

Comparative Politics with Endogenous Intra-Party Discipline¹

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Abstract: Why is intraparty discipline higher in parliamentary than in presidential regimes? Does it matter for policy? We propose a model of pre-electoral politics in which parties choose not only their ideological position but also their internal discipline. Discipline reduces policy uncertainty for voters. We show that weak institutional constraints, as in a Presidential regime, induce parties to choose low levels of discipline. Tighter constraints or reduced voter polarization induces them to choose high levels of discipline. This highlights a multiplier effect of party discipline: the parties' best responses amplify changes in institutional constraints. These effects find historical support in the evolutions of party discipline in the UK, the US, and France. We also show how polarization varies with institutions and voter preference heterogeneity. The latter prediction finds support in the observed dynamics of interparty polarization in the US.

Keywords: parties as brands, political regime, intraparty discipline, polarization

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1 Introduction

In Parliamentary democracies, political parties have gradually increased and then maintained high levels of internal discipline, with legislators sticking closely to the party line. Such evolution has been documented for example for Victorian England and for France in the years between the Third and the Fifth Republic.² By contrast, intraparty discipline in the US has been loose and reforms typically reinforced candidate freedom. For example, the introduction of direct primaries in basically all US States between 1899 and 1915 did away with the parties' hold on the selection of Congressional candidates.³ More recent reforms have not reduced these differences: currently, dissent between legislators and party leaders is the exception rather the rule in the main British parties (Kam 2009, p. 10) whereas discipline remains so low in the main US parties that they are described as “empty vessels” by Katz and Kolodny (1994, p31).⁴ The above facts suggest that party discipline is *endogenous* to the political regime. Yet, we still have a limited understanding of how and why intraparty discipline adapts in this way to the political regime. More generally, why *should* parties look so different in parliamentary and presidential regimes? Does this matter for policy, for example for the choice of party platforms?

To address these questions, we propose an electoral game in which parties choose both their ideological position and their internal discipline. The first key ingredient of our model is that parties are competing *organizations*. The second key ingredient is that voter preferences are district specific, and so are the preferences of local candidates, be they independents or party representatives:⁵ after all, voters and candidates in Liverpool or Detroit have different policy preferences than those of voters and candidates in London or San Francisco. The third key ingredient builds on the findings of Huber (1996a) and Diermeier and Feddersen (1998): we simply assume that, even in the absence of party discipline, majority and opposition tend to be more disciplined in a parliamentary system than in a presidential regime.

Our setup builds on a well-understood and universal function of parties: they provide voters with informational shortcuts about the preferred policy of their candidates through the –strategic and publicly observed– choice of both their ideological platform (Downs 1957) and their level of

²See Cox (1987) and Wilson and Wiste (1976) and Huber (1996b) respectively.

³Direct primaries are actually run for all public offices but that of the President. An outstanding account of their introduction is Ware (2002).

⁴The view that dissent in British parties is the exception rather than the rule has not been denied by the episodes of backbench rebellion that received a lot of attention in the media in the last three decades. For example, Kam (2009, p10) confirms that “[t]he vast majority of the time, parliamentary parties are highly cohesive”.

⁵We concentrate on elections that are run under plurality rule in single-member districts.

internal discipline (Cox and McCubbins 1993, Snyder and Ting 2002): full intraparty discipline perfectly informs voters about the future policy of a candidate: she cannot deviate from the party platform. With less-than-full discipline, the candidates of a party can put forth policies that together form a *cloud* around the announced party platform. This leaves voters partly uncertain about future policy decisions.

Building on this function, the extant literature explains why parties exist, but cannot explain why parties look the way they do in different institutional regimes. Our model achieves this by allowing parties to control how much discipline they impose on local candidates. We first show that intraparty discipline introduces a *certainty-versus-flexibility* trade-off: if party discipline is high, the message sent to voters is very precise but party candidates cannot pander to their local electorate – implying that voters could then prefer voting for a local independent over the party candidate. If discipline is low, legislators may better represent local preferences, but the informational content of the party label is more limited.

This certainty-versus-flexibility trade-off has opposite implications for the districts close to, and those distant from, the party platform. Close districts always value reduced uncertainty: the party platform represents their ideology well. They thus benefit from high discipline. Distant districts instead benefit from flexibility: if subject to tight discipline, legislators belonging to the party would necessarily stick to the party line, which is disliked by distant voters. Taken together, these opposite preferences imply that parties never value intermediate levels of discipline: these neither please close nor distant districts. Instead, they choose either high discipline that helps winning close districts but alienates distant ones, or low discipline, which nets distant districts but reduces utility in close ones.

How does this trade-off interact with institutional constraints? Parliamentary systems produce relatively tight constraints on legislative freedom. Surprisingly, we find that parties *do not* freeride on these external constraints to relax internal discipline: even with moderate legislative constraints, parties are induced to choose very high discipline. They also avoid strong levels of polarization: since they only attract close districts, they must locate sufficiently close to the centre to maximize their seat share. A US-type presidential regime is associated to laxer legislative constraints. In this case parties may decide to target distant districts: if preference heterogeneity is sufficiently high in the electorate, parties (1) reduce discipline and (2) choose polarized platforms. Only if district preferences were very homogeneous would parties select platforms close to the centre, and switch to maximal discipline.

Our analysis thus shows that if legislative discipline adapts to the political regime, it is largely

through the decisions of parties, and not simply because of external institutional constraints. This identifies a *multiplier effect* of the way parties organize: party leaders may want to switch from very low to very high discipline even when institutional changes are marginal. We document in Section 8 that this multiplier effect was crucial in the evolution of legislative cohesion in: 1) Victorian England, as described by Cox (1987); 2) the US at the end of the nineteenth century, as described by Ware (2002); and 3) France between the Third and Fifth Republics, as described by Wilson and Wiste (1976) and Huber (1996b). We also show how our theoretical results can be exploited to understand the empirical findings of McCarty et al. (2006): polarization between the two major US parties correlates strongly with income inequality.

The rest of the paper is organized as follows. Section 2 reviews some of the existing literature. Section 3 lays out the model. Section 4 identifies the effects of party discipline on electoral success, while Sections 5 and 6 solve for the equilibrium of the game in terms of intraparty discipline and platform positions. Section 7 discusses some extensions of the model. Section 8 shows how our findings can be used to explain a number of stylized observations. Finally, the last section concludes. Most proofs are relegated to the Appendix.

2 Related Literature

Two key ingredients in our model are the parties' screening technology and the institutional constraints on legislator freedom. We borrow the former from Snyder and Ting (2002), and build on Huber (1996a) and Diermeier and Feddersen (1998) for the latter.

Whereas our goal is to explain why parties look so different across political regimes, the goal of Snyder and Ting (2002, S&T henceforth) is to explain why parties exist at all. They propose a model in which parties impose a participation cost to candidates. This cost is exogenous and increasing in the distance between a candidate and the party position. As a result, only the candidates sufficiently close to the party platform run under the party banner. Higher costs mean that party candidates must be closer to the party platform, and the party label is thus more informative. Importantly, voters always prefer disciplined parties: if parties could, they would always choose maximal discipline in the S&T setup. This is in no small part due to the fact that in S&T all candidates have preferences that are drawn from the *same* distribution.

We build on S&T's "screening technology" as such, but allow each party to strategically choose both their platform and their level of intraparty discipline. We show that parties may either prefer minimal or maximal discipline in equilibrium. Technically, this result stems from the *certainty-versus-flexibility* trade-off that is absent from S&T. Central to this trade-off is

our assumption that candidate preferences are district-specific instead of being drawn from a common, national, pool.

The forces driving the strategic location of parties are also different from those in S&T, and produce qualitatively different results. In their setup, parties always select median platforms, unless the party label conveys very little information. In the latter case, parties must polarize to improve the informativeness of their label. Indeed, S&T assume that candidates have an ideology located on a bounded set, say $[-a, a]$. If the party locates close to $-a$ or a , the breadth of the set of party candidates gets smaller, which reduces uncertainty for the voters. In our setup instead, polarization has no aggregate effect on informativeness: since candidates are district-specific, polarization reduces breadth in some districts, but increases it in other districts. Polarization is thus driven by a very different rationale in our model: parties have an incentive to pander to different electorates. As the polity's socioeconomic characteristics become more heterogeneous, this incentive increases, as does equilibrium polarization.

Our paper also contributes to the growing literature on comparative politics. One recurrent element in this field is the marginalization of the role of parties and their internal organization.⁶ For example, in Persson, Roland and Tabellini (2000), all players are unitary actors –no clear distinction is made between parties and their candidates. Yet, they assume that the members of the majority coalition are predetermined in the parliamentary regime, and open in the presidential regime, a recognition that intraparty discipline is high in the former but low in the latter. To drive home our point, imagine what would happen in a parliamentary democracy if the executive could not rely on a stable enough majority in the legislature. Similarly, in a US-type presidential system, the checks and balances between the executive and the legislature would lose their effectiveness if the President could impose his will on Congress because of intraparty discipline. A missing link in that literature is thus why party discipline is different across institutional regimes.⁷

To address this issue, we introduce the constraints imposed by these regimes on the feasible

⁶See for example Persson, Roland and Tabellini (1997 and 2000), Persson and Tabellini (1999, 2000, 2003, 2004a and 2004b), Lizzeri and Persico (2001), Milesi-Feretti, Perotti and Rostagno (2002), Persson, Tabellini and Trebbi (2003), and Acemoglu and Robinson (2006).

⁷Conversely, to maintain tractability, we sideline here the analysis of post-electoral policy-making. Grossman and Helpman (2005, 2008) analyze the influence of party discipline on both pre and post electoral decisions and demonstrate that expected welfare is maximized when party discipline is high. A natural question then is why *equilibrium* discipline can be low in presidential regimes. Our model complements their analysis by showing that party discipline can be electorally costly.

level of party discipline: Huber (1996b) shows that the vote of confidence procedure induces high discipline in parliamentary democracies *even in the absence of parties*. Likewise, Diermeier and Feddersen (1998) rationalize differences in cohesion between *individual* legislators across parliamentary and presidential regimes, thus also in the absence of parties. These two analyses demonstrate that a Parliamentary regime produces more cohesive legislative assemblies than a Presidential regime.

We take the shortest possible route between their results and our analysis of party discipline and suppose that a parliamentary regime exogenously produces higher intraparty cohesiveness than a presidential regime. In other words, even in the absence of intraparty discipline, the party label would be more informative in a parliamentary regime than in a presidential one. Here, our contribution is to show that even subtle differences between these institutions can produce opposite party structures in equilibrium, through the *party multiplier effect*. That the way parties organize is correlated with the political regime is well known and is very precisely documented in the studies of Katz and Mair (1992 and 1994) on party organization in 12 Western democracies. Our model also extends these findings to show how the polity's socioeconomic characteristics influence party discipline.

We should mention a few other important contributions that are close to both Snyder and Ting (2002) and this paper: assuming exogenous party discipline, Eyster and Kittsteiner (2007) show that parties may adopt extreme positions to reduce interparty competition. Conversely, Ashworth and Bueno de Mesquita (2008) focus on how incumbent party members choose intraparty discipline but need exogenous party positions to perform their analysis: like in Snyder and Ting, parties would always maximize their vote share by maximizing discipline and choosing a median platform.

Callander (2005) is another paper that could be seen as rationalizing the evidence of McCarty et al. (2006) that we review in Section 8.2. Building on Palfrey's (1984) sincere voting setup, Callander (2005) introduces multiple districts and shows that parties may polarize more if inter-district heterogeneity increases. Yet, polarization would entirely disappear if voters relied on strategic voting, a strategy choice that fits the conventional wisdom about voter behavior in first-past-the-post elections since at least Duverger (1957).⁸ Further, as we explain in more detail in Section 8.2, his model cannot explain the observed distribution of individual candidate preferences McCarty et al. (2006) use to measure polarization.

Still related to our work are the contributions of Samuels and Shugart (2010), Dewan and

⁸On the role of strategic voting under first-past-the-post elections, see Morelli (2004) and Myatt (2007).

Myatt (2007, 2008 and 2010), and Diermeier, Eraslan and Merlo (2003, 2007). Samuels and Shugart (2010) also study the organizational choices of parties. Yet, they study the parties' incentives to *control their representative(s) in government*, while we study the incentives for *leaders to control their legislative troops*. Their findings complement ours: we show that leaders want to discipline their troops in a parliamentary regime, and they show that parties also want to make sure executives do not deviate from the party platform. Thus, in a Parliamentary regime, high intraparty discipline is the outcome, whether discipline means the party's tight control on its legislators (our contribution) or on its leadership (Samuels and Shugart's contribution). For presidential regimes, both Samuels and Shugart and our paper predict that legislative freedom should be high, even though our mechanism is different from theirs. Whereas we build on our certainty-versus-flexibility trade-off, they build on the hypothesis that the key contest for parties is the presidential election. Secondly, we take as granted that party leaders are able to set the party platform. Yet, this need not always be the case. It is thus important to understand what characteristics leaders should display for their troops to follow them. This important question has, for example, been investigated by Dewan and Myatt (2007, 2008 and 2010).

Last, Diermeier, Eraslan and Merlo (2003, 2007) also study parliamentary regimes. They show how institutional constraints affect government formation length, coalition sizes, and government stability: the coalition formation and eventual structure tends to neutralize some of the direct impacts of institutional constraints on government stability. Our multiplier effect of party discipline also evidentiates that institutions mainly matter through their effect on the actors playing the legislative game. One of our predictions is what the parties can offer when entering their negotiation game also depends on such institutions, through equilibrium discipline.

3 The Model

The policy space is unidimensional and represented by the real line. Following Snyder and Ting (2002), we model parties as brand names (see Section 2): while the policy of a given candidate is uncertain, party discipline can reduce this uncertainty. Our focus is thus on an electoral game with three types of players: voters, candidates and parties, in which parties are the main character of interest.

The Legislature. The economy is divided into a continuum of districts, and each district elects one legislator under plurality rule. To stack the deck against parties, we assume that each legislator controls a fixed fraction of the decisions that are made during the legislature,

independently of her party affiliation.⁹ It is easy to check that parties would win more seats if we assumed that their legislators controlled more decisions, but our results would remain qualitatively similar, as long as independent candidates had any strictly positive probability of influencing policy.¹⁰

Voters. The median voter of district i has single-peaked and quadratic preferences around $y_i \in \mathbb{R}$.¹¹ We assume that the district Condorcet winner is always elected, which is equivalent to assuming that the median voter is always pivotal in his district. In the presence of uncertainty, voters must gauge which candidate provides the highest *expected* utility, given the information available about the policy preferences of each candidate. That is, the candidate winning in district i is the one that maximizes:

$$\mathbf{E}[u(y_i, x_c)] = \mathbf{E}\left[-(y_i - x_c)^2\right],$$

where \mathbf{E} is the expectation operator on $x_c \in \mathbb{R}$, the preferred policy of candidate c . Party discipline affects expected utility through its effect on the conditional distribution of x_c ; this relationship is analyzed in Section 4.

Candidates. Each candidate's preferred policy position x_c is private information: alone, a candidate cannot reveal more information about her preferences than that x_c is uniformly distributed on $\mathcal{Y}_i \equiv [y_i - 1, y_i + 1]$ (Section 7 generalizes the setup to more general distributions). This distribution is district-specific, which captures the fact that in many democracies candidates must reside in the district in which they run.¹² Some candidates stand for election as independents, whereas others run as party candidates.¹³

⁹This also justifies our assumption regarding the electorate's voting strategy, see below.

¹⁰Whereas this model is somehow typical of the Downsian tradition in that it sacrifices the legislative bargaining part of the political game in order to focus more on the decisions of party leaders in terms of party positioning and organization, we recognize that the legislative bargaining game may also play an important role in shaping the leaders' decisions. Yet, dealing with this issue is beyond the scope of the present paper.

¹¹This parametric form of the utility function generates tractable closed-form solutions. Section 8 generalizes the utility function.

¹²There are two differences with citizen candidate models: first, candidate entry is not strategic as in Besley and Coate (1997) and Osborne and Slivinski (1996). Second, there is an information asymmetry between voters and candidates. In the framework of citizen candidate models, the impact of information asymmetries is studied among others by Casamata and Sand-Zantman (2008) and Großer and Palfrey (2008). These papers abstract from the role of political parties.

¹³We use this modelling approach to follow Snyder and Ting (2002) but independents could alternatively be seen as *potential entrants*. Their role in the model is only to provide an outside option to voters, which allows us to capture the effect of party alienation.

Parties. Parties maximize their seat share by intermediating between the voters’ demand for and the candidates’ supply of policies. They have two instruments at hand: they announce an *ideological position* x_P and how much *freedom of action* ϕ_P they grant to their candidates.¹⁴ These two dimensions of party policy are observed publicly.

The standard Downsian approach assumes that party ideology can be represented by a *point* on the real line. We extend this approach by letting parties define a *range* of admissible policies: they admit candidates with preferences distant up to ϕ_P from the party’s ideological position, x_P . Thus, any voter knows that a candidate running under the banner of party P must have preferences x_c in the range:

$$x_c \in \mathcal{X}_P \equiv [x_P - \phi_P, x_P + \phi_P]. \quad (1)$$

To allow for the party label to play its informational role, we restrict ϕ_P to be bounded from above by 1.

This modelling strategy abstracts from the set of other legislative incentives parties develop to ensure legislators vote along party lines. Whereas such an extension would clearly increase the realism of the model, it would not substantially modify its predictions. Indeed, Krehbiel (1999, p832) emphasizes that “primitive preferences account for a large share of legislative behavior”. Thus, even though our modeling choices cut through important realities, they capture a fundamental relationship between party discipline and legislative behavior in a parsimonious way. What is more, our focus is on pre-electoral strategies. Separating “primitive preferences” from other means of imposing legislative discipline is thus beyond the scope of this paper and we feel justified in relying on only one variable to proxy intraparty discipline. Finally, as the applications we cover in Section 8 will make clear, the strategic use of candidate selection does play a central role in shaping intraparty discipline.

Timing. We consider the following timing:¹⁵

- $t = 1$: party leaders L and R select their national platforms, x_L and x_R .
- $t = 2$: party leaders select intraparty discipline, ϕ_L and ϕ_R , and candidates are assigned to parties.
- $t = 3$: each district median elects his preferred candidate, and payoffs are realized.

¹⁴Assuming that parties can directly select ϕ_P allows us to save on notation. Snyder and Ting (2002) detail how this level of discipline can result from selection processes that impose costs on candidates. Our results would be identical if we allowed parties to choose this cost function.

¹⁵Reversing the timing between periods 1 and 2 produces the same results.

Institutional and economic environment. We introduce two (exogenous) parameters that define the country’s institutional and socioeconomic environment. The country’s institutional environment is summarized by its level of *legislative cohesion* λ . The socioeconomic environment is captured by the *heterogeneity of voter preferences*, σ .

Legislative cohesion is known to vary substantially across political regimes; it is typically higher when government survival depends on legislative support; see for example Huber (1996b) and Diermeier and Feddersen (1998). While these contributions focus on how legislative institutions impact on the cohesion of legislators in the absence of parties,¹⁶ we must translate their predictions into how these institutions would influence party cohesion. In a parliamentary regime, too low discipline would mean that the government falls regularly. In a Presidential regime instead, government survival does not depend on legislative support. We thus assume that, even in the absence of selection or party sticks, legislators are more cohesive in a parliamentary than in a presidential regime:

Assumption 1 *Institutional constraints, identified by the parameter $\lambda(\geq 0)$, determine the feasibility set of party discipline: $\phi_P \in [0, \lambda]$. More precisely, a majority can only operate if legislator preferences are within distance λ of the coalition’s median preference. λ is strictly smaller in a Parliamentary than in a Presidential regime.*

Of course, beyond these institutional constraints, party leaders can further constrain party members. Since we focus on selection, parties can decide to only accept candidates who have a preference within any distance $\phi_P \leq \lambda$ of the party platform x_P . This assumes that imposing discipline is (costless and) independent of the political regime. In reality, imposing tight discipline is more difficult in a presidential regime, for example because the executive cannot dissolve the assembly. Section 7.2 introduces these differences in the model. They actually reinforce our results. The assumption that discipline is costless is thus only meant to clarify the fact that costly discipline is *not* at the core of our results.

Turning to the economic environment, McCarty et al. (2006, chapter 3) show that economic inequality typically maps into more polarized voter preferences. Castanheira, Crutzen and Sahuguet (2010b) also illustrate that inequality in the US is associated with increased income dispersion across states, probably because inequality favors the clustering into “rich” and

¹⁶Diermeier and Feddersen (1998, p611), for instance, look for “an institutional explanation for voting cohesion that relies on the incentives created by the characteristic features of parliamentary constitutions”. Our focus is instead on why parties organize the way they do in different environments. Huber (1996b) deals with parliamentary systems only and assumes exogenous size and characteristics of the coalition supporting the executive.

“poor” states.¹⁷ We thus use only one parameter to proxy the heterogeneity of both ideological preferences and income inequality across districts. We introduce this parameter as follows:

Assumption 2 *The distribution of district medians y_i is a centered Normal with standard error σ :*

$$f(y_i) = \frac{\exp[-y_i^2/(2\sigma^2)]}{\sqrt{2\sigma^2}};$$

in which σ proxies preference and income heterogeneity across districts.

In the next three sections, we solve for the perfect Bayesian equilibrium of the game in terms of vote, intraparty discipline, and party platforms.

4 How Does Discipline Impact on Voting? (time 3)

Three sets of candidates can run in each district: (1) independent candidates, who are not affiliated with any party; (2) candidates affiliated with party L and (3) candidates affiliated with party R . Since voters cannot observe candidate preferences directly, all candidates within one of these sets are *ex ante* identical in the eyes of a voter. The district median’s expected utility from electing any local independent is:

$$\begin{aligned} \mathbf{E}u(y_i, x_c | x_c \in \mathcal{Y}_i) &= \mathbf{E}_{x_c \in \mathcal{Y}_i} \left[-(y_i - x_c)^2 \right] = \int_{y_i-1}^{y_i+1} -(y_i - x_c)^2 f(x_c) dx_c \\ &= -(y_i - y_i)^2 - 1/3 = -1/3. \end{aligned}$$

Voters have more information about party candidates: first, given that he runs in district i , the party candidate must have preferences somewhere in $\mathcal{Y}_i \in [y_i - 1, y_i + 1]$. Second, being a party candidate, he must also have preferences somewhere in $\mathcal{X}_P \equiv [x_P - \phi_P, x_P + \phi_P]$ (see (1)). Thus, voters know that a candidate of party P who runs in district i has preferences uniformly distributed on the set:¹⁸

$$\mathcal{P}_i(x_P, \phi_P) \equiv \mathcal{Y}_i \cap \mathcal{X}_P.$$

It follows that the median voter’s expected utility from electing a candidate of party P is:

$$\mathbf{E}_i u(y_i, x_c | x_c \in \mathcal{P}_i(x_P, \phi_P)) = -(y_i - \mu_i[x_P, \phi_P])^2 - \sigma_i^2[x_P, \phi_P], \quad (2)$$

¹⁷The relationship between economic inequality and polarization is reinforced by the clustering of individuals into subgroups that are internally homogeneous. See e.g. Esteban and Ray (1994) for a conceptualization of this argument.

¹⁸If the set is empty, no candidate from party P is expected to enter. In the out-of-equilibrium case one such candidate runs, beliefs are such that the candidate’s platform is the relevant boundary of \mathcal{Y}_i .

where, by the properties of uniform distributions:

$$\begin{cases} \mu_i[x_P, \phi_P] = \frac{\max[y_i - 1, x_P - \phi_P] + \min[y_i + 1, x_P + \phi_P]}{2}, \\ \sigma_i^2[x_P, \phi_P] = \frac{(\max[y_i - 1, x_P - \phi_P] - \min[y_i + 1, x_P + \phi_P])^2}{12}. \end{cases} \quad (3)$$

The district median's decision to vote for either candidate depends on (a) the distance between the median's bliss point y_i and (b) the platform x_P of each party. For a given platform x_P , we can separate the districts into those that are *close* and those that are *distant* from x_P :

- Define *close districts* as the set of districts such that y_i is within distance $1 - \phi_P$ of x_P : $|y_i - x_P| \leq 1 - \phi_P$. In these districts, the party set \mathcal{X}_P is *within* the district set \mathcal{Y}_i .
- *Distant districts* are the set of districts further than $1 - \phi_P$ from x_P . In these districts, the set of party candidates is both a function of the district and of the party set.

This is illustrated in Figure 1.

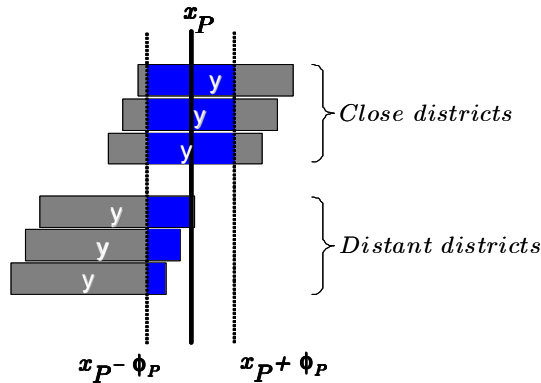


Figure 1: Set of possible platforms for party candidates.

In close districts, the expected position of a party candidate is x_P , independently of ϕ_P . As a consequence, voters in a close district have an unambiguous preference for tighter levels of discipline: this is the *variance-reduction effect* of party discipline. In distant districts instead, tighter discipline also implies that the expected distance between a party candidate and the district median y_i increases. This is the *legislative freedom effect* of party discipline, which reduces the expected utility of electing a party candidate. Substituting for (3) in (2) shows that expected utility in a distant district is maximized at $\phi_P = |y_i - x_P| + 1/2$ and thus hump-shaped in discipline. Yet, as the relevant comparison for voters in any district is between the utility

from voting for the party candidate and that from voting for the independent, distant districts unambiguously prefer minimal discipline. When choosing how much freedom of action to grant its candidates, the party will thus have to weigh the preferences of these two sets of districts against one another.

Remember that in any district a party P candidate faces two competitors: the independent and the candidate from the other party. This candidate must offer higher expected utility than both competitors to win the electoral seat. Our first step is to identify the set of districts in which a party P candidate beats the independent:

Definition 1 *The set of districts who prefer a candidate of party P to an independent is party P 's catchment area.*

Our first proposition formalizes how this catchment area relates to the party position x_P and to party discipline ϕ_P :¹⁹

Proposition 1 *All districts y_i within distance $\kappa(\phi_P)$ of the party platform x_P prefer the party candidate to the local independent. The catchment area of a party is therefore a compact set centered on x_P :*

$$\mathbf{E}_i u(y_i, x_P) \geq \mathbf{E}_i u(y_i, x_I) \Leftrightarrow |y_i - x_P| \leq \kappa(\phi_P),$$

where $\kappa(\phi_P) \equiv \max \left[\sqrt{\frac{1-\phi_P^2}{3}}, \phi_P \right]$, has a global minimum at $\phi_P \equiv \phi_{\min} = 1/2$, a local maximum at $\phi_P = 0$, and a global maximum at $\phi_P = 1$.

Figure 2 illustrates this result graphically. The parabolic curve is the outer limit of the set of close districts that vote for the party candidate. The straight lines are the outer limits of the set of distant districts that vote for the party candidate. The catchment area is the outer envelope of these curves.

¹⁹Omitted proofs are in the appendix.

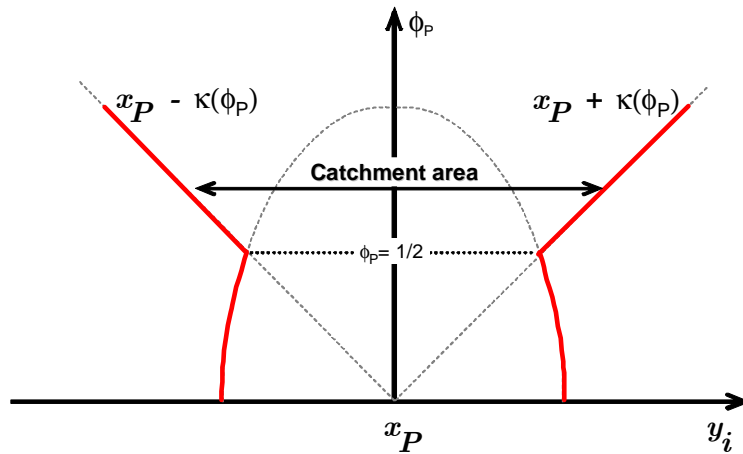


Figure 2: Party P 's *catchment area* depends on its internal structure

Proposition 1 and Figure 2 show how party discipline maps into electoral support. As we said above, intermediate levels of discipline do not maximize expected utility neither in close nor in distant districts. This is why the size of the catchment area $\kappa(\phi_P)$ is minimal in $\phi_P = 1/2$: intermediate party disciplines minimize electoral support. Parties thus prefer “extreme” forms of organization.

Which extreme form do parties choose? The intricacy is that the identity of the marginal district changes with discipline. For relatively low levels of candidate freedom, $\phi_P < 1/2$, the party catchment area contains close districts only. To expand its catchment area, the party thus benefits from further disciplining its candidates, to cash in on the variance-reduction effect of the party label. A local maximum is found when discipline is maximal ($\phi_P = 0$). This is the bottom part of the figure. By contrast, for relatively high levels of candidate freedom, $\phi_P > 1/2$, the marginal district is distant. In this case, the party has an incentive to further reduce discipline: this increases utility in the marginal district and induces the next district to also prefer the party candidate. The global maximum is found when there is full candidate freedom ($\phi_P = 1$).

Remark that we can focus on the preference of the marginal district because, from Proposition 1, districts closer to the party keep preferring the party candidate to the independent: the party catchment area is always a compact set. Compactness also implies that electoral support is bounded. This is because the legislative freedom effect of discipline implies *party alienation* beyond some distance. Traditional Downsian analyses abstract from party alienation: in the absence of competition from another party, the party catchment area is the whole ideological spectrum! This does not happen in our setup, because of the presence of independent candidates.

When voters have the option to vote for independents, they will do so when the party platform is too distant. The boundedness of the catchment area is key to the other findings below.

Finally, the actual shape of the catchment area is only partially due to the specific assumptions we made. For example, the linearity of the catchment area in ϕ_P for $\phi_P \geq 1/2$ does not depend on these. We investigate this and other issues in section 7 below, in which we discuss how generalizing our assumptions impacts on our results.

5 Equilibrium discipline (time 2)

At time $t = 2$, parties choose their level of intraparty discipline to maximize their seat share, taking as given the ideological positions chosen in the previous stage. From Proposition 1, we know that a party can win the seat in district i only if this seat is within its catchment area. The two parties' objective function can thus be written as:

$$V_P(\phi_P, x_P) = \int_{x_P - \kappa(\phi_P)}^{x_P + \kappa(\phi_P)} \mathbf{1} [u(y_i, x_P | \phi_P) > u(y_i, x_{-P} | \phi_{-P})] dF(y_i),$$

where $\mathbf{1}[\cdot]$ is the indicator function, taking value 1 when district i prefers the candidate of party P to the candidate of the other party, $-P$.

As this stage, we must distinguish between two cases: the first is when institutional constraints are tight –namely when $\lambda < 1/\sqrt{3}$. The second is when they are loose –namely when $\lambda > 1/\sqrt{3}$.

5.1 Case 1: tight institutions

We have:

Proposition 2 *When institutional constraints are tight ($\lambda < 1/\sqrt{3}$), maximal party discipline is a dominant strategy for any distribution of districts and any degree of polarization.*

The intuition for this result is a direct consequence of the findings of Section 4. Suppose first that the two party platforms are so distant that their respective catchment areas cannot overlap. Then, all districts in party P 's catchment area prefer the candidate of party P to that of the other party. Since, by Proposition 1, full discipline maximizes the size of the catchment area, $\phi_P = 0$ also maximizes P 's seat share.

If the two platforms are close in the sense that the two catchment areas (may) overlap, the two parties are competing directly for some (centrist) districts. By contrast, they only compete against independents in outer districts. The level of discipline that maximizes the number of seat won in outer districts is still $\phi_P = 0$. What about centrist districts? Given

the institutional constraint $\phi_P \leq \lambda$ ($\leq 1/\sqrt{3}$), these districts are at most at distance $1/\sqrt{3}$ from the party platform. The proof of Proposition 2 shows that these districts also prefer maximal discipline. Thus, any district that may potentially elect a candidate of party P prefers maximal discipline, independently of the distance between party platforms or the distribution of districts.

5.2 Case 2: loose institutions

When institutions put less constraint on the parties' choice of internal discipline, that is, when $\lambda > 1/\sqrt{3}$, we have:

Proposition 3 *If $\lambda > 1/\sqrt{3}$, ϕ_P^* depends both on party platforms and on the degree of preference heterogeneity σ :*

1) *If $|x_R - x_L| \geq 2\lambda$, such that the two catchment areas cannot overlap, then $\phi_P^* = \lambda$, that is parties minimize intraparty discipline in equilibrium.*

2) *If the two catchment areas can overlap, equilibrium discipline also depends on voter preference heterogeneity σ . Set $\lambda = 1$. Then,*

i) *if $-x_L = x_R \equiv x \geq 1/2$, parties minimize discipline: $\phi_P^* = 1$;*

ii) *if $-x_L = x_R \equiv x < 1/2$, there exists a cut-off $\sigma(x)$ such that $\phi_P^* = 0$ if and only if $\sigma < \sigma(x)$ and $\phi_P^* = 1$ otherwise.*

Together, Propositions 2 and 3 show how institutional constraints, ideological polarization and the socioeconomic environment interact to determine equilibrium intra-party discipline. They reveal a hierarchy of incentives due to, first, institutions, then polarization and then, thirdly, socioeconomic factors:

- First, if institutional constraints are tight, parties choose maximal intraparty discipline, irrespective of other considerations. If institutional constraints are loose, then parties face a more complex trade-off which depends on the extent of polarization.
- When platforms are highly polarized, parties avoid direct competition. Their primary target is then to maximize the size of their catchment area, which requires granting maximal freedom to their candidates. This is the *multiplier effect of party discipline*: small institutional changes (λ being slightly smaller or greater than $1/\sqrt{3}$) produce substantially different levels of party discipline (Proposition 2 versus Proposition 3). Section 8 documents the dynamics of party discipline in the UK and in France and shows how a progressive fall in λ did translate into a disproportionate increase in party discipline.

- If platforms are close to one another, socioeconomic factors enter into play. In this case, parties face two countervailing incentives. On the one hand, they should minimize discipline to increase the size of their catchment area. On the other hand, they should maximize discipline to gain seats in the centrist districts for which they compete directly. If preference heterogeneity is high, parties find it more valuable to minimize discipline, because there are few centrist districts. By contrast, if preferences are sufficiently homogeneous, many districts are “close”. Thus, parties prefer to tighten discipline as much as possible.

6 Equilibrium platforms (time 1)

We distinguish again between tight and loose institutional constraints.

6.1 Case 1: tight institutions

If $\lambda \leq 1/\sqrt{3}$, we know from Proposition 2 that parties necessarily enforce maximal discipline at time 2. The parties’ vote shares can then be expressed as:

$$\begin{aligned} V_L(\phi_L = 0, x_L; x_R) &= \int_{x_L - \frac{1}{\sqrt{3}}}^{\min[x_L + \frac{1}{\sqrt{3}}, \frac{x_L + x_R}{2}]} dF(y_i), \\ V_R(\phi_R = 0, x_R; x_L) &= \int_{\max[x_R - \frac{1}{\sqrt{3}}, \frac{x_L + x_R}{2}]}^{x_R + \frac{1}{\sqrt{3}}} dF(y_i). \end{aligned} \tag{4}$$

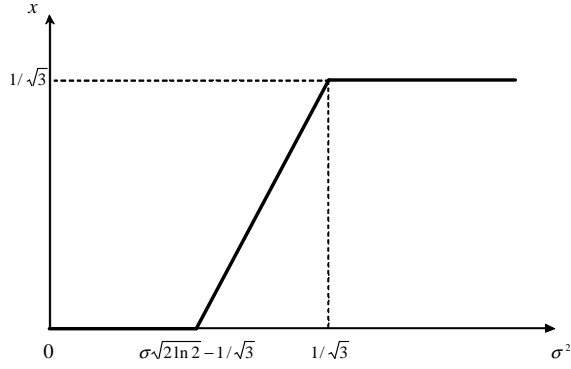
Our next proposition identifies the equilibrium platforms.²⁰

Proposition 4 *For $\lambda \leq 1/\sqrt{3}$, parties always adopt full discipline ($\phi_P = 0$) and the pair of manifestos is:*

$$\begin{aligned} (-x_L = x_R =) x &= 0, \text{ for } \sigma^2 < 1/(6 \log 2); \\ &= \sigma\sqrt{2 \log 2} - \sqrt{1/3}, \text{ for } \sigma^2 \in [1/(6 \log 2), 2/(3 \log 2)]; \\ &= 1/\sqrt{3}, \text{ for } \sigma^2 > 2/(3 \log 2).^{21} \end{aligned}$$

Hence, the median voter theorem holds only for a sufficiently homogeneous polity.

²⁰See below for a justification of why platforms are symmetrically distributed around the median.



Proposition 4 and Figure 3 show that the two parties choose the median voter’s preferred platform only when preferences are sufficiently homogeneous across districts. Otherwise, polarization increases in preference heterogeneity. Yet, there is an absolute ceiling to polarization. This stems from the endogenous *alienation effect*: since voters prefer the independent candidate when the party platform is too distant, a party cannot win seats in centrist and outer districts with the same ideological position. The party must choose a sufficiently extreme position to win in outer districts, but then loses in centrist districts. Consider the out-of-equilibrium case in which the two parties are so polarized that their catchment areas are not even tangent. In that case, both parties lose the center to independents. Since there are more centrist than extremist districts, both parties can increase their seat share by moderating their platform. In other words, parties never polarize beyond the point in which they lose the center, which explains the absolute ceiling to polarization in Proposition 4.

This being said, up to which point will the two parties move towards the center? Starting from the point in which the two catchment areas are tangent, any move to the center increases the overlap between the two parties’ catchment areas, and thus the extent of direct competition between the two parties. Since both parties choose maximal discipline (see Proposition 2), voters prefer the party that is ideologically closest to them. Thus, for $x_L < x_R$ a marginal move by L to the right amounts to:

1. the loss of $f(x_L - 1/\sqrt{3}) dx_L$ seats from the outer left districts, and
2. the gain of $\frac{1}{2}f[(x_L + x_R)/2] dx_L$ seats from the centrist districts.

The important difference with the case in which catchment areas do not overlap is that the marginal gain in the center is halved because of direct competition. That is, because of the overlap, each party wins only *half* as many centrist districts as in the absence of an overlap.

The larger is inter-district preference heterogeneity, the lower is the marginal gain of targeting the center, and the higher is the cost. An interior equilibrium is found when the marginal costs and benefits are equalized. Such interior equilibria are therefore characterized by symmetric platform positions, because of the symmetry of the distribution $f(y_i)$.

Corner solutions involve either full convergence to the median (when σ is sufficiently small) or maximal polarization (when σ is large). To understand the latter case, note that the seat gain from centrist districts is discontinuous at the point where the two catchment areas become tangent: it is reduced by a half. When σ is large, this halving makes the net payoff drop from a strictly positive to a strictly negative value. Both parties thus avoid either polarizing or moderating further: they both have an incentive to keep the two catchment areas exactly tangent.²²

6.2 Case 2: loose institutions

If institutional constraints are loose, platform choices at stage 1 can affect intraparty discipline at stage 2. Equilibrium platform positions are thus the result of more elaborate strategic considerations. We have:²³

Proposition 5 For $\lambda > 1/\sqrt{3}$,

- i) there exists $\sigma_B(\lambda)$ such that $\sigma > \sigma_B(\lambda)$ is a sufficient condition for parties to choose polarized platforms $x_R = -x_L = \lambda$ and maximal candidate freedom ($\phi_P = \lambda$) in equilibrium. In particular, $\sigma_B(\lambda = 1) = \sqrt{2/\log 2}$.
- ii) there exists $\sigma_T \equiv 1/\sqrt{6\log 2}$ such that $\sigma \leq \sigma_T$ is a sufficient condition for parties to choose centrist platforms $(x_L, x_R) = (0, 0)$ and maximal discipline ($\phi_P = 0$) in equilibrium.

Proposition 5 shows that, through preference heterogeneity, the parties' organizational choices become intimately related to their choice of ideological positions. As highlighted in the previous section, 'loose' institutions –that we associate with Presidential regimes– imply that parties may either prefer maximal discipline or maximal flexibility. Proposition 5 shows that when preference heterogeneity is “large”, parties would like to have the possibility of maximizing the size of their

²²This also implies that asymmetric equilibria also exist in the neighborhood (the size of which is increasing in σ) of the symmetric equilibrium, but the associated polarization is constant and always equal to $2\lambda = 2/\sqrt{3}$. We thus ignore these equilibria.

²³Like in the previous case, when σ is large, there exists a neighborhood around the symmetric pair of platform positions where parties can locate. Yet, as before, these equilibria are symmetric insofar as party discipline is concerned and polarization (2λ) is unaffected.

catchment area at time 2 – remember this is achieved by maximizing candidate freedom. To reach the subgame in which they can take full advantage of candidate freedom, parties must take action at time 1. Choosing polarized platforms is used for that purpose: it prevents direct competition and sustains maximal flexibility at time 2.²⁴

Conversely, when preference heterogeneity is “small”, centrist districts are numerous. In that case, parties maximize their seat share by becoming as strong as they can in these districts. This involves choosing a moderate ideology at time 1, and maximizing the signalling content of the party label at time 2 – remember this is achieved by maximizing discipline. Interestingly, this implies that the median voter theorem only holds when preference heterogeneity is sufficiently low: parties then locate at the very center of the preference distribution and impose that all their candidates deliver the same “median message”.

6.3 Wrap Up

Propositions 4 and 5 identify four cases in total, depending on whether institutions are tight or loose (λ small or large) and on whether preference heterogeneity is high or low (σ large or small). Table 1 below summarizes our findings.

Table 1. Summary of the main results.

	Preference heterogeneity:	
Institutional constraints:	Low	High
Tight: $\lambda \leq 1/\sqrt{3}$	$\sigma \leq 1/\sqrt{6 \log 2} \Rightarrow$ Centrist platforms: $x_P = 0$ Maximal discipline: $\phi_P = 0$	$\sigma > \sqrt{2/(3 \log 2)} \Rightarrow$ Moderate polarization: $x_R - x_L = 2/\sqrt{3}$ Maximal discipline: $\phi_P = 0$
Loose: $\lambda > 1/\sqrt{3}$	$\sigma \leq 1/\sqrt{6 \log 2} \Rightarrow$ Centrist platforms: $x_P = 0$ Maximal discipline: $\phi_P = 0$	$\sigma > \sigma_B(\lambda) \Rightarrow$ High polarization: $x_R - x_L = 2\lambda$ Maximal freedom: $\phi_P = \lambda$

Starting with the first column of the table, we see that institutions have little importance when preference heterogeneity is sufficiently small: independently of the institutional environment, parties want to be strong in centrist districts. This implies the choice of moderate platforms and high discipline. When preferences are very homogeneous, both parties locate exactly at the median voter’s bliss point. Note that this suggests that even in US-type presidential

²⁴Note that the timing of the game could be reversed without affecting this result. If parties first chose their level of discipline, they would select maximal flexibility at time 1 as a way to sustain polarization at time 2.

systems, parties would switch from their current, low-discipline, organization to one that would mirror the organization of parties in Westminster-type parliamentary democracies if the polity’s heterogeneity of preferences were to shrink sufficiently.

Moving to the second column, institutions affect both polarization and party discipline when preferences are sufficiently heterogeneous. Polarization is larger when institutions are “looser” precisely because of low discipline. In all cases indeed, the maximal extent to polarization is determined by the tangency of the parties’ catchment areas. Low discipline being an instrument to widen the parties’ catchment areas, it is also the driver of stronger polarization. Surprisingly, this may also imply that independents (or, for that matter, additional parties) are less likely to enter the political race when institutions are looser: despite the party label being less informative, parties manage to “cover” a larger part of the ideological spectrum.

7 Discussion and Extensions

7.1 Preferences of Candidates and Voters

In this section, we show that two assumptions made in Section 3 are not necessary for our results to carry through even though they are useful to obtain closed form solutions. Let us now relax the assumptions that (a) candidate preferences are uniformly distributed inside a district and (b) voters have quadratic preferences.

Let voter preferences be defined by some function f that is single-peaked and displays (weak) risk-aversion:

$$u_i(x_c) = u(y_i, x_c) = f(|x_c - y_i|),$$

with $f' < 0$ and $f'' \leq 0$. To maintain comparability with the quadratic case, we normalize $f(0)$ to zero.

Turning to the bliss point of a candidate, x_c is distributed according to some density function $g_i(x_c)$, with mean y_i . This district-specific distribution $g_i(\cdot)$ is the *translate* of a distribution $g(\cdot)$, with support $[-1, 1]$:

$$g_i(x_c) = g(x_c - y_i),$$

such that the support in district i is $\mathcal{Y}_i \equiv [y_i - 1, y_i + 1]$. The CDF of candidate preferences is denoted $G_i(x_c)$ with $G_i(y_i - 1) = 0$ and $G_i(y_i + 1) = 1$. Also, for any pair of districts i and j and any $x \in \mathbb{R}$ we have $g_i(x_c - y_i) = g_j(x_c - y_j)$. Finally, g is symmetric: $g(-x) = g(x)$ and quasi-concave: $g'(x) \leq 0 \forall x > 0$.

In this generalized setup, voter i 's expected utility of electing a local independent is:

$$U_I \equiv \mathbb{E}u(y_i, x_c | x_c \in \mathcal{Y}_i) = \int_{y_i-1}^{y_i+1} u_i(x) g_i(x) dx.$$

Given a party platform $\{x_P, \phi_P\}$, the bliss point of a party candidate must be in the subset $\mathcal{P}_i(x_P, \phi_P) \equiv \mathcal{Y}_i \cap \mathcal{X}_P$, where $\mathcal{X}_P \equiv [x_P - \phi_P, x_P + \phi_P]$. Focusing here on values of $x_P \geq y_i$ (the analysis is symmetric for $x_P < y_i$), through Bayesian updating, voters determine that the bliss point of party candidate is distributed according to the density function $g_{iP}(x_c)$, given by:

$$g_{iP}(x_c) \equiv \frac{g_i(x_c)}{G_i(\min\{y_i + 1, x_P + \phi_P\}) - G_i(x_P - \phi_P)}.$$

As before, two subcases must be considered: (i) districts that are “close” to party P , such that $x_P + \phi_P \leq y_i + 1$. (ii) districts that are “distant” from party P , such that $x_P + \phi_P > y_i + 1$. It follows that the expected utility of electing a candidate of party P is:

$$\begin{aligned} U_{iP}(x_P, \phi_P) \equiv \mathbb{E}u(y_i, x_c | \mathcal{P}_i(x_P, \phi_P)) &= \int_{x_P - \phi_P}^{x_P + \phi_P} u_i(x) g_{iP}(x) dx \text{ in close districts, and} \\ &= \int_{x_P - \phi_P}^{y_i + 1} u_i(x) g_{iP}(x) dx \text{ in distant districts.} \end{aligned}$$

This implies that:

Lemma 1 *The set of districts that prefer a candidate of party P to an independent is a compact set centered on x_P : there exists some $\kappa > 0$ such that*

$$U_{iP}(x_P, \phi_P) \geq U_I \Leftrightarrow |y_i - x_P| \leq \kappa$$

Thus, like in the particular case of the uniform distribution and quadratic preferences, the party catchment area is necessarily a compact set centered on x_P . Clearly, the cutoff value κ is still a function of ϕ_P . Among other things, the following proposition proves under which (mild) conditions on g the size of the party catchment area has a local minimum in $\phi_P = 1/2$:

Proposition 6 (a) *For $\phi_P \geq 1/2$ and any distribution $g(\cdot)$ the most distant district in the party catchment area is at distance ϕ_P from the party platform x_P . That is: $\kappa(\phi_P) = \phi_P$.*

(b) *Moreover, if candidate preferences are sufficiently uncertain, i.e. if $g(1)/g(0) > U_I/(u_i(y_i + 1) - U_I)$, then $\kappa(\phi_P)$ has a local minimum in $\phi_P = 1/2$. In this case, $\kappa(\phi_P)$ has two local maxima: one with strong discipline ($0 \leq \phi_P < 1/2$) and one with maximum candidate freedom ($\phi_P = \lambda$, conditional on $\lambda > 1/2$).*

Thus, the shape of the catchment area in this generalized case is very close to the one we found in Section 4, with a local minimum in $\phi_P = 1/2$, and a global maximum in $\phi_P = 1$. The main difference is that the other value of $\phi_P (< 1/2)$ for which $\kappa(\cdot)$ is maximized will be different from 0 and that the value of the expected utilities may not feature tractable closed-formed solutions.

7.2 Regime-Specific Restrictions on λ ²⁵

At the turn of the Twentieth century, American politics underwent what Ranney has described as “the most radical of all the party reforms adopted in the whole course of American history” (Ranney, 1975, p. 121, quoted by Ware 2002, pp. 1 and 95) with the introduction of the direct primary for all elected offices (except that of the President of the United States). This reform de facto reduced party control on the candidate selection process.²⁶

To introduce this loss of control in the model, suppose that parties can only select a value of candidate freedom $\phi_P \in [k, 1]$ with $k > 0$ under the direct primary. The obvious consequence is that party leaders value even less the maximal level of feasible discipline, since the size of the catchment area under maximal discipline k is bound to be smaller than under full discipline: $\kappa(k) < \kappa(0)$ for any $k < 1/\sqrt{3}$ and $\partial\kappa(\cdot)/\partial\phi_P > 0$ for any $\phi_P \geq 1/2$. Yet, if anything, this added restriction would increase the empirical validity of the model in that it provides an additional rationale for why US parties have chosen to organize as “empty vessels”. Not only does the presidential regime provide leaders with incentives to favor candidate freedom because of a larger value of λ ; it also reduces the party leaders’ capacity to tighten discipline, given the constraints imposed by the direct primary legislation.

8 Applications

This section shows how our theoretical results apply in practice. The first subsection focuses on the evolution of party discipline: we describe evolutions in the UK, the US, and France. It illustrates how institutional changes in the parliamentary regime led to more party discipline (the multiplier effect). In contrast, US parties took steps to decentralize candidate selection. The second subsection focuses on party polarization in the US and provides a theoretical rationale for the *dance* between polarization and inequality uncovered by McCarty *et al* (2006).

²⁵We thank Tom Cusack for drawing our attention on this point.

²⁶See for example Ware, 2002 for a very clear account of the introduction of direct primaries and Castanheira, Crutzen and Sahuguet (2010a) for a theoretical account that rationalizes its introduction.

8.1 Comparative Politics of Intra-Party Discipline

8.1.1 The Evolution on Intraparty Discipline in Victorian England

Contemporary British voters typically vote for a party: the personality of each local candidate bears little weight on the number of votes received because MPs must follow the rule dictated by that their party (Cox 1987, Chapter 9, and Kam 2009). Yet, the situation was opposite in the early 1800s: MPs were quite independent and voters focused primarily on the characteristics of their candidate. Cox argues that voter behavior changed because of the materialization of the “efficient secret” –*the ‘nearly complete fusion of the executive and legislative powers’ in the Cabinet*” (p. 51)– and dates the switch around 1868 (p. 92). What we argue here is that the institutional changes that occurred between 1832 and 1868 also caused the switch in party discipline –in line with the party multiplier effect identified by our model: once the efficient secret materialized, parties decided to control who would be given the most important appointments. Only then did legislative behaviour change strongly.

How the nineteenth century electoral Reform Acts led to the birth of Britain’s “efficient secret” is one of Cox’s main focuses. Relating these evolutions to our model, these acts produced an increase in preference heterogeneity in Parliament (σ increases in our model). Simultaneously, the birth of the efficient secret produced a gradual tightening of legislative constraints (λ falls progressively in our model). Eventually, this induced parties to increase discipline and tighten candidate selection because “*the [party] labels themselves became increasingly important as collective symbols [... S]ince their value could be depreciated by indiscipline or incompetence, the parties had a clear incentive to take a larger role in screening candidates who sought to campaign under their banners*” (p. 144).

In 1832, the First Reform Act extended the franchise and increased election competitiveness at the local level. As a consequence, each MP became extremely eager to be visible in Parliament: “*as Sir Robert Peel put it, ‘there was a great appetite for legislation, and a strong desire among hon. Members to be distinguished as the introducers of new laws’*” (p. 59). The result was a drop in parliamentary cohesion (p. 23, Tables 3.1 and 3.2): Parliament became overcrowded with proposals and hot air; meetings ended in the middle of the night, and the parliamentary session extended into late August. “*Thus, an apparent increase in the desire of members to participate was followed by a diminution of their ability to do so meaningfully. [...] The Commons, in other words, faced the ‘tragedy of the commons’.*” (p. 60).

As a corollary, the importance of the government rose progressively: “*the more or less*

unwitting beneficiary of this series of procedural crises was the ministry” (p. 61). The Cabinet took increasing control of the Parliament’s agenda and, by approximately 1850, “*came about the efficient secret*” (p. 51). At this stage, the government or, more precisely, the Prime Minister had to develop tools to overcome the tragedy of the Commons: right after the Second Reform Act of 1867, which further extended the franchise, the survival of the Cabinet was tied to Parliamentary support. The idea was that the threat of new elections should discipline MPs. However, the evolution of legislative cohesion cannot be entirely explained by this motion of confidence procedure: firstly, discipline first rose in the opposition, even though the motion of confidence procedure is available to the executive only. Secondly, because “*when MPs felt that an immediate dissolution would give them or their party a good chance at reelection, they might actually seek it*” (p. 85). In this case a motion of confidence should actually reduce discipline. Thirdly, if the threat of dissolution was the sole determinant of discipline, cohesion should have been decreasing as the date of the election neared. Yet, as shown by Cox (p. 86), this pattern is not in the data.

The multiplier effect identified in Propositions 2 and 3 can instead explain why discipline increased the way it did. We can decompose the increase in party discipline into two steps. First, until about 1870-1880, discipline increased little by little (in the wording of the model, ϕ falls in line with λ). As of 1870-1880 instead – that is soon after the Second Reform Act and the near fusion of powers in the Cabinet – parties introduced new measures that produced a leap in party discipline (the multiplier effect in the model), largely through candidate selection.

In the first phase, parties used “whipping” to increase discipline:²⁷ the percentage of whipped votes increased from 49% in 1836 to 67-69% in the period 1850-1869, to 82% in 1871, and to around 90% from 1875 onwards (Table 3.5, p 24). The effectiveness of whipping on actual cohesion was however mixed: intra-party cohesion increased markedly only after 1871-1875.

What changed MP behaviour in that later period? As the Cabinet progressively gained power in the 1850s, pledging allegiance to a party became increasingly important: “*Candidates unaffiliated with one of the major parties were unpledged on the single most important issue – the control of the cabinet – and increasingly had little chance against candidates who were pledged on this issue [...E]very voter with a clear preference as to control of the executive preferred an appropriately committed candidate to an uncommitted candidate*” (p. 143). Indeed, between 1856 and 1868, voters progressively switched from voting for candidates to voting for parties (Chapter 9). This gave parties the necessary leverage to finally obtain the additional zest of discipline that

²⁷ Whips are MPs (or Lords) appointed by each party to make sure that MPs vote the way the party wants.

whipping and fusion did not produce. To begin with, parties started selecting candidates for the cabinet strategically: an MP typically had to “*vote with the party whips consistently, speaking in support of his leaders, patiently awaiting his just reward*” (p. 78), instead of following the “riskier course” of criticizing the government with the hope of being bought off. This strategy bears its disciplining fruits from 1890-1900 (p. 79). Next, the Corrupt and Illegal Practices Act of 1883 deprived candidates from their finance to organize the campaign or buy votes. It constrained them to rely on the party to win a campaign, because it centralized campaign finance in the hands of the party. In parallel, “*it is soon after the third Reform Act [of 1884], according to Berrington (1967-68), that the English parties first began serious and regular efforts to negotiate intra-party differences, rather than carrying them into the division lobbies*”, and “*it is precisely in the late 1870s and 1880s that specifically partisan control of nominations [for the general election] began*” (p. 144).

In other words, the increasing dependence of the Cabinet on parliamentary support can be interpreted as a progressive reduction in λ in the model. When the critical level was reached ($\lambda = 1/\sqrt{3}$ in the model), parties decided to deeply reorganize their internal procedures to ensure that they could send a homogeneous signal to their voters, *i.e.* reduce ϕ as much as possible in the model. Both the timing of the events and the reading of Cox forcefully suggest that party reorganisation is a direct consequence of these institutional changes: the changes in electoral finance or organization occurred *after* the value of the party label rose, as “*postscripts, logical consequences and reinforcements of the fundamental changes in parliamentary procedure and electoral behavior*” (p. 136).

8.1.2 The United States around 1900²⁸

The situation in the U.S. around 1800 was similar to that of the UK: only a small fraction of the population was involved in elections, and the personal vote – that is, the importance of the personal characteristics and record of the individual candidates standing for election in any district – played a very important role. In contrast with the UK, however, the personal vote is still very important today (see for example Cain, Ferejohn and Fiorina 1984 and Morgenstern and Swindle 2005), and parties do not closely discipline their congressmen and senators. What we show here is that this lack of party discipline is not caused by some type of disciplining impossibility. Historical evolutions clearly show that, when faced with challenges similar to that

²⁸In what follows we ignore the Southern States as the evolution of candidate selection and discipline followed a different path for reasons that probably were largely linked to the importance of slavery in those States. See Besley, Persson and Sturm (2010) for more on this.

of UK parties, US parties *chose* to loosen discipline. They ensured that local candidates would be more independent from Washington, to reinforce the party label and compete independent candidates away.

A corner stone of the US political regime is full separation of powers between the executive and the legislative branches of government. Indeed, one of the Founding Fathers, Madison, concluded his paper XLVIII by stating: “*The conclusion which I am warranted [...] is that a mere demarcation on parchment of the constitutional limits of the several departments is not a sufficient guard against those encroachments which lead to a tyrannical concentration of all the powers of government in the same hands*” (Madison, Hamilton and Jay 1788 (1987), p. 312). In the context of our model, the US institutions were designed from the start to allow the government to function in the absence of a cohesive legislative body (λ is high in our model).

The evolutions of the electorate were similar to that of the UK: “*Between the 1820s and 1830s, the United States underwent a major transformation. A system of politics that had been based in the early decades of the republic on social deference and a rather limited popular participation in politics gave way to a political nation. This was a world in which most Americans were partisans and in which partisan politics was one of the central arenas of social life*” (Ware 2002, p. 65). In other words, polarization (σ in the model) increased in the electorate. Massification of politics also produced new informational asymmetries between candidates and voters: “*America consisted of small towns and rural hinterlands [...], it was a face-to-face society in which informal constraints were largely sufficient to regulate the conduct of politics [...]. However, in the decades after the emergence of mass party politics in the 1830s, the social base of America changed radically. [...] A style of politics that worked relatively well in the 1830s was working much less well in the new circumstances*” (Ware 2002, p. 21).

Still like in the UK, there was an increasingly strong perception among voters that corruption was plaguing the system. New entrants (independents in the wording of the model) could exploit this perception to compete increasingly strongly against the major parties. These parties had to address this problem. The solution found in the UK was the Corrupt and Illegal Practices Act, which deprived candidates from their capacity of campaigning without the support of the party. In the US, as shown by Ware (2002), parties chose to take the *opposite* route: they introduced the “American Direct Primary” which delegated the selection of local candidates outside the hands of the party:²⁹ the direct primary was aproved by all but three States between 1899 and

²⁹In Castanheira, Crutzen and Sahuguet (2010), we show when primaries improve the candidate incentives in a moral hazard setup.

1915. It introduced the legal obligation for parties to “*choose their candidates through state-administered elections in which any legally qualified person must be allowed to vote*” (Ranney 1975, p. 121, quoted by Ware 2002, p. 95).³⁰

This solution, despite being opposite to that of the UK, had a similar effect: it further reinforced the value of the party label in the eyes of the electorate and improved the electoral success of the main parties. Thus, American parties reacted to forces similar to those of the UK (increasing informational asymmetries and σ) by totally relinquishing their control over candidate selection to an independent bureaucracy, that is, by awarding local candidates as much freedom as allowed by the rules of the game: $\phi_P = \lambda$ in the wording of the model. Thus, while Victorian England saw the materialization of the *efficient secret* and high intraparty discipline, which now epitomize parliamentary regimes, the US became the archetypical presidential regime centered around separation of powers and loosely disciplined parties.

8.1.3 Changes between the Third and Fifth Republic in France

Another interesting case is France.³¹ Under the Third and Fourth Republics (that is, until 1958), French deputies had the reputation of being extremely undisciplined and individualistic, and governments were seldom long-lasting.³² The goal of the reforms introduced by the Fifth Republic (in 1958) was to eliminate this instability by tightening legislative constraints, among others by introducing the package vote and the confidence vote (Huber 1996b, p. 57). These reforms clearly increased the powers of the Prime minister and the President by either not giving legislators any say on proposed laws (the package vote requires legislators to vote in favor or against a proposed law without the right to propose any amendment) or by linking the survival of parliament to the outcome of a vote (through the confidence vote). In the terminology of our model, all these reforms severely reduced λ .

How did parties react to this change? The reaction of the Gaullist UDR is the most interesting case to analyze here, for the following reasons: 1) this was the party whose elite had crafted the Fifth Republic; 2) it was the party with the lowest initial level of internal cohesion, because

³⁰The actual rules and degree of decentralization of the selection procedure depend on the office for which the election is organized. The only election for which the direct primary *does not* apply is that for the President of the United States.

³¹We thank Howard Rosenthal for drawing our attention to the French case.

³²Sauger (2009, p310) reports that “21 governments were formed within the 12 years of the Fourth republic, compared to only 19 in 50 years for the Fifth Republic. Moreover, most of the Fourth Republic governments were dismissed because of internal divisions whereas only one of the Fifth Republic governments was dismissed by a no-confidence vote.”

it had the most diverse set of legislator preferences in 1958; 3) it managed to maintain its control of both the Presidency and the Prime Minister position from 1958 to 1981, when Mitterrand won over Valéry Giscard d'Estaing, partly because the latter lost his control of the right wing part of his party.

Even though the Gaullist leaders had crafted the Fifth republic, they quickly realized that they could not free-ride on its institutions, exactly as our model predicts. To the contrary, and in line with the multiplier effect put forth by this paper, after introducing the Fifth Republic in 1958, they built on this reform to tighten intraparty discipline from 1962 onwards:³³ “*UDR leaders [took] steps to enforce effective discipline: deputies who failed to observe party discipline were subject to immediate exclusion. [...] Even a single refusal of discipline on a key vote could bring expulsion*” (Wilson and Wiste 1976, p. 482). In the same year, they introduced the direct election of the President, which also reinforced the grip of the leader on his supporting majority in Parliament. Indeed, in his televised speech after his ascent to power in 1962, De Gaulle stated: “who ever believed that the General De Gaulle, being called to steer [the country], would limit himself to the inauguration of the chrysanthemes?”³⁴

With the evolutions of the UK in the nineteenth century, the reaction of the UDR to the introduction of the Fifth republic provides a second concrete case in which party discipline was introduced as a direct reaction to a change in the institutional environment. Finally, the Gaullists' capacity to stay in power for such a long spell of time and the fact that their defeat in 1981 can at least partly be attributed to a significant decline in internal discipline also suggest that the mechanisms and effects identified by our model are far from being of second order

³³Sauger (2009, p. 313) argues that 1962 was the key turning point for the increase in intraparty discipline and cohesion: it saw the only dismissal of a government –Pompidou's– by a no-confidence vote in the Fifth Republic, the move to the direct election of the President, and De Gaulle's dissolution of Parliament and his re-appointment of Pompidou as Prime Minister . Thus, from 1962 onwards, De Gaulle and his team understood that the institutions of the Fifth Republic required much higher intraparty discipline for the ruling coalition to stay in power. Remark that we are not saying that the presidentialization of parties that Samuels and Shugart (2010) focus on started in 1962. We believe this process happened much later. While we agree with Samuels and Shugart that, in France, parties are nowadays presidentialized, we would argue that the chain of events was: 1) the introduction of the Fifth Republic and of the direct election of the President in 1958 and 1962 respectively; 2) the tightening of discipline from 1962 onwards to ensure the smooth working of the executive-legislative relationship; 3) a gradual shift of the balance of power from the Prime Minister to the President, especially after the last reforms of 2000 and 2008. For more on this chain of events, see Sauger (2009) and Grossman and Sauger (2009).

³⁴His exact words in French were: “qui a jamais cru que le Général De Gaulle, étant appelé à la barre, devrait se contenter d'inaugurer les chrysanthèmes?”

importance.

8.2 The American Polarization ‘Dance’

While Section 8.1.2 focuses on the dynamics of US party discipline in the beginning of the twentieth Century, it is silent about the effects of preference heterogeneity on party positions. Proposition 5 predicts that parties should polarize more when voter preferences become more heterogeneous. With low discipline, this implies that the overlap between the catchment areas of the two parties should decrease (respectively increase) when preference heterogeneity increases (respectively: decreases).

This result provides a theoretical foundation for the findings of McCarty, Poole and Rosenthal (2006) who identify a strong statistical correlation between party polarization and economic inequality in the US. A first visualization of these evolutions is provided by Figure 4 below:³⁵ it displays the distribution of preferences of the US House representatives in the 93rd and 108th Houses.

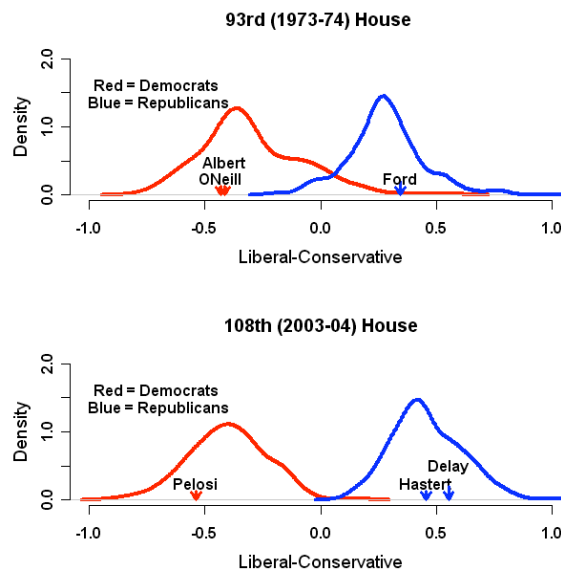


Figure 4: Democrat-Republican polarization dance and overlaps

Two facts stand out: first, policy preferences within each party form a cloud (roughly around the national party platform), consistently with our theory and contrary to usual Downsian models. Second, the overlap between the two sub-distributions (the catchment areas in the wording of the model) is greater in the 93rd House than in the 108th.³⁶ If our theoretical predictions

³⁵The figures are taken from <http://www.ou.edu/special/albertctr/extensions/fall2005/Poole.pdf>

³⁶This is especially evident when one compares across the two Houses the left tail of the Republicans and the

bear any water, income inequality – which is a good proxy for preference heterogeneity – should be greater in 2003-04 than in 1973-74. This is indeed what McCarty et al. document. Indeed, they provide a wealth of evidence that there is a systematic tendency for the distribution of legislator preferences to move closer or farther from one another in correlation with income inequality. Figure 5 below indeed depicts vividly what they call the “dance” between inequality and ideological polarization over the course of the XXth century.³⁷

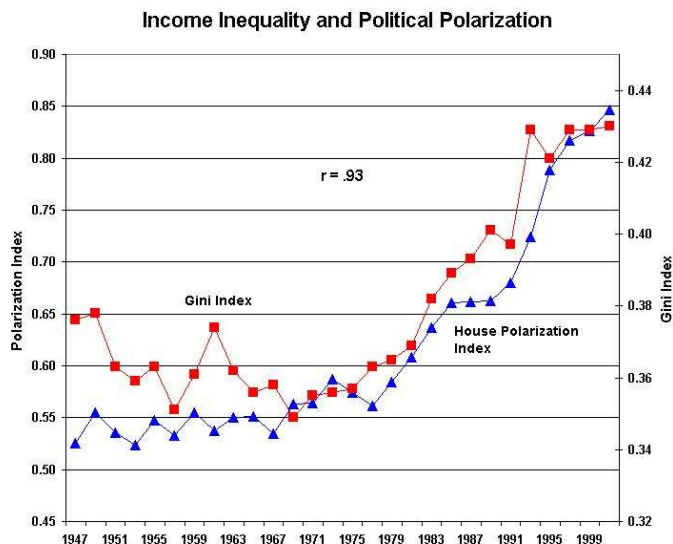


Figure 5: Income Inequality and Political Polarization (Source: <http://polarizedamerica.com/>)

9 Conclusion

Comparative studies of economic policy across political regimes implicitly rely on parties being highly disciplined in parliamentary regimes and highly flexible in presidential regimes. Yet, these studies systematically disregard parties, and thus cannot explain why parties adopt and maintain these different organizations. We proposed a model that fills this gap. We studied an electoral game in which parties can choose their intraparty discipline and their ideological

right tail of the Democrats.

³⁷We wish to emphasize that, while previous contributions, such as Callander (2005), may provide a rationale for the positive correlation between preference heterogeneity and the distance between party platforms, they cannot rationalize this evidence. Indeed, like in most Downsian models, parties are assumed to be a *single ideological point* in Callander (2005). In contrast, the measure of polarization put forth by McCarty et al. (2006) is based on all individual representatives’ liberty to express (and vote for) different positions inside the party. In other words, if there was full discipline, there would be no overlap between the two subdistributions in Figure 4, and polarization would always be maximal in Figure 5.

platforms to maximize their seat share. Contrary to the usual Downsian assumption, national parties and their local candidates do not coincide. Political parties act as a “brand”: they only admit candidates with preferences sufficiently close to the national platform. This selection process provides voters with information about candidate preferences and the amount of information revealed is endogenous: parties can make their message very precise by adopting strict internal discipline, or loose by letting their candidate choose their position more freely. We also endogenized party positions, and therefore polarization.

We showed that equilibrium discipline is determined both by institutional constraints and by population preference heterogeneity. In turn, discipline influences equilibrium polarization. Our results provide a rationale for the fact that U.S. parties are less centralized than, for example, British parties. Our results also provide a novel rationale for why income inequality and the ideological positioning of US parties ‘danced’ together in the Twentieth century.

Where do we go from here? If the macro-political economy research of the last twenty years was very successful in explaining broadbrush differences in policymaking across different democratic regimes, it abstained from disentangling the direct impact of such institutions from the impact of the party micro-structure. Yet, suggestions for reform do depend on the source of variation. Accordingly, in democracies where the policy formation process is experiencing difficulties, policymakers should ask themselves whether their reform efforts should focus on the electoral and representation system or on the parties’ ability to select and discipline their members (representatives or leaders). Indeed, our results suggest that the origin of policy decisionmaking problems could be a mismatch between the way parties are organized and the institutional setup in which they are embedded. Also, as shown by Grossman and Helpman (2005, 2008), the welfare effects of such issues can be substantial.

To conclude, we believe that understanding 1) the way parties organize and institutions are chosen; and then 2) how each of them shapes equilibrium policy should allow us to improve substantially our knowledge of the various channels that relate voters to policy outcomes and welfare in democracies. This paper focused on the first part of this research project. The second part is next on our agenda; there is probably still quite some road to cover, but it promises to be a fascinating journey.

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10 Appendix: Proofs

Proof of Proposition 1

Using (2) and (3), we need to show that:

$$\text{For } |y_i - x_P| \leq 1 - \phi_P, \mathbf{E}_i u(y_i, x_P) > \mathbf{E}_i u(y_i, x_I) \iff |y_i - x_P| \leq \sqrt{\frac{1 - \phi_P^2}{3}}, \quad (5)$$

$$\text{For } |y_i - x_P| \geq 1 - \phi_P, \mathbf{E}_i u(y_i, x_P) > \mathbf{E}_i u(y_i, x_I) \iff |y_i - x_P| \leq \phi_P (> 1/2). \quad (6)$$

(5) can be rewritten as:

$$\begin{aligned} |y_i - x_P| &\leq \min \left[\sqrt{\frac{1 - \phi_P^2}{3}}, 1 - \phi_P \right] = \sqrt{\frac{1 - \phi_P^2}{3}}, \quad \forall \phi_P \leq 1/2 \\ &= 1 - \phi_P, \quad \forall \phi_P \geq 1/2. \end{aligned}$$

Similarly, solving for (6) yields the condition : $|y_i - x_P| \in [\phi_P - 1, \phi_P]$, where the lower bound is negative. Combining this with the condition $|y_i - x_P| \geq 1 - \phi_P$ yields: $|y_i - x_P| \in [1 - \phi_P, \phi_P]$, which is an empty set for $\phi_P \leq 1/2$.

These results imply that the party candidate beats the independent in the districts i such that:

$$\begin{aligned} |y_i - x_P| &\leq \sqrt{\frac{1 - \phi_P^2}{3}} \text{ if } \phi_P \leq 1/2 \\ &\leq \phi_P, \text{ if } \phi_P \geq 1/2. \end{aligned}$$

For $\phi_P \leq 1/2$, all the districts within distance $\sqrt{\frac{1 - \phi_P^2}{3}}$ of the platform x_P vote for the party. This distance is decreasing in ϕ_P and has a maximum of $\sqrt{\frac{1}{3}}$ at $\phi_P = 0$. It has a minimum of $1/2$ at $\phi_P = 1/2$.

For $1 \geq \phi_P \geq 1/2$, all districts within distance ϕ_P of x_P vote for the party. QED

Proof of Proposition 2

Let $d_{i,P} \equiv |x_P - y_i|$. From Section 4, we know that all districts with $d_{i,P} < 1 - \phi_P$ prefer $\phi_P = 0$. Here, we show that all districts within distance $d_{i,P} < 1/\sqrt{3}$ prefer $\phi_P = 0$ to any other $\phi_P \in [0, 1/\sqrt{3}]$. We thus need to prove that:

$$\mathbf{E}_i u(y_i, x_P | \phi_P = 0) = -d_{i,P}^2 > -\frac{1 + (d_{i,P} - \phi_P) + (d_{i,P} - \phi_P)^2}{3} = \mathbf{E}_i u(y_i, x_P | \phi_P > 0), \forall \phi_P, d_{i,P} < 1/\sqrt{3}. \quad (7)$$

Rearranging this inequality yields:

$$1 + (1 - 2\phi_P) d_{i,P} - 2d_{i,P}^2 - \phi_P + \phi_P^2 > 0. \quad (8)$$

(8) always holds for the districts such that $d_{i,P} < 1 - \phi_P$. Differentiating with respect to ϕ_P also shows that the inequality is tightest at the corner value: $\phi_P = 1/\sqrt{3}$. Hence, $\phi_P = 0$ is preferred to any $\phi_P \in (0, 1/\sqrt{3})$ if it holds in $\phi_P = 1/\sqrt{3}$:

$$-2d_{i,P}^2 + \frac{\sqrt{3}-2}{\sqrt{3}}d_{i,P} + \frac{4-\sqrt{3}}{3} \geq 0,$$

which is true for any $d_{i,P} \leq 1/\sqrt{3}$. This proves that $\phi_P = 0$ maximizes party P 's seat share for any $\lambda \leq 1/\sqrt{3}$. QED

Proof of Proposition 3

For $\lambda > 1/\sqrt{3}$, the party must choose whether to adopt the structure that maximizes the size of its catchment area ($\phi_P = \lambda$) or the one that maximizes voters' utility in close districts ($\phi_P = 0$). When the two catchment areas cannot overlap, the party must maximize the size of its catchment area which, from Proposition 1, implies that $\phi_P^* = \lambda$.

Now, consider the case in which the catchment areas can overlap. For $\lambda = 1$, the median voter of the median district is indifferent between full flexibility and full discipline if party platforms are $(-x_L = x_R =)x = 1/2$:

$$\mathbf{E}_i u(y_i = 0, x = \frac{1}{2} \mid \phi_P = 0) = \mathbf{E}_i u(y_i = 0, x = \frac{1}{2} \mid \phi_P = 1) = -\frac{1}{4}.$$

It follows directly that the median district ($y_i = 0$) prefers maximal candidate freedom ($\phi_P = 1$) for any $x > 1/2$. That is, $\phi_P = 1$ maximizes seat share. For $x < 1/2$, the median district prefers full discipline ($\phi_P = 0$), whereas non-centrist districts (districts close to $x_P \pm 1$) prefer $\phi_P = 1$. Hence, switching from $\phi_P = 1$ to $\phi_P = 0$ allows the party to win districts around $y_i = 0$ at the cost of losing the non-centrist ones. Since the ratio $f(0)/f(y)$ is strictly decreasing in σ for any $y \neq 0$, the smaller is σ , the more weight parties put on winning districts around $y_i = 0$; in contrast, the larger is σ , the more parties put weight on winning in districts close to $x_P \pm 1$. It is easy to check that, for $\sigma \rightarrow 0$, full discipline always dominates. For $\sigma \rightarrow \infty$, full flexibility dominates. Since $f(0)/f(y)$ is monotonic in σ , there exists a unique cutoff value $\sigma(x)$ that makes the party indifferent between the two structures. QED

Lemma 2

The following lemma will help us prove Proposition 4.

Lemma 2 *For $\lambda < \sqrt{1/3}$, the equilibrium distance between x_L and x_R can never be larger than $2/\sqrt{3}$.*

Whenever $x_L + 1/\sqrt{3} < 0 < x_R - 1/\sqrt{3}$, we have that:

$$\begin{aligned} \frac{\partial V_L(\phi_L = 0, x_L; x_R)}{\partial x_L} &= f\left(\min\left(x_L + \frac{1}{\sqrt{3}}, \frac{x_L + x_R}{2}\right)\right) - f\left(x_L - \frac{1}{\sqrt{3}}\right) > 0 \\ \frac{\partial V_R(\phi_R = 0, x_R; x_L)}{\partial x_R} &= f\left(x_R + \frac{1}{\sqrt{3}}\right) - f\left(\max\left(x_R - \frac{1}{\sqrt{3}}, \frac{x_L + x_R}{2}\right)\right) < 0. \end{aligned}$$

Hence, both parties strictly prefer to move their platform in the direction of their opponent, which proves that $|x_L - x_R| > 2/\sqrt{3}$ cannot be an equilibrium. QED

Proof of Proposition 4

We first show that $-x_L = x_R = 1/\sqrt{3}$ is an equilibrium for $\sigma^2 > 2/(3 \log 2)$. Lemma 2 above shows that $x_L < -1/\sqrt{3}$ and $x_R > 1/\sqrt{3}$ can never be profitable deviations from $-x_L = x_R = 1/\sqrt{3}$. It remains to check under which condition $x_L > -1/\sqrt{3}$ and $x_R < 1/\sqrt{3}$ are not profitable either.

Focus on party R (the analysis is symmetric for party L): in $(x_L, x_R) = (-1/\sqrt{3}, 1/\sqrt{3})$, we have:

$$\begin{aligned} \frac{\partial V_R(\phi_L = 0, x_R; x_L)}{\partial x_R} &= f\left(x_R + \frac{1}{\sqrt{3}}\right) - \frac{1}{2}f(0) \\ &= \frac{\exp\left[-\frac{2}{3\sigma^2}\right] - \frac{1}{2}}{\sqrt{2\pi\sigma^2}}. \end{aligned}$$

A deviation to a position $x_R < 1/\sqrt{3}$ is only profitable if this derivative is strictly negative. It is immediate to see that this cannot be the case if $\sigma^2 \geq 2/(3 \log 2)$.

Conversely, for $\sigma^2 < 2/(3 \log 2)$, the first order necessary condition for a pair of platforms $x_L < 0 < x_R$ to be an equilibrium is that $\left(\frac{\partial V_R(\phi_R=0, x_R; x_L)}{\partial x_R}\right) = f\left(x_R + \frac{1}{\sqrt{3}}\right) - f\left(\max\left(x_R - \frac{1}{\sqrt{3}}, \frac{x_L + x_R}{2}\right)\right) = 0$. Given that a similar condition must hold for the other party and that the distribution of district medians is symmetric around 0, the two first order conditions imply that we must have $x_L^* = -x_R^*$ in equilibrium, that is, platforms must be symmetric around 0. Exploiting this fact, the first order condition boils down to :

$$f\left(x_R + \frac{1}{\sqrt{3}}\right) - f(0) = 0 \Leftrightarrow \exp\left[-\frac{1}{2}\left(\frac{x_R + 1/\sqrt{3}}{\sigma}\right)^2\right] = \frac{1}{2}.$$

Solving this equation yields $x_R^* \equiv \sigma\sqrt{2\log 2} - \sqrt{1/3}$. Of course, $x_R^* > 0$ requires that $\sigma^2 > 1/(6 \log 2)$. For lower values of σ^2 , we have the corner solution: $x_L^* = 0 = x_R^*$.

This establishes a necessary condition for an equilibrium. It remains to show that adopting any other position would indeed decrease the number of seats won by the party. For $\sigma^2 \in [1/(6 \log 2), 2/(3 \log 2)]$, and $x_L = -x^*$, we have:

$$\frac{\partial V_R(\phi_R=0, x_R; x_L)}{\partial x_R} = f\left(x_R + \frac{1}{\sqrt{3}}\right) - \frac{1}{2}f\left(\frac{x_R + \sqrt{1/3 - \sigma\sqrt{2\log 2}}}{2}\right). \quad (9)$$

For any $x_R < x^*$, this derivative is always positive: by the properties of Normal distributions, $f(x_R + 1/\sqrt{3}) > f(x^* + 1/\sqrt{3})$ and $f\left(\frac{x_R + x_L}{2}\right) < f(0)$. Hence, all $x_R < x^*$ are dominated by $x_R = x^*$. By Lemma 2, $x_R > x^*$ cannot be profitable deviations either.

QED

Proof of Proposition 5

We begin by demonstrating that $\phi_L^* = \phi_R^* = 1$ and $(x_L, x_R) = (-1, 1)$ is an equilibrium for $\lambda = 1$ and $\sigma^2 \geq \sigma_B(1) = \frac{2}{\log 2}$. To this end, we show first that these platforms are optimal if parties choose full flexibility at time $t = 2$.

For the same reason as in Lemma 2, parties never deviate towards a platform $x_L < -\lambda$ and/or $x_R > \lambda$. Let us now show that deviating towards a platform $x_L > -\lambda$ or $x_R < \lambda$ is not profitable either. We focus on potential deviations by L :

$$\begin{aligned} \frac{\partial V_L(\phi_L=\lambda, x_L; x_R=\lambda)}{\partial x_L} &= \frac{f\left(\frac{x_R+x_L}{2}\right)}{2} - f(x_L - \lambda) \leq \frac{f(0)}{2} - f(x_L - \lambda) \\ &= \frac{\frac{1}{2} - \exp\left[-\frac{1}{2}\left(\frac{2}{\sigma^2}\right)^2\right]}{\sqrt{2\pi\sigma^2}} \text{ for } \lambda = 1. \end{aligned} \quad (10)$$

(10) is necessarily non-positive for $\sigma^2 \geq 2/\log 2$. For such values of σ^2 , by the properties of Normal distributions, (10) is strictly negative for any $x_L \in (-1, 0]$. Furthermore, for $x_L > 0$, we have $V_L < F\left(\frac{x_L+x_R}{2}\right) - F(x_L - 1)$. Hence any $x_L > -1$ are dominated by $x_L = -1$ if full flexibility is maintained.

Now, we show that any deviation involving full discipline ($\phi_L = 0$) at stage 2 is also dominated, when $\lambda = 1$ and $\sigma^2 \geq 2/\log 2$. That is, we show that: $\max_{x_L} V_L(x_L, \phi_L = 0) < V_L(x_L = -1, \phi_L = 1)$. To this end, note that $V_L(x_L, \phi_L = 0)$ is necessarily smaller than $F(1/\sqrt{3}) - F(-1/\sqrt{3}) \simeq 0.226$. The latter is the maximum fraction of seats won by a party under full discipline in the *absence* of competition by another party. Conversely, for $\sigma^2 = 2/\log 2$, we have: $V_L(x_L = -1, \phi_L = 1) \simeq 0.381 > 0.226$. This is sufficient to establish that $x_L = -1, \phi_L = 1$ dominates any other (x_L, ϕ_L) when $\sigma^2 \geq 2/\log 2$ and $\lambda = 1$. This reasoning extends to any other value of λ greater than $1/\sqrt{3}$.

For $\sigma \rightarrow \infty$, the density of districts tends to a uniform. This implies:

$$\frac{V_L(x_L = -\lambda, \phi_L = \lambda)}{\max_{x_L} V_L(x_L, \phi_L = 0)} > \frac{2\lambda}{2/\sqrt{3}} > 1, \quad \forall \lambda > 1/\sqrt{3}.$$

By continuity, this establishes that, for any $\lambda > 1/\sqrt{3}$, there must exist a value $\sigma_B(\lambda)$ such that, $\forall \sigma > \sigma_B(\lambda)$, $-x_L = x_R = \lambda$, $\phi_L = \phi_R = \lambda$ is an equilibrium. This proves point *i*.

To prove point *ii*, note that, by exploiting the steps of the proof of Proposition 4, $x_L = x_R = 0$ are the optimal platforms if $\phi_P = 0$, $P = L, R$. Applying the same steps as in the proof of Proposition 4 for ϕ_L and/or $\phi_R = \lambda (\geq 1/\sqrt{3})$, it is immediate to see that $x_L = x_R = 0$ is also the equilibrium. This shows that, in equilibrium, the platforms must be $x_L = x_R = 0$. Now, we check that a deviation in party structure cannot be profitable.

If $\phi_R = 0$, we have:

$$V_L(x_L = 0, \phi_L = 1) = 2(F(1) - F(1/2)).$$

From the tabulated distribution of the Normal, this is strictly smaller than 0.267 , $\forall \sigma^2 \leq (6 \log 2)^{-1}$. By contrast:

$$V_L(x_L = 0, \phi_L = 0) = F(0) - F\left(-1/\sqrt{3}\right) > 0.38, \quad \forall \sigma^2 \leq (6 \log 2)^{-1}.$$

Since $V_L(x_L = 0, \phi_L = \lambda)$ is yet smaller for other values of λ , comparing these two vote shares demonstrates point *ii*. QED

10.1 Proof of Lemma 1

We first show that if $U_{iP}(x_P, \phi_P) \geq U_I$ for some $y_i (\leq x_P)$, then $U_{jP}(x_P, \phi_P)$ must be larger than U_I for any $y_j \in [y_i, x_P]$. By symmetry, this must also be true for districts to the right of x_P . Since $u_i(x_c)$ only

depends on the distance between x_c and y_i , and since all $g_i(x_c)$ are translates of a common distribution $g(x_c)$, it is equivalent to prove that a decrease in $|x_P - y_i|$ cannot decrease $U_{iP}(x_P, \phi_P)$ below U_I . We analyze the case of close and distant districts separately.

(a) close districts: holding ϕ_P constant, a marginal change from x_P to x'_P , such that $|x'_P - y_i| < |x_P - y_i|$, shifts probability mass away from $x_P + \phi_P$ towards $x_P - \phi_P$. Noting that $u_i(x_P + \phi_P) < u_i(x_P - \phi_P)$, it is straightforward to check that U_{iP} must strictly increase. This proves that, like in Section 4, voter preferences in close districts are single peaked in x_P .

(b) distant districts: holding ϕ_P constant, a similar marginal change in x_P has two effects. It reduces the expected distance between x_c and y_i , which increases expected utility. On the other hand, it increases the variance of x_c , since the length of the subset $\mathcal{P}_i(x_P, \phi_P) \equiv \mathcal{Y}_i \cap \mathcal{X}_P$ increases; this decreases expected utility. The total effect on expected utility is thus ambiguous, and a direct comparison of U_I and U_{iP} is needed. Given that:

$$U_I = \int_{y_i}^{y_i+1} u_i(x_c) \frac{g_i(x_c)}{1/2} dx_c \quad \text{and} \quad U_{iP} = \int_{x_P-\phi_P}^{y_i+1} u_i(x_c) \frac{g_i(x_c)}{1 - G_i(x_P - \phi_P)} dx_c,$$

it is straightforward to check that $U_{iP} \geq U_I$ iff $x_P - \phi_P \leq y_i$.

Combining (a) and (b), proves that the set of districts that prefer a party candidate to an independent is a compact set. Symmetry in the utility function and in g_i implies that this compact is centered on x_P .

QED

10.2 Proof of Proposition 6

(a) That $\kappa(\phi_P)$ is the identity function for $\phi_P \geq 1/2$ follows directly from part (b) of the proof of Lemma 1, in which we showed that $U_{iP} \geq U_I$ if and only if $x_P - \phi_P \leq y_i$.

(b) To show that $\kappa(\phi_P)$ has a local *minimum* in $\phi_P = 1/2$ if $g(1)/g(0) > U_I/(u_i(y_i + 1) - U_I)$, we must show that the latter condition implies that $\kappa'(\phi_P) < 0$ for $\phi_P = 1/2 - \varepsilon$ and $\varepsilon \rightarrow 0$, given that we already know that $\kappa'(\phi_P) > 0$ for $\phi_P = 1/2 + \varepsilon$.

Consider district i such that $y_i = x_P - \phi_P$. For $\phi_P = 1/2 - \varepsilon$, we have:

$$U_{iP}(x_P, \phi_P) \simeq \int_{x_P-\phi_P}^{x_P+\phi_P} u_i(x) g_{iP}(x) dx = U_I,$$

where the second equality stems from the fact that $x_P - \phi_P = y_i$ and $x_P + \phi_P = y_i + 1$. Differentiating with respect to ϕ_P must take account of two effects: both the bounds of the integral and the density function $g_{iP}(x)$ are a function of ϕ_P . This yields:

$$\begin{aligned} \frac{\partial U_{iP}(x_P, \phi_P)}{\partial \phi_P} &= [u_i(x_P + \phi_P) - U_{iP}(x_P, \phi_P)] g_{iP}(x_P + \phi_P) + [u_i(x_P - \phi_P) - U_{iP}(x_P, \phi_P)] g_{iP}(x_P - \phi_P) \\ &\xrightarrow{\varepsilon \rightarrow 0} \underbrace{[u_i(y_i + 1) - U_I]}_{<0} g(1) + \underbrace{[0 - U_I]}_{>0} g(0), \end{aligned}$$

which is negative iff $g(1)/g(0) > U_I/(u_i(y_i + 1) - U_I)$.

QED