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Coalition policy in multiparty governments: whose preferences prevail

Alessio Albarello [iD]

Department of Political Science, University of Rochester, Rochester, USA
Email: aalbarel@ur.rochester.edu

Abstract

In coalition governments, parties need to agree on a common policy position. Whose preferences prevail? The proportionality hypothesis, the idea that coalition partners' influence on policy is proportional to their share of seats, has been used widely in the literature on democratic representation, ideological congruence, and coalition politics. In my analysis of competing theories aimed at determining what influences policy compromise in multiparty governments, I reject the proportionality hypothesis. My results suggest instead that coalition partners exert equal influence on policy compromises, independent of their number of seats. More extensive analysis also provides evidence for increased party influence on policies when the party is the formateur or closer to the parliamentary median, ceteris paribus. As a by-product of my analysis, I provide a simple and better proxy for measuring a government's position when this position is not directly observable.

Keywords: Coalition governments; policy compromise; seat share; proportionality; formateur; parliamentary median; democratic representation

Most of the world's democracies are parliamentary systems governed by a coalition of parties. While the policy positions of these governing parties may differ substantially, as they often do, the government can only adopt a single policy. As a consequence, no party may expect to have its policy position entirely reflected in government action. Instead, parties need to compromise. In this paper, I study whose preferences prevail in coalition policy.

It is fundamentally important for the study of democratic representation that we understand the policymaking of coalition governments. We cannot evaluate how democracies perform unless we can assess what policies they adopt. Furthermore, a measure of policy outcome is helpful in other contexts, for example, in evaluating theories about individual behavior, such as whether voters vote on the basis of anticipated policy compromises or other party features, and how candidates trade office with policies. However, measuring the policy outcome of coalition governments is often hard or impractical. To overcome this issue, the literature commonly imputes coalition policy from the more easily observable parties' policy positions, making assumptions on how the different positions translate into a common policy. The predominant assumption is that policies are proportional to coalition parties' seat share in parliament. This hypothesis is used broadly in prominent research on coalition politics to analyze, for example, government formation (Martin and Vanberg, 2014b), legislative review (Fortunato, 2019), the size of coalitions (Bassi, 2017), government partisanship and the welfare state (Allan and Scruggs, 2004), as well as related work studying coalition policy outcomes (Martin and Vanberg, 2014a, 2019). Furthermore, seat proportionality is the accepted assumption in the study of democratic

representation, ideological congruence, and the median mandate (Huber and Powell, 1994; Powell, 2000; McDonald *et al.*, 2004; McDonald and Budge, 2005; Powell, 2006; Golder and Stramski, 2010).

The evidence for such proportionality is suggestive but not unequivocal. The key issue here is that finding a correlation between some (proportionally) weighted party position and actual government policy (Budge and Laver, 1992; Kim and Fording, 2001; Warwick, 2001; McDonald and Budge, 2005) does not mean the policy is in fact weighted proportionally. If the actual weights that prevail are correlated with seat shares, then a correlation is present even if these weights are not proportional to seats. For example, consider a case in which parties have the same weights and the formateur gets a bonus weight. Given that the formateur is, on average, a big party, weights and seats are correlated even if the weights are in fact not proportional to seats.[1] Additionally, most theories of government formation do imply a correlation between the shares of party seats and policies, but these correlations do not imply that the weights are proportional to seats. These theories allow for seats shares to have an influence by determining viable coalitions and opportunities to lead coalition negotiations, but also emphasize other variables such as being the formateur and the closeness to the median position in the legislature (Austen-Smith and Banks, 1988; Baron and Ferejohn, 1989; Baron, 1991; Morelli, 1999).

In this paper, I propose a statistical model that, by directly modeling the weights that parties bear in the policy compromise, nests the prominent hypotheses about the relationship between the seat share of parties and the coalition policy position as special cases, letting the statistical test tell which hypothesis, if any, is supported. In particular, the hypothesis about directly proportional weights is what in the literature is generally referred to as proportionality. Here, the power that parties have in determining government policy is exactly equal to their respective size in terms of parliamentary seats. In contrast, in the equal weights hypothesis, the government policy is independent from parties' seat share. In this case, all parties have the same power in determining the government position, conditional on their policy placement. Thus, a party with a policy position distant from a cluster of parties would pull the government policy independently from its status as a small or big party. As common in the literature on coalition politics, I use the Comparative Manifesto Project data to measure parties' and governments' policy positions (Budge and Laver, 1992; Budge, 2001), but I also replicate the analysis by using implemented pledges as a measure of party weights (Thomson, 2017).

My results reject the possibility that coalition partners' influence on policy is proportional to their share of seats. Instead, the findings are consistent with the hypothesis that coalition partners exert equal influence on policy compromises, independent of seats. Considering other elements that may affect the policy outcome in coalition governments, I find moderate evidence that being the formateur or being closer to the median position in parliament increases a party's influence on government policy. Additionally, I find no evidence for the possibility that supporting parties, that is, parties sustaining the coalition in the parliament but without cabinet portfolios, or opposition parties may influence the policy position of the government.

The estimated models from this study provide a new way to empirically impute the policy compromise of coalition governments when the actual policy position of the government is not observed. In fact, while assigning the government compromise as being proportional to seat shares may be a simple and good enough practice in some circumstances, the evidence from my analysis rejects this prevalent practice (Allan and Scruggs, 2004; Martin and Vanberg, 2014a, 2014b; Bassi, 2017; Fortunato, 2019; Martin and Vanberg, 2019) as well as the practice of expressing the government position as the position of the median coalition party (Huber and Powell, 1994). My results indicate that these analyses may not be using the best possible measure of government policy. Also, most research on the quality of democratic representation, ideological congruence, and the median mandate base their results on the proportionality

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[1]The weighted party positions and policies are also correlated.

assumption (Huber and Powell, 1994; Powell, 2000; McDonald *et al.*, 2004; McDonald and Budge, 2005; Powell, 2006; Golder and Stramski, 2010; Powell, 2019). My findings show that this literature may misestimate the gap between the representative voter and the government position. In this paper, I provide a simple proxy that better predicts the government position and can be easily used in lieu of the proportionality assumption.

1. Rationale for equal weights

The origin of the expectation for policy-seat proportionality can be traced to two distinct elements: the related research on cabinet portfolios and the complexity of coalition policy. First, in the literature on cabinet allocation, which precedes the related literature on policy compromise, there is a strong prediction that the number of cabinet portfolios a party gets is directly proportional to their share of seats; this is commonly referred as Gamson's law (Gamson, 1961). The similarity of the two bargaining processes, over ministries and over policies, induced the idea that what happens for cabinet allocation may translate into policy. Undoubtedly, forming a government and governing are two distinct processes. The former involves possibly all the parties in the parliament, while the latter is restricted to the coalition partners.[2] Second, coalition governments are more complex to analyze than the single parties of which they are made up. This led researchers to use parties' positions together with some mechanism to convert these into government positions rather than directly measuring the policy of the coalition. The assumption that government policies are best approximated by their parties' policy positions weighted by their seat share is the prominent method for imputing such measures, and it is currently unchallenged.[3]

The empirical policy literature has also looked at the role that seats play in determining government policy. Budge and Laver (1992) perform a content analysis of parties' statements and of government declarations to measure parties' and governments' positions in 11 advanced democracies. They calculate two expected government positions: one in which the seats are weighted and one representing the unweighted average of coalition party positions. These represent the two scenarios, one in which government policy is directly proportional to the parties' share of seats and another in which parties exert equal influence regardless of their seats. They find that both expected measures of government position correlates with the measured government position, but without one model dominating the other. Using analogous data and methodology, Kim and Fording (2001) and McDonald and Budge (2005) find positive but far from perfect correlations between the party seat weighted average position and the observed government position. Perhaps the strongest support for the idea of proportionality comes from Warwick's analysis (Warwick, 2001). By using the same dataset as Budge and Laver, Warwick regresses the observed government position on the cabinet weighted mean position finding a coefficient of 0.5, which is in line with the preceding scholarship. Conversely, when the regressions include additional factors, such as the government-formateur policy distance, the coefficient of the measured government position on the estimated government position becomes almost one.

Overall, the empirical literature has detected various levels of correlation between the party seats weighted average and the government positions. Importantly though, these correlations do not necessarily imply that parties' weights are in fact proportional. If the true weights are correlated with seats, we would observe a correlation even if weights are not proportional to seats. For example, as indicated also by Budge and Laver (1992), having positive and significant coefficients for the parties' weighted seat share does not exclude simultaneous positive and significant coefficients for the parties' unweighted seat share.

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[2]For a recent discussion see Cutler *et al.* (2016).

[3]To a much lesser extent, the cabinet median is also used as a proxy of government position. See for example Huber and Powell (1994).

While the empirical literature has focused on the appeal of the direct proportional hypothesis, the theoretical literature on government formation finds a more limited role for seat share. At the same time, the theoretical literature expects other factors to be relevant, such as being the formateur or being close to the median position in the parliament. Initially, the theoretical literature introduced models of bargaining which recognized that, given all the possible coalitions that may form, the more often a party is pivotal, the more power it should have. This principle is at the basis of bargaining power indexes such as the Shapley–Shubik Index, the Banzhaf Index, and the Minimum Integer Weights (Shapley and Shubik, 1954; Banzhaf, 1964; Ansolabehere *et al.*, 2005). By their nature, these indexes do not consider the fact that the party leading the negotiations may have greater power (Ansolabehere *et al.*, 2005). Similarly, they do not factor in the party policy positions, which may affect the homogeneity and thus the desirability of alternative coalitions.

Other literature finds instead a policy advantage for the proposer. For example, Austen-Smith and Banks (1988) and Baron and Ferejohn (1989) analyze non-cooperative bargaining models of legislatures where parties need to form a majority over a proposed distribution of limited resources. They both find a non-monotonic influence of seat share in the legislature, with the biggest (i.e. the proposer) and smallest parties relatively better off. The rationale for this is twofold. First, the proposer gets an advantage by limiting what her partners obtain thanks to her capacity to choose who is part of the negotiations. In fact, at each bargaining stage, each party has some reservation value, which is the value that the party would get in expectation from future negotiations should the current negotiation break down. Thus, the proposer can offer a party their reservation value and that party would be satisfied enough to join the coalition. However, not all the parties are offered a place in the coalition and the proposer can keep for herself the continuation value of the excluded parties. Second, smaller parties can be more likely to be in the government and thus affect its policy position. That is, for the proposer, it is cheaper to satisfy the third largest party than the second largest one since the latter has a larger reservation value given she would be more likely to become the proposer in the next negotiation attempt, thus gaining the proposer's advantage.

Additionally, other strands of the literature consider the policy effect of parties' policy positions. For instance, Baron (1991) analyzes a non-cooperative model of bargaining in legislatures in which parties have spatial preferences over policies. He finds that, in general, the adopted policy position is closer to the policy position of the centrally located parties. The reason for this is that, other things being equal, a proposer prefers to satisfy a centrally located party rather than a non-centrally located party since, on average, centrally located parties are closer to the policy position of the proposer than the other parties are. This rationale is closely related with the median voter theorem of Black (1948). In a one-dimensional policy space, the median position is the only one that cannot be defeated by any simple majority, and it will thus be the position that is adopted in an assembly. An additional rationale for central parties to get more policy concessions comes from the demand bargaining model of Morelli (1999). When the head of state has discretionary power to choose who starts the negotiations, and assuming she prefers the government policy to be as close as possible to the median voter, she will choose the median party as the formateur.

In sum, in coalition bargaining theory, seats determine what coalitions are winning (i.e.,, which will have a majority in parliament) and affect the likelihood of being chosen as formateur. Accordingly, while seats are still valuable, within each coalition there is no obvious strategic incentive for the policy outcome to be directly proportional to parties' seat share. Rather, leading the negotiations gives an advantage by choosing what parties are part of the coalition, and being close to the median position gives an advantage thanks to the lower average distance to the policy positions of the other parties.

2. Setup

To analyze what party's preferences prevail in coalition policy, I present a model that allows for the two hypotheses on the role of seat share, as well as for the addition of other possible explanatory factors. The starting point is a set of parties that agreed to form a government. As is common in the literature, I initially consider only parties with government responsibilities, but relax this assumption in the Analysis and Findings section. I focus on the parties' compromise on the left–right policy dimension. This scale is believed to capture most issues in policymaking, and it is regarded as the single most important policy indicator (Budge, 2001). I also assume that parties have single peaked preferences and that policies are Pareto optimal. Single peakedness implies that parties have some unique ideal policy position and prefer policies to be as close as possible to this ideal point. Pareto optimality is a minimal assumption to restrict the set of possible policy positions of the government. It means that the position of the government is such that it is not possible to find an alternative position that is preferred by all the coalition partners.

Under the above assumptions, the coalition compromise is restricted to be between the positions of the leftmost and rightmost coalition partners. In particular, parties bargain over the policy position of the government, and the coalition compromise can be expressed as a weighted average of the parties' policy positions. Let the parties in the i-th coalition be indexed by $j = 1, 2, ..., \bar{j}_i$. Let z_{ij} be the policy position of party j in coalition i. My statistical model expresses the government policy as:

$$y_i = \beta_0 + \sum_{j=1}^{\bar{j}_i} W_{ij} \times z_{ij} + \epsilon_i \tag{1}$$

where y_i is the policy position of government i, β_0 is a constant term accounting for possible systematic discrepancies between the positions of the government and the parties' weighted sum (Warwick, 2001), W_{ij} is the weight of party j in government i, and ϵ_i is an error term.

I express party weights as a function of party features.[4] To satisfy Pareto optimality, the weights need to be weakly positive and sum up to one. These assumptions ensure that the policy outcome is bounded by the most leftist and rightist parties in the government, while allowing the parties to exercise differential influence on the exact location of the coalition compromise. In specifying a parametric model of these weights, it is important for my purposes to subsume the two possible scenarios for seat share influence (equal weights and proportional weights) as well as allow for the presence of other possible explanatory factors. As a first cut, I consider parliamentary seats as the only element possibly determining the weights that parties have in the coalition policy compromise. I discuss the generalization of the model adding more independent variables in the Analysis and Findings section. To satisfy all the above conditions, I parameterize the weights according to:

$$W_{ij} = \frac{\exp(\beta_{LSS} \times x_{ij})}{\sum_{j=1}^{\bar{j}_i} \exp(\beta_{LSS} \times x_{ij})} \tag{2}$$

where β_{LSS} is the coefficient for the Log of the parliamentary Seat Share, and x_{ij} is the Log of the parliamentary Seat Share for party j in government i. Certainly, there may be other operationalizations satisfying the requirements. However, Theil (1969) suggests that this specification is a good one.[5]

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[4]Technically, the statistical model considers a subset of all the possible Pareto optimal policies. That is, the weights that parties have are a function of the observables, and parties with the same observables have the same weights. The model in which parties' weights W_{ij} are separately estimated parameters is not identified.

[5]For a similar class of models, see also Alemán and Calvo (2010) and Rosche (2019).

I use the Log of Seat Share to measure the effect of seats because in this way the weights nest the two hypotheses around the role of seats. In fact, when the Log of Seat Share is plugged into the weights' equation, the weights simplify to:

$$W_{ij} = \frac{SeatShare_{ij}^{\beta_{LSS}}}{\sum_{j=1}^{\bar{j}_i} SeatShare_{ij}^{\beta_{LSS}}}$$

In this way, the two leading hypotheses are special cases of the possible values of the coefficient β_{LSS}. When $\beta_{LSS} = 0$, W_{ij} converts to equal weights $1/\bar{j}_i$ for every party. That is, β_{LSS} corresponds to the equal weights hypothesis. Instead, when $\beta_{LSS} = 1$, W_{ij} is exactly proportional to $SeatShare_{ij}$, which corresponds to the direct proportionality hypothesis.

3. Data

To test the effect that parties have in coalition policy, I need a measure of parties' and governments' policy positions on the same scale. For this purpose, I use the parties' manifestos and governments' declarations provided by the Comparative Manifesto Project (CMP), as defined by Budge and Laver (1992) and released by Budge (2001). The parties' manifestos are the electoral programmes of the political parties, while the governments' declarations are the joint programmes agreed upon by the coalition partners and usually announced at the beginning of the term in office. Undoubtedly, parties and governments' manifestos are a measure of policy intention and not eventual policy output. Nevertheless, the CMP's left–right scale has become a common way to measure preferences in the coalition literature (McDonald *et al.*, 2004; McDonald and Budge, 2005; Fortunato, 2019; Martin and Vanberg, 2019; Powell, 2019) as well as in the literature on the effect of seats on government policy (Budge and Laver, 1992; Kim and Fording, 2001; Warwick, 2001; McDonald and Budge, 2005).[6] Additionally, the CMP provides a measure of party and government policy positions that is measured with the same metric, thus allowing for a direct comparison. Indeed, the literature confirms that this choice is at least as good as using other possible approaches such as experts' and voters' perceptions of party positions (Gabel and Huber, 2000; McDonald and Mendes, 2001).

In detail, the CMP manually coded the same methodology for both pre-electoral parties' manifestos and post-electoral government policy declarations on 56 policy areas, such as protectionism and the expansion of social services. The left–right policy position is calculated by subtracting the percentage of the statements on the 13 pro-right dimensions from the percentage of the statements on the 13 pro-left indicators. Thus, the left–right position of both parties and governments represent the overall difference in percentages of statements toward the left versus the right of their policy statements. Hence, a perfectly balanced text would have a position of 0, while an entirely pro left or pro right document would have positions of –100 and 100 respectively. In this way, the CMP measure is responsive to parties having preferences (or salience) concentrated in some issues, as dimensions can be more or less in line with some parties preferences, but they all proportionally affect the aggregated scale. Analogously, the CMP measure is robust to the possibly time-varying length of the coalition agreements (Indridason and Kristinsson, 2013), since measuring the difference in percentages implies that a short document and a long document with the same issue proportions will have the same measure of the policy compromise. On the whole, the observations I use in the analysis include all the CMP coded governments with at

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[6]The CMP sometimes coded the speeches that were given on behalf of the government at the beginning of the parliamentary section, instead of the coalition agreements. Still, any type of document needs to reflect the actual party balance. In fact, all the documents portray the planned policy for governments that need to be voted for in the parliament. Thus, any party that may be given less than what it should, could simply opt out for an alternative that would reflect its power.

least two coalition partners, with the inclusion of additional data provided by Warwick (2001) and the exclusion of non-compatible observations, for a total of 107 coalition governments in nine Western European countries from 1945 to 1998, with 64 of such governments formed right after an election.[7] In my dataset, the position of the governments ranges from −28.6 to 55.1, with a median value of 0.6, while the positions of the coalition parties range from −74.3 to 59.3 with a median of −6.36.

With regards to the independent variables considered in the analysis, the CMP also provides the information on the number of seats that parties have in the parliament. Using these data, the *Log Seat Share* is calculated as the log of the share of seats in the legislature, and the *Delta-t Seat Share* is determined by the difference in the party seat share between the current parliament and the previous one. The composition of the government is taken from the European Representative Democracy database (Andersson *et al.*, 2014). The *Formateur* dummy is operationalized as standard in the literature as the party providing the Prime Minister, as coded in the Parliament and Government Composition Database (Döring and Manow, 2010).[8] The *Absolute Distance to the Median Legislative Party* is measured as the absolute distance from the *Median Legislative Party*, scaled by the CMP measure range (200). Thus, the *Absolute Distance to the Median Legislative Party* ranges from 0 to 1, with a mean value of 0.074. All the other dummy variables are derived from these data: the *Biggest Coalition Party*, the *Median Party of the Coalition*, the *Surplus Parties*, and the *Ideologically Outlier Parties*.

4. Analysis and findings

The model specified by (1) and (2) is nonlinear. Thus, I estimate this model using a non-linear least square regression. I first analyze the model looking only at seat share as an independent variable, and then I examine possible additional explanatory factors. Subsequently, I analyze the robustness of the findings by considering supporting and opposition parties, and by looking at policy pledges as a possible measure of party power.

4.1 Effect of seat share on coalition policy

I report the results regarding the individual effect of Seat Share in Table 1.[9] I analyze the models with and without country fixed effects in specifications (1) and (2). I also restrict the analysis to the governments established as result of an election in models (3) and (4), given that the coalition agreement in the inter-election period may be less informative. For example, in the inter-election period there is a lower expectation for government duration and the coalition compromise may be influenced by the bargaining that led to the termination of the previous government.[10]

The strong finding is that the proportionality hypothesis is rejected. Which is, the analysis rejects the possibility that parties' weights are proportional to seats (p-value for null $\beta_{LSS} = 1$ consistently significant). Furthermore, it is not possible to reject the equal weights hypothesis independent of seat share. In fact, the coefficient on Log Seat Share is not significantly different from zero in all the specifications (p-value for null $\beta_{LSS} = 0$ consistently non-significant).

Another way to look at this result is to plot the the p-value by the value of the null β_{LSS}. I do this in Figure 1 for the four models in Table 1. Here, it appears even clearer how all the models reject the proportionality hypothesis. That is, they reject all parameter values in a large interval

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[7]For further detail on the data considered in the analysis see the online Appendix A.1.

[8]For a discussion regarding this choice see Warwick (1996) and Martin and Stevenson (2001).

[9]The β in the tables are the coefficients of the parameter estimates of my models, which should not be interpreted as standard ordinary least square coefficients.

[10]Here, I report the models with full data. However, I show in Table A.7 in the online Appendix A.4 that the results are robust by using only CMP data (see the online Appendix A.1 for the details on the type of data).

Table 1. Effect of seat share on coalition policy

	Dependent variable:			
	Left–right position of the government			
	(1)	(2)	(3)	(4)
β_{LSS} (Log seat share)	0.127	0.291	0.151	0.247
	(0.168)	(0.188)	(0.167)	(0.193)
β_0 (Constant)	8.095***		4.373***	
	(1.497)		(1.586)	
Log seat share:				
p-value for null $\beta_{LSS} = 0$	0.452	0.125	0.370	0.207
p-value for null $\beta_{LSS} = 1$	<0.001***	<0.001***	<0.001***	<0.001***
Country fixed effects	–	✓	–	✓
Observations	107	107	65	65
Pseudo R^2	0.066	0.235	0.104	0.226
Pseudo adjusted R^2	0.057	0.164	0.090	0.099
Residual SE	15.48	14.58	12.78	12.71
	(df = 105)	(df = 97)	(df = 63)	(df = 55)

Non-linear least squares model, standard errors in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.
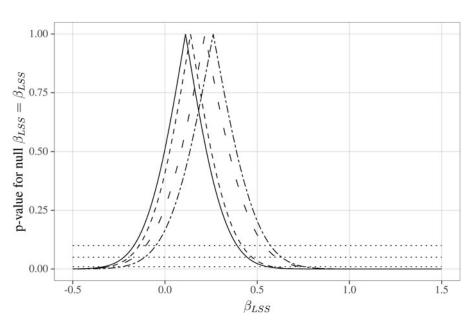

Figure 1. P-value by value of the null β_{LSS}.

around 1. On the contrary, no model rejects at conventional significance levels any parameter value in a sizable range around 0. Namely, they do not reject the equal weights hypothesis.[11]

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[11]A possible objection could be that we fail to reject equal influence because of the small sample size. Indeed, given the empirical findings in model 4 in Table 2, with a larger sample size we may reject the null $\beta_{LSS} = 0$ in Table 1. However, this would still not imply that weights are proportional to seats. Instead, the positive coefficient would be due to the correlation

Table 2. Effect of other variables on coalition policy

	Dependent variable:				
	Left–right position of the government				
	(1)	(2)	(3)	(4)	(5)
β_{LSS} (Log seat share)	0.127	−0.010	−0.681*	−0.844*	−0.586
	(0.168)	(0.195)	(0.397)	(0.444)	(0.571)
β_2 (Delta-t seat share)					−4.441
					(4.600)
β_3 (Median legislative party)					−0.283
					(0.715)
β_4 (Abs. distance to median legislative party)		−3.698**		−2.923*	−5.082
		(1.808)		(1.732)	(3.384)
β_5 (Formateur)			1.570**	1.590**	2.103
			(0.672)	(0.745)	(1.477)
β_6 (Biggest coalition party)					−0.501
					(1.825)
β_7 (Median party of the coalition)					−0.428
					(1.142)
β_8 (Surplus parties)					0.782
					(1.255)
β_9 (Ideologically outlier party)					−0.243
					(0.723)
β_0 (Constant)	8.095***	7.742***	8.194***	7,997***	8.164***
	(1.497)	(1.479)	(1.446)	(1.440)	(1.510)
Log seat share:					
p-value for null $\beta_{LSS} = 0$	0.452	0.958	0.089*	0.060*	
p-value for null $\beta_{LSS} = 1$	<0.001***	<0.001***	<0.001***	<0.001***	
Country fixed effects	−	−	−	−	−
Observations	107	107	107	107	107
Pseudo R^2	0.066	0.104	0.145	0.169	0.181
Pseudo adjusted R^2	0.057	0.086	0.129	0.145	0.105
Residual SE	15.48	15.24	14.88	14.72	15.08
	(df = 105)	(df = 104)	(df = 104)	(df = 103)	(df = 97)

Non-linear least squares model, standard errors in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

4.2 Effect of other factors on coalition policy

The fact that seat share does not influence the policy position of the coalition does not preclude possible influence of other variables. For instance, a party that increased its seat share compared to the previous election could bargain harder since it may be bolstered by increased popularity (Warwick, 2001). Thus, the difference in seat shares *Delta-t Seat Share* may be correlated with bargaining weights. Also, the biggest party of the coalition could have special power. The *Biggest Coalition Party* is the party that contributes the most to the coalition in terms of seats and, similarly to Powell's plurality legislative party, could have the largest influence on the policy position of the government (Powell, 2019).

Drawing from the formal theory literature (Austen-Smith and Banks, 1988; Baron and Ferejohn, 1989; Baron, 1991; Morelli, 1999), two other factors may influence coalition policy: the party leading the negotiations over the formation of the coalition, the *Formateur*, and the party occupying the median position in the legislature, the *Median Legislative Party*. Additionally, while in a uni-dimensional policy space the Median Legislative Party is the party that cannot be excluded by any winning connected coalition (Black, 1948), any centrally located party will be useful to limit the coalition's heterogeneity (Baron, 1991).

between seats and the formateur status. In fact, when the formateur is included in the regressions (see Table 2), seats become negative and significant, even with the current small sample size.

Hence, the lower the *Absolute Distance to the Median Legislative Party*, the greater the party's power may be.

The literature on the congruence between citizens and policymakers' policy positions has extended the concept of the median party to the coalition members, and the *Median Party of the Coalition* has been sometimes used as a proxy for the position of the government (Huber and Powell, 1994). Furthermore, while some parties are closer to the coalition's median, other coalition partners may be on the opposite side of the parliamentary median than the Median Party of the Coalition. These *Ideologically Outlier Parties* would have a smaller average policy distance to their partners in a coalition with current opposition parties. Accordingly, they could be rewarded more to compensate for their incongruous government participation. Also, a differential treatment could be reserved for parties that are numerically not needed by the remaining coalition partners to maintain the majority of the seats in the legislature. In fact, for *Surplus Parties* to get policy concessions, there must be at least one other coalition party that decides to give up some benefits.

To analyze multiple factors, I use the same statistical model but allow party weights to accomodate multiple explanatory variables by simply adding their effect in the exponentiated term, analogously to what would happen in a linear or logistic regression when moving from one to multiple independent variables. In this way, the statistical model permits the consideration of multiple independent variables together but also independently. That is, a coefficient of zero on some variables would make the model equivalent to a model without those variables. Furthermore, there is not any hierarchy among the explanatory factors considered. Thus, the role of seat share can still be analyzed in the same way while also accounting for other possible explanatory factors. Accordingly, the statistical model leaves open the possibility that the weights are a function only of the seat share or a function of other observables while independent from seats. Formally, the party weights become:

$$W_{ij} = \frac{\exp\left(\sum_{k=1}^{\bar{k}} \beta_k \times x_{kij}\right)}{\sum_{j=1}^{\bar{j}_i} \exp\left(\sum_{k=1}^{\bar{k}} \beta_k \times x_{kij}\right)}$$

where x_{kij} is the observable k for party j in government i, β_k is the coefficient for the observable k, and $\bar{k}$ is the number of observables.

I present findings with additional explanatory variables in Table 2.[12] I show the most interesting combination of independent variables, as well as the regression considering all the explanatory factors together. The main result is that the coefficient on the Log Seat Share is still both non-significantly different from zero and significantly different than one. The inclusion of other explanatory variables confirms the central finding that we cannot reject the possibility that parties have equal bargaining power irrespective of seat share, while we reject the proportionality hypothesis. Indeed, the coefficient on the Log Seat Share becomes negative for some model specifications. This would mean that parties with less seats have more power in pulling the position of the government. While in theory it is possible to construct coalitions in such a way, it has to be noted that the coefficient on seats is likely reduced because other variables that correlate with party size are included in the analysis, notably the formateur.[13]

Two factors, other than party's seats, seem to affect the policy position of the government: being the formateur and the Absolute Distance to the Median Legislative Party. For the former,

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[12]I consider here the case with both the inter-election and the after-election governments without country fixed effects. I show in the online Appendix A.4 that the results are robust to adding fixed effects (Table A.8), and to restricting the observations to after-election governments without and with fixed effects (Tables A.9 and A.10).

[13]In the dataset, the formateur is the biggest party of the coalition in 90 out of 107 cases.

the positive estimate denotes an increased influence over the government policy for the forma-teur. For the latter, the negative regression coefficient indicates that the greater the distance to the median, the smaller the power to pull the coalition compromise.[14] At the same time, the coef-ficient of the dummy for the Median Legislative Party is not significant, suggesting that all the parties close to the median position hold relatively more influence than the others, with no sig-nificant increase in power for the Median Legislative Party.[15] The null result for the Median Party of the Coalition suggests that the position of this party is not a good predictor for the position of the government, as sometimes proposed in the literature (e.g., Huber and Powell, 1994).[16] Also, the constant term indicates that there is a rightward bias for the government policy, confirming prior findings by Budge and Laver (1992), Kim and Fording (2001), and Warwick (2001).

Regarding the magnitude of the effects, the formateur effect dominates the distance to the median effect. While the exact proportion is context dependent, consider a simple example of a two party government with equally sized parties. Suppose also that one party is located at the legislative median and the other party is located on the left by 20 CMP units which corres-pond to a one standard deviation of the distribution of party positions. Switching the formateur status from the left party to the central party would increase the weight for the latter four times, from 0.21 to 0.86 (while roughly the opposite would happen for the left party's weight: decreasing from 0.79 to 0.14). The position of the government would move rightwards by 13 CMP units, or an astonishing 2/3 of the distance between the two coalition partners. Instead, to have the same change in weights between the two parties by altering their distance to the median, we would have to move the left party on the edge by 220 CMP units, or 11 standard deviations of the distribution of party positions, which would also be out of scale.[17]

Regarding the possible explanatory power of composite measures of bargaining power, such as power indexes and minimum integer weights (Ansolabehere et al., 2005; Snyder et al., 2005; Warwick and Druckman, 2006; Cutler et al., 2016), I analyze their possible effect in the online Appendix A.3. I find that these composite measures of bargaining power do not explain the bar-gaining compromise better than the simple measures considered thus far, nor do they alter the results in Tables 1 and 2 when included as possible additional explanatory factors.

4.3 The role of supporting parties and opposition parties

So far, the analysis assumed that the policy position of the government can be affected only by the parties in the coalition. However, coalitions sometimes have external *supporting* parties which support *governing* parties with their vote in the parliament, and thus may get policy concessions. Additionally, a government could also satisfy *opposition* parties, for example to smooth the legis-lative process. Accordingly, I analyze whether supporting parties and opposition parties have a systematic say in the policy position of the government. Thus, I now model the government pol-icy position as the weighted average of governing parties', supporting parties', and opposition par-ties' policy positions together:

$$y_i = \beta_0 + \sum_{j=1}^{\bar{j}_i^G} W_{ij}^G \times z_{ij} + \sum_{j=1}^{\bar{j}_i^S} W_{ij}^S \times z_{ij} + \sum_{j=1}^{\bar{j}_i^O} W_{ij}^O \times z_{ij} + \epsilon_i$$

[14]When country fixed effects are included, the Absolute Distance to the Median Legislative Party decreases significance, and the Formateur raises significance. When the observations are restricted to after-election governments, the Median Legislative Party marginally gains significance.

[15]The Median Legislative Party is significant when regressed alone. However, the significance does not resist the inclusion of other variables, differently from the Absolute Distance to the Median Legislative Party.

[16]I provide a more detailed discussion of this in the online Appendix A.2.

[17]The position of the government would also change, but this time because of changes in both weights and party positions.

where W_{ij}^G, W_{ij}^S, and W_{ij}^O are the weights for the governing parties, the supporting parties and the opposition parties respectively, $\bar{j}_i^{\,G}$, $\bar{j}_i^{\,S}$, and $\bar{j}_i^{\,O}$ are the number of governing parties, supporting parties, and opposition parties for government i respectively. I use different weights for different types of parties to allow supporting parties and opposition parties to have a possible different effect from governing parties:

$$W_{ij}^G = \frac{\exp\left(\beta^{LSS} \times x_{ij}\right)}{\sum_{j=1}^{\bar{j}_i^G} \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^S} \beta^S \times \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^O} \beta^O \times \exp\left(\beta^{LSS} \times x_{ij}\right)};$$

$$W_{ij}^S = \beta^S \times \frac{\exp\left(\beta^{LSS} \times x_{ij}\right)}{\sum_{j=1}^{\bar{j}_i^G} \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^S} \beta^S \times \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^O} \beta^O \times \exp\left(\beta^{LSS} \times x_{ij}\right)};$$

$$W_{ij}^O = \beta^O \times \frac{\exp\left(\beta^{LSS} \times x_{ij}\right)}{\sum_{j=1}^{\bar{j}_i^G} \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^S} \beta^S \times \exp\left(\beta^{LSS} \times x_{ij}\right) + \sum_{j=1}^{\bar{j}_i^O} \beta^O \times \exp\left(\beta^{LSS} \times x_{ij}\right)}$$

where β^{LSS} is the coefficient on the Log Seat Share, and β^S and β^O are the coefficients on supporting and opposition parties. In this way, the coefficients β^S and β^O measure the relative weight between supporting and opposition parties, and governing parties, with the null hypotheses being that supporting parties and opposition parties have no effect on the policy position of the government ($\beta^S = 0$; $\beta^O = 0$).

I use data on supporting parties from *Keesing's contemporary archives* (1945–1990) as coded by Warwick (1994).[18] I replicate in Table 3 the four models in Table 1, adding supporting and opposition parties. I find no elements favoring the hypothesis that supporting parties and opposition parties influence coalition policymaking. The coefficient for such parties is never statistically different from zero.[19] The findings are robust to possible different definitions of supporting parties as I report in Table A.11 in the online Appendix A.14. Accordingly, there is no basis to include supporting and opposition parties in the determinants of coalition policy.

4.4 Alternative policy measures

In the main analysis, I used government declarations to measure government policy position. Some literature has argued that declared policies may not be a good representation of coalition policymaking. The principal risk is that implemented policies may be overly influenced by the party controlling the relevant ministry (Laver and Shepsle, 1996). Even though more recent literature has found that the coalition agreement is indeed a good predictor of government policies (Martin and Vanberg, 2014a; Naurin *et al.*, 2019; Thomson, 2017), I verify that the results hold when using as the dependent variable the pledges that parties implement, using data from Thomson (2017).

It is important to note that there are some limitations in using implemented pledges to study what party gets their way. First, implemented pledges are not necessarily an estimate of total policy output. For example, not all policy positions are easily mappable onto policy outcomes, constraining the analysis to a subset of the pledges made by parties. For example, even state-of-the-art research does not translate claims such as "[We] will show respect for

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[18]I use the coding for declared allies parties which includes formal support parties.

[19]β_{LSS} (Log Seat Share) sometimes becomes positive and significant with the inclusion of supporting and opposition parties. The substantial difference in average seat share between governing parties (0.21) and supporting and opposition parties (0.13) makes it difficult to isolate the effect of seats from the effect of being in government. Consequently, the coefficient on seats partially captures the fact that on average bigger parties (governing parties) have influence whereas smaller parties (supporting and opposition parties) do not.

Table 3. Effect of supporting and opposition parties on government policy

	Dependent variable: government left–right position							
	All governments				Only after-election governments			
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
β^S (Supporting parties)	1.998	3.042	2.097	2.727	0.646	−1.800	0.882	−1.457
	(2.235)	(3.270)	(2.235)	(3.022)	(2.258)	(3.132)	(2.752)	(4.367)
β^O (Opposition parties)		0.236		0.265		0.255		0.242
		(0.153)		(0.188)		(0.165)		(0.159)
β_{LSS} (Log seat share)	0.126	0.614**	0.067	0.534*	0.147	0.535**	0.167	0.610**
	(0.168)	(0.244)	(0.172)	(0.240)	(0.168)	(0.253)	(0.181)	(0.273)
β_0 (Constant)	8.279***	8.994***			4.391***	5.504***		
	(1.487)	(1.419)			(1.621)	(1.526)		
Country fixed effects	−	−	✓	✓	−	−	✓	✓
Observations	107	107	107	107	65	65	65	65
Pseudo R^2	0.093	0.208	0.136	0.241	0.102	0.257	0.162	0.336
Pseudo adjusted R^2	0.076	0.185	0.056	0.162	0.073	0.220	0.025	0.213
Residual SE	15.32	14.39	15.49	14.59	12.90	11.83	13.23	11.88
	(df = 104)	(df = 103)	(df = 97)	(df = 96)	(df = 62)	(df = 61)	(df = 55)	(df = 54)

Non-linear least squares model, standard errors in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.

families" into policies (Thomson, 2017). Second, comparing parties' declared pledges with government fulfilled pledges cannot account for the possible strategic representation of parties' policy positions. That is, if parties state more leftward policies, as suggested by the positive constant in the main model, it would appear that rightward parties are more successful in fulfilling pledges, all else equal. Third, implemented pledges are inevitably recorded in the form of a few discrete levels of implementation, a coarse measure that may not capture all the nuances that define parties' relative strength.

Differently from what happens with the CMP measure, fulfilled pledges give a direct measure of party strength. Hence, it is possible to analyze fulfilled pledges with simple linear regressions in which the unit of analysis is now the party and not the government. I use two possible measures of parties' relative power. The first variable (Y_i^P) measures the proportion of pledges a party gets implemented divided by the sum of the proportions of pledges that the coalition parties get implemented. The second variable (Y_i^N) considers the ratio of the absolute number of pledges a party implements versus its partners. Formally, this translates to:

$$Y_i^P = \frac{P_i}{\sum_{j=1}^{\bar{j}_i} P_j}; \quad Y_i^N = \frac{N_i}{\sum_{j=1}^{\bar{j}_i} N_j}$$

where P_i is the share of implemented pledges for party i, which is the number of pledges implemented by party i (N_i) divided by the number of pledges stated by party i, and $\bar{j}_i$ the number of parties in the coalition of party i. In addition, as is common in the literature, I consider the possible ministerial drift by including in the regression a dummy for the party holding the Finance Minister given that its policy is the one that correlates most with the left-right policy scale (Thomson, 2017). Overall, I use a subset of Thomson data for a total of 32 parties/observations.[20]

I show the results of the analysis in Table 4.[21] In the first three specifications I use the share of the proportion of implemented pledges as the dependent variable. I report the cases respectively with only Seat Share, with the addition of the Formateur and of the Absolute Distance to the Median Legislative Party, and with the further addition of the dummy for the Finance Minister. I report the same models but with the share of the absolute number of party pledges implemented as the dependent variable in the other three specifications. The principal outcome is that, once more, the estimate on the share of seats rejects the proportionality hypothesis. The coefficient is consistently different than one, and indeed less than one, in all models including the one in which it is the only explanatory variable. Second, the coefficient on Seat Share does not reject the equal weight hypothesis. In fact, it is not different from zero in most cases except when it is regressed alone. This possible effect of party size, though, seems to be more consistently captured by the Formateur variable, and the effect of seat share is no different from zero once we control for the Formateur. Also, the estimate for Seat Share is likely biased upward due to the particular coding of the pledges that are common to multiple coalition members: they are implemented more often but coded only for the biggest party in the coalition.

The results for the other independent variables are also in line with previous findings. The Formateur is positive and significant in some models, while the Absolute Distance to the Median Legislative Party is in the right direction, although barely out of conventional significance levels. In addition, the Finance Minister estimate ranges from being insignificant in the cases considering the proportion of implemented pledges to being roughly half the size of the Formateur effect when analyzing the absolute number of implemented pledges. This outcome is in

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[20]I need to exclude the observations regarding parties not coded by the CMP and for which not all policy areas are coded, single party governments, and coalitions without all parties coded.

[21]I replicate the analysis including country fixed effects with analogous results, as reported in Table A.12 in the online Appendix A.4.

Table 4. Variables affecting parties' implemented pledges

	Share of share of pledges (Y_i^P)			Share of number of pledges (Y_i^N)		
	(1)	(2)	(3)	(4)	(5)	(6)
Seat share	0.284***	0.125	0.105	0.487***	0.167	0.086
	(0.065)	(0.104)	(0.109)	(0.100)	(0.158)	(0.156)
Formateur		0.099*	0.098		0.210**	0.203**
		(0.058)	(0.058)		(0.087)	(0.083)
Abs. distance to		−0.074	−0.074		−0.082	−0.081
median legislative party		(0.049)	(0.050)		(0.075)	(0.071)
Finance minister			0.027			0.111*
			(0.040)			(0.057)
Constant	0.336***	0.389***	0.383***	0.240***	0.320***	0.295***
	(0.035)	(0.042)	(0.044)	(0.055)	(0.064)	(0.062)
Seat share:						
p-value for null seat share=0	<0.001***	0.241	0.346	<0.001***	0.298	0.586
p-value for null seat share=1	<0.001***	<0.001***	<0.001***	<0.001***	<0.001***	<0.001***
Country fixed effects	−	−	−	−	−	−
Observations	32	32	32	32	32	32
R^2	0.392	0.483	0.492	0.440	0.548	0.605
Adjusted R^2	0.371	0.427	0.416	0.421	0.500	0.546
Residual Std. error	0.102	0.097	0.098	0.158	0.147	0.140
	(df = 30)	(df = 28)	(df = 27)	(df = 30)	(df = 28)	(df = 27)
F statistic	19.323***	8.712***	6.528***	23.580***	11.335***	10.320***
	(df = 1; 30)	(df = 3; 28)	(df = 4; 27)	(df = 1; 30)	(df = 3; 28)	(df = 4; 27)

OLS model, standard errors in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01.

agreement with recent research on the possible effect of the ministerial drift which finds that, if there is an effect at all, the drift is very limited (Martin and Vanberg, 2019).[22]

5. Conclusion

Multiparty coalitions are common in democratic regimes. Such governments face an inherent struggle over policymaking: coalition parties generally have different and contrasting policy agendas. Accordingly, a party's preferred policy cannot fully satisfy their partners, and parties need to come to an agreement on what policy to pursue.

In the absence of hard evidence for the weights that different coalition partners exercise on policy, the literature has relied on a proportionality hypothesis with seats. In this paper, I estimate the weights of the coalition partners in policymaking as a function of observables. All model specifications robustly reject the proportionality hypothesis: policy compromises are not proportional to coalition partners' share of seats. Of all the possible other observables that might affect policy compromise, I find that formateur status and proximity to the legislative median increases the influence of coalition partners on policy, all else equal.

Undoubtedly, these findings do not have causal status. That is, nothing in the analysis corrects for every possible endogeneity. But the correlations suggest a possible way in which the policy agreed upon by coalitions is different by some otherwise not controlled weights. The policy compromise story is not simple, straightforward, or proportional. Instead, the findings are consistent with a bargaining process in which the party leading the negotiations and the parties making coalitions more homogeneous have more power. The formateur has the privilege to choose who is part of the coalition, and it cannot be excluded from that potential coalition. The parties closer to the legislative median have higher coalition potential.

Importantly, the outcome for the closeness to the Median Legislative Party provides supporting evidence to the median voter theorem of Black (1948), and, together with the result for the formateur, represents a positive test of the non-cooperative theory of government formation of Baron (1991). Furthermore, the result for the formateur is consistent with recent literature on portfolio allocation (Akirav and Cox, 2018; Sharkansky, 2015). Additionally, and perhaps surprisingly, voters seem to have a compatible perception of the coalition policy compromise. In fact, they do not expect proportionality to hold and they assign more weight to larger (e.g., the formateur) and central parties (Bowler *et al.*, 2020).

My findings have important implications for democratic representation, electoral responsiveness, and coalition policymaking. In addition to the substantive meaning of the results, I provide in this paper a novel model that links parties' and governments' policy positions. By extrapolating from the empirically estimated weights from my sample, I provide a new way for the literature to impute the government policy that is more precise and still relatively simple when compared to the current practice of assigning government compromise as being proportional to seats.

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[22]Martin and Vanberg (2019) in their study of ministerial drift provide a compatible counterfactual: a government with two parties having equal seats. They analyze the effect that a change in the party controlling the proper ministry would have on unemployment. They find that the effect could range, for example, from a reduction in the share of labor force covered by unemployment insurance by 0.9 percent in the high ministerial autonomy case of France, to a non-detectable influence in the strong legislative institutions situation in Germany.

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