

Appointment versus Primary:
Which structure is optimal for parties when selecting a candidate?

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Abstract

This paper examines the internal workings of two political parties in determining the appropriate organizational structure. The party structure provides incentives for the candidates to improve their quality. By extending the works of Caillaud and Tirole, I look at the role that intra-party competition and the general election have on these incentives. I find that in equilibrium each party will select the same internal structure. The strategy used however, varies depending on the motivation of candidates, how well voters are informed, and the value of holding office.

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Appointment versus Primary

Which is optimal for political parties when quality is the deciding factor?

1. Introduction

The role of a political party is to provide the proper incentives to their candidates, such that the candidates will provide electoral success for the party. The goal of a party is to see that one of their candidates succeeds in the general election. The party has an incentive to select the appropriate organizational structure that will ensure them the probability of greatest success. The party selects the appropriate structure based on the candidates' motivation and the information available to the voters. The goal of a candidate is different from that of the party. An individual candidate is out to win for themselves whereas the party only cares that one of their candidates wins the general election. To win the general election, a candidate has an incentive to improve their quality to show that they are committed to winning. The incentives for the voters depend on how well informed they are about the candidates in the election. If the voters are highly informed they have the incentive to select the candidate with the highest observed quality. However, if the voters are poorly informed they do not know the quality of the candidates, they place their trust into the party structure. The voters select a candidate, not on the candidates' quality, but whether the party organization provides the proper incentives for the candidate to invest in quality, even though the voters would not observe it. What affect doe there different environments have on the organizational structure of the party?

In democratic elections, the electorate must choose one option among several candidates and each candidate represents a party. In order to analyze the motivation of candidates, first need to understand the behavior of parties, mostly the decision of internal organization. Currently parties do not have an option in the method of candidate selection. In the beginning of the 20th century, legislation was passed which mandated that candidate selection be done through primary elections. Prior to the legislation passing, parties were able to appoint their candidates during the parties' convention. This was a two-stage process where there would be an election of delegates, who then would name the party's candidate. Over time there was a change to remove the appointment strategy from candidate selection. Traditional theory suggests that the convention system

came under scrutiny from the people and political reformists. There were allegations of fraud and corruption ongoing during the candidate selection process. The conclusion of the traditional theory was that the Primary was established because the people demanded it.

A new theory, Ware (2002), proposes that changes within the United States population led to the change towards the Primary election. In the 1830s the United States was more of a face-to-face society. Since there were small towns, voters were able to know the candidates and were well informed, which led to the success of the parties appointing their candidates. However, by the 1890s the United States population expanded, became more urbanized and heterogeneous. With a change in the structure of America, the same tactics that used to work in a face-to-face society no longer applied. Thus the parties needed to adapt their strategy of selecting candidates to a more urbanized electorate, which led to the beginning of the primary election. Instead of reformers demanding change, the parties voluntarily adjusted from appointment to the primary structure in order to maintain the trust of the electorate.

This paper analyzes electoral competition with two parties, where each party consists of a party management which decides the candidate selection structure. The party management makes a decision so that the party will win so that their ideology is implemented, whereas the candidates want to win for themselves. Internal and external competition provides the necessary incentives for the two goals to coexist. The party management decides which structure to implement, Appointment or Primary, and this structure affects how much effort a candidate will give to improve their overall quality.

2. Related Literature

The seminal work in electoral competition is Downs (1957) which concludes that winning the election should serve the purposes of most of the groups in a party. Downs focuses on the competition between two parties at the final stage, however this approach overlooks the internal struggles that take place prior to the general election.

Caillaud and Tirole (2002) provide a model that analyzes the role of party organization and shows that internal struggles may affect the image of the party in the electorate. However, they focus on a single party leaving external competition out of the

analysis. Inter-party competition is a key component of political competition, which also determines the internal structure of the party. The concept of external competition on internal organization has been a focus within the industrial organization literature:

Schmidt (1997), Marin and Verdier (2002) and Legros and Newman (2004). These show that that the behavior of those inside the firm is influence by external factors. Legros and Newman also show that the internal structure of the firm influences those on the outside.

Within the political science literature Strom (1990) and Aldrich (1995) shows that appointing a candidate may lose support within the party which reduces the chance of winning the general election. I show that internal democracy affects the incentives of the candidates to invest in quality. If internal democracy improves incentives then the party becomes more competitive and the party management should support their candidate fully, which complements the existing literature. However this result is not one way. There are also cases where internal competition could decrease the incentives and the candidates invest less in quality. This reduces support of the voters and ends up being detrimental to the party management as well. Therefore, in this case, the party management would prefer to appoint a candidate instead of going through with a primary.

Klumpp and Polborn (2005) compare the sequential structure of the primary system to that of a simultaneous one-day primary. They allow the parties to choose which structure to use. The result is that the sequential structure is optimal in that it induces lower expected expenditures and the stronger candidate is selected with a probability close to one. Instead of allowing the parties the option of selecting the type of primary structure to implement, I allow parties to choose whether to use the primary structure or to just name their representative candidate by imposing the appointment strategy.

The paper is organized as follows. Section 3 describes the theoretical model. Section 4 discusses the incentives to office motivated candidates. Section 5 shows the incentives to ideology motivated candidates. Section 6 goes into the situation where candidates are motivated by office and ideology.

3. Model

There are two parties, L and R, that are competing to hold office in a general election. The ideological preferences will be in three categories: left, center, or right. The parties will locate symmetrically in policy space, with a left party and a right party. Each party consists of the party management members of the party, who will be making the decisions on what type of structure the party will use in naming their candidate for the general election. There will be two potential candidates, one of which will represent the party in the general election against the candidate from the opposition party. The representing candidate will be either appointed by the party management or be elected in a primary election. The role of the party is to select a candidate for the general election

Timing

The timing of the electoral game is as follows: First the party management determines the party structure for naming a candidate in the general election, either through appointment or a primary election. Then the candidates exert effort in order to improve their individual quality. Then the voters will receive a signal of candidate quality, followed by the naming of the two candidates. Finally there is inter-party competition in the form of the general election.

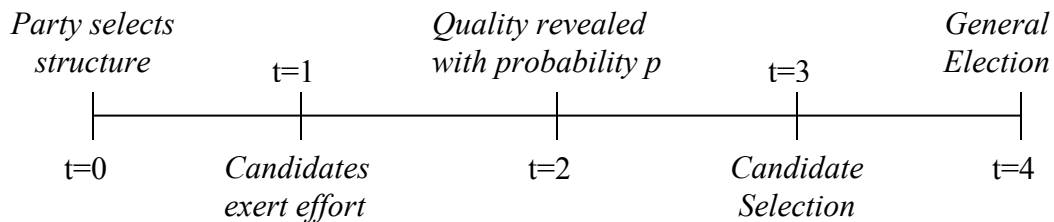


Figure 1: Timing

Candidates

Candidates have an option of being low quality or high quality. A candidate that wants to be high quality must exert effort, e . However there is a cost that is associated with high effort, $c(e) = \frac{\alpha e^2}{2}$. The effort, e , can be described as the probability that a candidate exerts high effort. The effort level of a candidate is not observable by either the party management or the voters.

With a positive probability, $p \in [0, 1]$, the candidates' quality will be known prior to the election, with probability $1-p$ then quality will not be observed. The quality observation probability, p , is similar to how knowledgeable the electorate is about the candidates.

The utility of holding office is, w , this is a wage paid to the candidates for those who are office motivated. Those who are policy motivated will receive utility $k = |L - R|$ if policy is implemented, 0 otherwise. For simplicity the assumption is made that candidates within the same party adopt the same ideology.

Swing Voters

Voters can be partisans, left or right, or centrist swing voters. The partisan voters will always prefer their own candidate to one from the other party, regardless of the candidates' quality. The centrist swing voters are pivotal in the election. They are indifferent to policy, but base their voting decision on the quality of the candidates. With probability p , the voters observe quality and the swing voters will vote for the candidate with the highest quality. If both candidates have the same quality, then each candidate will win with equal probability. With probability $1-p$, voters are uninformed about quality so they will have to form beliefs. The only information available is the party structure, therefore the swing voters have to have trust in the structure of the parties in order to select the best candidate. They will support the candidate with the highest expected quality. The trust is based on the belief on the equilibrium level of effort under each structure.

The two party structures are Appointment, which is when there is no primary election and one candidate is named to represent the party during the general election.

The other type is Primary, where there is intra-party competition between two candidates prior to the general election.

Incentives to Invest in Quality

3.1 Appointment

In a party that employs the Appointment structure, the candidate's only goal is to defeat the candidate of the other party in the general election. If candidate L wins, she receives payoff of $w+k-c(e_L)$, if she loses then the payoff is $-c(e_L)$

The probability that a candidate from an Appointment structured party will win the election depends on the expected quality of the competing party. Let \tilde{e}_R be the expected quality of the candidate from party R when qualities are revealed.¹ The probability that party L's candidate is elected when qualities are revealed

$$\begin{aligned}\pi_L(e_L, \tilde{e}_R) &= e_L(1 - \tilde{e}_R) + \frac{e_L\tilde{e}_R + (1 - e_L)(1 - \tilde{e}_R)}{2} \\ &= \frac{1}{2}(1 + e_L - \tilde{e}_R)\end{aligned}\tag{1}$$

The first part of the elected probability is when L's candidate will win for certainty when L has high quality and R's candidate has low quality. The second part is when both candidates are the same quality and each wins with probability $\frac{1}{2}$. When L's candidate is low quality and R's candidate is high quality the party R will win with certainty. As expected, the winning probability increases with an increase in own quality and decreases as the quality of the other party increases.

When the quality of the candidates is not known, then the voters can not condition on the realized quality of the candidates, but they have to form beliefs about the expected quality. This relates to the trust voters have in the party structure. Candidates can not influence this trust and the beliefs are independent of the exerted effort of the candidates. The probability that L wins the election when information is not available is

¹ If party R implements a primary structure then $\tilde{e}_R = 1 - (1 - e_{R_1})(1 - e_{R_2})$. Since the two candidates are competing to become the representative candidate for party R, the party will select a high quality candidate when one is available, which is one minus the probability that both are of low quality. If party R uses the Appointment strategy then \tilde{e}_R is the effort of the single candidate.

$$T_L(Ee_L, Ee_R) = \begin{cases} 0 & \text{when } e_L < e_R \\ \frac{1}{2} & \text{when } e_L = e_R \\ 1 & \text{when } e_L > e_R \end{cases} \quad (2)$$

Expected utility of a candidate under Appointment structure

$$U_L(A) = (w+k)(p\pi_L + (1-p)T_L(Ee_L, Ee_R)) - c(e_L) \quad (3)$$

and she selects e_L to maximize

$$(w+k)p\pi(e_L, \tilde{e}_R) - c(e_L) \quad (4)$$

since if quality is not observed, effort does not influence voters' trust, hence it does not factor into the candidates' maximization problem.

3.2 Primary

Under Primary structure two candidates within the same party compete prior to the general election. Therefore in order to win the general election a candidate under Primary structure was defeat two other candidates, instead of one under Appointment structure.

If she wins both elections then her payoff is $w+k$. If she loses the primary, but the other candidate within the party wins the general election, then her ideology is implemented and receives payoff k .

The effort of the two candidates be denoted as e_{L_1} and e_{L_2} under Primary structure and \tilde{e}_R be the probability that party R's candidate in the general election is high quality when qualities are observed.

When qualities are observed, the probability that candidate 1 from party L will win the general election is

$$\pi_{L_1} = e_{L_1} \left[(1-e_{L_2})(1-\tilde{e}_R) + \frac{e_{L_2}(1-\tilde{e}_R) + \tilde{e}_R(1-e_{L_2})}{2} + \frac{e_{L_2}\tilde{e}_R}{4} \right] + \frac{(1-e_{L_1})(1-e_{L_2})(1-\tilde{e}_R)}{4} \quad (5)$$

$$= \frac{[e_{L_1}(3 - \tilde{e}_R - e_{L_2}) + (1 - e_{L_2})(1 - \tilde{e}_R)]}{4}$$

This probability shows that candidate L_1 gets elected for certainty if she has higher quality than the other two candidates that she may face. Then if one competitor is of high quality and the other is of low quality, then she will have a $\frac{1}{2}$ probability of defeating the candidate with the same level of quality. If all candidates are of the same quality then she has a $\frac{1}{2}$ probability of defeating the opposing candidate at each stage of the election.

When candidate quality is not observed, the result depends on the trust that swing voters have with party format. The candidates in the Primary format each will advance to the general election with probability $\frac{1}{2}$. A candidates' payoff is thus

$$T_L(Ee_L, Ee_R) \left(k + \frac{w}{2} \right) \quad (6)$$

The expected utility of candidate 1 from party L is then

$$U_{L_1}(P) = p[\pi_{L_1}(w+k) + \pi_{L_2}(k)] + (1-p)T_L \left(k + \frac{w}{2} \right) - c(e_{L_1}) \quad (7)$$

and she selects e_{L_1} to maximize $(w+k)p\pi_{L_1} + kp\pi_{L_2} - c(e_{L_1})$

4. Office Motivated Candidates

The analysis begins by looking at office motivated candidates, which was used by Caillaud and Tirole (2002).

Under Appointment framework, the candidate in the general election solves

$$\max_{e_L} pw\pi_L(e_L, \tilde{e}_R) - c(e_L) \quad (8)$$

and if the party uses the Primary strategy, the candidate will solve

$$\max_{e_{L_1}} pw\pi_{L_1}(e_{L_1}, e_{L_2}, \tilde{e}_R) - c(e_{L_1}) \quad (9)$$

Solving for the optimal effort level by a candidate under each of the party structure yields the first proposition.

Proposition 1: When candidates are office motivated, the equilibrium level of effort

$$\text{Appointment: } e^*(A) = \frac{pw}{2\alpha} \quad (10)$$

$$\text{Two Primary parties: } e^*(P, P) = \frac{(4\alpha + 3pw) - \sqrt{(4\alpha + 3pw)^2 - 12p^2w^2}}{2pw} \quad (11)$$

$$\text{Asymmetric structures: } e^*(P, A) = \frac{pw}{2} \frac{6 - \frac{pw}{\alpha}}{4\alpha + pw} \quad (12)$$

Proof

$$\text{Appointment: } \max_{e_L} pw\pi_L(e_L, \tilde{e}_R) - c(e_L) = pw \left[\frac{1}{2}(1 + e_L - \tilde{e}_R) \right] - \frac{\alpha e_L^2}{2}$$

$$\text{FOC: } \frac{pw}{2} - \alpha e_L = 0 \quad (13)$$

$$e_L^* = \frac{pw}{2\alpha}$$

$$\text{Two Primary parties: } e_{L_1}^*(P) = pw \frac{3 - e_{L_2}^* - \tilde{e}_R}{4\alpha}$$

Now with both parties employing the Primary structure $\tilde{e}_R = 1 - (1 - \tilde{e}_{R_1})^2$

By symmetry

$$e^*(P, P) = pw \frac{3 - e^*(P, P) - \left[1 - (1 - e^*(P, P))^2 \right]}{4\alpha} \quad (14)$$

$$e^*(P, P) = pw \frac{3 - e^*(P, P) - 2e^*(P, P) + (e^*)^2(P, P)}{4\alpha} \quad (15)$$

$$pw(e^*)^2(P, P) - (4\alpha + 3pw)e^*(P, P) + 3pw = 0 \quad (16)$$

This leads to

$$e^*(P, P) = \frac{(4\alpha + 3pw) - \sqrt{(4\alpha + 3pw)^2 - 12p^2w^2}}{2pw}$$

Asymmetric party structure

Party L uses the Primary structure and party R implements the Appointment structure

$$e_L^*(P, A) = pw \frac{3 - e_L^*(P, A) - \frac{pw}{2\alpha}}{4\alpha} \quad (17)$$

$$4\alpha e_L^* = pw \left(3 - e_L^* - \frac{pw}{2\alpha} \right) \quad (18)$$

$$4\alpha e_L^* = 3pw - pwe_L^* - \frac{p^2w^2}{2\alpha} \quad (19)$$

$$(4\alpha + pw)e_L^* = 3pw - \frac{p^2w^2}{2\alpha} \quad (20)$$

Which yields

$$e^*(P, A) = \frac{pw}{2} \frac{6 - \frac{pw}{\alpha}}{4\alpha + pw} \quad \blacksquare$$

If the party uses the appointment strategy, the equilibrium level of effort is increasing in the probability of being observed by the voters and in payoff. Also it is decreasing in the marginal cost of effort. The optimal effort under Appointment is independent of the effort of the other party's candidate and of their structure. The reasoning of this is that under this setting no matter the quality of the other candidate, improving her own quality will always increase the winning probability by exactly $\frac{1}{2}$. If both candidates are of low quality, increasing to high will increase the probability of winning from $\frac{1}{2}$ to 1. If party L's candidate is low while the competitor is of high quality, increasing to high quality changes the probability of winning from 0 to $\frac{1}{2}$. Whatever the belief of the quality of the opposition, the marginal benefit of increasing quality is always the same.

Unlike Appointment structure, the optimal effort under the Primary strategy is dependent on the other candidates. The higher the expected quality of the opposition, the

lower is the marginal benefit of effort. If all the candidates are of low quality, the probability of winning is $\frac{1}{4}$, increasing to high quality, the probability of winning becomes 1. If both of the competitors are of high quality, the probability of winning is 0. Increasing to high quality increases the probability of winning to $\frac{1}{4}$. The marginal benefit of effort is higher when the average quality is lower. An increase in external competition decreases the incentives to invest in quality. Comparing to Appointment strategy, the marginal benefit of Primaries is higher if quality is low, but decreases when the expected quality is high. Therefore, with intra-party competition, an increase in the level of opposition decreases the incentives to invest in quality. Under the Appointment framework, the difficulty of the competition does not have an affect on candidates' incentives.

4.1 Voters' beliefs of party structures

When voters are able to observe the quality of the candidates, probability p , then the realized quality determines which candidate is elected. When quality is not observed, then the candidate with the highest expected quality will be elected. This depends on the structure that the party selected to use.

When both parties select the same strategy, the equilibrium effort by each candidate is identical across the parties. The voters have no way to differentiate the candidates from each other, so each party has the same probability of winning the general election. The difference arises when the parties select different strategies. Let party L select the Primary structure, while party R uses the Appointment strategy.

Proposition 2:

The effort of the candidates is only the same when $pw = \alpha$

When $pw < \alpha$, $e_L^*(P, A) > e_R^*(P, A)$ and $T_L(Ee_L, Ee_R) = 1$

When $pw > \alpha$, $e_L^*(P, A) < e_R^*(P, A)$ and $T_L(Ee_L, Ee_R) = 0$

Figure 2 below shows the equilibrium effort of a candidate under each party structure, $e_L^*(P, A)$ (concave) and $e_R^*(P, A)$ (straight line) for varying levels of w and setting $\alpha = 1$. Regardless of the payoff from holding office, when $p < \bar{p}$, where \bar{p} is the observable probability when $e_L^* = e_R^*$, quality is low and Primary has the advantage. This is due to the return of investment to be $\frac{3}{4}$, which is greater than $\frac{1}{2}$, the return under the Appointment structure. When $p > \bar{p}$, the return to the Primary structure is now $\frac{1}{4}$, which is less than $\frac{1}{2}$, therefore the Appointment structure provides a greater incentive to invest in high quality.

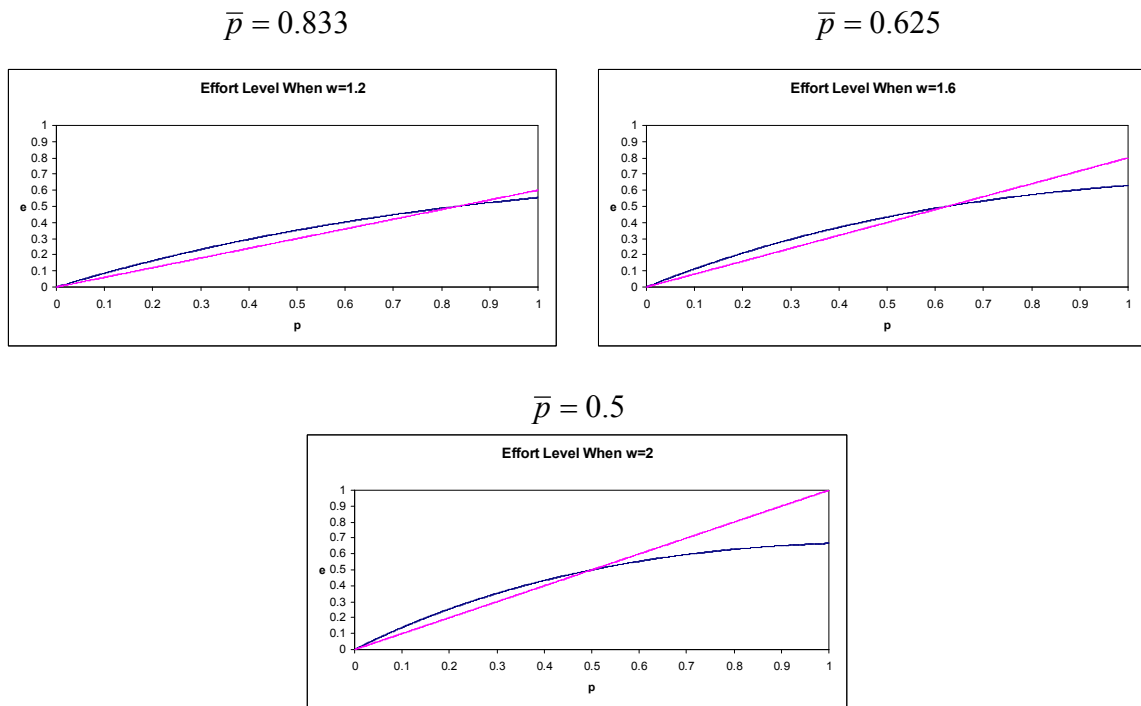


Figure 2: Effort level for asymmetric party structures for different levels of w

4.2 Preferred party structure under office motivated candidates

The goal of each party is for their candidate to win the general election. The party does not care which candidate of theirs wins, just as long as the winner is from their party. Therefore the party will select the competition format to maximize the probability that the party wins the general election.

When both parties choose the same structure, the expected quality of the candidates are the same, therefore there is no difference in trust by the voters. This leads to each party facing an equal probability of winning the election of $\frac{1}{2}$. To see what is going on, need to look at when exactly one party chooses each structure. Let party L select the Primary structure, which leads to

$$\pi_{L_1}^* = \pi_{L_2}^* = \frac{1 + 2e_L^* - (e_L^*)^2 - e_R^*}{4}$$

$$\pi_R^* = 1 - 2\pi_L^*$$

The probability that party L wins in equilibrium

$$\Pi_L^*(P, A) = p(\pi_{L_1}^* + \pi_{L_2}^*) + (1 - p)T_L(Ee_L, Ee_R) \quad (21)$$

If party R uses an Appointment strategy, then the probability that R wins is given by

$$\Pi_R^*(P, A) = p\pi_R^* + (1 - p)(1 - T_L(Ee_L, Ee_R)) = 1 - \Pi_L^* \quad (22)$$

The party management of party L prefer the Primary strategy whenever

$$\Pi_L^*(P, A) > \frac{1}{2} = \Pi_L^*(P, P) = \Pi_L^*(A, A)$$

Whenever this is the case, the only Nash equilibrium in the game is for both parties to play the Primary strategy.

Proposition 3

1. $p < \bar{p} = \alpha/w$ the Nash equilibrium is (Primary, Primary)

When p is small, there is a need to obtain the voters' trust. The trust goes to the party strategy that gives the highest incentives to the candidate to select high quality, which is under the Primary structure.

As p increases the advantage of selecting the Primary structure decreases as well as the importance placed on voters' trust.

When $p = \bar{p} = \frac{\alpha}{w}$ and $e_L^* = e_R^*$ the level of trust is shared equally between the parties.

The decrease in importance of the Primary strategy does not matter as long as the probability of winning the general election remains above $1/2$. This depends on the values of w and α .

2. $p > \bar{p}$ and $w \leq 5\alpha/4$ then $\Pi_L^*(P, A) > 1/2$ the Nash equilibrium is (Primary, Primary)

Despite the loss in trust, the Primary structure is still the Nash equilibrium because with the primary, there are more options to the voters, which may give the party an edge, even though there is an absence of trust.

3. $p > \bar{p}$ and $w > 5\alpha/4$ then there is a $p' > \alpha/w$ then the Nash equilibrium is (Appointment, Appointment) as long as $\bar{p} \leq p \leq p'$ and for $p \geq p'$ (Primary, Primary) is the Nash equilibrium

The Primary structure provides two incentives. When there is a low p , intra-party competition provides incentives to the candidates to be of higher quality and gives the voters' trust to the party. When p is high, voters are informed, primaries help the selection of the best candidate, which is being recognized by the voters.

Proof of Proposition 3

From propositions 1 and 2:

$$\begin{aligned}
 e_R^* < e_L^* < 1/2 \text{ iff } p < \bar{p} = \alpha/w \\
 e_R^* = e_L^* = 1/2 \text{ iff } p = \bar{p} \\
 e_R^* > e_L^* > 1/2 \text{ iff } p > \bar{p}
 \end{aligned} \tag{23}$$

For $p < \bar{p}$, then $T_L = 1$

$$\Pi_L^*(P, A) > \Pi_L^*(A, A) = 1/2 = \Pi_L^*(P, P) > \Pi_L^*(A, P)$$

Therefore choosing the Primary structure is the dominant strategy when $p < \bar{p}$, which proves #1

For $p > \bar{p}$, $e_R^* > e_L^*$, and $T_L = 0$

$$\begin{aligned}
 \Pi_L^*(P, A)|_{pw > \alpha} &= 2p\pi_{L_1}(e_{L_1}^*, e_{L_2}^*, \tilde{e}_R^*) \\
 \Pi_L^* &= 2p \left[\frac{1 + 2e_L^* - (e_L^*)^2 - e_R^*}{4} \right] \\
 &= 2p \left[\frac{1 + 2\left(\frac{pw}{2} \frac{6 - pw/\alpha}{4\alpha + pw}\right) - \left(\frac{pw}{2} \frac{6 - pw/\alpha}{4\alpha + pw}\right)^2 - \frac{pw}{2\alpha}}{4} \right]
 \end{aligned} \tag{24}$$

$$\lim_{p \rightarrow (\alpha/w)^+} \Pi_L^* = \frac{5\alpha}{8w}$$

$$\frac{5\alpha}{8w} \geq 1/2 \text{ if } w \leq 5\alpha/4$$

Still need to show that this behaves for all p above \bar{p} . To show this, the derivative of Π_L^* with respect to p is strictly increasing if $\Pi_L^* \geq 1/2$

$$\text{Using } \Pi_L^* = 2p \left[\frac{1 + 2e_L^* - (e_L^*)^2 - e_R^*}{4} \right],$$

$$\text{then } \frac{d\Pi_L}{dp} = \frac{\Pi_L}{p} + p(1 - e_L^*) \frac{de_L^*}{dp} - \frac{pw}{4\alpha} > 0$$

$$\frac{d\Pi_L}{dp} = \frac{\Pi_L}{p} + p(1 - e_L^*) \frac{de_L^*}{dp} - \frac{1}{2} > 0 \text{ holds since } \frac{\Pi_L}{p} > 1/2 \text{ and } \frac{de_L^*}{dp} > 0$$

This proves point #2 that (Primary, Primary) is the Nash equilibrium when $p > \alpha/w$.

From the above results, if $w > 5\alpha/4$ then $\lim_{p \rightarrow (\alpha/w)^+} \Pi_L^* < 1/2$. Therefore (Appointment,

Appointment) is the only Nash equilibrium when $p \rightarrow (\alpha/w)^+$

However, have to take into account the possibility that there exists a $p' > \bar{p}$ such that

$\Pi_L^*(P, A)|_{p'} = 1/2$ then it must hold that $\Pi_L^*(P, A) > 1/2$ for $p > p'$

Therefore (Appointment, Appointment) is NE for $p \in (\bar{p}, p')$ and

(Primary, Primary) is NE for $p \notin (\bar{p}, p')$

This proves #3 ■

Figure 3 below shows what is going on in Proposition 3. The first graph represents #2 in the proposition, when $p > \bar{p}$ and the Appointment strategy induces higher effort (from figure 1), the probability for L to win is still above 0.5. This leads to the Primary structure being the Nash equilibrium. The second figure represents #3 where the probability of winning drops below 0.5, but as voters become more informed the probability jumps back above. The third graph represents the case for all $p > \bar{p}$ then the Appointment strategy is the Nash equilibrium.

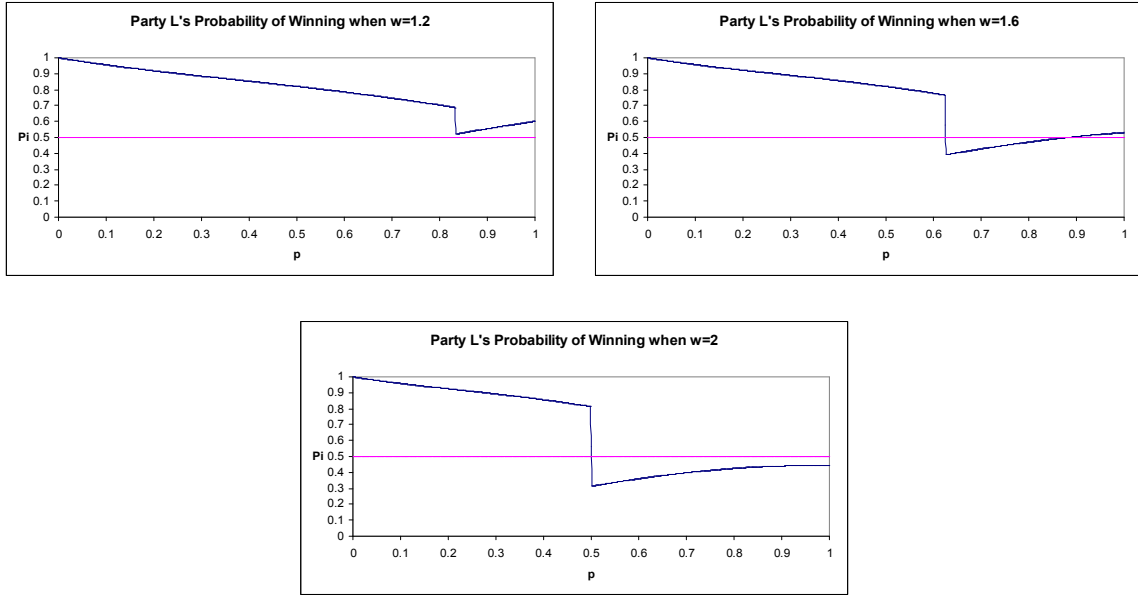


Figure 3: Party L's probability of winning, a function of p , for various levels of w

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In Caillaud and Tirole (2002), they conclude that the higher is p ; the better is the Primary structure. They also say that if p is large enough, incentives to the candidate may be reduced. This result is due to inter-party competition being exogenous. I show that marginal costs to effort along with payoffs determine level of competition. When w is low or α is high, inter-party competition is low, leading to stronger intra-party competition. Unlike, Caillaud and Tirole the impact on party image of the Primary is not always positive, it depends on the incentives to the candidates, which rely on w , p , and α .

5. Ideological Motivated Candidates

How does ideology change the incentives of candidate quality and how does it change the competitive structure of the parties? Since candidates within the same party have the same ideology, under the Primary framework, candidates also receive benefits if the other candidate wins the general election. This may weaken intra-party competition, since this acts as insurance to the candidate who loses the primary election.

Candidate who are purely motivated by ideology receive payoffs $k > 0$ and $w = 0$. The equilibrium efforts are:

$$e_R^*(A) = \frac{pk}{2\alpha} \text{ and } e_L^*(P) = \frac{pk}{2\alpha + pk} < e_R^* \quad (25)$$

The equilibrium effort is lower under the Primary structure due to each candidate only caring about the party winning the general election, that they are tempted to free ride off of the other candidate. This is because the candidates are not motivated by holding office, so it only matters that the party wins but it does not matter who wins.

Once again it is interesting to look at the case where the parties select different strategies. The probability that party L wins the election using the Primary strategy is thus:

$$\Pi_L^*(P, A) = \frac{p}{2} [1 + e_L^*(2 - e_L^*) - e_R^*] \quad (26)$$

This differs from the office-motivated case in that as $p \rightarrow 0$, $\Pi_L^* < 1/2$.

Proposition 4 When candidates are solely ideology motivated, voters will always trust a party that uses the Appointment strategy over a Primary strategy. The Nash equilibrium is (Appointment, Appointment) for all $p < \bar{p}$, which is less than 1 iff $k < \alpha(\sqrt{5} - 1)$

Proof of Proposition 4

Voters only trust the Appointment strategy. From proposition 3 able to find

$\Pi_L^*(P, A) > 1/2$ for all $p > p'$. It is sufficient to compute $\Pi_L^*(P, A)$ when $p=1$ to check the existence of a value of p such that $\Pi_L^*(P, A) > 1/2$. Once again using

$$\Pi_L^* = 2p \left[\frac{1 + 2e_L^* - (e_L^*)^2 - e_R^*}{4} \right], \text{ plugging in the values of } e_L^*(P, A) \text{ and } e_R^*(P, A) \text{ along}$$

with $p=1$ yields

$$\frac{1}{2} \left(1 + \frac{2k}{k + 2\alpha} - \left(\frac{k}{k + 2\alpha} \right)^2 - \frac{k}{2\alpha} \right)$$

$$-\frac{1}{2} \left[\frac{k^3 - 12\alpha^2 k - 8\alpha^3}{2\alpha(2\alpha + k)^2} \right] > \frac{1}{2}$$

$$k^3 + 2\alpha k^2 - 4\alpha^2 k < 0$$

Solving out for k gives

$$k < \alpha(\sqrt{5} - 1) \blacksquare$$

When candidates are ideology motivated, the Appointment strategy is preferred over the Primary structure, which is the opposite result of when candidates were office motivated.

6. Office and Ideology Motivated Candidates

Now let's compare the two party strategies when candidates are motivated by both office and policy. The equilibrium effort when the parties select the Appointment strategy is:

$$e_L^*(A) = \frac{p}{2\alpha}(w + k) \quad (27)$$

Once again, as each party chooses the same competitive structure, then voters can not trust one party over the other and the candidates have the identical expected quality, thus they get elected with the same probability

The interesting case is when each party selects a different strategy. Let party L select the Primary structure and focus on candidate 1. The candidate maximizes her utility with respect to effort.

$$\max_{e_{L_1}} \frac{p(w+k)}{4} [e_{L_1}(3 - e_R - e_{L_2}) + (1 - e_{L_2})(1 - e_R)] + \frac{pk}{4} [e_{L_2}(3 - e_R - e_{L_1}) + (1 - e_{L_1})(1 - e_R)] - c(e_{L_1})$$

Taking the first order condition and in equilibrium $e_{L_1} = e_{L_2}$ gives

$$\frac{p(w+k)}{4}(3 - e_R - e_L) + \frac{pk}{4}(-e_L + e_R - 1) - \alpha e_L = 0$$

$$e_L = \frac{p}{\alpha} \left[\frac{1 - e_L}{2} k + \frac{3 - e_R - e_L}{4} w \right]$$

Solving for equilibrium levels of effort:

$$e_R^*(P, A) = \frac{p}{2\alpha} (w + k) \quad (28)$$

$$e_L^*(P, A) = \frac{p}{2\alpha} \frac{6\alpha w + 4\alpha k - pw^2 - pwk}{4\alpha + pw + 2pk} \quad (29)$$

Figures 4 and 5 show the equilibrium effort provisions, $e_L^*(P, A)$ (concave) and $e_R^*(P, A)$ (straight line), when allowing w and k to vary. When the probability of voters observing quality is low, $p < \bar{p}$, the Primary structure provides a greater incentive for candidates to invest in quality. When $p > \bar{p}$, the Appointment structure provides a greater incentive for candidates to invest in quality.

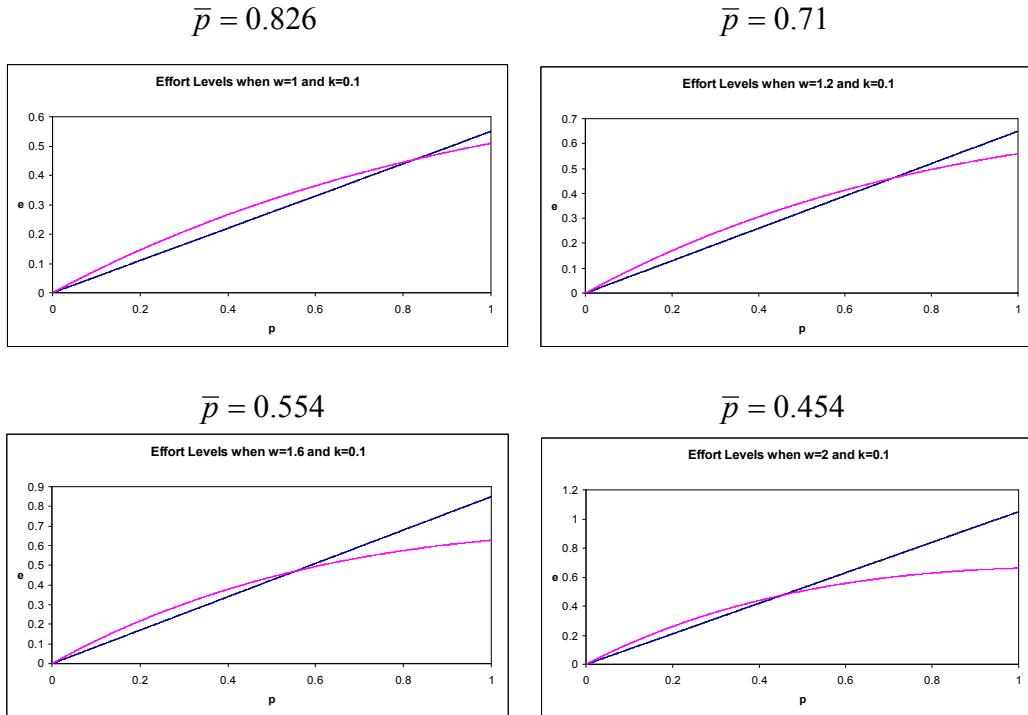


Figure 4: Effort levels for different levels of w with $k = 0.1$

As before with just office motivated candidates, as the value of holding office increases, there is a greater likelihood of candidates investing in higher quality. The introduction of ideological motivation has reduced the attractiveness of the Primary structure.

Comparing Figure 4 with Figure 2, the cutoff between low and high effort is lowered with the inclusion of ideology.

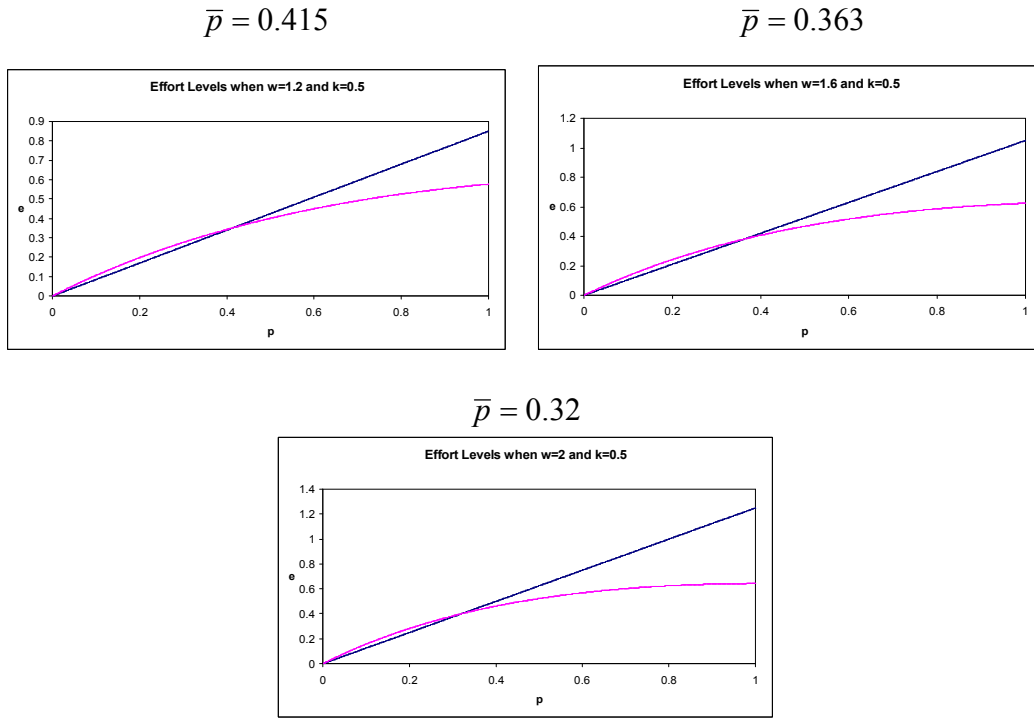


Figure 5: Effort levels for different levels of w with $k = 0.5$

Comparing Figure 5 with Figure 4 shows that with an increase in ideology payoff, the benefit of selecting the Primary structure is reduced further. As the payoffs to office and policy increase, the attractiveness of the Primary party structure continues to be lowered.

When a party selects the Appointment strategy, office motivation and ideology motivation have the same positive effect on effort and it is independent of the effort level of the candidate from the competing party.

$$\frac{\partial e_R^*}{\partial w} = \frac{\partial e_R^*}{\partial k} = \frac{p}{2\alpha} > 0$$

When the party selects the Primary structure, equilibrium effort increases more in w than k , leading to believe that there is still some free riding going on between candidates. Also inter-party competition only affects candidates that are office motivated

$$\frac{\partial e_L^*(P, A)}{\partial k} = \frac{p}{2\alpha} \frac{16\alpha^2 - 12\alpha pw + p^2 w^2}{(4\alpha + pw + 2pk)^2}$$

This is positive if: $16 - 12\frac{pw}{\alpha} + \frac{p^2 w^2}{\alpha^2} > 0$ which depends on the size of $\frac{pw}{\alpha}$

It is positive iff $\frac{pw}{\alpha} < 6 - 2\sqrt{5}$

It is clear that the impact of ideology is greater under the Appointment strategy than the

Primary: $\frac{\partial e_R^*}{\partial k} > \frac{\partial e_L^*}{\partial k}$

When compared to the case of office motivated candidates, the introduction of ideology motivation decreases the appeal of the Primary structure. The reasoning is that ideology motivation allows for free riding to appear, since the candidate who loses the primary still gets rewarded if the party wins the general election.

Proposition 5

The equilibrium effort is equal between the two structures when $p = \frac{\alpha w}{(w+k)^2} = \bar{p}$ and similar to proposition 3:

1. When $p < \bar{p}$ the Nash equilibrium is (Primary, Primary)
2. When $p > \bar{p}$ the Nash equilibrium is (Appointment, Appointment) when k or w is large enough
3. When $p > \bar{p}$, when w and k are both small enough, then there exists a $p' > \bar{p}$ such that for $p \in (\bar{p}, p')$ the Nash equilibrium is (Appointment, Appointment). For $p \notin (\bar{p}, p')$, then the Nash equilibrium is (Primary, Primary)

The figures below show the probability of party L winning the general election when using the Primary strategy and verify each of the points in Proposition 5.

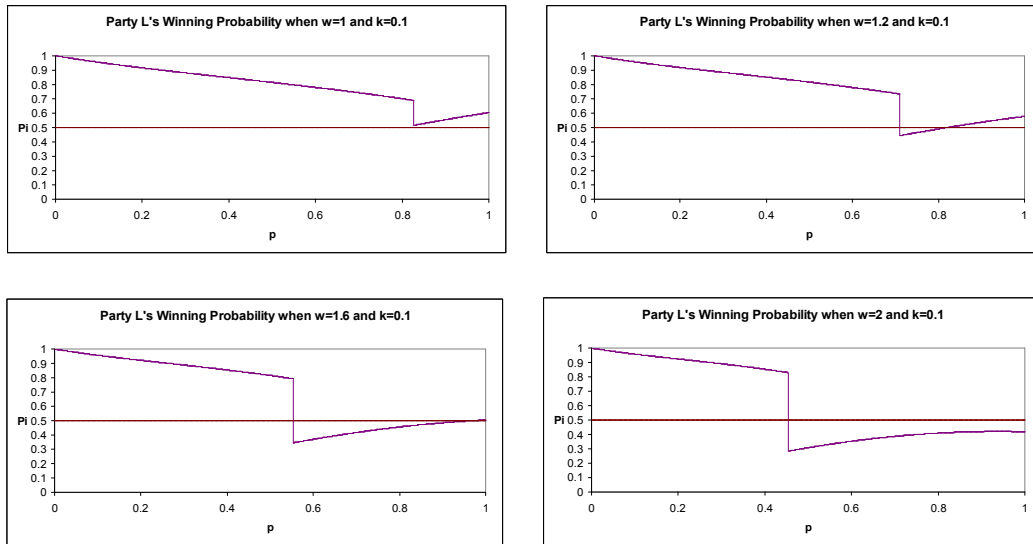


Figure 6: Party L's probability of winning for various levels of w , holding $k = 0.1$

Figure 6 verifies that the inclusion of ideology reduces the incentive of a party to implement the Primary strategy. Compared to Figure 3, where there was no ideology motivation, $k=0$, the probability of L winning the general election is lowered for each level of w .

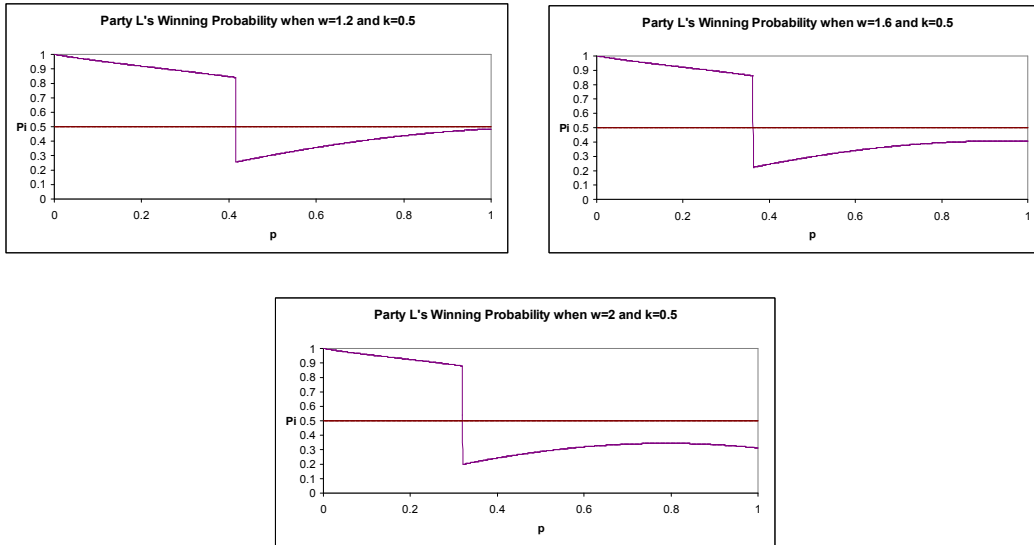


Figure 7: Party L's probability of winning for various levels of w , holding $k = 0.5$

As the payoff of ideology increases, the probability of winning the general election using the Primary structure is smaller. The advent of ideology motivation has decreased the attractiveness of using the Primary method of candidate selection.

When candidates become more ideology motivated, the w/k ratio decreases and the Primary structure is not preferred. This could be a result of polarization among the parties, because the more polarized the parties, the greater importance is placed on implementing the parties' preferred policy. The extremist parties should be using the Appointment strategy, while the more centrist parties should use the Primary structure. As shown in the graphs below, as k increases, the area that the Primary structure is preferred reduces.

7. Conclusion

This paper analyzes the interaction between inter-party and intra-party competition by modeling the internal structure of two competing parties. The selection of a particular party structure created an incentive to candidates to invest in becoming a high quality candidate. The decision to implement the Appointment or Primary structure is also influenced by how knowledgeable the electorate is about the candidates. When the

electorate is poorly informed, then the Primary structure is the preferred method, but when the voters become more informed, then the advantage of using the primary decreases. A problem with the primary structure is that it creates an incentive to candidates to free ride when they are motivated by ideology.

When parties employed the Appointment strategy, the United States was more of a face-to-face society where party members. Voters could easily participate in politics since they knew the party members and the candidates and they were well informed about the preferences of candidates. This is a society where the probability of observation, p , is high. The optimal party organization is the one that maximizes the probability that at least one candidate is of high quality. In this time in history, the Appointment strategy was the preferred way in candidate selection. The main argument against appointing candidates is the possibility of fraud. When the electorate is knowledgeable about the political on-goings, fraud would be easily detected.

With the movement into a more urbanized society, the electorate has become less informed, a decrease in p . With voters less informed, they no longer trusted the party organization. With the movement away from the face-to-face society, the electorate preferred the primary structure which provided more choices to discover a candidate of higher quality. The parties modified their structure to meet the needs of a changing society.

References

- Aghion, P., M. Dewatripont, and P. Rey (1999), "Competition, financial discipline and growth," *The Review of Economics Studies*, 66, 825-852.
- Aldrich, J. (1995), *Why Parties?*, University of Chicago Press.
- Caillaud, B. and J. Tirole (1999), "Party Governance and Ideological Bias," *European Economic Review*, 43, 779-789.
- Caillaud, B. and J. Tirole (2002), "Parties as Political Intermediaries", *Quarterly Journal of Economics*, 117, 1453-1489.
- Carrillo, J. and M. Castanheira (2001), "Platform divergence, political efficiency and the median voter theorem," *Mimeo*.
- Crutzen, B. (2004), "Intra-party discipline, rent extraction and electoral rules," *Mimeo*.
- Downs, A. (1998), *Political Theory and Public Choice*, Edward Elgar Publishing.
- Fleck, R. (2001), "Inter-party competition, intra-party competition, and distributive policy: A model and test using New Deal data," *Public Choice*, 108, 77-100.
- Klumpp, T. and M. Polborn (2005), "Primaries and the New Hampshire Effect," *Mimeo*.
- Legros, P. and A. Newman (2004), "Competing and Ownership," *Mimeo*.
- Marin, D. and T. Verdier (2002), "Power inside the firm and the market: A general equilibrium approach," *Mimeo*.
- Roemer, J. (2001), *Political Competition Theory and Applications*, Harvard University Press.

Strom, K. (1990), "A behavioral theory of competitive political parties," *American Journal of Political Science*, 34, 565-598.

Ware, A. (2002), *The American Direct Primary, Party Institutionalization and Transformation in the North*, Cambridge University Press.