increase the level of democracy above the dangerous mid-level. As with the advice based on the Polity measure above, different variables could be addressed: Increasing per capita income would have a positive effect, as would increasing the proportion of other democracies in the world. Note, however, that I have not assumed the effects of changes in the variables, as is done with the components of Polity. Instead, I tested their impact above in Table 2.

Thus, this approach has two advantages. Firstly, the direct interpretation of the effect of democracy does not rely on arbitrarily assigned numbers that reflect hundreds of possible combinations of characteristics. Rather, interpretation is straightforward: **coefficients capture the effect of the *probability of democracy***. The probability of democracy is clearly defined as the probability that key government offices are filled through contested elections. Secondly, the factors that contribute to this probability are explicitly tested and their effects are estimated.

4. Conclusion

Given that all measures of democracy are highly correlated, the conception of democracy proposed in this paper may largely reproduce what is found using other measures.[19] But if we are to have a science of politics, it is important that our concepts and measures have strong analytical content. If we are to suggest that democracy is continuous – that there exists a middle level democracy distinct from other regimes – we should be able to define it.

The debate over the proper definition of democracy stretches over 2000 years. Rather than enter into this larger debate, this paper starts with the assumption that the Schumpeterian conception of democracy as codified by Przeworski et al. (2000) is valid: Democracy is a political system in which contested elections fill the important political offices. The main point of the paper is that subscribing to this minimalist conception of democracy does not preclude thinking about democracy along a continuous scale. Countries can be more or less democratic if we believe they are more or less likely to have key government offices filled through contested elections.

[19] Are they really highly correlated? Not at the pivotal mid-level. See Cheibub and Gandhi (2003) for a rigorous look at this question.

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