



## Citizens' freedom to choose representatives: Ballot structure, proportionality and “fragmented” parliaments

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### ABSTRACT

Analysis of the political consequences of electoral laws has emphasized how individual characteristics of the electoral system (electoral formulas, district magnitude, ballot structure) affect the degree of parliament “fragmentation” and proportionality. This paper argues that the personal attributes of representatives are also an important consequence of electoral laws, and that they are in part determined by citizens' freedom to choose representatives. We clarify this concept and develop an index of citizens' freedom to choose members of parliament as a function of the ballot structure, district magnitude and electoral formulas. Using data from 26 countries, we find that neither proportionality nor the effective number of parties is significantly affected by voters' freedom of choice. This result has important normative implications for electoral reform.

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### 1. Introduction

Electoral systems are perhaps the most powerful set of rules in representative democracies. There is widespread agreement that elements of electoral systems – electoral formulas, district magnitude, and electoral thresholds – influence, although not mechanically, political outcomes such as the number of political parties in parliament, the internal structure of these parties, the political stability, and the proportionality of vote shares and seat shares. In short, electoral laws have political consequences (Rae, 1971; Lijphart, 1990; Mueller, 1996). To analyze these consequences the relevant variables must be measurable. District magnitude and electoral thresholds are measured quantitatively and electoral formulas are measured qualitatively. Both variables have an impact on the political outcomes that are measured by indices such as the disproportionality

index<sup>2</sup> and the effective number of parties in parliament.<sup>3</sup> Such indices are very important to understand the likely effects of electoral reforms; namely how changes in certain variables of the electoral systems affect objectives like political stability or the fairness of representation.

The effect of electoral systems, and more specifically the effect of ballot structures, on the type of members of parliament elected received little attention during the 20th century. However, in the 19th century Mill (1861), Hare (1859) and other prominent social reformers were perfectly aware that electoral systems were crucial in determining the personality, intelligence and interests of those elected to

<sup>2</sup> In this paper we will use the disproportionality index of Loosemore and Hanby (1971) which divides by two the sum of the module of differences between each party's seat share and vote share. Gallagher (1991) suggested another index, and Bernie Grofman and others suggested that instead of scaling by one half the vote-seat deviation, it should be scaled by the effective number of parties. We agree that for some purposes of empirical analysis it is more accurate to use the effective number of parties. However, if it is necessary to disentangle the effect of an electoral system variable on proportionality and the effective number of parties, it should not be included.

<sup>3</sup> The most frequently used index is the inverse of the sum of the squared percentage of seats that each party has in parliament (see Laakso and Taagepera, 1979).

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serve as members of parliament. Mill (1861, p. 256) states: “It has been seen that the dangers incident to a representative democracy are of two kinds: danger of a low grade of intelligence in the representative body, and in the popular opinion which controls it; and danger of class legislation on the part of the numerical majority.” He was aware that a critical issue in determining “intelligence in the representative body” was the breath of political competition to access parliament, and that the level of political competition is influenced by the ballot structure and the electoral formula. In a certain sense Mill and Hare were calling attention to the personal consequences of electoral laws.<sup>4</sup>

To date, the research on the importance of ballot structures is somewhat inconclusive and it is target to the political (not personal) consequences of electoral laws. Rae (1971) formulated the hypothesis that “ordinal” ballots, where voters can choose more than one party (candidate), are more favorable to a fragmented parliament (greater effective number of parties in parliament) than a “categorical” vote, where voters have to vote for only one party (or candidate). However, he rejected the hypothesis. Subsequently, Lijphart (1990) replicated Rae’s work with more data and different methodology and reached a similar conclusion; ballot structure is not a very relevant variable in electoral systems. Lijphart only found evidence of the importance of ballot structures in plurality rule systems where the Australian “alternative” vote produces more parties than the UK plurality rule. A few authors have recently addressed the importance of the information given in the ballot (Bowler and Grofman, 2000; Carey and Shugart, 1995; Farrell and McAllister, 2006; Norris, 2004). Such disregard of this issue may be associated with the difficulty in capturing the diversity of ballot structures within a single measure.

In this paper we focus on voters’ freedom of choice. Implicitly we assume that the personal attributes of members of parliament are, in a large measure, a function of the degree of competition for a seat in parliament.<sup>5</sup> This

<sup>4</sup> John Stuart Mill was a supporter of Thomas Hare’s single transferable vote electoral formula, based on the expected effects on the representation of minorities and also the attributes of representatives. On this last point he says (Mill, 1861, p. 264): “At present, by universal admission, it is becoming more and more difficult for any one who has only talents and character to gain admission into the House of Commons. The only persons who can get elected are those who possess local influence, or make their way by lavish expenditure, or who, on the invitation of three or four tradesmen or attorneys, are sent down by one of the two great parties from their London clubs...”

<sup>5</sup> The personal attributes of members of parliament are a function of the potential pool of candidates, the effective pool of candidates and the electoral system. The potential pool of candidates is a function, among other factors, of extrinsic incentives (politicians’ pay in relation to private sector alternatives or opportunities for corruption within the political system) or intrinsic incentives (public service motivation). The effective pool depends on the potential candidates and also the institutional procedures for candidate selection (mainly intra-party competition). Finally, within a given set of candidates/parties, personal attributes of those elected depend on the electoral systems and particularly voters’ freedom of choice and voters’ ability to choose. This paper deals only with freedom of choice. Empirical research on the effects of changes in extrinsic incentives (e.g. the effects of politicians’ pay rises) is still burgeoning (see Besley, 2004; Poutvaara and Takalo, 2007). In an interesting preliminary result Katakorpí and Poutvaara (2008) found that the 20% pay rise of Finnish MPs in 2000 does seem to have had a positive impact on the education level of female candidates but not on male candidates.

competition can arise from two different processes: inter-party competition or intra-party competition. The latter has two different aspects: competition in order to be a party candidate and (in some electoral systems) competition to have the highest rank in party lists. Voters’ freedom of choice is greater when voters have more candidates and political platforms to choose from, more possibility to express their preferences, and more information about the candidates.

Therefore, one aim of this paper is to make the case that it is worth measuring freedom of choice because of its intrinsic and instrumental values. Freedom of choice is one of the criteria that should be considered in electoral reform. A second aim is to indirectly test Rae and Lijphart’s hypothesis of a quasi nonexistent relationship between ballot structure and either proportionality or party fragmentation. A third aim is to develop a synoptic index that captures different degrees of “freedom of choice” in different democracies and clarify the possible applications of such an index in testing new hypotheses. Therefore, Section 2 clarifies the concept of “freedom of choice” from the perspective of social choice theory. Section 3 builds the index from three dimensions: choices available to voters, effective preferences they can express in the ballot, and information concerning candidates. Section 4 presents empirical evidence on “freedom of choice” and how it relates to proportionality and the effective number of parties. Finally, Section 5 discusses the implications of our analysis for electoral reform and develops several hypotheses that can be further tested with the present index.

## 2. Freedom and choice: concept and measures

Liberty and freedom of choice have been extensively discussed by eminent scholars in quite different perspectives (e.g. Berlin, 1969; Sen, 1988, 1991). The most useful approach for our purposes here is the axiomatic approach that has been developed in social choice literature.

In some sense, what distinguishes democracy from authoritarian regimes is freedom of choice. Consider a case where a ruler unilaterally transfers his power to his son, and the alternative case where his son obtains the power through winning a competitive and deliberatively fair struggle to obtain popular support in a democratic election. Although the ultimate ruling person is the same, the democratic process is associated with citizens’ freedom to “choose” (directly or indirectly) the new leader.

This example also highlights an important point that has been emphasized particularly by Sen (1991), concerning the “instrumental” and “intrinsic” values of freedom of choice. The value of freedom of choice in democracy is not just that there is a higher probability that better leaders are selected (or incompetent leaders dismissed), but also that there is an intrinsic value associated with participation in the political process.

Consider an individual who eats a “*pastel de nata*” with an espresso everyday, which he selects from a menu (or opportunity set) of many cakes and diverse beverages.<sup>6</sup> If

<sup>6</sup> The “*pastel de nata*” is a typical and well known Portuguese custard tart.

he were forced to eat that meal, he could not stand it. The fact that people value outcomes and procedures (the way those outcomes are reached) show two different dimensions of freedom of choice.

Most people agree that the “intrinsic” value of freedom of choice increases (even at a diminishing rate) with the augmentation of the opportunity set. If there are more cakes to choose from, her freedom of choice increases, even if she still chooses to eat the same “*pastel de nata*,” because she prefers this cake to any other that was added to the set.<sup>7</sup> Conversely, if the opportunity set decreases, her freedom to choose decreases.

In this paper we will assume that freedom of choice increases (decreases) when the elements in the opportunity set increase (decrease). One simple measure for ranking opportunity sets according to freedom of choice is the cardinality of the sets.<sup>8</sup> If one has three cakes, one has more freedom than if one has only two.

In markets, choice is over private goods and it is a real choice. However, in politics, we are in the realm of collective or social choices. The information citizens express through the ballot is aggregated and transformed through the rules of the electoral system into a social choice. Each citizen does not “choose” anything, but instead he has a greater or smaller freedom to express his preferences concerning the opportunity set that is presented to him.

Apart from the cardinality of the opportunity set there are two additional dimensions that should be considered in order to measure freedom of choice. The first dimension is the number of items that can be “selected” from the “menu.” *Ceteris paribus*, if just one item can be “selected” from a given set, the freedom to choose is less than if the “choice” is between two items of the same set. Alternatively, the same number of available choices (e.g. 2) in menus of different sizes (e.g. 3 and 6 items) is also associated with different degrees of freedom.<sup>9</sup> However, if what I “receive”, does not take into account my revealed preference, my freedom, from an instrumental point of view, is less valuable.

The second dimension is the information associated with each item in the menu. If our individual does not have any information concerning the characteristics of the items

she is choosing from, her freedom is in some sense virtual. She could just select a random number to make her “choice”. *Ceteris paribus*, the more information associated with each item in the menu, the greater the freedom to choose.<sup>10,11</sup>

The index developed in this paper considers the cardinality of the opportunity set, the number of effective revealed preferences, and information concerning the candidates. They will be labelled as “options”, “choices” and “information”, respectively. However, the capabilities’ dimension is not introduced for simplicity reasons.

### 3. Freedom of choice: “options”, “choices” and information

The first critical issue we need to address is the options voters face in assessing the cardinality of the opportunity set (the “menu” of choices).<sup>12</sup> We assume that, if given the chance, citizens will vote for political parties and for candidates (the “personal vote” on the characteristics of the candidates). Since each political party has a distinct platform, when the *effective* number of parties increases, the citizens’ freedom to express political preferences in different ways also increases. However, there is a problem with using the effective number of parties. Among other things, we want to analyze the possible causal effect of “freedom of choice” on the fragmentation of parliament (given by the effective number of parties). So in the freedom of choice (FC) index it is assumed that opportunities to express political preferences must be independent of the actual effective number of political parties. We consider three parties, a Left-wing Party (L), a Center Party (C) and a Right-wing Party (R), as the opportunities to express diverse political preferences.<sup>13</sup>

Apart from ideology, we assume citizens care about candidates’ personal characteristics and that these are

<sup>7</sup> There is, however, an objection to that assertion. From a cognitive perspective some authors have argued that, after some point, to have more elements in the opportunity set create cognitive dissonance so that less is better than more.

<sup>8</sup> This measure was suggested by Pattanaik and Xu (1990). Three axioms univocally determine this measure. First, the indifference between no-choice situations (e.g. indifference between two plebiscites with different candidates); second, strict monotonicity (e.g. freedom increases when the number of candidates increases); and third, independence. Sen (1991) argues that freedom should not only include the opportunities of choice available to the individual, but also take into account his preferences in relation to the elements of the opportunity set. For other criticisms of Pattanaik and Xu (1990) see Holler (2007) who emphasizes power and the control over the opportunity sets.

<sup>9</sup> The more complicated issue is how to rank different size menus with different number of choices. The “freedom of choice” index developed in this paper, satisfies both conditions mentioned in the text, and has an implicit tradeoff between having more items to choose and more possibility to choose.

<sup>10</sup> Again, there are simple cases and more complicated cases. From a no information menu, to a menu where one has information on one item, there is an increasing freedom. This is the simplest case. Complicated cases are those where it is possible to have more information on some items and less in others.

<sup>11</sup> Information on political candidates can arise from different sources: the candidates themselves, the political parties, interest groups and the media. What this dimension says is that we consider more information and more diversified information to be better than less information. Taking into account cognitive limitations, the marginal benefit of increasing information should be decreasing.

<sup>12</sup> The measure of freedom, with only one dimension, can be ordinal or cardinal. When comparing voters’ opportunity sets it is possible to rank order all sets using the cardinality of the sets. However, when considering more than one dimension (e.g. three as we do) it is necessary to introduce (explicitly or implicitly) additional value judgements, i.e. a metric in order to weight these different dimensions. Thus, the measure of freedom becomes cardinal.

<sup>13</sup> The average effective number of parties in our sample of 26 countries is 3.78. However, we have chosen 3 for reasons of symmetry that can be justified in order to give equal weight to ideological diversity and personal characteristics. As explained below the index is invariant to a change in the ideological spectrum. If instead of assuming three parties (L, C, R) we would have assumed four parties (L, CL, CR, R) the index value for each country would be the same.

independent of political platforms.<sup>14</sup> If given the opportunity, citizens would vote for particular candidates as well as for political platforms.

To analyze the cardinality of different electoral systems, let us start by looking at Table 1, where each column refers to a different party (L, C, R) and each row is a candidate (1, 2, 3) belonging to the party's list (when applicable).

We establish an upper limit for voters' "options" given by the product of three parties and three candidates. This can be considered as an unnecessary constraint on voters' available choices because some ballots allow for more options. However, the concept of freedom, as we want to measure it, is not just the input information that the voter introduces in the ballot, but it is also related to the effectiveness of this information in the final selection of candidates. This suggests a limitation in the available options in the relevant opportunity set. Moreover, all citizens have cognitive limitations so that, even from the strict point of view of the voter input in the ballot, a limitation on available "options" should be considered.

In order to distinguish "options" related to parties and candidates we use the following notation: L, C, R refers to parties; L1, C1, R1 are candidates in single member districts and Li, Ci, Ri, candidates in multi-member districts. The voters' "options" (the cardinality of the opportunity sets), associated with the main ballot structures and electoral systems, are the following<sup>15</sup>:

- PR – plurality rule with nominal vote in one candidate (e.g. UK or USA) or the "alternative" vote (AV) with ordinal vote (e.g. Australia)  
 $\#X_{plr} = \#X_{pr\_av} = \#\{L1, C1, R1\} = 3$
- AM – absolute majority rule in runoff elections (e.g. France)  
 $\#X_{am} = \#\{L1, C1, R1\} = 3$
- CLPR – closed list proportional representation (e.g. Portugal)  
 $\#X_{clp} = \#\{L, C, R\} = 3$
- MS – mixed systems using dual ballot (e.g. Germany)  
 $\#X_{db} = \#\{L, C, R, L1, C1, R1\} = 6$
- OLPR – open party list proportional representation (preferential voting) (e.g. Czech Republic)  
 $\#X_{olp} = \#\{L1, L2, L3, C1, C2, C3, R1, R2, R3\} = 9$
- STV – single transferable vote with rank order ballot (e.g. Ireland) and OBP – open ballot proportional representation (e.g. "Panachage" in Switzerland and Luxembourg)  
 $\#X_{stv} = \#X_{obp} = \#\{L1, L2, L3, C1, C2, C3, R1, R2, R3\} = 9$

<sup>14</sup> If we were to consider a spatial analysis, which is not the case here, we would say that the two dimensions are orthogonal. There is no *a priori* reason to suppose that left-wing politicians have better (or worse) attributes than right-wing politicians. Note also that there can be a conflict between ideology and personal attributes. The candidate "closest" to the voter ideology can have a low "score" on personal attributes and vice-versa.

<sup>15</sup> For a good discussion of electoral systems and intra-party competition see Chapter 1 of Colomer (2004). This characterization of ballot structures and electoral systems covers the vast majority of real world situations in democratic countries.

**Table 1**

Citizens' opportunities to select candidates.

L1	C1	R1
L2	C2	R2
L3	C3	R3

If freedom to choose were based only on options available to voters to express preferences, an ordinal ranking could be established. Maximum freedom would be associated with the rank order ballot used in STV, open ballot and open party list; an intermediate level of freedom with dual ballot in mixed systems and finally the lowest voter freedom would be associated with CLPR, PR and AM. However, other dimensions should be also considered and this implies adopting a cardinal measure.

A second dimension of freedom is "choices" or the revealed preferences of the voters, i.e. the number of items a voter may "select" (or order) so that it has an effective impact on candidates' choice. It is important to define an upper boundary for the *relevant* number of revealed preferences, i.e. those which have an impact on candidate selection. We establish this number as three, since for the reasons stated below, the practical importance of citizens' fourth preference is rather low and should be disregarded.

A main distinction between the different ballot systems is whether voters can only reveal their first preference, or more. In plurality rule with a candidate ballot or in closed list proportional representation with a party ballot, voters can vote for one candidate or one party, respectively, so that only the first preference counts. This has been labelled a "categorical" ballot in the literature. In all other systems voters can reveal more than one preference (ordinal or not) in what has been labelled "ordinal" balloting following Rae (1971).

In the French electoral system (party ballot with runoff), if a party has an absolute majority, the candidate of that party is elected. If not, there is a second round. So the second preference of the voter only is necessary in some districts. Therefore, we consider 1.5 to be the effective number of revealed preferences.

In plurality rule, with a candidate ballot and with previous "open" primaries (e.g. most states in USA), voters even if they are not affiliated with a specific party, can vote for the nomination of a party candidate. They can express preferences over candidates first and then over parties. It is an intermediate situation between plurality rule (without primaries) and dual ballot where all voters have two choices. Therefore, we consider that each voter has 1.5 "choices".

In dual ballots, where voters have the single member district to vote for candidates and regional or national district to vote for parties, voters have two "choices".<sup>16</sup>

<sup>16</sup> Lijphart (1990) correctly points out that the mixed systems should not be included in the "categorical" category as Rae (1971) did. We always use the term ordinal ballot within brackets because we cannot say that voters rank a party with a candidate in mixed systems. However, we can say that they express preferences for a party and a candidate.

**Table 2**  
Electoral systems, ballot structures, and voters' options and "choices".

	Ballot type	Electoral system	Votes	Vote in party, candidate (or both)	Voters' options <sup>a</sup>	Voters' "choices" <sup>b</sup>	Single member districts (SMD) or/and multi-member districts (MMD)
1	Candidate ballot	Plurality (without primaries)	1	C	3	1	SMD
2	Party ballot	PR (close list)	1	P	3	1	MMD
3	Candidate ballot (runoff)	Majority	1 or 2	P	3	1, 5	SMD
4	Candidate-preference ballot	Plurality ("alternative vote")	1	C	3	3	SMD
5	Dual ballot	Mixed system	1	P	6(3)	2(1)	SMD
			1	C	(3)	(1)	MMD
6	Candidate ballot	Plurality (with primaries)	1	C	3	1, 5	SMD
7	Preference ballot	PR (open list) ("weak")	1	C, P	9	1, 5	MMD
8	Preference ballot	PR (open list) ("strong")	1	C, P	9	2	MMD
9	Open ballot	PR (open ballot)	1	C, P	9	3	MMD
10	Rank ballot	Single transferable vote (STV)	1	C, P	9	3	MMD

<sup>a</sup> Available set of candidates/parties to choose from ( $c$  in index FC).

<sup>b</sup> Number of relevant candidates/parties "chosen" by the voter in her ballot ( $p$  in index FC).

Some literature considers the rank ballot as giving the greatest amount of "choice" to the voter. In fact, the voter is able to fully or partially rank order the candidates across political parties. This is an input oriented interpretation of the ballot. However, what is relevant is not the maximum information the voter can express through the ballot, but the individual "choices" that are relevant for the collective choice of candidates. Taking into account that the fourth preference onwards has a minor impact on candidate selection, we assign the maximum value of three "choices" to the rank ballot (used in STV), to the open ballot ("panachage") and also to the candidate-preference ballot of Australia, although here the choice set (number of candidates) is much smaller.<sup>17</sup>

Given its diversity, the preferential system poses more difficulty in determining the available ballot "choices." There are two main dimensions in preferential voting that open up many variants: the *approval possibilities*, the maximum number (or proportion) of approved candidates in the ballot, and the *approval threshold*, the minimum percentage below which the candidate does not override the party list. The most relevant dimension is the *approval threshold* since with a high threshold, preference revelation on candidates has minor effects on overruling party lists. All these possibilities have an impact on citizens' effective freedom to choose. However, in order to keep the index simple, we only distinguish between "weak" and "strong" preferential systems following Karvonen (2004). A "strong" preferential system is the situation where only individual votes are relevant for the selection of members of parliament (e.g. Finland). In this case there is no approval threshold. On the other hand, in a "weak" preferential system, voters are not obliged to choose candidates, and by default (if they do not express a particular preference) the party list order is assumed. Usually there are approval

thresholds.<sup>18</sup> The distinction between "weak" and "strong" open list systems is translated into 1.5 and 2 for voters' "choices" in Table 2.<sup>19</sup> Voters can choose among parties and candidates in both cases, but the *instrumental value* of candidate choice is diminished in the former case. Clearly, the "choices" available in open list proportional representation systems are smaller than in the STV<sup>20</sup> – Table 2 summarizes the conclusions concerning available "options" and "choices".

Finally, the last issue to address is the information available to the voter about the candidates. We assume that information on each candidate is a decreasing function of average district magnitude ( $M = S/D$ ), with  $S$  the size of the assembly and  $D$  total number of districts (upper and lower tier).<sup>21</sup> In single member districts, opportunities for

<sup>18</sup> To illustrate the diversity of preference voting, note that in the "strong" Finnish system voters have to vote for one specific candidate, while in the "weak" Swedish system supporting a candidate is optional and the "approval percentage" is 8%. In the Czech electoral system the minimum percentage for the candidate to overrule the party list is 7%, and the maximum number of "approved candidates" in the ballot was recently reduced from four to two candidates (see 2006 revision of Act 247/195). There are mainly two types of ballots used in preferential systems. Either the ballot allows selection of one or more candidates (approval) or the voter can actually rank the candidates. Note, however, that in the former case, "approval votes on candidates" are used with electoral formulas (e.g. method d'Hondt) different from "approval voting" (see Brams and Fishburn, 1983) which is not an electoral formula for multi-member districts.

<sup>19</sup> Note that with a very high threshold, the preferential system converges to a party list system because it is almost impossible to overrule the party list. We assume implicitly that this situation does not occur in practice.

<sup>20</sup> It is clearly the case that in a set of  $k$  candidates, a partial ordering of  $n < k$  candidates is associated with more "freedom" than purely giving "approval" to the same subset of  $n$  candidates. In the former case there are  $n!$  different ways to express preferences, while in the latter just one (e.g. with  $n = 3$ ,  $3! = 6$  as opposed to 1). Our index is a function of approved candidates in the ballot because this is the essential information that is transformed through the electoral formula.

<sup>21</sup> Chin and Taylor-Robinson (2005, p. 465) found that "voters in closed list proportional representation access less of the available candidate information compared with subjects in the SMD electoral system". Our specification of the "information function" is consistent with their findings.

<sup>17</sup> In terms of the informational input of the ballot, the open ballot has less information than the rank order, since candidates are not ranked. However, in some cases, it is possible to add names to the ballot, which is ruled out by the rank order ballot. Given these countervailing factors we treat them as similar. Colomer (2004) also considers them similar.

interaction between candidates and voters are greater. This is important mainly for the knowledge of the personal attributes of particular candidates. Information on each candidate decreases as the magnitude of the district increases because it depends on how many candidates every voter has to pay attention to. It is important to understand how  $M$  takes this into account in single tier and two tier systems. Let  $S_l$  refer to seats allocated in the lower tier and  $S_h$  seats allocated at upper tiers. Therefore,

$$M = \frac{S}{D} = \frac{S_h}{D} + \frac{S_l}{D} \quad (1)$$

In plurality rule with candidate ballot,  $M=1$ . In dual ballot systems the average district size (electors per mandate) is higher if, for a given number of electors, the number of single member districts decreases. This effect is captured by  $M$  as the following example illustrates. South Korea has 253 single member districts (and, respectively, the same number of MPs) out of a total of 299 (85%). On the other hand, Germany has only 50% of MPs elected through single member districts. This means that, disregarding the absolute assembly size, South Korea ( $M_k=1.18$ ) is much closer to the UK average district magnitude ( $M_{UK}=1$ ), than Germany ( $M_G=1.99$ ). Thus, taking the overall average district magnitude enables us to distinguish between mixed systems with different proportion of MPs elected in single member districts.<sup>22</sup>

Amongst different possibilities we adopt this function for a proxy of the information that citizens have on the personal characteristics of candidates<sup>23</sup>:

$$I = \frac{1}{1 + \log M} \quad (2)$$

where  $\log M$  stands for the decimal logarithm of  $M$ .

Therefore, the index of freedom of choice is a combination of these three characteristics. It is an increasing function of voters' available "options" (the cardinality of the

opportunity sets), voters' "choices" (the number of relevant revealed preferences), and the information about the chosen candidate. To combine the first two aspects we use the geometric mean<sup>24</sup> and we multiply this value by the information value, assumed as a function of  $M$ . Consequently the index is based on  $\sqrt{c \times p}/(1 + \log M)$ , where  $c$  stands for the "options" available to the voters,  $p$  for the "choices". Finally we standardize the formula in such a way that the index value for the candidate ballot (UK) is 1, i.e. for the country  $i$  the index is given by<sup>25</sup>:

$$FC_i = \frac{\sqrt{c_i p_i}}{(1 + \log M_i) \sqrt{3}} \quad (3)$$

This index has the advantage of not being a function of the effective number of parties and will be used to analyze the relationship between the two variables.<sup>26</sup>

#### 4. Empirical results: freedom of choice indices

Table A1 (in the Appendix) shows the characteristics of electoral systems in 26 democracies. We have restricted the application of the index to countries that, according to Freedom House, have been considered free since 1999. The average district magnitudes, the effective number of parties and the Loosemore–Hanby proportionality index enables some comparison between the electoral systems.

An application of the "freedom of choice" index to several types of ballot structures and electoral systems is shown in Table 3. It can be used to test hypotheses concerning the political consequences of electoral laws and to discuss electoral reforms, since it only depends on variables from the electoral system. The interpretation of the FC index is straightforward as seen in Section 3. Values can be directly compared with the reference value given by the candidate ballot system (without primaries). Consequently, in The Netherlands or Israel, the freedom of choice is approximately one third of the level existing in the UK, while in Ireland the level is almost twice the reference value. This is due mainly to the dimension of (reduced) information on candidates in the former countries given that they just have one electoral district. On the other hand, Ireland has relatively small districts (for a proportional representation system) and benefits from a greater menu of voter choices.

Several conclusions can be drawn from the index of freedom to choose (FC). First, we can derive a rough ranking of the different ballot structures: party ballot, candidate ballot (without primaries), preference ballot, dual ballot and rank order ballot, in ascending order. However, some

<sup>22</sup> There are different approaches to district magnitude. Rae (1971) considers average district size. Taagepera and Shugart (1989) and Taagepera (2002) use an "effective district magnitude" which is an implicit function of the assembly size and the number of seat winning parties. There is always a loss of information when using an average instead of the distribution of district magnitude, namely we lose the variation of the distribution (see Monroe and Rose, 2002). We agree with Taagepera's criticisms to the average district magnitude, namely that it does not take into account neither effective thresholds nor the effects of nationwide compensation in a national district (when it applies). However, the effective district magnitude is an output based measure and since we want to build an input based index we follow Rae's approach. Moreover, the aim of our analysis here is to measure how much information is provided by candidates to voters. As explained in the text, even when district magnitude is an average of several single member districts and one national district, district magnitude changes with the proportion of seats allocated in single member districts. The implicit assumption is that for a given assembly size and electorate, as the number of single member districts decreases, the size of each district increases and therefore the "information distance" between candidates and voters increase, i.e. there is an information loss.

<sup>23</sup> Since it is a convex and decreasing function of  $M$ , we implicitly assume that information about candidates decreases at a diminishing rate (positive sign of second derivative). It means that when the district size increases from 1 to 2, the information loss is greater than when it increases from 20 to 21.

<sup>24</sup> The geometric mean is computed by multiplying  $c$  and  $p$ , then taking the square root of the product.

<sup>25</sup> The non-standardized index is  $\overline{FC}_i = \sqrt{c_i p_i}/(1 + \log M_i)$  is while the value for the UK is  $\overline{FC}_{uk} = \sqrt{3 \cdot 1}/(1 + \log 1) = \sqrt{3}$  and the standardized index  $FC_i = \overline{FC}_i/\overline{FC}_{uk}$  is given by Eq. (3).

<sup>26</sup> Note that although it may seem that the index is asymmetric with respect to  $c$  and  $p$ , since the range of  $p$  is between 1 and 3 and the range of  $c$ , between 3 and 9, this is not the case. In fact, it can easily be demonstrated that we could multiply  $c$  by any positive scalar, so that the standardized index would not change. This means that, as stated above, although we have restricted ideological diversity to three parties (right, centre and left), if we had considered four or five, etc. the resulting index would not change.

**Table 3**

Countries ranked by increasing voters' freedom to choose (FC) MPs.

Ballot structure	Country	Effective number of parties	Mean district magnitude	LH index	FC
Party ballot	The Netherlands	4.81	150	0.95	0.31
Party ballot	Israel	5.63	120	0.96	0.32
Party ballot	Portugal	3.14	10.45	0.83	0.50
Party ballot	Norway	4.36	8.68	0.95	0.52
Party ballot	Romania	3.37	8.17	0.92	0.52
Party ballot	Spain	2.73	6.73	0.93	0.55
Preference ballot (weak)	Czech Republic	4.15	25	0.89	0.88
Candidate ballot	UK	2.11	1	0.80	1.00
Candidate ballot	Canada	2.98	1	0.83	1.00
Preference ballot (weak)	Sweden	4.29	12.03	0.97	1.02
Preference ballot (weak)	Slovenia	5.52	11.25	0.84	1.03
Preference ballot (weak)	Denmark	4.92	10.53	0.98	1.05
Preference ballot (weak)	Belgium	9.05	7.5	0.96	1.13
Preference ballot (strong)	Finland	4.93	13.33	0.95	1.15
Candidate ballot (primaries)	USA	1.99	1	0.94	1.22
Preference ballot (strong)	Poland	2.95	8.85	0.82	1.26
Dual ballot	Germany	3.30	1.99	0.94	1.54
Dual ballot	Hungary	3.45	1.97	0.86	1.55
Dual ballot	New Zealand	3.78	1.82	0.96	1.59
Open ballot	Switzerland	5.08	7.69	0.93	1.59
Dual ballot	Japan	2.93	1.61	0.86	1.66
Candidate-preference ballot	Australia	2.61	1	0.84	1.73
Dual ballot	Taiwan	2.46	1.42	0.95	1.74
Rank order	Malta	2.00	5	0.98	1.77
Dual ballot	South Korea	2.36	1.18	0.84	1.87
Rank order	Ireland	3.39	3.95	0.88	1.88

countries have higher (smaller) values in the index than was previously supposed by the type of ballot they use.<sup>27</sup>

It is not surprising that the party ballot index is below the reference value given by the candidate ballot system (without primaries). The options available to the voters and the possible “choices” are the same in both systems, yet in the party ballot, the voter has much less information concerning the personal characteristics of candidates. On the other hand, the effect of primaries, when plurality rule and candidate ballot are used, is to increase intra-party competition and to enlarge voters' freedom of choice so that the USA score is significantly higher than the UK score.

The dual ballot systems are associated with quite different positions in the ranking given the fact that mean district magnitude differs significantly from country to country (e.g. Germany (1.54) has a lower degree of freedom of choice than South Korea (1.87)).

The preference ballot systems also occupy different positions in the FC index. The Czech system has the lowest ranking not only because it is a “weak” system, but also due to its large average district magnitude with 25 MPs. On the other hand, Poland occupies the highest position because it is a “strong” system and the average district magnitude is a mere 8.85.

It is interesting to note how the proportionality index, such as the Loosemore–Hanby, and the freedom to choose index give different types of information on electoral

systems. Australia and Slovenia have the same degree of proportionality (0.84), but voters' freedom to choose in Australia is much higher. Norway (party ballot) and Taiwan (dual ballot) also share the same high degree of proportionality (0.95) but voters in Taiwan have more possibilities to express their preferences.

A similar situation occurs when we compare the effective number of political parties using the FC index. The USA and Malta have a similar effective number of political parties, but the FC index is higher for Malta than for the USA.

If we consider a more aggregated analysis of the averages of “categorical” ballots (party and candidate ballots) and the averages of “ordinal” ballots (all the others) it is possible to test Rae's hypothesis. Table 4 shows that, for each type of ballot, the averages of the effective number of parties and the degree of proportionality are similar. This gives support to the rejection of the hypothesis that the ballot structure has an effect either on the fragmentation of parliaments or on proportionality. On the other hand, as expected, ordinal ballots are associated with significantly larger freedom of choice for voters.<sup>28</sup>

<sup>27</sup> This shows an important methodological difference between our approach and the traditional studies of ballot structure that just create a typology of different ballots and ranked them. We rank freedom of choice of country specific electoral systems, not ballot types.

<sup>28</sup> We test the hypothesis that there are no differences between means amongst the two groups for each characteristic (number of parties, average district magnitude, etc.), using a normal framework and the Welch approximation (i.e. we do not impose the equality of the variances in the two groups). At a 5% level, we do not reject the same means for the effective number of parties, the proportionality index, and the average district magnitude. However, we strongly reject the means equality for the FC index. The use of more robust testing techniques leads to the same conclusions.

**Table 4**  
“Categorical” and “ordinal” ballots.

	Effective number of parties	Average district magnitude	Proport. LH	FC
Candidate and party ballot (“categorical”)	3.46	34.11	0.90	0.66
Other ballots (“ordinal”)	3.95	6.83	0.91	1.44

It is also worth mentioning that the average district magnitude of ordinal ballots is relatively small, while it is very large in categorical ballots given the weight of party ballots.<sup>29</sup>

Finally, to analyze how the freedom to choose index can be related to other characteristics of an electoral system, such as proportionality or the effective number of political parties, we estimate a linear regression where the dependent variable is the effective number of parties and the covariates are the freedom of choice (FC) index and the decimal logarithm of average district size. The estimated values are (standard errors below the estimated coefficients)

$$\widehat{\text{NParties}} = 2.084 + 1.679 \log(M) + 0.406\text{FC}$$

(0.598)                      (0.716)

$$R^2 = 0.326, \quad n = 26, \quad F\text{-Statistic} = 5.574,$$

$$p\text{-value} = 0.011$$

where NParties stands for the effective number of parties.

We confirm that district magnitude is relevant for the effective number of parties, but “freedom of choice” is not.<sup>30</sup>

An important consequence of this result is that changes in electoral systems that increase voters’ “freedom of choice” do not have a significant negative impact, as could be expected, on a more fragmented parliament and therefore they do not stimulate increased instability in parliamentary regimes.

We also estimate the possible effect of “freedom of choice” on proportionality and reach a similar conclusion. The FC index is not statistically significant but the district magnitude is, now, marginally significant.<sup>31</sup>

$$\widehat{\text{LH Index}} = 0.836 + 0.053 \log(M) + 0.027\text{FC}$$

(0.025)                      (0.030)

$$R^2 = 0.178, \quad n = 26, \quad F\text{-Statistic} = 2.483,$$

$$p\text{-value} = 0.106$$

<sup>29</sup> The no rejection of the equality of the means is due to a very large variance in each group, namely in the categorical one.

<sup>30</sup> If we estimate two simple linear regressions to explain the effective number of political parties, the first one, using  $\log(M)$  as explanatory variable, is significant ( $p$ -value of 0.003 for the  $F$ -test) but the second one, using freedom of choice (FC), is statistically not significant ( $p$ -value of 0.124 for the  $F$ -test). All calculations are available from the authors at request.

<sup>31</sup> A simple linear regression to explain the LH index using  $\log(M)$  as explanatory variable is significant ( $p$ -value of 0.053 for the  $F$ -test).

where LH index is the Loosemore–Hanby index of proportionality.

The finding that “freedom of choice” does not affect these variables does not lead to the conclusion that it should be considered a “weak” variable. The arguments presented in Section 2 that “freedom of choice” has an intrinsic value apart from an instrumental value implies that increasing freedom is valued positively on its own. In the next section, we will discuss some empirical evidence that suggests it can also have an instrumental value concerning variables other than fragmentation of parliament and proportionality.

## 5. Discussion

The freedom citizens have to express their political preferences and their preferences concerning relevant characteristics of representatives to parliament (congress) depend on the structure of polity. More decentralized structures of government (in unitary or federal countries) are – *ceteris paribus* – associated with overall greater freedom of choice. This means that the results of this paper should be interpreted with some caution, since we only apply the index to national legislatures (lower houses).<sup>32</sup> It is necessary to bear in mind that the role of the lower house is different in parliamentary and presidential regimes and also in unicameral and bicameral regimes.<sup>33</sup> Moreover, we have not considered an obvious important factor, the internal competition within parties in organizing lists (when applicable).

With these provisos in mind, this paper developed an index of freedom of choice of members of parliament that takes into account three distinct dimensions: voters’ “options” (the cardinality of the choice domain), “choices” (the number of revealed preferences on candidates/parties), and “information” (on candidates characteristics). Empirical evidence shows that the index cannot be univocally associated either with electoral systems, proportionality indices, effective number of parties, or other measures of electoral systems. In fact, one of the aims of developing such an index is to be able to discriminate between electoral systems that have similar degrees of proportionality or similarly “fragmented” parliaments, as measured by the effective number of parties.

The debate around the reform of electoral systems – namely the possible shifts from majoritarian to mixed systems, or changes within proportional representation regimes – arises from the fact that there are several rele-

<sup>32</sup> The index can also be applied to parliaments of States, Provinces or Lander in Federations. In those federations where there are significant linguistic, religious, ethnic, or other divisions and citizens are segregated in part according to these divisions, it is natural that if the electoral system is the same at national and regional levels, the effective number of parties is slightly higher at national level.

<sup>33</sup> Spiller and Tommasi (2007) argue that in the case of Argentina, the lower house has no significant effective power. If this is the case, it follows naturally that greater citizens’ freedom of choice in the same would not be very relevant to legislative behavior.



## Appendix

Table A1

Countries ranked by increasing degree of proportionality of electoral systems.

Ballot structure	Country	Total number of MPs	Number of SMD	Number of MMD	Number of districts	Number of list MP	Prop. LMP/MPs	Mean district magnitude	Effective number of parties	Index prop. (Loosemore–Hanby)
Candidate ballot	UK	659	659	0	659	0	0%	1.00	2.11	0.80
Preference ballot	Poland	460	0	52	52	460	100%	8.85	2.95	0.82
Candidate ballot	Canada	301	301	0	301	0	0%	1.00	2.98	0.83
Party ballot	Portugal	230	0	22	22	230	100%	10.45	3.14	0.83
Candidate-preference ballot	Australia	148	148	0	148	0	0%	1.00	2.61	0.84
Dual ballot	South Korea	299	253	1	254	46	15%	1.18	2.36	0.84
Preference ballot	Slovenia	90	0	8	8	90	100%	11.25	5.52	0.84
Dual ballot	Japan	500	300	11	311	200	40%	1.61	2.93	0.86
Dual ballot	Hungary	386	176	20	196	210	54%	1.97	3.45	0.86
Rank order	Ireland	166	0	42	42	166	100%	3.95	3.39	0.88
Preference ballot	Czech Republic	200	0	8	8	200	100%	25.00	4.15	0.89
Party ballot	Romania	343	0	42	42	343	100%	8.17	3.37	0.92
Party ballot	Spain	350	0	52	52	350	100%	6.73	2.73	0.93
Open ballot	Switzerland	200	0	26	26	200	100%	7.69	5.08	0.93
Candidate ballot	USA	435	435	0	435	0	0%	1.00	1.99	0.94
Dual ballot	Germany	656	328	1	329	328	50%	1.99	3.30	0.94
Party ballot	Norway	165	0	19	19	165	100%	8.68	4.36	0.95
Party ballot	The Netherlands	150	0	1	1	150	100%	150.00	4.81	0.95
Dual ballot	Taiwan	334	234	2	236	100	30%	1.42	2.46	0.95
Preference ballot	Finland	200	0	15	15	200	100%	13.33	4.93	0.95
Party ballot	Israel	120	0	1	1	120	100%	120.00	5.63	0.96
Dual ballot	New Zealand	120	65	1	66	55	46%	1.82	3.78	0.96
Preference ballot	Belgium	150	0	20	20	150	100%	7.50	9.05	0.96
Preference ballot	Sweden	349	0	29	29	349	100%	12.03	4.29	0.97
Rank order	Malta	65	0	13	13	65	100%	5.00	2.00	0.98
Preference ballot	Denmark	179	0	17	17	179	100%	10.53	4.92	0.98

Source: data for Finland, Ireland, Malta and Portugal collected and computed by the authors. Other data from Norris (2004).

vant normative criteria (political stability, fair representation, freedom of choice) and there are frequently tradeoffs between them.<sup>34</sup> For example, there is a possible tradeoff between political stability and fair representation in parliamentary regimes: increased fairness of representation may lead to a more “fragmented” parliament and more unstable coalition governments.<sup>35</sup>

The empirical analysis developed in this paper shows that there seems to be no tradeoff between greater voter participation in the political process and either political stability or fair representation. The conclusion that greater “freedom of choice” does not have implications for proportionality or the effective number of parties has an important normative implication for electoral reform. It shows that it is possible to design systems with a greater role for voters’ participation in the political process without negative side effects. Nevertheless, it does not follow that greater citizens’ freedom of choice is always beneficial. The role of political parties in screening candidates when

selection follows a competitive procedure may be important. Also, citizens have limited cognitive abilities, so expanding freedom of choice after some point may have no significant advantage.

We have also shown that some ballot structures give more power to the voters and less to the party elites in selecting representatives. Other ballot structures give exclusive selection privileges to political parties, and still others aim for a more balanced weight of voters and parties in the selection process. The importance of measuring voters’ “freedom to choose” is precisely to weight the relative importance of voters and political parties in selecting candidates.

The hypothesis, implicitly formulated by Stuart Mill, that the quality of representatives, as measured by voters’ standards, will depend on voters’ freedom of choice, can be tested controlling for the fact that it will also be a function of party selection procedures. Intuition suggests that the worst situation is low competition within parties, low freedom of choice and a presidential regime.

There is some evidence that the degree of voter satisfaction is higher in countries where “freedom of choice is higher.”<sup>36</sup> Other hypotheses that have been tested and that deserve further research are the relationship between

<sup>34</sup> See, among others, Boix (1999), Norris (2004), Rae (1995), Schugart (2001) and Sen (1995).

<sup>35</sup> It is worth distinguishing between *formal* political stability and *informal* political stability. Formal political stability is the capacity of governments to fulfill their normal legislative term (usually four years). It makes an emphasis on the parliament–executive relationship. The *informal* political stability is related to a low level of political conflict outside parliament. The *tradeoff* referred to is between formal political stability and fair representation.

<sup>36</sup> See Farrell and McAllister (2006). An experiment in British Columbia (Canada) also reveals that one highly valued criterion for electoral reform is freedom of choice.

electoral systems and corruption,<sup>37</sup> the effects of freedom of choice on voter turnout and on the participation of women in politics, and the intertemporal consistency of electoral promises by elected representatives.

Any index that considers several dimensions to measure freedom of choice is necessarily subjective and subject to controversy. However, an important implication of building an index is to focus attention on the diversity of ballot structures and how electoral systems can use more or less information from voters as an input for candidate selection.

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<sup>37</sup> Kuniková and Rose-Ackerman (2005) present evidence that the combination of closed list proportional representation (CLPR) and presidentialism is the institutional environment that most favors corruption. The fact that CLPR is associated with higher levels of corruption seems consistent with the evidence presented in this paper that they have the least degree of citizens' freedom to choose representatives. The index developed in this paper enables the development of research considering a continuous composite variable of electoral systems and not a tripartite division (CLPR, OLPR and plurality) or a binary division ("ordinal" and "categorical" ballots).