The impact of party organization on electoral outcomes[1]

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Abstract

We present a model of electoral competition in which parties act as brands and use competition to select their candidates. We show that the forces that shape the competition between party representatives and independents rationalize the positive correlation between inequality and polarization documented by McCarty, Poole and Rosenthal (2006) for the US. We also show that, when voters are badly informed about the quality of candidates, it is optimal for party to use primaries to get an edge on independent candidates. This rationalizes the introduction of the American direct primary in the US at the beginning of the twentieth century.

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JEL codes: D23, D72, D82.

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1 Introduction

The U.S. is one of a few countries in which Duverger's Law is vindicated: two parties clearly dominate the political arena. It is in such a two-party context, if any, that one should expect the median voter theorem to hold. In contrast, the two parties' ideologies have consistently been distinct. They never fitted the Tweedle-dee/Tweedle-dum description of the "rational choice" school in political science. Even in the period between 1935 and 1970, when inequality and polarization were at a minimum, platforms remained markedly different. This is documented convincingly in McCarty, Poole and Rosenthal (2006), who also show that political polarization goes hand-in-hand with income inequality.

A second US peculiarity is that the two major US parties are best described as relatively loose organizations within which individual electoral candidates enjoy substantial autonomy. For example, Katz and Kolodny (1994, p. 29) describe them as "empty vessels". This freedom is due to a combination of several institutions. First of all, under the US Presidential regime, the executive does not need the support of any majority in the legislature to survive and thus has no explicit incentives to discipline legislators. Second and more importantly for the purposes of this paper, the selection of Congressional candidates is regulated by the American direct primary.[2] The American direct primary is a set of laws that stipulate that parties "are required by law to choose their candidates through state-administered elections in which any legally qualified person must be allowed to vote" (Ranney 1975, p121). Third, US legislation stipulates that candidates running in legislative elections must reside in the district in which they run.

These institutions shape the agenda pursued by elected candidates: the last two institutions give politicians incentives to pander to their local constituency, and the first institution explains why national parties do not constrain them to focus only on nation-wide, general interest, issues. The result is that elected candidates typically pursue policies that are a mix between their party (national) platform, their own preferences, and that of their constituency (see e.g. Levitt 1996 for evidence on senators). Hence, voters must have information on 1)

[2] The laws on the direct primary were introduced at the level of the States mainly between 1899 and 1915. According to Ranney (1975, p121, quoted by Ware 2002, pp1 and 95) "The adoption of the direct primary by the states from the early 1900s onward is [...] the most radical of all the party reforms adopted in the whole course of American history".

candidate preferences, 2) party platforms and 3) the quality of the candidates' projects to make their decision.

This paper shows how party organization impacts on voter information, and thereby on party and candidate behavior. First, we show that, because of local constituencies, "party as a brand" effects *à la* Snyder and Ting (2002) induce parties to adopt polarized positions. Moreover, the equilibrium degree of polarization typically correlates with economic inequality. To the best of our knowledge, this approach to electoral competition provides the first theoretical foundation supporting the empirical regularities identified by McCarty *et al.* (2006). Second, we focus on the candidates' incentives to engineer better platforms. We show that local primaries typically improve the incentives of party candidates, and do not influence the independents' incentives. This result contributes to the debate about the rationale behind the inception of the American direct primary (see Ware 2002): it shows that primaries allow parties to win districts otherwise lost to independents.

Our model is centered on two essential features: candidates are local and the internal structure of parties acts as an information revelation device about the preferences and quality of their candidates. There is a continuum of districts. Each district elects one legislator under plurality rule. There are at most three candidates per district: one for each of the two national parties, and an independent. As in Snyder and Ting (2002), the ideologic preferences of candidates are private information. As in Castanheira and Crutzen (2007), voters only know that they are random draws from a district-specific distribution of ideologic preferences. Only party affiliation allows for a (partial) revelation of the future policy of the candidate: the is the "party-as-a-brand" effect. The median voter of each district is pivotal and elects his preferred candidate.

Our first result is that the "branding" function of parties implies that each party only enjoys the support of districts that are within a certain ideologic distance from its national platform. This contrasts sharply with classical Downsian models of electoral competition, in which the right-wing party typically enjoys the support of all districts to the right of the median and the left-wing party receives all the votes of the electorate to the left of the median.

The intuition builds on a simple mean-variance trade-off. Consider the problem faced

by the median voter in a given district. Based on national platforms, he can immediately identify which party he prefers. But, should he vote for that party or for the independent? The party label reduces the uncertainty about the future behavior of its affiliated candidates. This gives party candidates an advantage over independents when the bliss point of the voter is not too distant from the party platform. But, the larger this ideologic distance, the less voters value party control. Beyond a certain distance, voters (and hence districts) prefer the independent because she depends on her local constituency only.

Our second result is that, under very mild conditions, the two parties choose to polarize their platforms. The point is that, by differentiating their platforms, they can win a larger number of districts: by moving too close to the national median, they would lose extreme districts to independents. Again, this is in sharp contrast with the usual Downsian "median voter" finding.

This first set of results provides a novel theoretical rationale behind the dance between polarization and inequality uncovered by McCarty et al. (2006). Indeed, suppose the economy is initially such that inequality across districts is very limited.[3] Then, the Downsian prediction must hold: the lion's share of the votes is at the centre, pushing both parties to converge to the national median's preferred policy, in an effort to capture all those votes. What happens if inequality increases? Parties now face a trade-off: if they stay at the centre, they lose the districts in the tails of the ideologic distribution. If they polarize, they lose some centrist districts. We show that the cost of polarizing is a loss proportional to only *half* the centrist districts, because these districts are shared with the other party. Instead, the gain is proportional to *all* the districts in the tails (here the two parties do not compete directly with one another). Hence, it is a dominant strategy for both parties to polarize as inequality increases (up to the point where the marginal benefit of such a move equals its marginal cost).

Next, we go back to another consequence of the presence of the American direct primary. Given that these primaries are tournaments, we show that, in a world where the electorate is badly informed about candidates, the winner of each primary has always an additional electoral advantage over independents. This result builds on previous work by Castanheira,

[3] In section 3.3, we show why economic inequality must correlate with preference heterogeneity across districts. See also McCarty et al. (2006).

Crutzen and Sahuguet (2007). Primaries, like any tournament, influence effort provision by candidates. Here we show that when parties are able to identify good platforms and voters are not, candidate effort must increase in equilibrium, which in turn gives them a valence advantage over independents. As a consequence, voters trust party candidates more than independents, who do not face the same pre-electoral tournament.

This second set of results allows us to rationalize why parties voluntarily decided to adopt the American direct primary between 1899 and 1915, even though it partly stripped parties of their freedom to select their candidates. Before that period, the US was a largely rural and face-to-face society, in which political candidates were well known to their electorate. Thus, informational problems about their preferences and their quality were largely absent. Yet, in the space of a few decades, the country moved away from this face-to-face society, as industrialization and urbanization gained pace. As a consequence, the American society became more anonymous. Voters found themselves knowing much less about political candidates.[4] In such an environment, parties realized they had to modify the system to allow their candidates to regain a competitive edge over independents. The American direct primary was the solution they adopted: by increasing the expected valence of party candidates, the direct primary allowed parties to keep or even reconquer the political ground independents had taken away from them.

2 The Model

Two parties, D and R, are competing in a country-wide election. Parties choose their national platform in order to maximize their seat share in Congress. One seat is associated with each district i, and we assume a continuum of districts. A district is characterized by y_i, the bliss policy of the district median voter. We assume a uniform distribution of districts y_i from $-a$ to a. The median voter is always decisive in his district: the winner is his most preferred candidate.

Voter preferences

The policy space is unidimensional. On the ideological dimension, the median voter in district i has single-peaked, quadratic, preferences. In addition, policy incorporates a

[4] See Ware (2002) for an outstanding account of this evolution and its effects on political competition.

"valence" dimension, v_i:

$$u(y_i, x) = -(y_i - x_i)^2 + v_i, \tag{1}$$

where x_i is the ideological position of the policy implemented by the winning candidate and v_i is the valence of his/her policy.

Voters face uncertainty regarding the two dimensions of policy. Taking expectations, we have:

$$\mathsf{E}_i\ u(y_i, x_i) = -(y_i - \mu_i)^2 - \zeta^2 + \nu_i, \tag{2}$$

where μ_i is the *expected policy position* of the candidate, and ζ^2 is the *variance* of that policy position. Similarly, ν_i is the candidate's *expected valence*. We endogenize these valences in Section 4, where we will show that expected candidate valence depends on party affiliation. Until then, we assume that all politicians have equal valence.

Candidate policy preferences

Three candidates are running in each district: one from party D, one from party R and one independent, I_i –in what follows, party candidates are men and independents are women. Each candidate has privately known policy preferences. If the winning candidate is the independent, her agenda in Congress is entirely determined by private preferences. If the winner is a party candidate, he follows his own agenda only on a fraction of the decisions, which implies that the median voter's expected utility is a combination of the candidate's (expected) preferences and of the party platform (see 'Parties' below).

Candidate policy preferences x_i are distributed according to some district-specific distribution $g_i(x_i)$.[5] Following the above notation, the mean of the distribution is μ_i, which we assume equal to the preferences of the median voter: $\mu_i = y_i$. Taking expectations, the expected utility of the median voter is therefore:

$$\mathsf{E}u_I \equiv -\zeta^2 + \nu_I,$$

if the independent is elected. This summarizes in a tractable way the idea that candidate selection is local in the U.S., and based on local primaries. The results in Section 3 would

[5] This distribution of candidate preferences may be thought to reflect the distribution of preferences in the local electorate. The difference with citizen candidate models is that candidate entry is not strategic as in, e.g., Besley and Coate (1997) or Osborne and Slivinski (1996).

easily extend to a biased candidate selection process, such that $\mu_i = y_i + \delta$, or if the expected preferences of the candidates were a convex combination of local and national preferences. In Section 4, we show why the main parties benefit from a selection process based on primaries.

Parties

The two parties choose their national party platform, x_D and x_R, simultaneously. Voters observe them perfectly. Yet, these national platforms will only prevail on a fraction of the decisions voted during the term since, for the reasons highlighted in the introduction, party candidates pursue their own (local) agenda on a substantial fraction of the decisions. We denote the latter fraction by ϕ. Second, while independent candidates only face one electoral hurdle, party candidates face two of them: first, they must win the primary election contest. Second, contest winners must compete in the general election. Section 4 shows why this second hurdle leads to a higher expected valence for candidates affiliated with a party.

The distinction between candidates and parties is at the center of our analysis. Cox and McCubbins (1993) and Snyder and Ting (2002) argue convincingly that candidates cannot communicate their future policy as easily as a party (see also Levy 2004). Hence, by joining a party, they can partly tie their hands and commit to follow pre-announced policies. The parameter ϕ captures the idea that this commitment remains imperfect.

The implication for voters is that, for a fraction ϕ of the decisions, their expected utility is the same as with an independent. For the remaining fraction $(1-\phi)$, they know that x_P is implemented. Hence, their expected utility is:

$$Eu\left(y_i, x_P\right) = \phi \mathsf{E}u_I - (1-\phi)\left(y_i - x_P\right)^2 + \nu_P,$$

if the candidate of party $P \in \{D, R\}$ is elected.

3 Platform choices[6]

The party chooses a policy x_P. Yet, the party also leaves its candidates autonomous on some fraction ϕ of the decisions. We show that the trade-off between policy uncertainty (uncertainty is higher with independent candidates) and party policy centralization (which only prevails for party candidates) shapes a set around the party national position that we call the *party catchment area*: districts outside this set are alienated by party affiliation,

[6] This section is based on Castanheira and Crutzen (2007).

and strictly prefer the independent. This has non-trivial effects on the party strategy: since their catchment area has finite size, both parties prefer to polarize when districts have sufficiently heterogeneous preferences. Since, as we show in Section 3.3, preference heterogeneity correlates with economic inequality, our results actually provide a sound theoretical rationale for the "dance" between inequality and polarization uncovered by McCarty, Poole and Rosenthal (2006).

3.1 Party catchment area

Here, we analyze the voting decision of the median voter in each district, and determine the set of districts that favor a party candidate; we call this set the *party catchment area*. It will be used to explain the equilibrium choice of party platforms in the next subsection.

Voters choose between a candidate free from party links (the independent) and a candidate whose legislative activity will (partly) be controlled by his party. Hence, a party can only win a district if it provides value added to local voters. In this sense, independent candidates act as an outside option to voters in an otherwise duopoly market; their potential entry acts as a constant threat on the parties' seat share.[7]

This alters the way a party's electoral support is determined. In Downsian models, the two parties compete only with one another. The left-wing party wins all the districts to the left of its national policy platform. Likewise, the right-wing party wins all the districts to the right of its platform. This is not true in our setup, because voters have a third option.

Formally, the median voter of district i elects the candidate of party D if he dominates both the candidate of party R and the independent (a similar condition holds for party R):

$$\phi \ \mathsf{E}u_I - (1-\phi)\left(y_i - x_D\right)^2 \geq \max\left\{\mathsf{E}u_I,\ \phi \ \mathsf{E}u_I - (1-\phi)\left(y_i - x_R\right)^2\right\}$$

This implies:

Proposition 1 *When all candidates have equal valence, the* ***catchment areas*** $\mathcal{C}_P\left(x_D, x_R\right)$ *of the two parties are the sets of districts sufficiently close to each national party platform.*

[7] For simplicity, we assume that the independent always runs, even if she has a zero probability of winning. Adding an entry stage would not alter our conclusions: by backward induction, independents would not enter when their winning probability is zero, and would otherwise enter. *Potential* entry of local independents is thus sufficient for our analysis to be valid.

Formally:

$$D \text{ wins in the set of districts } \mathcal{C}_D(x_D, x_R) : |y_i - x_D| \leq \min\{|y_i - x_R|, \zeta\},$$

$$R \text{ wins in the set of districts } \mathcal{C}_R(x_D, x_R) : |y_i - x_R| \leq \min\{|y_i - x_D|, \zeta\},$$

Independent candidates win in all other districts:

$$I_i \text{ wins if: } \min\{|y_i - x_D|, |y_i - x_R|\} > \zeta.$$

Since the independent candidate is free from party ties, she may have excessive liberty in the agenda she pursues once elected. From an *ex ante* perspective, this freedom of action constitutes a risk for the voters. The cost associated with this risk is summarized by ζ, the standard-error of the distribution of candidate preferences.[8]

But freedom of action also has advantages: independent candidates pursue a policy that, in expected terms, better links with the preferences of the district median. In contrast, party candidates must follow their party *national* policy, which does not depend on *local* preferences. Being a party candidate is therefore a handicap in districts that are too distant from the national party line. The proposition shows that the cost of electing the party candidate is fully summarized by $|y_i - x_P|$, the distance between the national party platform and the bliss policy of the district median.

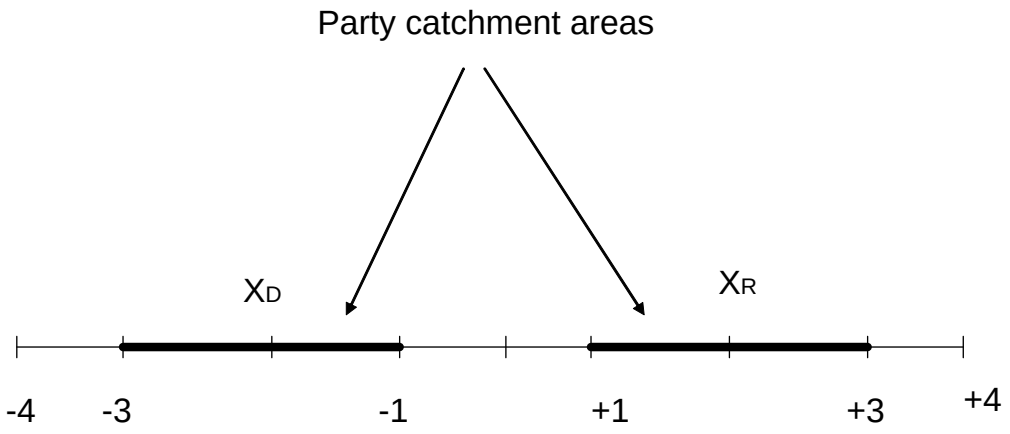
In this simplified setup, voters simply compare this distance with the uncertainty surrounding the preferences of a single candidate: the party candidate is preferred when $\zeta > |y_i - x_P|$. Conversely, the independent is preferred when $\zeta < |y_i - x_P|$. This implies that the set of districts electing party candidates is always bounded: the *party catchment area* can never extend beyond a distance ζ from the national party platform.[9] This contrasts with models that overlook the micro-level process of candidate affiliation. In such

[8] This is due to the simplified specification we have chosen in this paper. Castanheira and Crutzen (2007) consider a more elaborate and realistic candidate selection rule, which relies on national criteria to determine which candidates are sufficiently close to the national party line. In that case, the rule is actually more selective in distant districts than in close districts, which has non trivial influence on the voters' valuation of party candidates. In particular, this implies that different districts develop different preferences for intra-party discipline. In the present paper, we decided to leave these considerations aside.

[9] In the next section, we show how primaries may induce party candidates to produce platforms with higher expected valence than independents. In that case, the catchment area extends further.

models, there is no party alienation: all left-wing districts support the left-wing party, and conversely for right-wing districts.

Let us take a numerical example: assume that $\zeta = 1$, $x_D = -2$ and $x_R = 2$. In standard models, D should win in all districts $y_i < 0$ and R in all districts $y_i > 0$. Applying Proposition 1, one can check that, in our setup the catchment area of party D is instead $\mathcal{C}_D(x_D, x_R) = [-3, -1]$. That is, because D is too far away from 0, it cannot win moderate districts. Likewise, because it is not overly extreme either, it cannot win districts $y_i < -3$. Conversely, all the districts: $y_i \in \mathcal{C}_R(x_D, x_R) = [1, 3]$ elect the candidate of party R.



3.2 Equilibrium: platform positioning

We now turn to the impact of voting behavior on party platform choices. Parties choose to polarize as long as their catchment areas intersect.[10] Conversely, they choose to move towards the center if their catchment area stretches beyond the support of district preferences (from $-a$ to a). The result of this trade-off is that parties will generally adopt polarized platforms, to an extent that is proportional to the degree of preference heterogeneity across districts.

The rationale for the result is as follows. The party catchment area being bounded, a move to the left (resp.: right) implies that the party loses some districts to its right (or: left). Let us consider party D, with a platform $-a < x_D < \zeta - a$. This platform implies that the left-most district ($y_i = -a$) strictly prefers party D to the independent. Hence, the

[10] This stark result hinges on the uniform distribution of districts. See Castanheira and Crutzen (2007) for an analysis with more general distributions.

party cannot lose that district by slightly moving towards the center. Since the party wins some centrist districts, it strictly prefers a more moderate platform.

Now consider a centrist platform: $\zeta - a < x_D < x_R$. In that case, the party loses in the most extreme districts: a move to the left can be profitable. What is the cost in terms of lost centrist districts? Whenever the two party platforms are close to one another, the swing district is the one indifferent between the two parties: $y_i = \frac{x_D + x_R}{2}$. In this case, the size of the catchment area must increase when party D moves left: for each district won at the tail of the distribution, the party only loses $1/2$ district in the centre. Hence, the party strictly prefers a more extreme platform.

Whether the party has an incentive to adopt a more moderate or a more extreme platform will thus depend on the two parties' positions and on the distance between the centre and the most extreme districts. This distance is typically related to economic inequality: the more unequal is income distribution, the more distant economically will be the richest and the poorest districts in the country. We document this in more detail in the next subsection.

Formally, the parameter of interest will thus be a, the position of the most extreme districts. To limit the number of cases to consider, we assume that the degree of preference heterogeneity across districts is sufficiently small: $a \leq 2\zeta$. This potentially allows the two parties to cover all districts, thereby foreclosing all independents. Larger values of a will be of interest for the next section.

Starting with symmetric positions: $-x_D = x_R > 0$, Proposition 1 and the informal discussion above reveal that there are two cases to consider: when platforms are sufficiently polarized, that is when $-x_D = x_R > \zeta$, the two parties' catchment areas are disjoint:

$$\begin{cases} \mathcal{C}_D(x_D, x_R) = [x_D - \zeta;\ x_D + \zeta] \\ \mathcal{C}_R(x_D, x_R) = [x_R - \zeta;\ x_R + \zeta]. \end{cases}$$

Conversely, when platforms are less polarized, that is when $-x_D = x_R \leq \zeta$, the two parties are competing with each other for moderate districts. Proposition 1 shows that centre-left districts then elect a party D candidate, whereas centre-right districts elect a party R candidate:

$$\begin{cases} \mathcal{C}_D(x_D, x_R) = \left[x_D - \zeta, \frac{x_D + x_R}{2}\right] \\ \mathcal{C}_R(x_D, x_R) = \left[\frac{x_D + x_R}{2}, x_R + \zeta\right]. \end{cases}$$

Knowing that there is one seat associated with each district, how do these catchment areas translate into seat shares? Let $F(y_i)$ denote the cumulated density function of the

distribution of districts. Given the uniform distribution of districts, $F(\cdot)$ is given by:

$$\begin{aligned} F(y_i) &= 0, \ \forall y_i < -a \\ &= \frac{y_i + a}{2a}, \ \forall y_i \in [-a, a] \\ &= 1, \ \forall y_i > a. \end{aligned}$$

To illustrate the incentive for polarization, consider the case in which the two parties are sufficiently close ($-x_D = x_R < \zeta$) and district heterogeneity is sufficiently large ($a > \zeta$). In this case, the two parties are competing in centrist districts but lose extreme districts. The seat share of party D, denoted s_D, is then:

$$\begin{aligned} s_D(x_D, x_R) &= F\left[\tfrac{x_D + x_R}{2}\right] - F[x_D - \zeta] \\ &= \frac{x_R - x_D + 2\zeta}{4a} \end{aligned}$$

and a similar equation holds for party R. This seat share is strictly decreasing in x_D: the party has a strict incentive to polarize, because it only loses half as many centrist districts as it wins extreme districts.

Conversely, for sufficiently extreme platforms, i.e. for $x_D < \zeta - a$, the party's catchment area stretches beyond the most extreme district: $F[x_D - \zeta] = 0$. In this case, the party can clearly increase its seat share by adopting a more moderate platform. We thus find that:

Proposition 2 *For any $a \geq \zeta$, equilibrium platform positions are: $-x_D^* = x_R^* = a - \zeta > 0$, whereas $-x_D^* = x_R^* = 0$ for $a < \zeta$. That is:*
a) the median voter theorem only holds for sufficiently low levels of inequality ($a < \zeta$);
b) for higher levels of inequality ($a \in [\zeta, 2\zeta]$), interparty polarization is increasing in the level of inequality.

Proof. For $x_D - \zeta < -a$, we have: $s_D(x_D, x_R) = F\left[\min\left\{\frac{x_D + x_R}{2}, x_D + \zeta\right\}\right]$, which is strictly increasing in x_D. Hence, party D never selects a platform $x_D < \zeta - a$. For the same reason, party R never chooses $x_R > a - \zeta$.

For $x_D - \zeta \geq -a$, we have:

$$s_D(x_D, x_R) = \frac{x_R - x_D + 2\zeta}{4a},$$

which is strictly decreasing in x_D. Hence, party D never selects a platform $x_D > \zeta - a$; its seat share is necessarily maximized in $x_D^* = \zeta - a$. By symmetry, $x_R^* = a - \zeta$. ■

Beyond some level of polarization, some centrist districts are lost without any benefit: all extreme districts are already electing a party candidate. Therefore, the party has an incentive to adopt a more moderate platform – this is the standard argument behind the median voter theorem. But there is another force: if platforms are already moderate, the parties' incentive to move towards the center is actually overshadowed by the desire to win extreme districts. Indeed, when they are sufficiently close to one another, that is when $x_R - x_D \leq 2\zeta$, the two parties are in a "direct competition zone". If D moves its platform to the right by ε, then it only wins in $\varepsilon/2$ additional centrist districts while it loses ε districts on the tail of the distribution. Castanheira and Crutzen (2007) show that the same argument is valid in a more general set-up.

3.3 Application: the American dance of ideology and inequality

McCarty et al. (2006) document the empirical correlation between party polarization and economic inequality. If we interpret higher economic inequality as voters' preferences being more heterogeneous across districts, proposition 2 gives a theoretical explanation for this phenomenon. Parties increase polarization at times of increased inequality. It is thus interesting to see how inter-district heterogeneity correlates with aggregate economic inequality in the U.S.

The Gini coefficient of income inequality, used by McCarty et al. (2006), is generally considered as a good proxy for the median voter's preference for redistribution (see for instance Persson and Tabellini 1994, Bolton and Roland 1997, or the summary in McCarty et al., 2006, chapter 3). We thus use the standard deviation of with*in* U.S. state Gini coefficients to proxy the heterogeneity of preferences across districts: a larger variance of these Gini coefficients means that average ideological distance between two typical U.S. States has increased. The *State data on Gini Ratios by State*, from the U.S. bureau of Census provides this information. The Census provides data on both household and family Gini indices for the following three years:[11]

[11] The series on families also has data for 1969. The average of Gini ratios and the difference between the highest and smallest Gini ratios are about the same as in 1979. However, the standard deviation is noticeably higher. For all the other years, quartile indicators and standard deviations evolve together.

Table 1: State level Gini indices

		1979	1989	1999
(1)	Average of State-level Gini indices (households)	0.401	0.429	0.448
(2)	Standard deviation between states	0.018	0.023	0.026
(3)	(2)/(1)×100	4.41	5.47	5.71
(4)	Average of State-level Gini indices (families)	0.362	0.397	0.416
(5)	Standard deviation between states	0.020	0.026	0.032
(6)	(5)/(4)×100	5.64	6.40	7.59

Source: U.S. bureau of Census (http://www.census.gov/hhes/www/income/histinc/state/state4.html), and own computations

As one can see, both rows (2) and (5) in Table 1 show that our proxy for inter-district preference heterogeneity increases at the same time as within-state Gini coefficients do. What is more, an increase in the average of state-level Gini coefficients is associated with a *more than proportional* increase in interstate heterogeneity (see rows (3) and (6)).

4 Primaries and endogenous candidate valence

In this section, we endogenize the valence of the candidates' platforms. To simplify matters, we assume that the two parties' platform positions, x_D and x_R, are fixed. As in Caillaud and Tirole (2002) and in Castanheira, Crutzen and Sahuguet (2008), candidates must invest time and effort to increase the valence (or "quality") of their platform. Clearly, party catchment areas must increase in size when party candidates invest more than independents.

We assume that effort increases the *probability* that a candidate's platform has high valence. Formally, in the absence of effort, valence is always 0. With effort, valence can be either 0 or take a higher value. The probability that valence is high is equal to the effort e supplied by the politician, at a cost $c(e) = e^2/2$. We assume throughout that efforts are not observable: neither the party nor the voters observe the politicians' effort levels. The objective of politicians is to maximize their election probability, net of effort costs.

Voters do not observe either actual valences.[12] Instead, parties do: primaries reveal

[12] This assumption is made to simplify the analysis; different information structures can be considered. For instance, Castanheira, Crutzen and Sahuguet (2008) proposes a model in which voters also get information

information inside the party. The party primary can thus select the candidate with the highest valence for the general election. Primaries are thus the channel through which candidate effort can be valued. Indeed, effort cannot play a direct role at convincing voters, since they have inferior information. Yet, voters know that primaries give incentives to candidates. In equilibrium, expected valence will reflect these incentives: we show below that the candidate from a party with internal primaries gets an expected valence premium compared to an independent candidate.

As before, a regular district is characterized by the median voter position y_i, and the position of the two parties. The independent candidate has an expected position of y_i. The median voter has expectations (ν_I, ν_D, ν_R) about the valence of each of the three candidates and compares the utilities from the three candidates before deciding for whom to cast his ballot. As in Section 2, there exist party catchment areas, which correspond to the districts that vote for this party.

With endogenous valences, an equilibrium in district y_i is a list of effort provisions by candidates (e_I, e_D, e_R), a voting decision by the median voter and a list of consistent beliefs by all players. Beliefs are as follows. Given the effort provision, the median voter has consistent expectations about the expected valence of the candidates. Given the voting decision of the median voter in district y_i, the party candidates hold expectations about their party winning probability in district i and choose their effort to maximize their expected utility. We thus have:

Lemma 1 *An independent candidate never exerts any effort: $e_I = 0$, and thus $\nu_I = 0$.*

Proof. *Since quality is not observable and since effort cannot directly affect the anticipations of the median voter, the independents' marginal return to effort is zero.* ■

Lemma 2 *For party candidates, equilibrium effort is proportional to the party's expected probability of winning the district. This probability of winning depends on the voters'* ***expectation*** *of equilibrium efforts and on the parties' national platforms.*

Proof. *A candidate of party D who is selected wins with probability $P_D(y, (\nu_I, \nu_D, \nu_R))$. The*

about platform qualities. In that setup, we identify under which condition a given party prefers to organize internal primaries, given the internal structure of the other party, the preferences of the candidates, and the information available to voters.

probability to be selected depends on the observed qualities of the two party candidates and is equal to $\left(e_1^D(1-e_2^D+\frac{1}{2}e_2^D)+\frac{1}{2}(1-e_1^D)\left(1-e_2^D\right)\right)=\frac{1}{2}e_1^D-\frac{1}{2}e_2^D+\frac{1}{2}$. *The marginal benefit of increasing effort is thus* $\frac{1}{2}P_D\left(y,(\nu_I,\nu_D,\nu_R)\right)$. *The marginal cost is* e_1^D. *The equilibrium effort is thus* $e_D^*\left(y_i\right)=\frac{1}{2}P_D\left(y_i,(\nu_I,\nu_D,\nu_R)\right)$. ■

The expected valence corresponds to the probability that at least one party candidate has high quality. It is thus $\nu_D=1-\left(1-e_D^*\left(y_i\right)\right)^2$, where the second term is the probability that both candidates have low quality.

We thus find that, the stronger is the party in a district, the larger is the equilibrium level of effort by its candidates. In all cases, the party candidate who wins the local primary ends up being reinforced as compared to a scenario in which there is no primary election:[13]

Proposition 3 *The* ***catchment areas*** $\mathcal{C}_P\left(x_D,x_R\right)$ *of the two parties increase when valence is endogenous, in the sense that independent candidates win in fewer districts.*

Proof. We want to compute the district that is indifferent between party D and the independent. When party candidates expect to be elected for sure, their effort is $e_1^D=$. The expected valence is then $\nu_D=1-(1-1/2)^2=\frac{3}{4}$. The marginal district is then defined by the following equality:

$$\begin{aligned}-\phi\zeta^2-(1-\phi)\left(y_i-x_D\right)^2+3/4&=-\zeta^2\\ \left(y_i-x_D\right)^2&=\zeta^2+\frac{3}{4(1-\phi)}\\ y_i&=x_D\pm\sqrt{\zeta^2+\frac{3}{4(1-\phi)}}\end{aligned}$$

When party candidates expect to lose the election for sure, they make no effort, the expected valence is thus zero and the party catchment area is the same as in the case of exogenous valence. The marginal district is then $y=x_D\pm\zeta$. ■

[13] The only exception would be the self-fullfilling case of a party candidate who expects to have exactly zero-probability of winning. In this case, he has no incentive to exert any effort, and his position cannot improve thanks to primaries. Note still that another equilibrium generally co-exists with this one: imagine that voters expect party candidates to exert some effort and, in that case, elect the party candidate with strictly positive probability. This shift in expectations is sufficient to give party candidates an incentive to exert positive effort, and thereby beat the independent with a higher probability.

4.1 Direct Primaries and the threat of independents

Proposition 2, in the previous section, focused on the case $a \leq 2\zeta$. When a increases above that threshold, the threat of independents is real: the two parties necessarily lose some extreme districts to independents. Proposition 3 shows that introducing competition through primary elections is then a way to recover some of the ground gained by independents. Political parties thus give their candidates two advantages. The first one is the *brand effect* highlighted in the previous section. The second one is the *trust effect* highlighted here. Being part of a party is a way for a candidate to commit himself to work harder at crafting good platforms. Ill-informed voters therefore "trust" more the platform of party candidates: they expect him to have higher valence. As we showed, this valence advantage is a direct result of the additional tournament faced by party candidates: they must first win primary elections before being able to run in the general election. Proposition 3 shows that, when the brand effect is not sufficient, parties can benefit from organizing internal primaries: these are a way to fight against the threat of independent candidates in extreme districts. It is therefore rational for political parties to introduce intraparty competition in the form of primary elections when the political environment becomes more uncertain and districts become more heterogeneous.[14]

4.2 Application: the American Direct Primary

Direct primary elections were introduced at the beginning of the 20th century and changed the structure of the US political system in many ways. In 1899, Minnesota was the first state to introduce a legislation mandating the use of direct primaries; by 1915, all states but three had enacted similar legislations. Before, parties could nominate their candidates through a system involving caucuses and conventions. The main characteristic of this system was that decision powers were in the hands of party delegates, and that there was little intraparty competition. The adoption of the direct primary increased this competition dramatically.

This switch to a competitive, candidate-centered system whose rules are largely outside the span of control of parties is still a puzzle to most political scientists. The classical expla-

[14] See Castanheira, Crutzen and Sahuguet (2008) for a more detailed analysis of the incentives to institute primaries, and Castanheira and Crutzen (2007) for an analysis of the relationship between catchment area size and the optimal positioning of the parties.

nation, put forward by Merriam and Overacker (1928), is that the caucus-convention system was not working anymore and that, under pressure from the public and from outsiders, parties were forced to accept a reform that reduced their power. Ware (2002) casts doubts on this interpretation and argues that the parties were not actually forced into this reform. They willingly adopted the direct primary in response to a change in the environment; they took advantage of these pressures to reinforce their domination on the political scene. Ware centers his analysis on his observation of the incentives that politicians, party leaders, and party elites were facing at the time of this reform. In particular, he argues that the threat of independent candidates was one of the reason behind the adoption of the direct primary. Our model thus also provides a sound theoretical rationale for that reform: Proposition 3 indeed shows that parties benefit most from introducing primaries precisely when the threat posed by independents is more serious.

5 Conclusion

In this paper, we put forward a model that emphasizes how the internal organization of parties allows voters to gather information about the future policy choices and the quality of politicians. We have shown that accounting for intraparty politics and allowing for the presence of independents in an otherwise standard model of electoral competition provides a formal rationale behind the dance between inequality and polarization that McCarty *et al.* (2006) document for the US. We have also shown that such an extended model of electoral competition can rationalize the introduction of the American direct primary in the US at the beginning of the twentieth century, a reform that Ranney (1975, p121, quoted by Ware 2002, pp1 and 95) describes as "*the most radical of all the party reforms adopted in the whole course of American history*".

In this paper, we kept voluntarily the model to its bare bones. We now discuss how generalizing several of its aspects impacts on our results and opens avenues for further findings.

Starting with the relationship between candidate selection and the median voters' decision, how do our results generalize to a setting in which parties cannot force politicians to follow the party line but, rather, the candidate selection rule can only screen out candidates whose preferences are not sufficiently close to the party line, as in the framework of

Snyder and Ting (2002)? This is the case studied by Castanheira and Crutzen (2008), who show that different districts value the capacity of parties to constraint the choices of their politicians differently: districts close to the party line want as much discipline as possible, whereas distant districts want as little discipline as possible. This implies that the optimal level of intraparty discipline is always either of two extremes:[15] *full discipline* (in which case all selected politicians have the party line as their bliss point) or the *minimum* level of discipline allowed by the political system in which parties are embedded.

On top of being able to rationalize the American dance between polarization and inequality, they also show how this result offers novel rationales behind the observed differences in term of both intraparty discipline and the equilibrium number of parties in representative democracies. When institutions limit the freedom of party members (such as Parliamentary systems with a vote of confidence procedure for the executive), parties will not free ride on these institutions. Rather, they will push intraparty discipline to its maximum. Conversely, absent institutional constraints on party discipline, as in the US presidential system, parties will choose as little intraparty discipline as possible. These findings complement the results of Huber (1996) and Diermeier and Feddersen (1998) and further refine our understanding of the forces underlying the functioning of different political regimes in democracies such as the U.K., India, Canada and the US.

Finally, Castanheira and Crutzen (2007) also show that Duverger's Law (the proposition that in democracies relying on plurality rule only two parties are likely to be serious competitors) is more likely to hold under presidential regimes, in which parties choose to have as little discipline as possible, than in regimes in which intraparty discipline is high. Thus, their results rationalize the cross-country differences in the effective number of parties and complement the findings of, for example, Morelli (2004).

Turning to the role of primaries in the selection of candidates, we assumed in this paper that their role is a pure signalling one, given that voters never observe the politicians' realized valence levels. This is a special case of the analysis in Castanheira, Crutzen and Sahuguet (2008). That paper presents a two-party general equilibrium model of electoral competition in terms of party structures that extends previous work by Caillaud and Tirole

[15] This is the level that maximizes the party's catchment area.

(2002) and Carrillo and Castanheira (2008). It focuses on the relationship between the party's incentives to adopt internal primaries and the amount of information voters have on politicians realized qualities. If their findings qualify proposition 3 above, they do not invalidate what was said in this paper: when voters are badly informed about politicians' qualities, primaries increase their chances of victory and are the parties' dominant strategy.

Castanheira et al. (2008) also examine other related issues. They examine how the parties' incentives to adopt primaries vary with the value of the rents from office, the degree of polarization between the parties and the objectives of individual candidates. This allows them to offer novel rationales for why, for example, moderate parties are typically more internally democratic than extreme ones. The data in both Lundell (2004, p36) and in Bille (2001, p366) indeed show that the more extreme parties are, the less competitive are their candidate selection procedures. The 2007 election in France provides another case in point. The members of the Socialist and the center-right UMP parties elected their respective leading candidates, Ségolène Royal and Nicolas Sarkozy. To the contrary, Jean-Marie Le Pen was the unchallenged leading candidate of the Front National, an extreme right-wing party. Le Pen has been more or less unchallenged since the creation of his party, in October 1972![16]

Where do we go from here? There are many interesting questions that have not received much attention so far but that could be analyzed within a framework similar to the one we proposed here. For example, how will changes in the legislation on campaign finance affect the political forces highlighted in this paper? Will a move to more candidate-centered politics, as seems to be happening in the US, strengthen or weaken parties? Will such a move lead to less party discipline, to the appearance of new parties, to more polarization? Should the US and other representative democracies promote the introduction of open primaries in which voters can select their favored candidate irrespective of whether they are party

[16] Other recent examples of leaders selected through open intraparty competition in moderate parties include the socialists Jose Luis Zapatero and Romano Prodi in Spain and Italy respectively, and the centre-right Stephen Harper in Canada and Didier Reynders in Belgium. The competitive nature of the above selection procedures contrasts with that of extreme parties in the same countries: the Vlaamse Belang in Belgium is dominated by Filip Dewinter and in Italy the extreme left Rifondazione Comunista and the separatist/extreme right Lega Nord are dominated by Fausto Bertinotti and Umberto Bossi respectively.

candidates or not? How do such open primaries compare to other electoral systems such as the French runoff? These are all fascinating questions that still await an answer but that we hope the profession will address in the near future.

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