The Potential of Direct Democracy: A Global Measure (1900–2014)

David Altman[1]

Abstract To what extent is direct democracy achieved in current polities? To answer this question, I develop an index, *Direct Democracy Practice Potential*, which is applied to 200 polities worldwide. This index results from the aggregation of the scores of four types of mechanisms of direct democracy: popular initiatives, popular referendums, obligatory referendums, and authorities' plebiscites. This index measures: (1) how easy it is to initiate and approve each type of popular vote, and (2) how consequential that vote is (if approved). Ease of initiation is measured by: (a) the existence of a direct democracy process, (b) the number of signatures needed, and (c) time limits to collect signatures. Ease of approval is measured by quorums pertaining to: (a) participation, (b) approval, (c) supermajority, and (d) district majority. Regarding how consequential the vote is, it considers its decisiveness (whether the decision is binding), and the threat capability of citizen-initiated mechanisms of direct democracy as measured by the frequency with which direct popular votes have been used and approved in the past. Finally, the study tests the validity of the new measure, discussing its strengths and limitations.

Keywords Direct democracy · Referendums · Popular initiatives · Democracy · Quality of democracy

1 Introduction

Direct democracy in the form of popular and direct votes is not new. However, the use of direct democracy has been increasing worldwide, particularly following World War II. Mechanisms of direct democracy (MDDs) have been used in both dictatorships and

✉ David Altman
  daltman@uc.cl

[1] Instituto de Ciencia Política, Pontificia Universidad Católica de Chile, Campus San Joaquín, Av. Vicuña Mackenna 4860, Santiago de Chile, Chile

democracies; in presidential and parliamentary regimes; in poor, developing, and rich countries; in federal and unitary states; in both the south and the north; at the local, regional, and national levels of government; in times of joy and in times of trouble. Almost every imaginable political subject has been put forth for public consideration at one time or another (Butler and Ranney 1994; LeDuc 2003; Altman 2011; Qvortrup 2014). However, the lack of a measure of direct democratic rights has meant that we have been unable to determine whether direct democracy is spreading around the world, and even less capable of assessing its quality.

Thankfully, the absolute absence of cross-national longitudinal data on direct democracy has changed since the release of V-DEM database at the beginning of 2016. This database covers virtually all countries of the world (and some dependent territories) from 1900 to present, and provides a platform for systematically measuring many aspects of democracy that were nonexistent to date, including 40 variables on direct democracy.[1] Taking advantage of V-DEM, this paper fills the lacuna regarding measurement of direct democracy by offering an index designed to measure the potential practice of direct democracy at the national level.[2]

This study proceeds as follows: it first defines what is meant by direct democracy and its mechanisms, bringing order to a rather convoluted area of knowledge. Next, the paper unpacks the construction of the indices with regard to three key factors. The first dimension looks at ease of initiation of MDDs; the second considers ease of approval. The third dimension pertains to the consequences of these votes. I then present an aggregation procedure for combining these dimensions. Once we have the indices, I proceed to check their validity and present my conclusions.

2 What is Direct Democracy?

Unlike other common concepts in political science, such as "political parties" or "elections," definitions of direct democracy lack a common connotation. What we understand as direct democracy has different meanings in different places, and the different institutional components of this concept (popular initiatives, referendums, or plebiscites) have diverse normative undertones. For instance, a referendum in one country is called a plebiscite or even a popular initiative in another. Essentially, "there exists no universal referendum terminology" (Suksi 1993: 10). To complicate things further, in certain countries concepts such as "initiatives," "plebiscites," and "referendums" are often used interchangeably, even within the very same piece of legislation!

In this paper, *direct democracy* refers to an institutionalized process by which citizens of a region or country register their choice or opinion on specific issues through a ballot. It encompasses initiatives, referendums, and plebiscites, but does *not* encompass recall

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[1] V-DEM distinguishes among 7 high-level principles of democracy (e.g. liberal, participatory, deliberative, etc). It also disaggregates into dozens of lower-level components of democracy such as regular elections, judicial independence, direct democracy, and gender equality, and provides disaggregated indicators for each concept and each component. V-DEM also provides an estimate of measurement reliability for each rating whenever possible. Overall, the database is composed of more than 15 million data points. The data, including those used in this paper, are public, free of charge, and fully available to researchers at V-DEM's homepage (https://v-dem.net/en/).

[2] This measurement serves as the basis of the direct democracy index in the V-DEM database (Coppedge et al. 2016a, b), which constitutes one of the components of the participatory variety of democracy as described in greater detail by Coppedge et al. (2011).

elections, deliberative assemblies, or other settings in which the vote is not secret and the purview is restricted. It also does not apply to elections for representatives.

More specifically, I define a mechanism of direct democracy (MDD) as a publicly recognized institution wherein citizens decide or express their opinion on issues—other than through legislative and executive elections—directly at the ballot box through universal and secret vote. Secret voting is a necessary condition, without which, any mechanism of direct democracy (hereinafter MDD) is not possible.

For this research I distinguish between two major groups of mechanisms of direct democracy. The first group is composed of those MDDs initiated by signature gathering, also called "citizen-initiated" (CI-MDDs): popular initiatives and referendums. The distinction between popular initiatives and referendums is crucial. Popular initiatives are designed to alter the status quo, whereas referendums are created to prevent change. The second group is composed of those MDDs that are (directly or indirectly) initiated by authorities: mandatory referendums and plebiscites.[3] Figure 1 graphically demonstrates the different types of MDDs addressed in this research.

Description:

- *Popular initiatives (PI)* A popular initiative is a bill, statute, or constitutional amendment supported by a group of citizens that offers an alternative to the status quo. Citizens are allowed to decide directly at the ballots on matters of concern to them, without the consent of the country's main political officials. They therefore serve as a proactive institution on certain topics.
- *Referendums (RF)* Unlike popular initiatives, optional referendums allow citizens to reject a law passed by the legislature (the "people's veto" in US jargon, also sometimes called a "popular referendum" (Donovan 2014)). Citizens move second, i.e. they react to a previous move by the authorities. It is a "defensive" instrument in the hands of citizens, par excellence.
- *Obligatory referendums (OR)* These are, in most cases, limited to certain specific topics in the constitution or—as in Switzerland, Uruguay, and even all but one of the American states (Delaware)—to an amendment of the constitution. Strictly speaking however, it is not a right the population uses in any active way. Rather, it is a defensive right or a veto right.
- *Authorities' plebiscites (PL)* Plebiscites are those mechanisms of direct democracy that allow authorities to pose a question to the citizenry to answer. These institutions are not necessarily related to popular sovereignty in its traditional sense, which is why some scholars claim that they cannot even be characterized as belonging to the direct democratic world (Kaufmann and Waters 2004).[4] Though leaders can use plebiscites perversely, during the vote itself citizens exercise their sovereignty and are thus still fulfilling the definition of MDD provided above.

The first question to address is as follows: *how can we determine the amount of direct democracy in a particular time and place?* Although the next section offers the rationale

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[3] While there is neither "universal referendum terminology" (Suksi 1993: 10), nor a unique typology (see Hug and Tsebelis (2002), Vatter (2009)), here I employ the terminology used by the *National Conference of State Legislatures* (http://www.ncsl.org/), the *Initiative & Referendum Institute* of the University of Southern California (http://www.iandrinstitute.org/), and the *Centre for Research on Direct Democracy* of the University of Zurich (http://www.c2d.ch/).

[4] They claim "Plebiscites have nothing to do with initiatives and referendums; on the contrary, they are often used by governments who want to get a special legitimacy on their policies by bypassing existing laws and constitutional rules" (p. xix).
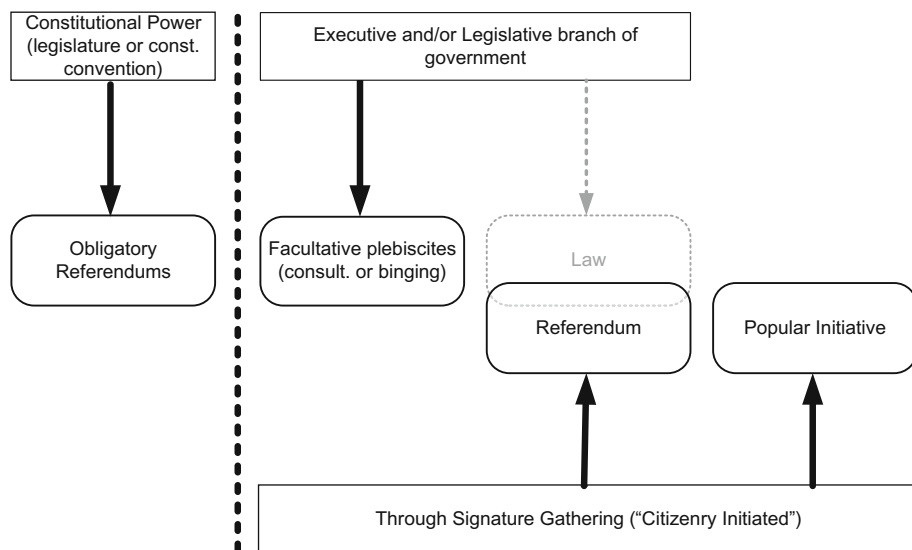
Fig. 1 Simplified procedural typology of mechanisms of direct democracy

behind the construction and operationalization of an index that will help answer this question, let me first delineate some of the tricky problems associated with such an endeavor.

To begin with, the credible menace of triggering a CI-MDD (a reactive referendum or a proactive popular initiative) plays a crucial role in moderating political decisions and shifting the political course even before the gathering of signatures starts (e.g. Papadopoulos 2001). Several years ago I asked former Uruguayan presidents Jorge Batlle and Julio María Sanguinetti whether they took into account the fact that a popular referendum could potentially be triggered when they submitted a bill to congress. Their answers were crystal clear. Sanguinetti argued: "If one did not take that into account, he was almost committing suicide. It was decisive." Batlle said: "Of course! What—the other players do not play?" (for the complete interviews with former presidents, see Altman 2011: 180–186).[5] The problem thus becomes quantifying something which seldom occurs, while its potential use has an enormous impact on political life. This has been called the "indirect effect" of direct democracy (Matsusaka 2014) or the *direct democracy paradox* (Altman 2013).

Thus, simply counting occurrences of MDDs is meaningless for measuring how much direct democracy potential exists in a given country. Such an approach to measurement would "reward" divided societies where agreements are not attainable and thus everyone uses all the institutional ammunition at their disposal to reach their goals (for example:

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[5] This is not a particularity of relatively healthy democracies such as Uruguay or Switzerland (Papadopoulos 2001) or the United States (Gerber and Lupia 1995) where this phenomenon has been studied in great detail. This can also happen in non-democratic regimes such as Iran, as evidenced by Erdbrink (2015), where the threat of a referendum may be sufficient to change politics at the highest levels. Of course, this is a hard thing to measure, but it is a good example of where "de jure" features of a constitution may matter more than we think.

popular initiatives).[6] On the contrary, a society where settlements are found before everyone uses the strongest weapon at their disposal—i.e. an MDD—would be "punished." Thus, conceptually, two different places might have the very same 'amount' of direct democracy, but in 'A' several MDDs are held per year and in the other, 'B,' MDDs only appear once in a while (Altman 2013: 622).

Typologies, scales, and even indices of direct democracy are relatively new in the discipline. Most of these endeavors face one or more of six major flaws, to differing degrees. First, they are tailored to a limited number of observations and thus their generalizability is reduced as most of those observations (like cantons in Switzerland) share many attributes.[7] Second, some of these indices use an overly fluid concept of direct democracy and fail at concept specification. In other words, they do not set a clear line between what direct democracy is and what it is not. Third, they fuse *Top Down-MDDs* and *Citizen Initiated-MDDs* into the same category. There are dozens, if not hundreds of plebiscites, called in an ad-hoc manner by leaders who are just seeking some form of legitimization, mobilization, or simple delegation of a difficult decision to the citizenry. Of course, not all TD-MDDs (e.g. plebiscites) are alike, but calling a plebiscite usually results from one of these incentives. Fourth, they tend to follow formalities in constitutional texts, ignoring semantics: what one country calls a plebiscite, can just as easily be called a popular initiative in another. Fifth, they mix the potential use of MDDs with their actual use in a general and somewhat cryptic way. This is problematic because we cannot differentiate whether we are measuring the occurrence of MDDs or assessing the potentiality of direct democracy. Finally, the very few and partial indices of direct democracy only provide a cross-sectional picture at a given point in time; they do not allow us to study the evolution of this political dimension. To overcome the problems mentioned above, I propose new measures for assessing the direct democracy potential that exists in any given country of the world since 1900.[8]

3 Indices of Direct Democracy

This section advances an index of direct democracy that takes into consideration how easy it is to initiate and approve each type of popular vote and how consequential that vote is (if approved). Each term is composed primarily of indicators available from the V-DEM data set either directly, or after a transformation. I coded each country based on its de jure features (usually constitutional), but also took into account de facto direct democratic "ventures" (usually performed by autocrats). The rule used for non-independent states (e.g. colonies) is a presumptive zero, which allows for the combination of this index with other V-DEM indices.[9]

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[6] This type of approach was taken by Tolbert et al. (2001).

[7] These studies have either countries as units of analysis, such as those in Continental Western Europe (Gross and Kaufmann 2002; Vatter 2009), Latin America (Breuer 2011; Madroñal 2005), and South East Asia (Hwang 2005), or subnational units, most notably Swiss cantons (Freitag and Stadelmann-Steffen 2010; Trechsel and Serdült 1999; Frey et al. 2001; Stutzer 1999), American states (Gerber 1999; Bowler and Donovan 2004), or German Länders (Scarrow 1997; Schiller 2011; Vatter and Stadelmann-Steffen 2013)).

[8] Popular votes do not occur in an institutional vacuum and the extent to which they are free and fair is crucial in the same way it is for regular elections. Perhaps, as with any electoral procedure, a popular vote held in an autocratic setting is notably different from the same type of vote in a democratic context.

[9] I am aware that there were some cases in which MDDs occurred in non-independent states. The major problem I face in coding them is that in several cases, the votes took place in territories that are

There are important differences at the procedural level for the deployment of popular votes across countries and time, even when studying the same type of MDD (e.g. popular initiatives). These differences are crucial for assessing the degree of potential use of direct democracy (e.g. in terms of the amount of signatures required, participation and approval quorums, circulation time limits, qualifiers, etc.). For instance, the higher the percentage of signatures needed to carry on a popular initiative, the lower the probability of such a popular vote occurring since only powerful and resourceful organizations can afford such enterprise. Likewise, the shorter the available time to gather signatures endorsing a potential popular vote, the smaller the potential use of these institutions. MDDs may also simply be "guns without triggers" if the chances of producing political change are virtually zero regardless of the frequency of their use. This stands in stark contrast to the few indices the literature has advanced thus far, which tend to fuse these two dimensions into one—a problematic approach for the reasons previously mentioned.

We can imagine a situation in which the triggering of an MDD is relatively easy, while the probability of that MDD being approved is quite slim due to, say, extremely high participation quorums.[10] These are theoretically distinct dimensions for which an index must account. The first dimension considers how much potential exists for the use of an MDD in a given country for a given year (i.e. how "easy" it is to trigger an MDD). The second dimension refers to, once an MDD is qualified, how probable it is that this institution will achieve its purpose (*changing or altering the status-quo*).[11]

3.1 How Easy is it to Trigger an MDD?

It would be extremely easy to trigger a direct popular vote if it required only 1 % of the electorate's support; however, having a popular vote does not mean that the chances of a measure being approved are higher, especially if we need an affirmative vote of, say, 80 % of the electorate. I claim, then, that there are certain institutional characteristics that are crucial for triggering popular votes and others that are crucial for those votes being approved.[12]

For a popular vote to be triggered it must first exist as an institution; I call this "Existence" ($\exists$). If there is no legal provision for initiatives or referendums, this term has the

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Footnote 9 continued

circumscribed to different current countries (e.g. French and British Togoland, British Southern and Northern Cameroons, Southern Rhodesia, Danish West Indies).

[10] Let me illustrate with two prodigious users of direct democracy: Switzerland and Uruguay. In Switzerland it is extremely easy to qualify a popular initiative as the requirement for a minimum number of signatures is one of the lowest cross-nationally (100,000 signatures, which represent less than 2 % of the electorate); in Uruguay, however, an initiative must have at least 10 % of the signatures of the electorate to qualify. At the same time, the chances of approving a qualified CI-MDD in Switzerland are lower than in Uruguay because of the requirement of double majorities (citizens and cantons). In Uruguay, a majority of the electorate determines the fate of the initiative (as long it represents 35 % of the electorate), which is far lower than a double majority.

[11] Of course, I could think that in the long run, knowing popular votes' previous results might influence the prospect of some groups attempting to qualify a CI-MDD, but even so it might not necessarily undermine the chances of triggering a CI-MDD per se. The question, therefore, is which characteristics are crucial for triggering and which are crucial for approval.

[12] If the country under consideration is federal, then this index should ideally correspond to the average of the sum of each subnational unit (the same logic applies for the rest of the terms). In this research, however, only the national dimension is covered. Finally, as it happens with most democracy indices, this index does not include subnational uses of/rights to use MDDs regardless of how intensive their use may be (American states, Swiss cantons, German länders, etc).

minimum value (zero). All procedures in the hands of citizens must fulfill some required minimum level of support. This support is universally obtained through signatures; I call this term "Signatures" $(1 - S)$. This term is the portion of signatures of the whole electorate required to trigger the DD measure. If 25 % of citizens must support the measure, then this term equals 0.75 (i.e. 1–0.25). The more signatures required, the more difficult it is to trigger the CI-MDD. As TD-MDDs are triggered by some combination of authorities' desires, they do not require the gathering of signatures and the like.

It is also apparent that it would be harder to gather the required signatures if the time available time to do this was just 3 months versus, for instance, 1 year. I call this term "Circulation Time" (CT); the less CT, the more difficult it is to trigger the CI-MDD. Aware that the cut points are rather arbitrary, I take 1 year as a focal point (CT = 1); if there is more time to gather signatures, CT remains at 1. If there is less than 1 year available to gather signatures, then I calculate CT as the square root of the remaining days to complete a year available to gather the signatures (scaled on a 0–1 range).[13] Thus, if the available circulation time is 3 months, then CT = 0.5 (half a year = 0.7; nine months = 0.86, etc.).

Thus, the initiation of an MDD in a particular country is calculated as follows:

$$\text{Practice Potential} \ = \ (\exists) * (1 - S) * (CT) \tag{1}$$

3.2 How Easy is it to Approve an MDD?

It is one thing to capture how easy it is to trigger a popular vote; however, it is a completely different matter to assess how consequential that vote is. In regard to how effective these institutions may be once they are on their way, different types of quorums should be taken into consideration. Quorums and super majorities are intended to raise the bar for potential change. Sometimes, the decision at the polls is contingent on a minimum amount of citizens participating in the procedure ("participation" quorum). Other times, a minimum number of people endorsing the proposal has to be met ("approval" quorum). Occasionally super majorities are needed for a decision to be binding. Basically, quorums in general have two major objectives: to stop change and to provide legitimacy.[14]

The literature shows diverse treatments of quorums. The most typical way to deal with them has been to think of them as a series of dummy variables (regardless of whether there were any statistical models), as if they are completely independent from each other. This is incorrect because they are intimately related. Therefore, one might think that the multiplication of quorums is a fairly straightforward measure of their interaction, and it is easy to calculate. But this is also problematic because their relationship is more complex; actually, we can think of the approval quorum as a subset of the participation quorum as it is impossible to obtain, say, a 40 % endorsement of a measure without at least 40 %

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[13] I could have opted for a logarithmic transformation, but the shape of the obtained line does not fit my theoretical expectations, particularly when only a few days are available to gather signatures.

[14] As Maniquet and Morelli comment: "quorums are a simple way of protecting the status quo" (Maniquet and Morelli 2010: 2), "a low turnout in referendums is seen as a threat to their legitimacy" (Qvortrup 2002: 164). It has been shown elsewhere that participation quorums may have a pernicious effect on the process of direct democracy as they produce incentives for strategically derailing certain proposals through vote abstention, thus helping in not reaching the quorum. Not only are they expected to decrease electoral participation, but they may also violate the secrecy of the vote (see Altman 2011: 18–24; Aguiar-Conraria and Magalhães 2010a, b). Since the incentives to abstain disappear under approval quorums, they are considered superior—better institutional tools—than participation quorums.

participation. Hence, the multiplication method punishes countries that simultaneously require two or three quorums. Let me explain.

As studies by Côrte-Real and Pereira (2004), Aguiar-Conraria and Magalhães (2010a, b), and Altman (2011) have demonstrated, all possible results of an MDD can be represented on a surface delimited by two orthogonal axes (yeas and nays), thereby taking into consideration their interaction with participation and approval quorums. Here, I take a step further, fusing participation quorums, approval quorums, and super-majorities into a new variable that calculates the polygon's surface within the mentioned surface, OAC (the shaded area in Fig. 2.) I call this variable the *Status Quo Surface* (SQS). The larger the area, the more protected the status quo. Having used traditional arithmetic operators to fuse quorums (such as by averaging or multiplying them), for a country with "a" approval and "p" participation quorums in Fig. 2, I would count shaded regions ε and δ twice, over-estimating the combined effect of two or even three quorums simultaneously in a given place. Though SQS and the multiplicative term are highly correlated, SQS is the best measure in this regard. (See the appendix for interpretation of the figure, and most importantly, how exactly I calculate this variable.)

Some federal countries such as Switzerland or Australia require double majorities for particular types of MDDs to be approved (i.e. they must win both a majority of citizens' votes and a majority of states in the country). Ceteris paribus, these *administrative quorums* or *double majorities* are more difficult to obtain because there are other institutional veto players to overcome along the way. AQ is operationalized as follows:
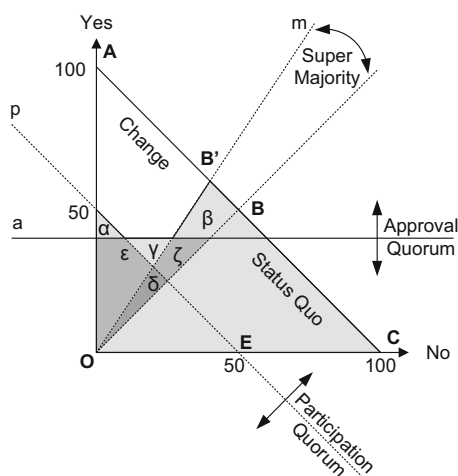

Fig. 2 Fusing all quorums into SQS. The line that represents the approval quorum (line *a*) is always parallel to $\overline{OC}$ *Note* The line that represents the participation quorum (line *p*) is always parallel to $\overline{AC}$. The line that represents the super-majority (line *m*) always originates at *O*. In case these requirements exist in combination: Any point falling in sector α is defeated by participation quorum. Any point falling in sector β is defeated by super-majority requirements. Any point falling in sector γ is defeated by approval quorum. Any point falling in sector ε is defeated by participation AND approval quorums. Any point falling in sector ζ is defeated by approval quorum AND by super-majority requirements. Any point falling in sector δ is defeated by participation AND approval quorums AND super-majority requirements

$$AQ = 0.5 + \left(\frac{1 - RD}{2}\right)$$

where RD represents the fraction of the required districts for approval.

For a country that needs half of its districts to approve an MDD (such as Switzerland) AQ = 0.75; in cases where all districts are required to approve an MDD (such as Tanzania, with Zanzibar and the continental districts' approval required) AQ = 0.5. Thus, the effectiveness potential of CI-MDDs existing in a particular country is calculated as follows:

$$\text{Effectiveness Potential } = (1 - \text{SQS}) * (\text{AQ}) \tag{2}$$

3.3 How Consequential is the Vote?

Finally, there are two variables that deserve some attention as they conceptually stand on their own merit, (i.e. they are not related to either the qualification of an MDD or how easy it is to approve a popular vote). The first of these two is the *decisiveness* of the MDD (D). This variable, relates to whether the decision reached at the polls constitutes a binding resolution (D = 1) or simply an expression of popular desire (D = 0.75).[15] Though, decisiveness does not constitute an "entrance toll" for an MDD, it does also affect the incentives for starting the process at all.

The second variable is called "credible threat" (T) and is relevant for citizen-initiated MDDs. By credible threat I mean the effectiveness of the menace of a CI-MDD. Sometimes, a group of citizens can threaten that, if a certain decision is not made or changed, they will launch a popular initiative (or a referendum for that matter) to make the change themselves, regardless of what the authorities (executive and/or legislative) want. Yet, if citizens have never used such an institution, the threat is not as credible as if they have used it before, let alone if the previous use was successful. Thus, the threat is mediated by the time elapsed since the instrument was previously used and how successful it was.

Therefore, a credible threat should be understood as a discount factor or a decay function that occurs since the last time a particular type of CI-MDD occurred. This decay function will asymptotically approach the threshold of a credible threat for countries that have the legal possibility of initiating a CI-MDD, yet have never experienced one. In other words, once we reach a certain distance from the last CI-MDD, that particular CI-MDD is no longer a threat. Though I can assume that a political repertoire lasts for about 20 years, it makes sense to think that the second year after a particular event—when memories are notably fresh—is drastically different than some 19 years later.

In some countries, once a CI-MDD is qualified by citizens, the realization of the vote is concurrent with the next election for authorities. I should therefore account for the electoral cycle in order to not punish a popular vote qualified during the first year of a given electoral cycle in case such a rule exists. Within the democratic world, the largest gap between elections is 5 years (e.g. France, Ireland, United Kingdom, Uruguay); I use that number as a benchmark.

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[15] Regardless of whether the decision is binding, any decision taken directly has a great dose of legitimacy that is hard to undermine, particularly under a democratic regime. Thus, a consultative vote is more than "half" but less than a binding vote.

In a given political cycle the threat of a CI-MDD is equal to 1 during the first 5 years and from the 6 year onwards the threat decreases linearly by 0.06 units yearly, if the CI-MDD was successful. This means that by the 20th year after the occurrence of that CI-MDD the threat level reaches 0.1, which is the baseline I use for those countries that have the legal apparatus to hold a particular MDD but have never experienced one.[16] If the use of a given CI-MDD was not successful, the future potential menace loses some credibility. Thus, in this case, the first 5 years account for 0.9 and then the decay function decreases by 0.1 yearly. I call this the long cycle.[17]

The idea of being sensitive to actual occurrences of MDDs instead of just potential rights is based on previous works on the quality of democracy. Altman and Pérez-Liñán have studied how effective participation and competence are in the context of Latin American democracies, going beyond the mere existence of the right to compete and to participate as, until their 2002 paper, there had been a virtually hegemonic way of understanding democracy (Altman and Pérez-Liñán 2002). This approach is shared by several scholars and reaffirmed by colleagues such as Przeworski who, in a thoughtful passage, stated:

> Take, for example, Freedom House's ranking of countries. They rate countries according to whether people are free to do things. So the United States ranks close to the top. Americans are free to form political parties, they are free to vote. But they don't form political parties, and half the population doesn't vote, even in presidential elections. I find ideologically tainted and unconvincing this idea of freedom as an abstract potentiality divorced from the ability to exercise it. Rosa Luxemburg once said, "The problem is not to be free, but to act freely" (Przeworski in Munck and Snyder 2007: 477).

3.4 Aggregation

Although I have put forward all of the crucial components we must take into account to construct the index of direct democracy potential for each country-year, I have not yet discussed the aggregation of these components. Of course, as Munck and Verkuilen carefully state (2002), before engaging in the architecture of this index theoretical considerations should take priority over empirical in the choice of aggregation rules.

As presented, there are two (or three) big components depending on whether the considered MDD is a TD-MDD or a CI-MDD respectively, namely: the ease of triggering, the ease of approval, and how consequential the vote is if approved. For each type of MDD, the ease of initiation is measured by:

- The existence of a direct democracy process $(\exists_{xti})$,
- And when considering CI-MDDs (e.g. popular initiative or referendum), we should also include:

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[16] A similar rule also applies for plebiscites and obligatory referendums just in the case a country has the legal architecture to use a particular TD-MDD but never had one. The threat score of that TD-MDD equals 0.1.

[17] As the assumption that the cycle endures for 20 years is rather controversial, I have also explored this decay function with a shorter cycle of about of 10 years. As in the long cycle, during the first five years the threat equals 1, but then it loses 0.15 yearly in case of success. In case of failure, the first five years equals 0.9 and then it loses 0.2 yearly. No substantial differences were found between the 10- and 20-year cycles.

- • The number of signatures needed $(1 - S_{xti})$, and
- • Time-limits to circulate the signatures (CT_{xti}).[18]

The ease of approval is measured by the interaction among the quorums pertaining to:

- • Participation, approval, supermajority $(1 - SQS_{xti})$, and
- • District majority (AQ_{xti}).

The vote's consequentiality is measured by:

- • The legal status of the decision made (binding or consultative) (D_{xti}), and
- • Threat Capability (frequency with which direct popular votes have been held in the past and their success), (T_{xti}).[19]

The overall measure of MDD practice potential is built upon two independent terms (triggering and approving), which are affected by how consequential the vote is. Each term works like a chain defined by its weakest link, and the aggregation provides an equal weighting to each. In other words, the ease of initiation is as important as the ease of approval. As the terms are independent from each other, but each has conditions of mutual necessity, I propose an aggregation architecture of the practice potential for each MDD that does not adhere uniquely to defaults such as additivity, but combines two logic operators $(*)$ and $(+)$ (Goertz 2005). From the perspective of aggregation, each MDD's practice potential becomes a complex index and it is aggregated using this formula:

$$MDD\_PP_{xt} = [(\exists_{xti})(1 - S_{xti})(CT_{xti}) + (1 - SQS_{xti})(AQ_{xti})](D_{xti})(T_{xti}) \qquad (3)$$

where x refers to country, t to a particular year, and i to a particular MDD.

Following my theoretical expectations about the differing natures of MDDs explained in the first section of this paper, I need to check whether they can be aggregated into family indices; after all, "the number of dimensions in a concept is an empirical question" (Coppedge 2012: 26). Still, this decision goes beyond pure theoretical matters (Bollen and Grandjean 1981). As explained by Coppedge, Alvarez and Maldonado:

> If a researcher assumes that a phenomenon varies along just one dimension but then constructs a single indicator of it by adding together some indicators of one dimension and some indicators from another dimension, she increases measurement error […] And because the extra empirical dimensions in the data create systematic

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[18] By definition there is no signature gathering for obligatory referendums or authorities' plebiscites.

[19] Sometimes, leaders call for plebiscites without the legal framework needed to do so. These "ad hoc" plebiscites are usually justified by governments as a means to bypass national emergencies or crises, and are recurrently based on "façades of legality" through sometimes-obscure administrative acts. The question is what status to assign to a regime that has no permanent constitutional authorization for plebiscites but uses them nonetheless, perhaps even regularly. There are two alternative ways to deal with this problem: treat them either as single events or as lasting characteristics of the regime where they occur. Whether we treat them as single events ("flashes" of direct democracy) or lasting characteristics of the regime depends on the research question at hand. Sometimes we need to measure discrete events of direct democracy, other times we are more interested in the ongoing character of a regime. Here I treat them as flashes of DD rather than a lasting characteristic of a regime for two reasons: first, I do not have reliable information about the length of each regime in each country on earth; and second, treating them as flashes provides valuable information which enriches the analysis particularly if combined with polyarchy indices. In any case, given the index for assessing the potential for plebiscites was composed by two terms, the first being $(\exists) * (D)$ and the second $[(1 - SQS) * (AQ)]$, for "ad hoc" plebiscites the first term will be zero for the whole period that a particular government was in power.

measurement error, they bias the interpretation of any findings that may emerge. […]
On the other hand, if a researcher supposes the phenomenon to be multidimensional
and creates a separate indicator for each dimension, yet empirically those indicators
are unidimensional, then collinearity will make it practically impossible to distin-
guish one from another (Coppedge et al. 2008: 632).

In checking whether my indicators could be aggregated into higher level indicators, I
rely on factor analysis (see Table 1). Two factors are obtained and are consistent with my
theoretical expectations. Factor 1 is composed of popular initiatives and referendums.
Factor 2 comprises obligatory referendums and plebiscites; however, it is much more
problematic to interpret as the *uniqueness* of both of its components is quite high. In other
words, Factor 2 pulls obligatory referendums and plebiscites together; however, the
uniqueness of these two types of MDDs calls into question any assumption of common
variation; indeed their correlation is quite weak (r = 0.22).

Given these results, I proceed with the extraction of the loadings of the underlying
process affecting popular initiatives and referendums. I call this factor "bottom-up" (BU).
As expected, it is weakly associated with obligatory referendums (r = 0.30), and not
associated with plebiscites whatsoever (r = 0.08). Thus, I can make a clear separation
between those that are CI-MDDs (popular initiatives and referendums) and the rest (ple-
biscites and obligatory referendums), which do not constitute a strong group by them-
selves. These data are multidimensional, where three dimensions are present.

Given the multidimensional nature of these data, I have two options at this point. Either
I stop here with discrete indicators for these distinct dimensions or I continue toward a
more aggregated index of *Direct Democracy Practice Potential* (DDPP). The first choice
has the advantage of avoiding any risky assumption about how these dimensions might
combine. The disadvantage is that we are left without a single summary indicator of DDPP
(something that could be notably useful for certain research questions) (Coppedge 2012).

Risky as it is, I proceed to integrate both indices into a higher level index pertaining to
the overall *Direct Democracy Practice Potential*. Fusing the original four indicators into a
higher level index requires a clear definition about how these dimensions of direct
democracy combine. The way they combine must be perfectly consistent with the defi-
nition of the higher level index (Goertz 2005). The amount of DDPP is determined by the
presence of either of either terms or their combination. In other words, as no indicator (PI,
RF, PL, OR) is a necessary condition for having some DDPP, I do not have to make a
demanding aggregation rule such as multiplication or geometric mean. A simple
aggregative index seems appropriate.

Still, some considerations must be made. As observed in the aggregation above, the ease
of initiation is more demanding for CI-MDDs than for TD-MDDs, as they include extra
components (signatures and circulation time), which interact with the mere existence of the
MDD. Accordingly, CI-MDDs run with an ingrained disadvantage as no popular initiative

Table 1 Rotated factor loadings (pattern matrix) and unique variances for MDDs in independent polities
since 1900 (n = 13,008)

Variable	Factor 1	Factor 2	Uniqueness
Citizen initiatives	0.7432	0.1035	0.4370
Referendums	0.7473	0.0419	0.4398
Obligatory referendums	0.2527	0.3519	0.8123
Plebiscites	0.0687	0.3626	0.8638

or referendum can be initiated without collecting a certain amount of popular support (signatures) in a pre-established timeframe. I expect the terms for CI-MDDs to be systematically lower as compared with those terms for TD-MDDs. In other words, though each type of MDD (PI, RF, PL, OR) can reach a similar maximum theoretical value, it is highly unlikely to be the case.

A simple addition of the scores of each indicator would provide a biased picture favoring TD-MDDs versus CI-MDDs. The question is how to compensate CI-MDDs for the "price" paid for signatures, circulation time, and threat credibility. In order to estimate this compensation I take the year 2014 into consideration. In this year, of the 197 countries analyzed, 45 allowed popular initiatives and 28 had referendums. The indicator for required signatures was on average 0.92 for PI and 0.93 for RF (which means that signatures needed were about 8 and 7 % respectively). In regard to circulation time, PIs have an average of 0.90, and 0.89 for RFs. There are also discounts in terms of credible threat
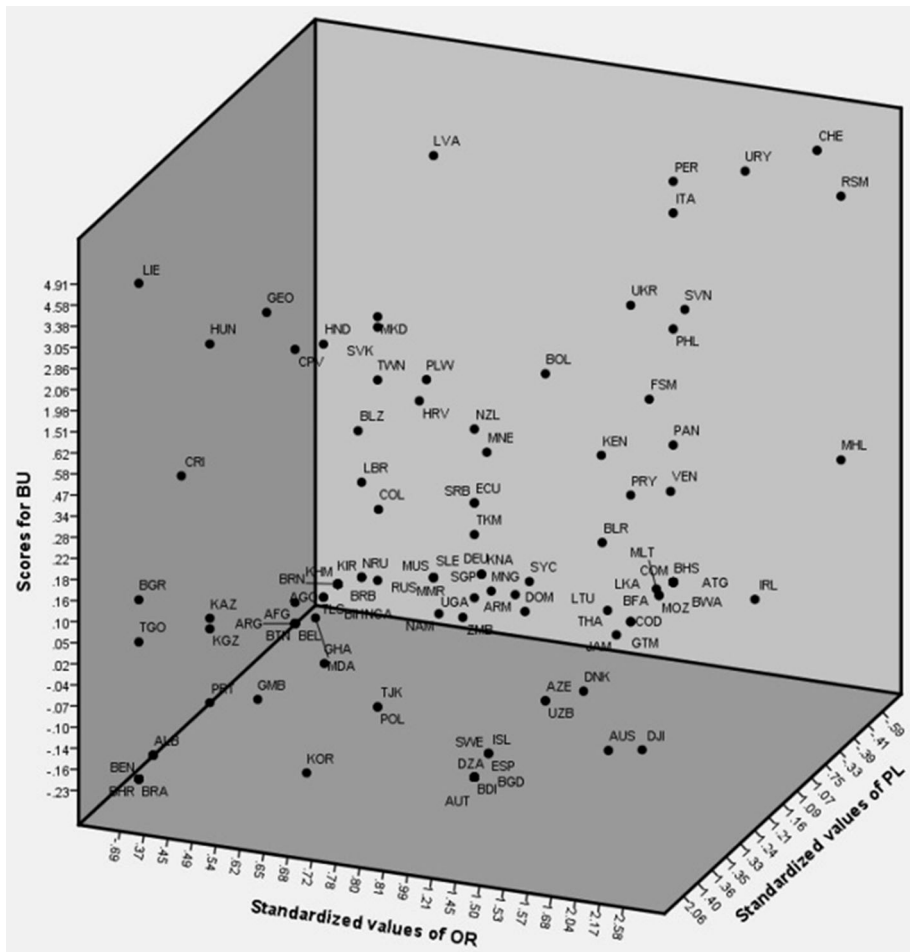
Fig. 3 Relationships between obligatory referendums (OR), plebiscites (PL), and citizen-initiated MDDs (BU) for all countries in 2010 (standardized values)

(T). The average of T for PI is 0.34 and 0.36 for RFs. In other words, on average CI-MDDs (popular initiatives and referendums) suffered a discount of about 50 %. Based on this fact, I weight CI-MDDs 50 % more than plebiscites and obligatory referendums in the aggregated DDPP. Thus, DDPP is calculated as follows:

$$DDPP = PI * 1.5 + RF * 1.5 + OR + PL \tag{4}$$

4 Validation Check

Validation of the new index is difficult because, to my knowledge, no other measure of DDPP other than that proposed here is available on a worldwide scale, and the existent measures have notorious flaws as previously mentioned. Also, given that I have strong reasons to doubt the internal consistency, aggregation procedures, and even theoretical grounding of the few and incomplete indices available as previously argued, it adds little value to validate mine against those. This does not mean, however, that validation checks are impossible.

This section is structured around two tests. On the one hand, I ask if these measures make sense and if they address the concept they purport to measure (face-validity). On the other hand, based on Campbell and Fiske (1959), I perform a discriminant validation test. It has to be noted at this point that, despite the lack of other comparable measures of direct democracy, the building blocks of this new index come from observables (not based on coders' perceptions). Therefore, measurement error is minimized, simplifying validation exams.

4.1 Face Validity

Although the literature does not provide indices like the ones I am presenting, it informs us in great detail about countries where direct democracy plays a crucial role (Altman 2011; LeDuc 2003; Butler and Ranney 1994; Qvortrup 2002). Beyond the "world-champion" of CI-MDDs, Switzerland, we can also include Lichtenstein (Marxer and Pállinger 2007), Italy (Uleri 2002), Slovenia (Nežmah 2011), and Slovakia (Tornic 2012) in Europe; as well as Uruguay in Latin America (Breuer 2011; Kaufmann et al. 2010). In regard to TD-MDDs, Austria (Vatter and Stadelmann-Steffen 2013), Denmark (Bulmer 2011), and France excel in Europe, Ecuador (Morales Viteri 2008) and Venezuela (Lissidini 2007) in Latin America, and Azerbaijan and Belarus in Eastern Europe & Central Asia.

To visually check whether these data are aligned with the literature, in Fig. 3 I graphically represent how countries are distributed in the three-dimensional space discussed in the previous section. For graphical purposes only, the year 2010 is taken into consideration. Each axis represents the standardized values of Factor 1 (BU) with obligatory referendums on the one hand and plebiscites on the other.

Results are as expected. Slicing the cube horizontally starting from the top (i.e. countries with high BU, but different degrees of PL and OR), it is possible to identify countries such as Switzerland, Uruguay, San Marino, Italy, Latvia, Hungary, and Liechtenstein, which is perfectly concordant with the literature. Cutting the cube vertically on the right side (i.e. countries with high OR, but different degrees of BU and PL), it is possible to observe Switzerland, Uruguay, Marshall Islands, Ireland, and Venezuela, which also make sense; in these countries, constitutions cannot be altered without the people's agreement.

Finally, carving off the front of the cube from the reader's perspective (i.e. countries with high PL, but different degrees of BU and OR), we encounter Togo, Benin, Bulgaria, Kazakhstan, and Kyrgyzstan, known for being highly plebiscitarian polities where politicians frequently turn to citizens to validate their political choices. This figure is extremely informative given the lack of comparable data.

As it is important to test how all countries are distributed in a given time, it may be similarly telling to see how they evolve as time passes. In this regard, the literature also provides important clues about the inception and development of direct democracy. For example, in the Latin American context, Barczak claims that in the mid-1990s "the emergence of direct democracy may be both an indicator of and a cause behind weak representative institutions" (2001: 39). Figure 4 represents how CI-MDDs and TD-MDDs evolved in Latin American countries since 1900. In doing so I combine the scores of popular initiatives and referendums into a term called the citizen-initiated component (CIC) and plebiscites and obligatory referendums into a term called the top-down component (TOC). Latin America's direct democracy is a late 20th century phenomenon, with Uruguay being the only outlier.

There are several interesting points to make within the context of "developed countries" seen in Fig. 5. It is unsurprising that Switzerland and Italy, along with the micro-states of Liechtenstein and San Marino, show extremely high levels of CIC. Actually, these four countries constitute the epicenter of popular initiatives and referendums. Simultaneously, Ireland is probably the most exigent case of obligatory referendums in Europe (along with Denmark); not in vain, those two countries were the responsible for halting the adoption of the Nice Treaty in 2001–2002, the Lisbon Treaty in 2008–2009, and the Maastricht Treaty in 1992–1993 respectively (Atikcan 2015). France, conversely, can be pointed out as a
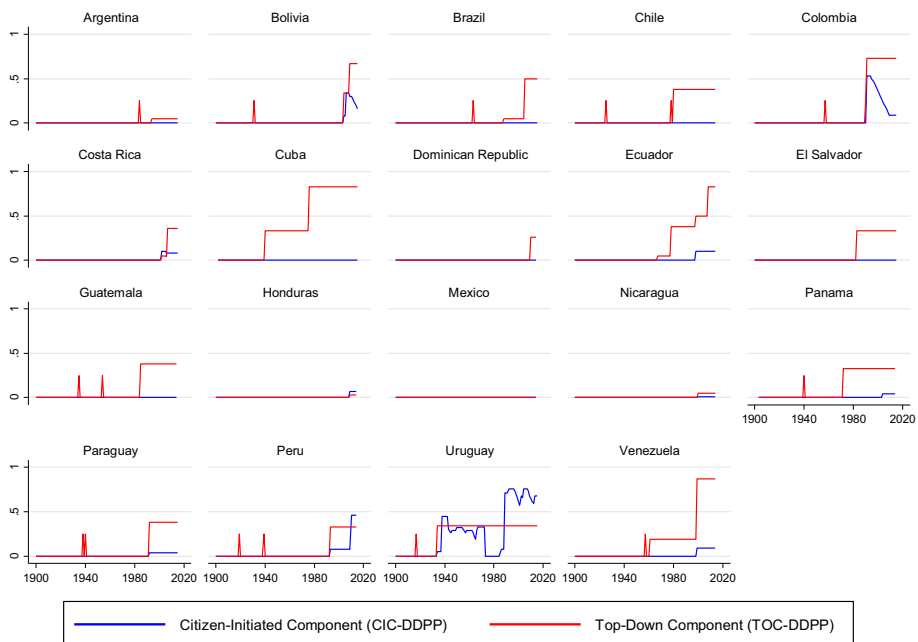

Fig. 4 Citizen-initiated and top-down components of direct democracy practice potential in Latin America
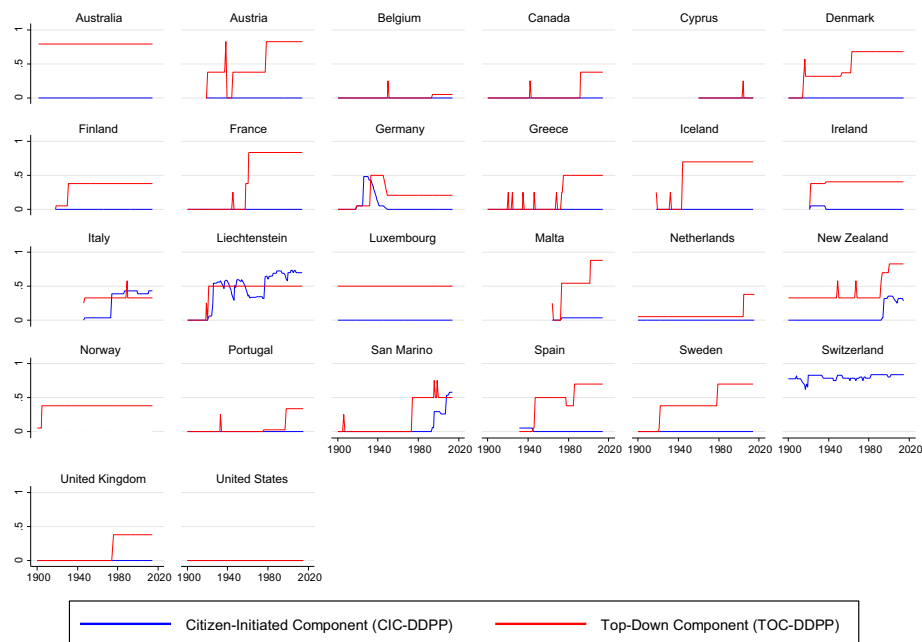
Fig. 5 Citizen-initiated and top-down components of direct democracy practice potential in western Europe and north America
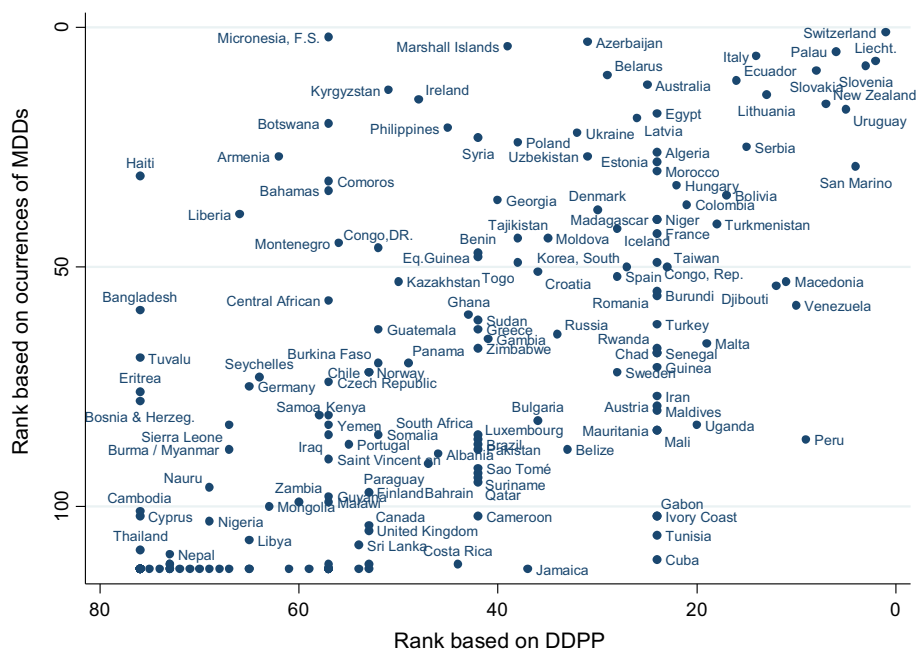

Fig. 6 Sorting countries by occurrences of MDDs and DDPP

serious contender in terms of plebiscites. The French case is crucial given its gravitational power in terms of political legacies (particularly in Africa). Finally, an interesting case that catches our eye is Germany. During the Weimar Republic in the inter-war period, Germans had an open environment for using different types of MDDs, which clearly ended with the fall of the Nazi regime.

4.2 Discriminant Validity

Though construct validity tests are also difficult to perform, I ask whether these new data provide a better approximation of the concept I am measuring if I can contrast them with another type of assessment of the same concept. As noted at the beginning of this paper, several indices estimate the amount of direct democracy by simply counting the occurrences of MDDs. From this perspective, the more events of MDDs a country has, the more direct democracy exists in that given place, ignoring the "indirect effects" or the direct democracy paradox previously mentioned.

To foresee how different my measures are from what could be characterized as a "cumulative count" of MDDs, I sort all countries from highest to lowest based on their DDPP for the year 2014. Then, I rank all countries by their cumulative MDDs up to the year 2014. I expect both measures to be relatively closely aligned at the extremes, but weakly so in the middle. In effect, both measures a moderately correlated (r = 0.66), showing that there is a fair common ground between them. This relationship is represented in Fig. 6, where the quadrants along the diagonal are quite crowded with cases.

Beyond Switzerland, which ranks first in both measures, dispersion is quite obvious. For example, at the very top-left of the figure we find Micronesia. This country excels in its massive use of obligatory referendums where dozens of constitutional amendments are submitted to the citizenry every few years. Does this mean that Micronesia has a broad DDPP? Of course not; it only reflects the extensive use of just one type of MDDs (i.e. OR). Likewise, Haiti, Botswana, and Kyrgyzstan have had a relatively intensive use of MDDs but a low DDPP; Peru, Gabon, and Mali show the inverse.

As demonstrated, these tests are a strong check to validate that my results are aligned with in-depth case studies (See Fig. 3). These new data also line up with our knowledge of the patterns of MDDs' inclusion and historic evolution (see Figs. 4, 5). Finally, these data produce better results than a cumulative index of MDD counts (see Fig. 6).

5 Conclusions

The use of mechanisms of direct democracy is growing worldwide. It is not strange that, in the context of a political conflict, the contentious make strong claims for "letting the people decide." The fact is, regardless the intentions of MDD promoters (leaders or citizens), direct democracy occupies a relevant place in the minds of political players everywhere, for better or worse. Despite the growing interest in the topic, an important limitation of the literature on direct democracy is that thus far we have not had tools to measure how much direct democracy exists in a given place. This paper has presented an original index of direct democracy to fill this lacuna.

This index measures: (1) how easy it is to initiate and approve each type of popular vote, and (2) how consequential that vote is (if approved). Ease of initiation is measured by: (a) the existence of a direct democratic process, (b) the number of signatures needed,

and (c) time limits to collect signatures. Ease of approval is measured by quorums pertaining to: (a) participation, (b) approval, (c) supermajority, and (d) district majority. Consequences are measured by: (a) the legal status of the decision made by citizens (binding or consultative), and (b) the frequency with which direct popular votes have been used and approved in the past.

I am aware that a useful index, almost by definition, has to sacrifice important, interesting, and sometimes unique country-specific aspects of the phenomenon under consideration but whose inclusion would make the index unintelligible. It is also important to acknowledge that this index is not intended to cover each and every dimension of the direct democratic world that might have an effect on the prospects of using MDDs. For example, it does not tell us anything regarding potential limitations on the topics citizens can bring to a popular vote (taxes, sovereignty) or how the vote is scheduled.

Not only did I have to omit certain aspects from DDPP's aggregation scheme, but I am also very aware that every single indicator of DDPP could be problematized. For example, one of the simplest terms in the DDPP's calculation is the quantity of signatures required to launch a CI-MDD. As simple as it appears, in some polities those signatures must be gathered from a specific amount of the state's districts (as is the case in Alaska), and may even specify the minimum number of signatures to be collected in each district. Obviously, this distribution requirement adds to the difficulty of qualifying an initiative or referendum. Yet, including it in the high level aggregation scheme could blur the meaning and power of the overall measure.

The overall results of this piece of research satisfy my expectations. The findings are suggestive, robust, and align with our knowledge from in-depth case studies and the literature in general. Moreover, for the very first time, we have global data on direct democracy covering almost 200 polities for more than 100 years each. These data not only provide an aggregated index of direct democracy potential, but are also explicit about all the building blocks supporting them. In this regard, and depending on the research question at hand, the researcher is free to choose any independent constitutive part of DDPP (e.g. PL), a group of them (e.g. CIC), or the overall measure (DDPP). These findings are likely to contribute greatly to the study of this alluring subject.
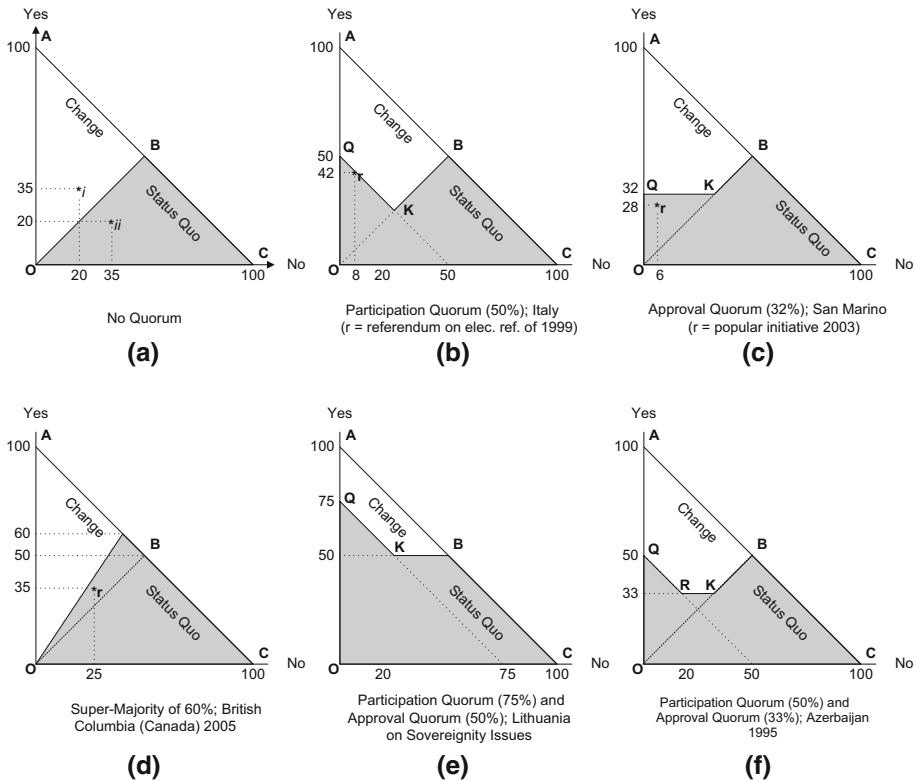
Appendix

See Fig. 7.

Fig. 7 Calculating the status quo surface. **a** There are neither quorums nor super majorities. In this case, there are no mysteries: every point falling in the shaded area is defeated; every point in the white area wins. SQS = 50 %. **b** In this case there is a participation quorum of 50 % (very common in post-Soviet European countries). The represented case corresponds to a referendum held in Italy in 1999 against electoral reform. Though the referendum was brutally successful in terms of the relative distribution of votes between the yeas and nays (91 % yeas from the valid votes), participation reached only 49.6 % and therefore did not surpass the required 50 %. This referendum failed. The SQS results from the addition of 50 % (ΔOBC) and a new triangle (rectangle with a side of 50 units) which represents 12.5 % of the $\Delta A0C$. Thus $SQS = (\Delta OBC) + (\Delta OKR) \to 62.5$ %. **c** In this case an approval quorum exists. Here, the example is San Marino with its 32 % approval rate. Again, as in the Italian scenario above, the distribution of the vote was more than clear: an evident superiority of yeas (81 %) versus nays (19 %). Nonetheless, given that the yeas represented about 28 % of the national vote, this result was not legally binding and the popular initiative was defeated. The SQS results from the addition of 50 % (ΔOBC) and a new triangle (with a side of 32 units) which represents 10.2 % of the $\Delta A0C$. Thus $SQS = (\Delta OBC) + (\Delta OKR) \to 60.2$ %. **d** Here, a super majority is needed to be successful. This case represents the popular vote following the British Columbia Citizens Assembly for electoral reform. The rules of the game stipulated that this change had to be approved by at least 60 % of the voters, otherwise it was defeated. **e** and **f** represent combinations of both participation and approval quorums

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