

Electoral Systems and Government Stability: A Simulation of 2006 Italian Policy Space

Luigi Curini*, Paolo Martelli**

Received 5 July 2007; Accepted 27 July 2008

Abstract This paper tracks a path from electoral results to government formation, in order to assess whether the characteristics of the party system put forward by the spatial theory of voting may influence, and how, the relationship between electoral system and government stability. In this regard we perform a simulation concerning the 2006 Italian general election, by computing the parliamentary seats that parties would get in an election through various electoral systems, starting from given electors' votes. We then introduce two well-known game theoretical models that explain stability and instability of coalition governments. We draw some counterfactual deductions about what would have occurred to Italian government stability if other electoral systems had been in use. The results of our simulation suggest that the stability consequences of technical changes in an electoral system are influenced by the spatial features of the party system.

Keywords Electoral systems, spatial theory of voting, simulation, government stability, Italian party system

JEL classification D72, C15

1. Introduction

The impact of electoral systems on the functioning of democracy has been extensively considered in the literature of political science. Stemming from Maurice Duverger's "sociological law" (Duverger 1954), a systematic analysis has linked the consequences of electoral systems on party systems and parliamentary majorities to various indices such as representation threshold, deviation from proportionality, district magnitude (Lijphart 1999; Taagepera and Shugart 1989). In their turn these consequences are measured by a set of indices such as fractionalization (Rae 1971), polarization (Powell 1982), effective number of parties (Laakso and Taagepera 1979). A rather different perspective considers these numerical indices unsatisfactory, as they do not take due account of parties mutual positions and forces in a party system, and proposes to discount the parties that have neither coalition potential nor blackmail potential (Sartori 1976, p. 122–24). Moreover, as government stability depends on the structure of legislature, and legislative majorities are often manufactured by the electoral system, the role of the electoral systems in the stability of governments has begun to be extensively

* Università degli Studi di Milano, Dipartimento di Studi Sociali e Politici, via Conservatorio 7, 20122 Milano, Italy. E-mail: luigi.curini@unimi.it.

** Corresponding author. Università degli Studi di Milano, Dipartimento di Studi Sociali e Politici, via Conservatorio 7, 20122 Milano, Italy. E-mail: paolo.martelli@unimi.it.

investigated (Holler 1987; Cox 1997). These studies, as well as Sartori's proposal, were both inspired by the *spatial theory of voting*, which has progressively become the standard framework of the formal analysis of committee and electoral decisions (Black 1958; Downs 1957; Plott 1967; McKelvey 1976; Enelow and Hinich 1984).

On the other side, the empirical research on government stability links it either to Parliament's characteristics (mainly the fragmentation and polarization of the party system in representative assemblies) or to government's features (basically its ideological compactness) (Strøm et al. 1988; King et al. 1990; Warwick 1994). In this sense, this area of research shows that the relationship between electoral system and government stability is fundamentally an indirect one, that works through its (possible) impact on the nature and structure of the parliamentary party system.

This paper is an attempt to track a path from electoral results to government formation in a case study of multiparty parliamentary democracy, in order to assess whether the characteristics of the party system put forward by the spatial theory of voting may influence, and how, the relationship between electoral system and government stability.

In Section 2 we take advantage of ALEX 4.1.3 software program for the computation of the parliamentary seats that parties would get in an election through various electoral systems, starting from given electors' votes (Bissey et al. 2004). In particular we perform a simulation concerning the Italian general election in April 2006. In Section 3, a particular methodology for building the political space, where parliamentary parties place themselves and interact, is dealt with. Hence, in Section 4 we introduce two well-known game theoretical models that try to explain stability and instability of coalition governments. In Section 5, putting all preceding findings together, we can draw some counterfactual deductions about what would have occurred to Italian government stability if other electoral systems had been in use. The results of our simulation suggest that the stability consequences of technical changes in an electoral system may be influenced by the spatial features of the party system.

2. A simulation under six different electoral rules

We first put into ALEX 4.1.3 the percentages that parties got in the 2006 Italian general election. For simplicity, we will concentrate in all our simulations and analyses only on the Lower Chamber of the Italian Parliament (*Camera dei Deputati*, therein after *Camera*).

The 2006 election was held with an electoral system established in late 2005, which re-introduced proportional representation with a majority prize for the winning pre-electoral coalition. In the Camera a party needs to get either 2% at the national level (if it belongs to a coalition who gets at least 10% on national basis) or at least 4% (if it competes alone) in order to participate to the seats distribution. Moreover, every vote given to a party is counted for the respective coalition, regardless of the vote share of the party. As in 2006 only two coalitions were competing, which included all parties, the incentives for strategic voting were almost nonexistent. That gives us the opportunity to use the revealed political preferences of the Italian voters as their sincere preferences (see Fragnelli et al. 2005 on this point).

Table 1 presents in its first row the two pre-electoral coalitions: centre-right led by the incumbent Prime Minister Silvio Berlusconi and centre-left led by the challenger Romano Prodi. The parties we have considered, divided according to their political coalition, are listed on the second line. In the third row parties' positions along a 1 to 20 left-right scale (where 1 means extreme left and 20 extreme right) are reported. They are derived from the expert survey to be dealt with in the next section.¹ The fourth row of the Table is a slight elaboration of the percentages of votes that parties gained. In fact we have decided to deal only with the 14 parties included in the survey we have adopted to build the policy space.² Finally, the fifth row shows the number of constituencies where parties are concentrated, while their own coefficients of concentration are reported in the sixth.³

Table 1. Italian general elections data in 2006: *Camera dei Deputati* (slightly elaborated)

	The Union							House of Freedoms						
	Centre-left pre-electoral coalition							Centre-right pre-electoral coalition						
	Rc	Pdci	Verdi	Ulivo	Rosa	Iv	Udeur	Npsi	Udc	Fi	An	Ln	Msft	As
Left-right	2.3	3.1	4.2	7.3	8.2	9.4	10.6	11.8	12.3	15	16.3	17.3	19	19.1
% votes	6.16	2.62	2.36	31.7	2.9	2.6	1.7	0.8	6.84	23.87	12.44	4.65	0.65	0.72
Coefficient	1.38	1.43	1.58	1.41	1.62	2	2.39	0	1.48	0	1.5	2.27	0	0
Conc. districts	54	80	46	51	18	26	131	0	34	0	34	131	0	0

Note: Rc = Rifondazione Comunista; Pdci = Partito dei Comunisti Italiani; Verdi = Verdi; Ulivo = Ulivo; Rosa = Rosa nel pugno; Iv = Italia dei Valori; Udeur = Unione Democratici per l'Europa; Npsi = Nuovo Partito Socialista; Udc = Unione dei Democratici Cristiani; Fi = Forza Italia; An = Alleanza Nazionale; Ln = Lega Nord; Msft = Movimento Sociale Fiamma Tricolore; As = Alternativa Sociale.

We have put these electoral data in ALEX program, processing them in a number of electoral systems that the program takes into account. They are:

- (i) *Holland*: a proportional system with a single national district, with d'Hondt rounding and a 0.67% threshold (similar to the one used in the Dutch Lower Chamber);
- (ii) *Italy 48–92*: a proportional system with Imperiali rounding and with large districts (magnitude: 18), similar to the one used during the Italian First Republic (1948–92);
- (iii) *Germany*: a proportional system with a single national district, with d'Hondt divisor system rounding and a 5% threshold;

¹ Let us anticipate, however, that, assuming a one-dimensional space for the electoral competition (as done in ALEX) and a multidimensional space for assessing the degree of stability of a government (as we will do in our theoretical analysis) does not amount to a contradiction, once we recognize how the electoral debate is usually simplified and consolidated into left-right differences, while policy debates in elected Parliaments tend to specialize in a variety of issues. See Budge et al. (2001, p. 61).

² We have assigned the votes of excluded parties by proximity to a major party.

³ We assume conventionally that a party is concentrated in a constituency if the share of votes for that party is at least 1.3 times its national share. With this convention the concentration index for each party is calculated following the definition and procedure in Ottone et al. (2009).

- (iv) *Spain*: a proportional d'Hondt system at the district level with a 3% of threshold and a magnitude of 7, reminding the system currently used in Spain;
- (v) *Italy 94–01*: a mixed majoritarian/proportional system, somehow close to that adopted in Italy in the 1994, 1996, and 2001 general elections;⁴
- (vi) *UK*: the English plurality system (first past the post).

For both *Italy 94–01* and *UK* we consider the possibility of strategic voting. In particular, we set it to its extreme intensity, which means that in each district an elector will vote with certainty for the largest party of the pre-electoral coalition to which that party belongs. Implicitly this assumption entails that each coalition presents in each constituency one only candidate.⁵ This way to represent the mixed and the plurality system is a clearly strong advantage for the largest party of each coalition (i.e., Ulivo and Fi), given that in almost all districts these two parties are the largest of their respective coalition. As a consequence, voters will rarely have the chance to vote for a candidate other than one belonging to Ulivo or Fi.

The above mentioned assumption implies that minor parties accept to become members of pre-electoral coalitions in which they have practically no hope of winning a seat. This seems to be in contradiction with our general assumption of parties as rational actors. The apparent inconsistency is solved, however, considering that under the *Italy 94–01* system, the plurality component of the electoral system became “proportionalised” (Bartolini et al. 2004). That means that parties of each pre-electoral coalitions used to accept “stand-down agreements” (in Italian “patti di desistenza”) through which a unique candidate of the coalition is presented in single-member districts. This allowed even minor parties to present their own candidate in some pre-definite districts as coalition candidate, with the pact that all other parties of the coalition would abstain to present their candidates. Introducing these intra-coalitional pacts in our analysis, we assume that the following “allocation-rule” is applied: each member party of a coalition receives a number of “safe” seats in single member plurality districts that is roughly proportional to the size of their electoral contribution to the success of the coalition. In our case, this “size of contribution” imputed to smaller parties is assessed according to the average of parties’ results in the two last elections held in Italy with a PR system before 2006 (the European election of 2004 and the Regional election of 2005). Conversely, the reason why larger parties accepted this allocation-rule in the *Italy 94–01* era, is that smaller allies are generally equipped with a considerable proportion of loyal voters (i.e., willing to vote for their own parties regardless of strategic reasons) and that gives them an “electoral blackmail power” which larger parties cannot ignore (Bartolini et al. 2004).

The simulated results for these revised electoral systems, named *Italy 94–01 revised* and *UK revised*, are reported in Table 2, together with those of the other six

⁴ In our simulation we assign 25% of the seats through proportionality (with a threshold of 4% and Hare rounding) and 75% through plurality.

⁵ ALEX 4.1.3 computes the probability of strategic voting p in the following way: $p = 1 - kD/100$, where $0 \leq D \leq 100$ is the distance between the preferred party and the largest party of the coalition. We set $k = 0$ (which maximises strategic voting).

systems already presented. In the whole exercise we have considered a unicameral Parliament composed of 630 seats (like the real *Camera*) and an equal number of districts, each one with 100 electors. Clearly the eight simulated legislatures differ from one another in the number of seats that parties receive.

Table 2. Eight parliaments (*Camera dei Deputati*) simulated through ALEX

	Parties	% votes	Actual Italy 2006	Hol- land	Italy 48–92	Ger- many	Spain	Italy 94–01	Italy 94–01 revised	UK	UK revised
The Union Centre-left coalition	Rc	6.16	44	39	40	48	11	12	40	0	38
	Pdci	2.62	19	16	7	0	0	0	12	0	17
	Verdi	2.36	12	15	5	0	0	0	13	0	17
	Ulivo	31.7	227	203	220	246	276	297	216	319	210
	Rosa	2.90	19	18	23	0	0	0	10	0	13
	Iv	2.60	13	16	13	0	0	0	9	0	12
	Udeur	1.70	12	10	7	0	0	0	9	0	12
House of Freedoms Centre-right coalition	Npsi	0.80	6	5	0	0	0	0	8	0	11
	Udc	6.84	38	43	40	53	7	13	43	1	41
	Fi	23.87	139	153	167	186	218	247	145	271	135
	An	12.44	76	79	82	97	94	52	81	39	77
	Ln	4.65	25	29	26	0	24	9	36	0	37
	Msft	0.65	0	0	0	0	0	0	2	0	3
	As	0.72	0	4	0	0	0	0	6	0	7
Total	100	630	630	630	630	630	630	630	630	630	630
Winner			U	U	Tie	HoF	HoF	HoF	HoF	U	U
Majority			346	317	315	336	343	321	321	319	319

Note: HoF = House of Freedoms, U = the Union.

Let us draw attention on two outcomes of the simulation. In the case of *Holland*, which most resembles the actual 2006 Italian electoral system, the centre-left coalition wins by a very narrow margin. As that system actually produced the victory of the centre-left for less than 30.000 votes (over more than 40 million), we interpret this closeness between real and simulated results as a validity check of our exercise. Moreover, with *Italy 94–01 revised* and *UK revised* the distribution of seats is definitely very much closer to the real one than the distribution resulting with *Italy 94–01* and *UK* respectively. That means that the allocation rule hypothesised for sharing seats within the “revised” systems is quite a good proxy for the strategies that parties undertook in the Italian fractionalised party system in order to prevent the effect of plurality.

3. The political space: survey and data analysis

The legislatures derived from ALEX 4.1.3 are now to be placed into the political space where parties interact to form a coalition government.

Contemporary political analysis adopts several methods to collect the data necessary for building such a space and for envisaging parties’ locations in it (Mair 2001).

We chose the “expert survey” method. In this kind of research, a survey is administered directly to country specialists who are asked to locate parties in their “own” countries on a (set of) predefined policy dimension(s): from the general left-right scale, to a variety of more specific dimensions.

We have employed the expert survey kindly provided us by Benoit and Laver that the two authors ran just few weeks before the 2006 election.⁶ Here nine policy dimensions are included: (i) economic policy (interpreted as the trade-off between lower taxes and higher public spending); (ii) social liberalism (interpreted as policies on matters such as abortion, gay rights, and euthanasia); (iii) decentralization of decision making; (iv) environmental policy (interpreted as the trade-off between environmental protection and economic growth); (v) deregulation (interpreted as the degree of state involvement in economic regulation); (vi) immigration (favouring policies designed to help immigrants to integrate into the national society vs. favouring policies designed to help immigrants to return to their country of origin); (vii) EU policy authority (interpreted as whether the domain within which the EU can authoritatively make policy decision should be expanded or restricted); (viii) EU accountability (interpreted as whether the lives of citizens should be influenced directly by EU through its institutions such as the European Parliament or should instead be regulated by national governments); (ix) EU security (a policy dimension on the issue of expanding the role of the EU in collective security, foreign policy, peacekeeping and other military affairs). For each policy dimension Benoit and Laver use a scale running from 1 to 20. The experts were also asked to locate each party on a general left-right dimension, where 1 indicates the extreme left and 20 the extreme right. Table 3 reports the parties’ mean location given by the experts for the nine dimensions and for the left-right scale (L-R).

Table 3. Summary data from the Italian expert survey (2006): means reported of each party on each dimension

	Rc	Pdci	Verdi	Ulivo	Rosa	Iv	Udeur	Npsi	Udc	Fi	An	Ln	Msft	As
(i)	3.57	3.56	5.44	7.67	11.75	8.52	9.16	11.26	10.67	16.82	10.41	16.39	7.78	7.81
(ii)	3.34	4.09	3.28	8.64	1.94	9.04	16.36	6.68	17.68	13.84	17.68	18.38	18.96	18.76
(iii)	13.74	13.38	11.3	10.00	8.70	10.86	11.72	9.45	10.77	8.03	13.62	2.11	17.91	17.67
(iv)	5.25	6.09	2.30	8.78	10.41	9.00	11.89	11.8	12.71	17.32	14.42	16.26	12.40	12.82
(v)	3.13	3.59	5.53	8.96	14.29	8.58	9.25	11.64	10.43	15.74	8.62	14.49	5.40	5.52
(vi)	2.85	3.37	3.32	5.94	6.43	8.79	10.18	10.11	11.59	14.66	16.43	19.33	19.14	19.37
(vii)	11.38	10.53	7.65	6.13	6.45	7.62	9.91	9.58	9.47	15.74	13.53	18.76	17.64	17.75
(viii)	7.26	7.53	6.56	6.98	5.63	7.33	10.14	9.75	10.72	15.3	14.65	16.16	18.19	18.06
(ix)	16.89	15.94	15.9	8.08	5.70	8.06	7.33	6.63	6.97	6.39	6.00	12.19	11.56	10.47
L-R	2.28	3.05	4.15	7.30	8.19	9.35	10.60	11.82	12.33	14.98	16.28	17.30	19.03	19.08

⁶ Note that this expert survey differs from the one published in Benoit and Laver (2006) that has been administered, for the Italian case, in late 2002.

We are, however, interested in the underlying significance of the full set of policy dimensions estimated for 2006 Italy. At this regard, a common approach in the literature is to use a principal components analysis, a “data reduction” technique that essentially groups together sets of highly correlated variables, identifying a lesser number of underlying factors that explain most of the variance in the data. The meaning of each underlying factor is then drawn from the set of variables that contribute to its definition.

In our case only two underlying factors extracted from the dimensional analysis registered an eigenvalue greater than one, explaining 73% of the total variance in the data. On this account, therefore, we can assume with a good approximation that our policy space is two-dimensional. The first and most important factor is responsible for about 50% of the whole variance of the data. By looking at the input variables loading highly on it (social liberalism, environment, immigration, EU accountability and EU authority), we can refer to this first latent factor as a “Progressivism vs. Traditionalism dimension”. The second factor emerging from this analysis explains about 24% of the variation in the input variables. We see from the table that this factor appears to relate to Italian parties’ positions on the two economic dimensions (taxes vs. spending and deregulation), and, to a lesser extent, on decentralization and on the role of the EU in collective security. Therefore we refer to this second factor as a “State vs. Market dimension”.

Figure 1 offers a visual picture of parties’ locations in the two-dimensional policy space according to their factor scores stemming from the data reduction implemented.

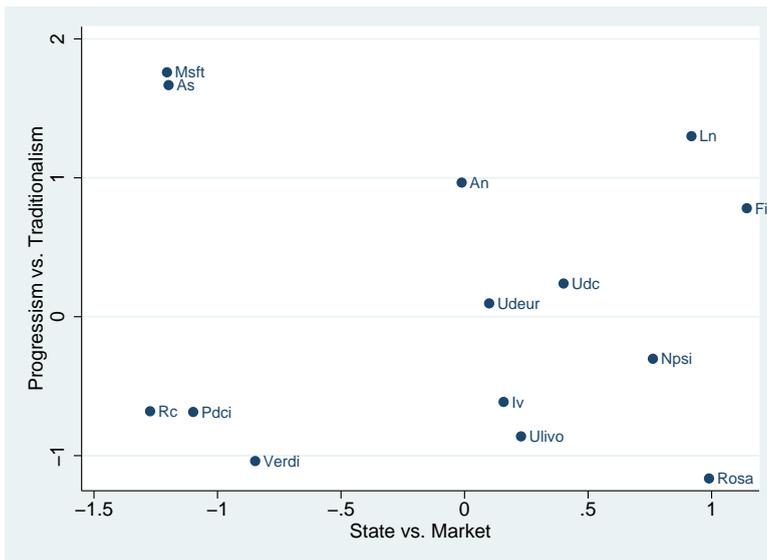


Figure 1. Parties’ locations on the two-dimensional policy space

3.1 Strategic models of government coalitions

We want now to figure out patterns of coalition governments and relative policy programs from the spatial construction of the preceding section. To this purpose we will employ two important models that have been proposed in the literature: the first is thoroughly developed in Laver and Schofield (1990), and the second in Laver and Shepsle (1996). As an application of game theory, both models aim to find the equilibria of the negotiation strategies that parties of a multiparty system undertake after an electoral event in order to give rise to a policy agreement among parties, and then to a government formed by those parties. Their common assumption is that parliamentary parties try to influence as much as possible the policy program of the prospective government. More precisely they both share the idea that parties' payoffs are positively related to the spatial proximity between their ideal points and the policy agreement pledged by the forthcoming government.⁷ As a consequence, both models maintain that stability is assured if a majority agreement among parties cannot be threaten by other majorities, finding a different agreement more valuable.

Here the problem arises whether models of post-electoral negotiation among parliamentary parties fit the Italian situation that, since 1994 election, has witnessed the insurgence of pre-electoral coalitions among parties' organizations. Recalling what we said in the first section about the pre-electoral pacts among Italian parties, we maintain that no contradiction exists in applying post-electoral models of parties' strategies to our case study. Italian pre-electoral coalitions have been indeed simple electoral groupings of parties formed as a means to win the elections, with almost no further mutual obligation. That has been realised by the already mentioned "stand-down agreements" in single-member districts, which have been the answer of the party system to the government attempt to simplify it through the partial introduction of plurality. Consequently, parties — and not coalitions — have remained the main actors of post-electoral agreements to form a coalition government, and they have always felt free to change alliance in Parliament each time an opportunity occurred to support policies closer to their ideal points (on this point see also Giannetti and Laver 2001). This happened regularly in Italy during the *Italy 94–01* era, when no coalition government lasted its expected term of office, being besieged by contrasting claims of the member parties.⁸ On this basis, neglecting the role of pre-electoral coalitions in determining parties' behaviour within the parliamentary arena seems reasonable in our case study.

⁷ Accordingly, the theories we employ assume that any aprioristic government coalition is indeed possible within a given policy space, and that all considerations that matter for Parliamentary parties are embedded in measures of distance and Parliamentary force in the policy space. In other words the spatial reasoning takes account by its own nature of any possible political/ideological concern, with no further need of side hypothesis on amity or hostility among parties.

⁸ The first Berlusconi government, born in 1994, was dismissed, and Parliament dissolved, in 1996 when Ln abandoned it. After new elections, Prodi was appointed as Prime Minister, but his first government lasted only two years, and resigned when Rc left it. Afterwards, three more governments followed one upon the other till 2001 elections, after which the second Berlusconi government took place that lasted relatively lengthily (almost four years) although changing many important ministers, because of serious contrasts inside its own majority. Finally it was obliged to resign, and a third Berlusconi government succeeded till 2006 elections that were held with a new proportional system. Then the second Prodi government was appointed, but it resigned in 2008, when a minor partner abandoned its supporting majority.

3.2 Laver and Schofield: the role of the Parliament

Laver and Schofield's model (therein after LSC) concentrates on the equilibrium policy program that emerges from the constellation of partisan forces in the Parliament. More in details, using LSC we focus on the *policy stability* during the lifespan of a given legislature, i.e. on how the program agreed upon by the majority coalition that won the post-electoral bargaining is indeed stable. As a consequence LSC does not assign any special role to the government as a political actor in the process that bring to its formation and stability. On the contrary, it centres explicitly on Parliamentary dynamics.

The previous spatial theory considered at length the problem that, in a two-dimensional space, *cyclical majorities* (McKelvey 1976) frequently occur when voters' choices depend on more than one policy,⁹ so that majority rule cannot effectively produce a collective decision. However LSC introduces the concept of *winning core*, i.e. the set of those programs in the policy space that cannot be beaten by a majority vote. In this regard, the two authors were able to demonstrate that in a two-dimensional space a winning core can exist, and corresponds to the ideal program of the largest party, if it happens that its location in the policy space is such that no other policy program will be preferred to it by some majority coalitions. Moreover that takes place when all *median lines*¹⁰ intersect at the largest party's ideal point, which for that reason constitutes the *core party*. Therefore, when such a situation is verified, the negotiations among parties will end with a coalition government that has the core party as a member and its ideal point as a policy program.

Furthermore Laver and Schofield have showed that, when the winning core is empty, assuming that no policy proposals will be made that make all members of a majority coalition worse off, only the points in the policy space that are Pareto optimal for every majority coalition can be solutions of the bargaining game among parties. The space locus of these points has been named *cycle set*.¹¹ Then, we can infer that the existence of a core party may enhance cabinet stability by giving the core party a strong bargaining position (Schofield, Grofman and Feld 1988). On the contrary the absence of a core party may lead to cabinet break-up because if exogenous events change party preferences even slightly, there are competing winning coalitions that could form with outcomes preferred to that produced by the present coalition (Grofman 1989, p. 302). In this sense, the width of the cycle set should be inversely related to cabinet longevity.

3.3 Laver and Shepsle: the role of the Cabinet

Contrary to LSC model, Laver and Shepsle's (therein after LSH) explicitly deals with the government formation process, focusing in particular on the allocation of portfolios in the cabinet.

The basic idea of LSH is that cabinet Ministers have full control over the policy

⁹ To be sure, parties are the voters in our post-electoral bi-dimensional space.

¹⁰ A median line is a line dividing the policy space so that a majority of the voters' ideal points lies on one side and on it, while another majority lies on it and on the other side.

¹¹ Formally the cycle set is the area limited by the intersection of the *median lines*.

dimension associated with their ministry. That means that each proposal to form a coalition government, to be credible, must include a specific allocation of cabinet portfolios among the coalition partners. Since the jurisdictions of key portfolios define the dimensions of the policy space, the program of the proposed coalition on each policy dimension must coincide with the preferred policy of the party to whom the portfolio that controls that dimension has been allocated. That amounts to say that the legislature is not allowed to vote on any possible policy package (i.e. on any point in the policy space), but only on alternative combinations of ministries allocation (that form a *lattice set* of parties' ideal policy combinations). The analytic purpose of the model is then to restrict the possible governments that can be formed, and thereby reduce the potential for voting cycles in multi-dimensional policy spaces. The realistic side of its proposal is to take account of the central role of the government (the cabinet) in democratic law making, with particular consideration of its agenda setting power.

A central concept of the model is the *winset* of a government, defined as the set of governments (i.e. ministries allocations) that some majorities consider better than that government. As for a two-dimensional policy space such as that of our case study, LSH amounts to consider governments characterized by two key ministries. In this case the authors show that a government consisting of the two key portfolios allocated to parties that are at the median position along the two key policy dimensions is an equilibrium if there is no alternative government in its winset. In other words, if there is no new assignment of ministries that is preferred by an alternative legislative majority, the dimension-by-dimension median (DDM) cabinet is a stable solution of the game of forming a majority government. Moreover, if no DDM cabinet exists with empty winset in a given legislature, we would rank the different scenarios of government instability accordingly to the number of alternative governments that are present in the winset of the DDM cabinet: the higher that number is, the more cabinet cycles are likely, and therefore the less cabinet stability is granted (see Warwick 1999 for a similar approach).

4. Results and discussion

We need now to measure the stability of the eight legislatures simulated in Table 2 as it is theoretically assessed. In other words, the same parties' positions in the policy space of Figure 1 can form various unlike majorities in the different simulated legislatures, therefore giving rise to different degrees of government stability, as it is assessed by both LSC and LSH.¹²

To take an example, Figure 2 (left side) shows what happens when one applies LSC to the two-dimensional Italian policy space of Figure 1 where parties' parliamentary forces are taken from Table 2 using the *Germany* electoral system. In this case, the median lines do not intersect at a single point. As a consequence, we do not have a

¹² We consider the policy preferences of the parties as an a-priori preceding the definition of the characteristics of an electoral system and not significantly affected by any change of it (at least in the short run). This allows us to analyze the different simulated legislatures with the *same* policy space illustrated in Figure 1. Although we recognize that different voting rules can possibly change parties' strategies, since they change their incentives, we do not consider the issue here.

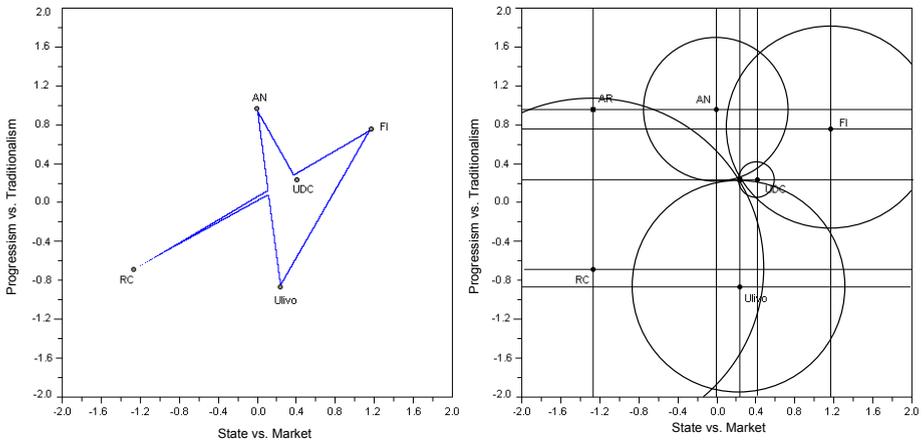


Figure 2. The two-dimensional Italian policy space obtained using the *Germany* electoral system: an empty core and nonempty cycle set using LSC (left); indifference curves related to DDM cabinet (Ulivo-Udc) with an empty winset using LSH (right)

core party. Another way to see this is by looking at the position of the largest party of this simulated legislature (Ulivo), the only one which can aspire to become a core party. Given its peripheral position, Ulivo is indeed excluded by a large number of possible majority coalition, so its aspiration can never be realized. We are left with a 0.760 wide cycle-set including five parties (An, Fi, Udc, Rc, and Ulivo).¹³ Some level of instability is thus the outcome theoretically expected.

The right side of Figure 2, on the contrary, stems from the application of LSH to the same simulation. The ideal points of the five parties have been identified with dots and labels, and come out from the intersection of the two coordinates representing the two ideal party policies in our two-dimensional space. For instance the two lines through the dot labelled An represent An's preferred positions on the two dimensions. Each intersection of two lines represents a possible government, i.e. a cabinet of two key ministries controlling the two dimensions. Given the policy dimensions to which the two latent factors are mostly correlated, we can attribute the "State vs. Market" dimension to the Finance Minister, and the "Progressivism vs. Traditionalism" dimension to the Prime Minister. For example, the intersection labelled AR means a coalition government assigning the Finance ministry to Rc and the Prime Minister to An.¹⁴ In Figure 2, in particular, we plotted the indifference curves that other parties reveal with respect to the DDM cabinet formed by Ulivo (along the horizontal axis) and Udc (along

¹³ Cycle set width in Table 4 are reported in square-units corresponding to the dimensions of the axes in the Figure. What is relevant is, of course, their relative width.

¹⁴ The apparent peripheral position of such a coalition in the policy space is an evidence of its implausibility as a stable government (see also fn. 7). A formal confirmation of it can be drawn from parties' indifference curves for AR, which reveal that its winset includes several possible governments.

the vertical axis). As one can see, in this case the DDM winset is empty. Therefore, by applying LSH to this simulated legislature we can identify a much more stable situation compared to LSC. We will go back to this point below.

The main results of our inquiry are reported in Table 4. In the first three columns we report respectively a measure of the deviation from proportionality of each electoral system employed (estimated using the Gallagher index: Lijphart 1999) together with two indices which take account of the distribution of party strengths in Parliament. These are the Effective number of parties (Laakso and Taagepera 1979) and Polarization (Powell 1982). The first one weighs parties in relation to their strength, while the second is a measure of support for extremist parties.¹⁵ These two party-system features together help to define “the bargaining context in which a government is forced to survive” (Laver and Schofield 1990, p. 155). According to the empirical studies cited in the introduction, this context influences critically the level of government stability. In particular, we should expect a higher level of stability when both previous values decrease, precisely because this fact helps to create a simpler bargaining context. In this sense, given the negative association that appears in Table 4 between the degree of non-proportionality and both indices, we should anticipate a higher degree of stability as the degree of non-proportionality grows. However this expectation is not properly confirmed by our simulations.

Table 4. An evaluation of the expected stability of simulated legislatures (LSC and LSH)

Electoral systems	G	E	P	LSC		LSH	
				Core Party	Cycle Set Width	DDM cabinet with empty winset	Parties controlling the portfolios allocation in DDM cabinet and alternative portfolios allocations present in DDM winset
Holland	0.01	6.78	0.14	No	0.775	No	win(Ulivo;UDEUR)= 2
Italy 94–01 rev.	0.03	6.26	0.15	No	0.903	No	win(Ulivo;UDEUR)= 2
UK revised	0.03	6.64	0.16	No	1.007	No	win(Ulivo;Npsi)= 1
Italy 48-92	0.04	5.91	0.12	No	0.681	Yes	win(Ulivo;UDEUR/UDC)= 0*
Germany	0.09	4.66	0.08	No	0.76	Yes	win(Ulivo;UDC)= 0
Spain	0.14	3.68	0.04	No	1.039	No	win(Ulivo;FI)= 2
Italy 94–01	0.17	3.44	0.03	No	1.039	No	win(Ulivo;FI)= 1
UK	0.21	2.94	0	Yes	0	Yes	win(Ulivo;Ulivo)= 0

Note: G = Gallagher index; E = Effective number of parties; P = Polarization index

* UDC and UDEUR share the median position along the second dimension

Indeed, as for LSC, stability is reached for the highest level of non-proportionality (*UK*, where the Gallagher index is 0.21 and cycle set width is 0): a somehow granted result given that Ulivo controls the majority of seats (319 over 630, see Table 2). However, at the lowest level of non-proportionality (*Holland*) as well as at intermediate levels (*Italy 48–92*, and *Germany*) we have relatively more stability (i.e., the cycle set width is narrower) than at higher levels (*Spain* and *Italy 94–01*).

¹⁵ We conventionally define “extremist parties” the parties that on the left-right scale provided in Table 1 scored less than 3.5 or more than 16.5 (i.e., Rc, Pdci, Ln, Msft, As).

This far from regularly growing relationship between non-proportionality and government stability appears also for LSH. In this case, we can see that while stability begins to reduce if we pass from extreme level (*UK*) to the following two higher levels of non-proportionality (*Italy 94–01* and *Spain*), it turns out to grow again for the two intermediate proportional systems (*Italy 48–92*, and *Germany*: in both cases we have a DDM cabinet with an empty winset), before decreasing once again for the remaining systems.¹⁶

These results do not suit therefore any simply growing trend between non-proportionality and stability. It is possible, however, to get from them an estimation of their linear relationship. Indeed, if we plot the Gallagher index against the cycle set width of our eight simulated legislatures (i.e. the measure of their instability as we have attained it through LSC) we find that Pearson's coefficient of correlation is -0.421 . Although this theoretically derived figure refers to a single case study, it is interesting to compare it with the same coefficient between non-proportionality and stability established in empirical research. We have done this in Figure 3 starting from data presented in Lijphart (1999). In this case the correlation between government instability of European governments (expressed as the opposite of government duration) and the non-proportionality of their electoral systems (expressed by Gallagher's index) is -0.437 , which is, interestingly, quite close to our theoretical deduction's.

However, measuring the instability of our simulated legislatures through LSH (i.e. counting the number of alternative governments in the DDM cabinet winset) the value of correlation considerably decreases to -0.330 . To shed light on this difference, we first consider the disagreement of the predictions envisaged by LSC and LSH, i.e. the absolute stability attained by *Germany* and *Italy 48–92* for the latter but not for the former. About this it is useful to go back to the different perspective with which the two models look at the stability of representative institutions. Indeed, LSC stability denotes parties' ability to define a programmatic agreement that can persist, therefore evoking the power of the legislature to effectively address the government's action agreed upon by a parliamentary majority. This can be obtained, as noted, only with the presence of a core party.

Vice versa, LSH stability refers to ministers' effectiveness to realize the policies outlined in the programmatic agreement, therefore evoking the power of the cabinet to avoid that parties, after having agreed on a given program, decide to break it, trying to gain "visibility". As a consequence, according to LSC, given the peripheral position (see Figure 1) of the two major parties that can potentially aspire to become core party (Fi on one side, Ulivo on the other), the only way to create stability is decreasing the total number of parties so much that Fi or Ulivo can finally benefit of a majority of seats by its own. This is reached in our simulated scenarios just in the case of *UK*. On the contrary, LSH stability does not depend on the (relative) size of the parties involved

¹⁶ It is worth noting that, while the "proportionalization" of the plurality system (i.e., *UK revised*) undermines the stability of pure *UK*, both mixed systems (with and without "proportionalization") produce a remarkably similar (and unsatisfactory) level of instability. Then our simulations suggest that the proportional system newly introduced just before 2006 election cannot be responsible for the high level of instability found in the Camera (see below). Indeed we should have expected a similar level of instability under the previous mixed system.

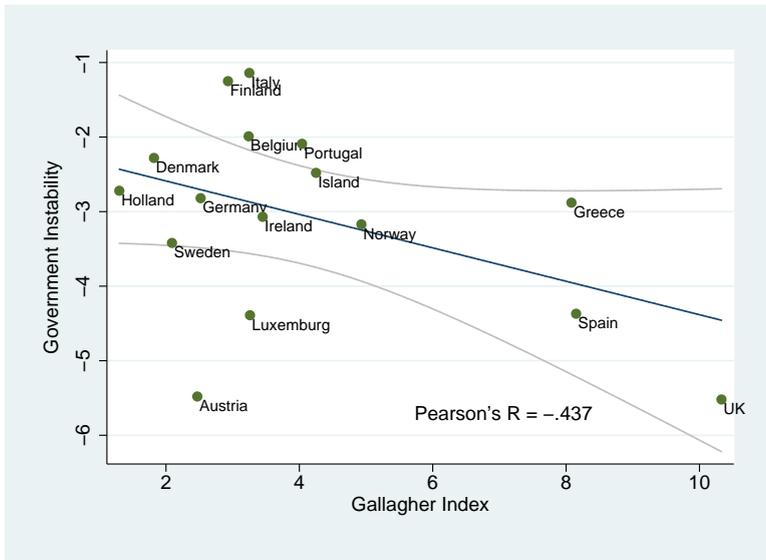


Figure 3. The relationship between the Gallagher Index and Government Instability (expressed as the opposite of the average government duration in years) in European democracies 1945–1996: linear relationship with its 95% confidence interval reported (original data from Lijphart 1999)

in a DDM cabinet, but merely on their positional advantage in a situation in which the government — and most notably the Ministers in the cabinet — control the political agenda. And that relieves the search for stability. Interestingly, if we go back to Fig.3, and we compute once again the usual correlation between non-proportionality and cabinet instability, but *this time* taking into account the effect of the agenda setting power of governments (as reported in Tsebelis 2002) this correlation passes from -0.437 to -0.180 : a remarkable decrease that points out the important role played by the agenda power of the government. This reduction in empirical data mirrors the weakening of the relationship between non-proportionality and instability that we have noticed above in the models, passing from LSC to LSH.

4.1 A snapshot on the Italian 2006 Parliament

Let us now abandon the simulation and, as a supplementary exercise, let us make a note on the stability of the Italian legislature which started in 2006. As noticed above, the Italian General Election of 2006 was highly competitive, resulting in a victory of the Union by a very narrow margin in terms of votes. Nevertheless the electoral system in force in the *Camera* manufactured a substantial majority in terms of seats by means of a majority prize, which gave rise to Prodi's government. As this majority is very heterogeneous as for policy preferences, it might be of interest to test its government

stability through the theoretical framework we have introduced in this paper, and to confront it with the empirical findings.

In Table 5 we report the estimated level of stability for Prodi's government. As we can see, both LSC and LSH share the common judgement that the predicted stability is remarkably low. In fact, no core party exists and the area of the cycle set is wide for LSC.¹⁷ In its turn LSH shows that no DDM cabinet with empty winset exists.¹⁸ Moreover, considering that Prodi's government is, with our conventions, a Ulivo-Ulivo one,¹⁹ we can count eleven possible alternatives in the cabinet winset.

Table 5. An evaluation of the expected stability for LSC and LSH (2006: Camera dei Deputati)

Electoral systems	G	E	P	LSC		LSH	
				Core Party	Cycle Set Width	DDM cabinet with empty winset	Parties controlling the portfolios allocation in DDM cabinet and alternative portfolios allocations present in DDM winset
Chamber of Deputies	0.04	5.94	0.14	No	1.27	No	Win(Ulivo;Ulivo)=11

Note: G = Gallagher index; E = Effective number of parties; P = Polarization index

These findings suggest two theoretically based previsions. On the one hand we expect any majority to be involved in a persistent conflict about the policies to pursue. In other words, any pre-electoral policy commitment among the members of the Union would not be robust enough to bear their strategic bargaining once the Parliament was elected. On the other hand, in case the majority supporting the government collapsed, we would expect a complex and difficult bargain inside the Parliament, that may even end with the breaking up of it and new elections. This is exactly what happened at the beginning of 2008²⁰ and as such this empirical fact provides a good illustration of the theoretical insights of the spatial theory of coalition formation.

5. Conclusion

A tradition of studies in political science, starting from Duverger (1954) points out that majoritarian rules reduce the number of parties while proportional rules increase it. From this, and from the simplification of the bargaining contest that a lesser number of parties implies, the inference comes out that majoritarian rules cause government

¹⁷ To be more precise, it is the widest cycle set among all the values obtained in the different simulated Parliaments reported in Table 4. This is mainly due to the relatively high share of seats controlled by the more leftists parties: Rc, Pdc and Verdi.

¹⁸ The DDM cabinet is a Ulivo-Iv government (with 4 alternatives in its winset).

¹⁹ Both Prime Minister Prodi and Finance Minister Padoa Schioppa can be ascribed to Ulivo.

²⁰ See fn. 8 above. To be sure the crisis began into the *Senato* (the Upper Chamber) where, because of a different electoral rule, the majority margin of the Union was much narrower than the *Camera*'s. However the conflict about policies was permanent inside the Prodi's majority, so that an occasional event, such as a personal annoyance of a Minister concerning a non-policy issue, was sufficient to determine the end of legislature.

stability while proportional rules bring about instability. Although acceptable in principle, this inference does not mean that a regular decreasing relationship exists between non-proportionality and instability, as the low correlation coefficient between the two variables we have elaborated from empirical research seems to show.

In the case study we have dealt with in this paper, we have made use of the tools of the spatial theory of voting to explain the reasons why the policy preferences of the Italian parties may undermine the (potential) stabilization effect of a reform toward more majoritarian rules. Besides, assuming that parties react strategically to change in electoral rules, we have reasoned about the possibility that the partial introduction of plurality in the Italian fragmented party system induced in it even more fragmentation and instability.

More generally we maintain that these results witness that the spatial theory of voting and its applications to coalition governments should be taken into account while considering the relationship between electoral system and government stability in parliamentary democracies. Its contribution may indeed be important in political analysis as well as in electoral reform.

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