Flip-Flopping, Primary Visibility and Selection of Candidates*

Marina Agranov

California Institute of Technology

December 2013

Abstract

We present an incomplete information model of two-stage elections in which candidates can choose different platforms in primaries and general elections. Voters do not directly observe the chosen platforms, but infer the candidates' ideologies from observing candidates' campaigns. The ability of voters to detect candidates' types depends on the visibility of the race. This model captures two patterns: the post-primary moderation effect, in which candidates pander to the party base during the primary and shift to the center in the general election; and the divisive-primary effect, which refers to the detrimental effect of hard-fought primaries on a party's general-election prospects.

1 Introduction

Political primaries, an influential institution in the American political process, require candidates to obtain a party nomination by vote in order to compete in the general election. Two established facts about primaries are: (1) Candidates tend to pander to the party base during primaries and moderate their platforms after securing the nomination,[1] and (2) More prominent and, thus, hard-fought primaries can influence a party's chances of

*I would like to thank Andrew Schotter and Alessandro Lizzeri for the invaluable help and encouragement they have provided during the course of this project. I thank Alex Agranov for suggesting the idea for this paper. I also thank Elliott Ash, Mark Dean, Matthew Embrey, Guillaume Frechette, Alessandro Gavazza, Anna Ingster, Daniel Martin, Rebecca Morton, Nicola Persico, Pietro Ortoleva, Debraj Ray, Ofer Setty, Chloe Tergiman, Emanuel Vespa and seminar participants at New York University for their useful comments.

[1]Using U.S. congressional data Burden (2001) shows that candidates adopt more extreme positions in primaries than in general elections.

winning the election.[2] The first observation, "post-primary moderation," follows from the premise that primary voters hold more extreme political views than the general-election voters. The second observation, the so-called "divisive-primary" hypothesis, suggests that a candidate's prospects in a general election may be affected by the visibility of the primary race.

These two observations hardly seem surprising. Despite this, the theoretical literature lacks a model that can deliver both of these results simultaneously. The reason is that most existing models use one of two extreme assumptions: either that candidates make binding commitments to electoral platforms (as in Wittman (1983) and Coleman (1972)[3]), or that announcements made by candidates are purely cheap talk (as in Alesina (1988)). If a candidate commits to a platform, then the mere fact of commitment precludes moderation. If a candidate has no access to a commitment technology, then his general-election prospects should not be affected by the visibility of the primary race. In either case, a model with either of these two assumptions cannot explain both the post-primary moderation and the divisive-primary effect.

In this paper we develop a model of two-stage electoral competition that captures both the post-primary shift and the divisive-primary effect. In our model, candidates have policy preferences and a *partial* commitment to these policies, which is captured by incorporating costs of lying as well as by having the candidates' platforms revealed imperfectly. Voters are forward-looking and take into account that a more extreme candidate has a smaller chance of winning the general election than a moderate one does. However, voters do not observe candidates' true ideological positions (types) and try to infer them from platforms candidates campaign on. Voters' ability to detect candidates' types are affected by the properties of the scrutiny function and summarized by prominence or visibility of a race, which measures the informativeness of a race. The more prominent the race is, the more likely voters are to learn the true type of a candidate. The candidates strategically choose

[2]The conventional wisdom that hotly contested primaries can damage a party's chances in the general election is based on the theoretical work of Key (1953). Empirical literature that studies this conjecture has produced mixed results: Abramowitz (1988), Bernstein (1977) and Lengle et al (1995) find that prominent primaries hurt candidates in the general elections; Alvarez et al (1995) and Westlye (1991) find that prominent primaries help candidates in the general election; Atkenson (1998) and Kenney (1988) find that general election prospects are not affected by the primary visibility; and, finally, Born (1981) and Hogan (2003) find a mixed relationship. In this paper, we use theoretical analysis to shed light on the relationship between the visibility of the nomination process and general election outcomes. The mechanism studied here delivers a negative correlation; i.e., it shows that prominent primaries are detrimental to a party's chances of winning general elections.

[3]Wittman (1983) studies a one-stage election model with policy-motivated candidates, whereas Coleman (1972) investigates a two-stage election model (with primaries and general elections) with office-motivated candidates. Both models assume that at the beginning of the election candidates choose one position, which will be implemented if they get elected.

campaign platforms depending on their levels of visibility, and, as a result, candidates' true preferences are partially revealed.

In equilibrium, candidates "flip-flop" by pandering to the median voter of the primary race during the primary and then shifting to the center once the nomination is obtained. In the primary voters elect a candidate they believe to be more extreme. The extent to which candidates mimic each other depends on the costs of lying and the visibility of each stage. We show that in this equilibrium an increase in the primary visibility lowers the chances of the party holding it to win the general election. This is because prominent primaries increase the chances of moderate candidates to lose the nomination and decrease the chances of extreme challengers to win the general election.

While the basic model studied here treats visibility of a race as an exogenous parameter, we extend this model in Section 4 to explore how primary visibility is determined. In this extended model, we allow candidates to influence primary visibility via costly investment that precedes the primary race. We show that there exists a separating equilibrium of this extended model in which extreme candidates invest in boosting primary visibility while moderate ones refrain from doing so, and candidates play the pandering equilibrium described above conditional on the primary race being prominent.

The trade-off at the heart of the model is a classic one in political economy: the probability of winning versus the policy outcome should you win. This trade-off is the key idea in the work-horse models of Wittman (1983) and Calvert (1985). The difference in this paper is that this trade-off is being made by the median voter of the primary election rather than the candidate herself. To execute the trade-off, the primary median has to learn the type of candidate he is nominating. This selection problem itself induces a trade-off: the primary median wants to nominate a more extreme type (which is closer to his policy preferences) but as he learns whether a candidate is extreme or not, so too does the general election median. This lowers the probability further that an extreme nominee will win the general election both directly and indirectly. The indirect effect is that a candidate that is strongly perceived to be extreme will pander less to the general election median.

The rest of the paper is structured as follows. Section 2 lays out the model. In Section 3 we characterize the pandering equilibrium and obtain comparative statics results. Section 4 presents the extension of the basic model, in which candidates can influence primary visibility. The related literature is discussed in Section 5, and, finally, in Section 6 we offer some conclusions.

2 Model

We modify the standard one-dimensional electoral competition setup to include a two-stage election process. There are two parties: a left-wing party (Democrats) and a right-wing party (Republicans). A member of one party is currently holding the office (incumbent). The incumbent will be challenged by the nominated member of the other party in the general election. The non-incumbent party selects its nominee by conducting a primary election. Without loss of generality, we assume that the incumbent belongs to the Republican party; thus, it is the Democratic party that holds a primary election. There are two Democratic party candidates, $j = A, B$, who compete in the primary. For a candidate j, winning the office involves the defeat of the other Democrat in the primary and the defeat of the Republican incumbent in the general election.

Each politician has a policy intention that she will implement if elected to office.[4] We will refer to this policy intention as the type of the politician. Each Democratic candidate $j = A, B$ is equally likely to be liberal type $t^j = L$ or moderate type $t^j = M$. The type of the Republican incumbent is denoted by $t^{\text{Inc}} = R$ and it is related to the policy chosen by the incumbent in the previous period, denoted by $\bar{R}$. Specifically, $R = \bar{R} + \epsilon$ where ϵ is distributed according to a continuous cumulative distribution function G with mean zero. The uncertainty about which policy the incumbent will implement if re-elected captures changes in the political and economical environment between the last term and the current one. We naturally assume that $L < M < \bar{R}$. The type of each candidate is her private information, while everybody in the society shares the same prior about the distribution of types. Thus, at the end of the two-stage election process, one of the three policies (L, M, R) will be implemented.[5]

The society comprises a continuum of voters. Each voter i has preferences over policies, which are represented by a utility function decreasing in the Euclidean distance between the policy decision and her ideal point $z_i \in \mathbb{R}$. We denote the utility of voter i with ideal point z_i when policy p is implemented by $u(z_i, p)$ and assume that $u(z_i, p) = -(z_i - p)^2$.[6] Ideal points are distributed according to a continuous cumulative distribution function F,

[4] That is, each candidate is assumed to have already solved for their optimal behavior once in office and the post-election stage is modeled as reduced form.

[5] It is possible to extend the model to the continuous policy space. The main predictions of this different specification are similar to the one presented here and available from the author upon request. We focus on the discrete policy space for simplicity.

[6] Quadratic preferences is one of the two most commonly used forms of voters' preferences in the literature on spatial competition (see Austen-Smith and Banks (1988), Banks (1990), Baron (1994), Callander and Wilkie (2007) and Callander (2008)). The results of the model remain essentially unchanged if voters have linear Euclidean preferences $u(z_i, p) = -|z_i - p|$, as in Wittman (1973), Adams and Merrill (2003) and Aragones, Palfrey and Postlewaite (2008), except for one of the regularity conditions. These results are available from the author upon request.

the median of which is commonly known and denoted by m^{Pop}. A subset of all voters, $z_i \leq \bar{z}$, are registered Democrats and vote in both the primary and the general election. The remaining citizens, $z_i > \bar{z}$, vote only in the general election; however, they observe what happens in the Democratic primary and update their beliefs about candidates' types. The ideal policy of the median Democrat is also commonly known and denoted by m^{Dem}. We assume that the median Democrat is located to the left of the population median, $m^{\text{Dem}} < m^{\text{Pop}}$, and these median voters have the following preferences over the candidates

$$u(m^{\text{Dem}}, L) > u(m^{\text{Dem}}, M) > \mathbb{E}u(m^{\text{Dem}}, R)$$

$$u(m^{\text{Pop}}, M) > \max\{u(m^{\text{Pop}}, L), \mathbb{E}u(m^{\text{Pop}}, R)\}$$

where we denote by $\mathbb{E}u(z_i, R) = \int u(z_i, \bar{R} + \epsilon) dG(\epsilon)$.

During the primary, the two Democrats campaign to win the nomination by choosing costly efforts that may affect voters' perception of their type. Formally, we model this process by introducing the *scrutiny* function $h(x^j, t^j, m_1)$ where $x^j \in [0, 1]$ is the effort invested by candidate j with type t^j to disguise his true type, and m_1 is a parameter that captures the prominence of the race. The prominence of a race represents all the factors related to the salience, informativeness and visibility of a race such as how much time and resources voters devote to following this race, their ability to absorb campaign information, and the media coverage of the race. We start with the model in which election prominence is exogenous. In Section 4 we extend this model to allow candidates to influence election prominence and show that the same type of the equilibrium exists in the extended model. The scrutiny function h is interpreted as the likelihood that the candidate with true type $t^j = L$ (alternatively, $t^j = M$) that exerts effort x^j is indistinguishable from the candidate with true type $t^j = M$ (alternatively, $t^j = L$) that puts in no effort at all and speaks his heart during the campaign period for a given prominence level m_1. In other words, this is the probability that the candidate is successful at pretending to be a different type.

We impose the following assumptions on the scrutiny function h. First, the candidate that puts in no effort at all cannot fool the voters and successfully pretend to be a different type than his true type, $h(0, t^j, m_1) = 0$.[7] Second, the maximum effort of $x^j = 1$ does not necessarily guarantee success, $h(1, t^j, m_1) \leq 1$. Third, for a fixed prominence level m_1, the higher the effort the less likely it is for a candidate to be detected by the voters, $h_x > 0$, and this effect diminishes as the amount of effort is increasing, $h_{xx} < 0$. Fourth, the higher the prominence of the race m_1 the less likely it is that the candidate will be successful in pretending to be a different type for a given effort x, $h_{m_1} < 0$. Finally, $h_{x_{m_1}} < 0$, that is,

[7] We will use expressions such as "candidate speaks her heart", or "candidate tells the truth" to describe the situation in which a candidate chooses to exert no effort.

the marginal benefit of successful mimicking is decreasing in election prominence.

After witnessing the primary campaign, voters update beliefs about the two candidates and the subset of voters that belong to the Democratic party cast their votes in the primary election. We will denote voters' beliefs about the Democratic candidates after the primary campaign and before the primary vote by $p_1^j = \Pr[t^j = M]$ for $j = A, B$. The winner of the primary, determined by the majority of votes cast, will challenge the Republican incumbent in the general election. For simplicity, we assume that all voters are paying attention to the primary election and hold the same belief about the challenger's type at the beginning of the general election stage.[8]

During the general election, the Democratic nominee (challenger) competes against the Republican incumbent whose role is passive in this game.[9] Similar to the primary stage, the challenger chooses an effort $y \in [0, 1]$, which feeds into the scrutiny function $h(y, t^{Ch}, m_2)$ and may affect voters' beliefs about her type. The parameter m_2 represents the prominence of the general election race, t^{Ch} denotes the true type of the challenger and we maintain the same assumptions regarding the function h. After observing the general election campaign of the challenger, voters update their beliefs about her type and cast a vote. We will denote voters' beliefs after the general election campaign and before the final vote by $p_2 = \Pr[t^{\text{Ch}} = M]$. The winner of the elections determined by the majority of votes assumes the office and implements her true type.

Notice that the general election stage in this game is the standard two-candidate electoral competition game with known median voter m^{Pop} and uncertainty about positions of the candidates. Thus, the behavior of voters in the general election stage can be summarized by a function $f(p_2)$ which captures the probability that the challenger wins the election when voters believe that she has type M with probability p_2 and type L with probability $1 - p_2$. To keep the model as simple as possible and to focus on the new trade-offs that arise in the two-stage election process, we assume that the winning function f takes a linear form, that is, $f(p_2) = \alpha + \beta p_2$ for $p_2 \in [0, 1]$ with $0 < f(0) < f(1) < 1$.[10]

Politicians derive a utility from winning the election and bear a cost of effort incurred during the campaign. Following the existing literature, we assume that only the politician that wins the office pays the costs of effort (lying during the campaign period) while the losing candidate pays no such cost. Formally, the payoff of a candidate j that wins the

[8] At the end of Section 3 we discuss what happens when this assumption is relaxed.

[9] Incumbent's position is commonly known up to the noise ϵ, since she served in the previous term.

[10] One way to obtain a linear winning function f is to have symmetric and uniform noise $\epsilon \sim U[-a, a]$ and voters with linear Eucledian preferences, which is standard in many models in the literature. We emphasize that the assumption about the functional form of f carries no importance and is used only to simplify the calculations. What is required for our results is that function f is strictly increasing in $p_2 \in [0, 1]$ which follows directly from the assumption regarding preferences of the median voter m^{Pop}.

election is $\Pi^j = (1 - x^j - y)$, where (x^j, y) are the effort levels exerted by candidate j in the primary and in the general election, respectively, and the benefit of winning the office is normalized to 1.[11] The losing candidate gets a payoff of zero.

To summarize, the timing of the game is as follows:

- *Information stage*
  - Nature determines the types of Democratic candidates (t^A, t^B).
- *Primary stage*
  - Candidates campaign by choosing effort levels x^A and x^B.
  - Voters observe the primary campaign and form beliefs about candidates' true types p_1^A and p_1^B given the campaign prominence parameter m_1.
  - Registered Democrats vote for one of the candidates. The nominee determined by the majority of votes continues the race in the next stage and will henceforth be called the challenger.
- *General election stage*
  - The challenger chooses effort level y for the general election campaign.
  - Voters observe the general election campaign and update beliefs about the challenger's true type p_2 given the campaign prominence parameter m_2.
  - The winner of the election is determined by the winning function $f(p_2)$.
- *Implementation stage*
  - The elected politician implements his preferred policy and payoffs are determined.

We refer to the described game as the election game. To analyze the outcomes of the election game, we will look for Perfect Bayesian Equilibria (equilibria hereafter), restricting attention to those in which all voters hold the same beliefs about the candidates' types. Moreover, we will focus on symmetric equilibria, in which candidates with the same ideology employ the same strategy at each stage of the game and voters are forward-looking and use Bayes' rule (whenever possible) to update their beliefs about candidates' types. A voter that has a strict preference for one of the candidates necessarily votes for her, while a voter who is indifferent randomizes equally between the two candidates. Abstention is not allowed.

[11] See Banks (1990) and Callander and Wilkie (2007) for a similar formulation.

3 Pandering Equilibrium

In this section we present the main result of the paper: a characterization of pandering equilibrium (PE), in which candidates pander to the median Democrat during primaries and shift to the center during general elections. The driving force behind flip-flopping behavior of candidates in equilibrium is the disagreement in policy preferences between the median Democrat, m^{Dem}, whose position is decisive in the primary race, and those of the general election median, m^{Pop}, whose position is decisive in the general election stage, and the need to appeal to both groups in sequential order.

Theorem "Pandering to the Party Base". Consider an election game described above in which the general election stage is at least as prominent as the primary, $m_1 \leq m_2$. Then, under regularity conditions (1) - (3), there exists a **pandering equilibrium** in which during the primary race, liberal candidates speak their heart and moderate ones pretend to be liberal by exerting effort $x^* \in (0,1)$, while in the general election a moderate challenger speaks her heart and a liberal one mimics moderate behavior by choosing effort $y^* \in (0,1)$. In the primary election: a) if posterior beliefs about candidates are different, then an uncertain type wins over the most moderate type for sure; b) if posterior beliefs are the same, both candidates obtain the nomination with a probability of 50%. Optimal efforts of candidates (x^*, y^*) are characterized by the following system of equations:

$$\begin{cases} (1-x^*)h_x(x^*, M, m_1) - h(x^*, M, m_1) = Q \\ (1-y^*)h_y(y^*, L, m_2) - h(y^*, L, m_2) = P \end{cases}$$

where $P > Q$, $x^* > y^*$ and $h(x^*, M, m_1) > h(y^*, L, m_2)$.[12]
The regularity conditions are:

$$\begin{array}{ll} (1) & h_y(0, L, m_2) > \frac{2\alpha}{\beta} \\ (2) & \alpha > \beta \\ (3) & \frac{1}{2}\left(u(m^{\text{Dem}}, L) + \mathbb{E}u(m^{\text{Dem}}, R)\right) > u(m^{\text{Dem}}, M) \end{array}$$

In the remainder of the section, we discuss the main trade-offs faced by the voters and the candidates at different stages of the electoral game and provide intuition for the regularity conditions. We will start by analyzing the challenger's behavior in the general

[12]The exact expressions of P and Q are $P = \frac{\alpha}{\beta} \cdot \frac{h(x^*, M, m_1) + h(y^*, L, m_2)}{h(x^*, M, m_1)}$

$$Q = \frac{(\alpha+\beta)[h(x^*, M, m_1) + h(y^*, L, m_2)](1 - h(x^*, M, m_1))}{2\alpha[h(x^*, M, m_1) + h(y^*, L, m_2)] + \beta[2h(x^*, M, m_1) - h(y^*, L, m_2) + h(x^*, M, m_1)h(y^*, L, m_2)]}$$

election, then discuss voters' behavior in the primary election, and, finally, the behavior of Democratic candidates during the campaign that precedes the primary election. The proofs are presented in Appendix A.

Challenger's behavior in the General Election

In the general election stage, a moderate challenger has a dominant strategy to exert no effort because effort is costly and it can only hurt her chances of winning the election. This follows immediately from the fact that the winning function $f(p_2)$ is strictly increasing in voters' posterior belief p_2 that a challenger is truly moderate. A liberal challenger, on the contrary, has an incentive to exert costly effort to increase her chances of winning the election. Regularity condition (1) rules out the situation in which a liberal challenger prefers to separate in the general election stage and exerts no effort at all.[13] The optimal effort of the liberal challenger depends on the costs of effort, scrutiny function $h(\cdot)$ and voters' belief p_1 about the challenger's type at the beginning of the general election campaign. Corollaries 1 and 2 describe the properties of optimal effort of the liberal challenger.

Corollary 1. Liberal challenger exerts a higher effort in the general election campaign when voters' beliefs about his likelihood of being a moderate type are higher at the beginning of the general election stage, that is, $\frac{dy^*}{dp_1} > 0$.

Corollary 1 establishes that a "shift to the center" performed by a liberal challenger in the general election is larger when voters believe that she is more likely to be a moderate type at the beginning of the race. To intuit this result, consider a liberal challenger who won the primary with a very small p_1. In this case, voters are fairly confident that the challenger is a liberal and we say that the general election campaign starts with a relatively informative prior about challenger's type.[14] This challenger will have a hard time convincing voters that she is a moderate. That is, a liberal challenger will be less successful at pretending to be moderate for a given effort level y when she starts the general election race with more informative prior p_1 rather then less informative prior $0 < p_1 < p_1' \leq \frac{1}{2}$. Given that cost of effort does not change with the prior, a challenger

[13] In fact, when regularity condition (1) does not hold, that is, $h_y(0, L, m_2) < \frac{2\alpha}{\beta}$, both types of challengers prefer to separate in the general election stage and reveal their types even when voters are uncertain of the type of a challenger at the start of the general election campaign, that is, $p_1^{\text{Ch}} \in (0, 1)$. In this case, in the primary race, the liberals still tell the truth while the moderates partially mimic liberals by exerting positive effort. Moreover, this equilibrium is unique as liberal candidates gain nothing from keeping their identity hidden during the primary race. On the contrary, if regularity condition (1) holds, there might be other equilibria in which both candidates have an incentive to keep their identities hidden in the primary: the moderate candidate does so because he wants to increase his chances of winning the primary, while the liberal candidate does so in order to enjoy a higher chance of winning the general election conditional on obtaining the nomination and successfully pretending to be moderate in the general election.

[14] The most uninformative prior that voters can have is $p_1 = \frac{1}{2}$.

with p_1 will pander less towards the general election median. This result highlights the danger of an early resolution of uncertainty about the challenger's type that may happen during the primary race. Revealing the true type of the nominee may impact her ability to impact voters' beliefs in the general election race and ultimately her likelihood of winning the election.

Corollary 2. General election races with higher visibility are more likely to detect liberal challengers, that is, $\frac{dh(y^*,L,m_2)}{dm_2} < 0$.

The prominence of the general election stage affects directly the cost-benefit analysis that determines the optimal effort level of a liberal challenger. In particular, an increase in m_2 decreases the likelihood of a liberal challenger to successfully pretend to be a moderate. Two components contribute to this effect: a direct effect, according to which the probability of successful pretending decreases in m_2 for any effort level ($h_{m_2} < 0$) and an indirect effect, according to which a liberal challenger will try less hard and exert a smaller effort when m_2 is higher ($\frac{dy^*}{dm_2} < 0$).

Overall, optimal behavior of a challenger in the general election stage paints familiar picture of the one-stage election models: candidates pander towards the position of the decisive voter (population median) and moderate types win elections more often than the extreme ones (liberal Democrats in our setup).

Primary Election

Now that we have determined politicians' behavior in the general election stage, we move back to the primary stage and discuss the behavior of the primary voters. After the primary campaign is over, voters update their beliefs about candidates' types given the prominence of the primary m_1, which captures how informative the primary race was. If posteriors about candidates are the same ($p_1^j = p_1^k$) then candidates are indistinguishable in the voters' eyes and each candidate wins the nomination with a probability of 50%. The interesting case arises when voters contemplate moderate candidate j ($p_1^j = 1$) and candidate k with uncertain type ($0 < p_1^k < 1$). The trade-off that primary voters face is the need to weigh the relative importance of two factors that jointly determine voters' payoffs: candidates' ideology and their chances of winning the general election. In terms of ideology, the median Democrat prefers a liberal over a moderate candidate, and, consequently, a candidate with an uncertain type over the moderate one. However, the latter has a higher chance of winning the election if nominated than the former for any given level of the general election prominence m_2. The regularity conditions (2) and (3) guarantee that from the perspective of the median Democrat the benefit of nominating a candidate with a closer ideology (uncertain type) outweighs the loss from more frequent defeats of an uncertain type compared with the moderate type in the general election. The same restrictions also

imply that all voters with ideal points to the left of the median Democrat agree with the argument above and also prefer an uncertain type over the moderate one in the primary.

Now that we have determined the voters' behavior in the primary election, given the beliefs induced by the candidates' actions, we move back to analyze the behavior of the candidates in the primary race. The driving force behind pandering behavior of moderate candidates in the primary race is the fact that primary voters elect an uncertain type over the moderate one in the primary election, which makes the position of the more extreme Democrat (liberal type) beneficial at the primary stage. The regularity condition (2) guarantees that a liberal Democrat prefers to speak his heart in the primary race and exert no effort at all, while a moderate Democrat mimics the behavior of the liberal ones and pretends to be liberal. The extent of mimicking depends on the prominence of the primary race m_1, scrutiny function $h(\cdot)$ and cost of effort. Corollaries 3 and 4 describe the properties of optimal effort of moderate candidates in the primary race as a function of the primitives of the model.

Corollary 3. In primaries with higher visibility moderate candidates pander less, $\frac{dx^*}{dm_1} < 0$ and are revealed more often as moderates by the voters, $\frac{dh(x^*,M,m_1)}{dm_1} < 0$.

The intuition of Corollary 3 is similar to the one described in Corollary 2. The prominence of the primary m_1 affects how informative the primary campaign is and how likely voters are to detect moderate candidates that mimic behavior of the liberals. Higher visibility of the primary race affects cost-benefit analysis that determines the optimal effort of moderate candidates in the equilibrium and, as a consequence, affects the likelihood that voters will be able to detect true moderates.

Corollary 4. The higher the primary visibility, the lower effort will the liberal challenger exert in the general election stage conditional on getting there, that is, $\frac{dy^*}{dm_1} < 0$.

Primary visibility affects not only the behavior of candidates in the primary race, but also behavior of candidates in the general election stage. In particular, as Corollary 4 states, liberal challengers respond to higher visibility of the primary race by decreasing their effort in the general election stage conditional on getting there. The reason for that behavior comes from Corollary 1 that established that liberal challengers perform a smaller shift to the center when they start the general election stage with more informative prior p_1. When the primary race is more visible, the liberal challenger that wins the nomination starts the general election stage with a lower p_1, which indicates a more informative prior about his type.

Proposition "Divisive-primary effect": Probability of a Democrat to win the election decreases with primary visibility m_1.

Proof. Given optimal behavior of candidates in the pandering equilibrium described in Theorem 1, the probability of a Democrat to win the election simplifies to

$$\alpha + \beta \cdot \frac{1 + h(x^*, M, m_1)}{4}$$

where $\frac{dh(x^*,M,m_1)}{dm_1} = h_x \frac{dx^*}{dm_1} + h_{m_1} < 0$ as established in Corollary 4, **q.e.d.**

Primaries with high visibility affect the probability of a Democrat to get elected through two distinct channels. First, primaries with high visibility make it harder for a moderate candidate to obtain the nomination, since these candidates are more likely to be detected and defeated by liberals in the primary race. Second, liberal candidates that obtain the nomination are handicapped in the general election campaign because of the informative prior they carry over after the informative primaries as described by Corollary 1. Both effects are detrimental to the Democratic party.

The Effect of Voters' Attention

We conclude this section by discussing the assumption about the information structure of the game. We have assumed that even though only a subset of voters participate in the primary election, all voters observe what has transpired during the primary campaign. In other words, at the beginning of the general election stage, all voters hold the same beliefs about the challenger's type. While this assumption does not change the nature of the pandering equilibrium characterized above, it does affect the extent of mimicking that candidates engage in during both the primary and the general election stages.

To show this point, consider an extreme situation, in which all voters believe that any Democratic nominee has an equal chance of being a liberal or a moderate. This corresponds to the situation in which voters that have not participated in the primary election never had a chance to observe what happened there, while those that participated in the primary election forgot/abstracted away from what they learned during the primary campaign.[15] In this case, both a liberal challenger in the general election and a moderate candidate in the primary will pander more compared to the degree of pandering characterized in Theorem "Pandering to the Party Base". More pandering on the part of a liberal challenger follows directly from Corollary 1 that establishes that liberal challengers exert higher effort when p_1 is higher, which is precisely the case here. Conditional on obtaining the nomination voters that observed what has transpired in the primary stage believe that challenger of an

[15] Alternatively, this corresponds to the situation in which Democratic party does not hold the primary election at all and randomly chooses a nominee to compete in the general election stage.

uncertain type is more likely to be a liberal ($p_1 < \frac{1}{2}$) while voters that abstracted away from the information revealed during the primary race believe that a challenger is equally likely to be a moderate or a liberal ($p_1 = \frac{1}{2}$). The second effect is indirect. Moderate candidates will exert more effort in the primary anticipating a higher reward in the general election stage conditional on winning the nomination. This higher reward is due to a higher effort exerted by a liberal challenger and a "more advantageous" starting point of a challenger with an uncertain type. Therefore, in this extreme example in which voters "forget" what has transpired in the primary election, the Democratic party as a whole benefits, as a Democratic candidate wins the election more often. This extreme example highlights the main forces that determine the optimal amount of pandering in equilibrium and can be generalized with an appropriate modifications to the intermediate situation in which only a subset of voters (say primary voters) observe what happens during the primary campaign, while the remaining voters believe that each Democratic challenger is equally likely to be moderate or liberal.[16]

4 Endogenous Primary Prominence

In this section we take a first step at exploring how primary prominence is determined. Indeed, while some characteristics of the political competition are less likely to be influenced by the candidates' behavior (such as the capacity of voters to absorb information), there are other characteristics that surely depend on campaign strategies of the candidates. For instance, candidates can spend financial and political resources to advertise the importance of a particular race through media outlets, and by this affect how much time and effort voters decide to devote to a particular race, which, in turn, will affect the prominence of the race.

To explore these strategic considerations, we extend the basic model presented in Section 2 to allow candidates to influence primary visibility via costly investment that precedes the primary race. More precisely, we consider the following **modified** election game:

[16] To allow voters to have different beliefs about challenger's type at the beginning of the general election stage, one need to modify the probability winning function $f(\cdot)$ as it is currently assumes that all voters hold the same belief p_1 which is then updated to p_2 and feeds into $f(p_2)$ to determine the probability of winning for a challenger with type p_2.

- Information stage
  - Nature determines the types of Democratic candidates (t^A, t^B).
- Investment stage
  - Candidates simultaneously choose whether to invest amount $c > 0$ to increase primary visibility from level $\underline{m}_1$ to $\bar{m}_1$ or not.
  - Candidates observe each other's investment decisions after making their choice.
  - If at least one candidate decides to invest then primary visibility becomes $m_1 = \bar{m}_1$, otherwise it remains low at level $m_1 = \underline{m}_1$.
  - Voters do not observe investment decisions of the candidates, but do observe the eventual visibility parameter m_1.
- Primary stage
  - Candidates choose effort levels x^A and x^B given primary visibility m_1.
  - Voters observe primary campaign and form beliefs about candidates p_1^A and p_1^B.
  - Registered Democrats vote for one of the candidates. The nominee, determined by the majority of votes, continues the race in the next stage and will henceforth be called the challenger.
- General election stage
  - The challenger chooses effort level y for the general election campaign.
  - Voters observe the campaign and form beliefs about the challenger's type p_2.
  - The winner of the election is determined by the winning function $f(p_2)$.

We maintain all assumptions of the basic election game, including the restrictions on the preferences of the median Democrat and the population median as well as the restrictions on the scrutiny function $h(\cdot)$ and winning function $f(\cdot)$.

There are a few important differences between the basic and the extended model. First, after the investment stage, candidates learn the type of their opponent and can condition their behavior on that information. Second, if voters observe that the primary visibility is low $m_1 = \underline{m}_1$ then they can infer that there are two moderate candidates that are running against each other in the primary election. In that case candidates will exert no effort at all in the primary race, the primary nomination will be determined by a flip of a coin and each candidate expects to earn a payoff of $E\Pi^{t^j=M} = \frac{1}{2}f(1)$. If, on the other hand, voters observe that primary visibility is set at a higher level $m_1 = \bar{m}_1$, then they cannot infer the

types of the candidates competing for nomination; however, they update their prior beliefs and think that for each candidate $j = A, B$

$$Pr[t^j = L] = \frac{2}{3} \text{ and } Pr[t^j = M] = \frac{1}{3}$$

Theorem "Pandering when Primary Visibility is Endogenous" characterizes an equilibrium of this extended model in which there is full separation in the investment stage: liberal candidates invest in boosting primary visibility, while moderate candidates refrain from doing so and candidates play pandering equilibrium conditional on a high visibility primary $m_1 = \bar{m}$. As before, we focus on the symmetric Perfect Bayesian Equilibria, restricting attention to those in which candidates with the same types follow the same strategies in the investment stage and in any of the election stages, be it the primary or the general election (all the proofs are in Appendix B).

Theorem "Pandering when Primary Visibility is Endogenous". Consider the modified election game in which the general election stage is at least as prominent as the primary race, that is, $\underline{m_1} < \bar{m_1} \leq m_2$. Then, provided that the cost of investment in primary visibility is not too high, $c < \bar{c}$, and regularity conditions (1) - (3) specified in Theorem "Pandering to the Party Base" hold, there exists an equilibrium in which in the investment stage liberal candidates invest in increasing the primary visibility and moderate candidates do not invest. Following the investment stage, if the primary visibility is low, $m_1 = \underline{m_1}$, then candidates exert no effort in either the primary or the general election campaign. In this case, the nominee of the Democratic party is determined by a coin flip. However, if the primary visibility is high, $m_1 = \bar{m_1}$, then during the primary race liberal candidates exert no effort and moderate candidates pander towards the median Democrat by choosing $x_E^* \in (0, 1)$, while in the general election the moderate challenger exerts no effort and the liberal challenger panders towards the population median by choosing $y_E^* \in (0, 1)$. The candidate with uncertain type wins the primary race over the candidate with for sure moderate type. The optimal effort levels (x^*, y^*) are determined as follows:

$$\begin{cases} (1 - x_E^*)h_x(x^*, M, m_1) - h(x_E^*, M, m_1) = 0 \\ (1 - y_E^*)h_y(y_E^*, L, m_2) - h(y_E^*, L, m_2) = P \end{cases}$$

where $P = \frac{\alpha}{\beta} \cdot \frac{h(y_E^*, L, m_2) + h(x_E^*, M, m_1)}{h(x_E^*, M, m_1)}$, $x_E^* > y_E^*$ and $h(x_E^*, M, m_1) > h(y_E^*, L, m_2)$.

Separating equilibrium characterized in the theorem above highlights several interesting features of the modified election game. First, the pandering equilibrium exists irrespective of the information that candidates have regarding each other's type. Indeed, the pandering equilibrium exists both when candidates are aware of each other's type (as in modified

election game when two candidates have different types) and when candidates don't know the type of their opponent (as in the basic election game). Second, under the conditions that guarantee the existence of the pandering equilibrium, an increase in primary visibility is beneficial for a liberal Democrat and is detrimental for a moderate one. To understand why this is the case, we will discuss the trade-offs faced by each type of the candidate.

For any candidate, winning the general election involves necessarily winning the primary first. When primary visibility is low and a moderate Democrat competes against another moderate Democrat, each wins the primary with a probability of 50% and the nominee has the greatest possible chance of winning the general election, which is equal to $f(1) = \alpha + \beta$. When primary visibility is low, the only way a moderate Democrat can get the nomination is when she is successful at pretending to be the liberal type during the primary campaign, since she necessarily faces the liberal opponent. In this case, the probability that a moderate Democrat wins the primary is lower than 50%, and on top of that her chances of winning the general election are lower and equal to $f(p_2) = \alpha + \beta p_2$ conditional on obtaining the nomination. Therefore, moderate candidates prefer low primary visibility. Consider now the liberal Democrat. High visibility of the primary race has two effects that work in different directions: prominent primaries increase the chances of the liberals to obtain the nomination and decrease the chances of a liberal challenger to win the general election conditional on winning the nomination. However, the regularity conditions that guarantee the existence of the pandering equilibrium also guarantee that the first effect is stronger than the second. In other words, since the probability of the winning function $f(\cdot)$ is flat enough, the liberals enjoy the higher probability of obtaining the nomination more than they suffer from the lower probability of winning the general election stage when the nomination process is intense. This is the reason that liberals are ready to invest in boosting the primary visibility, while moderates refrain from doing so.

5 Related Literature

The model presented here belongs to the literature that studies information transmission through electoral competition. The first classical model is that of Banks (1990) who showed that when misrepresenting one's true ideological position (lying) is costly, extreme candidates tend to reveal their true positions while moderate ones tend to pool together. Callander and Wilkie (2007) extend Banks's model to allow for heterogeneous costs of lying and find that, although liars are favored in the elections, the honest types are not always defeated. Kartik and McAfee (2007) study a related situation, in which a fraction of candidates have a "character" and are exogenously committed to a campaign platform. Finally, Bernhardt and Ingberman (1985) model costly movements of candidates by as-

suming that candidates are tied to their reputations. The model presented in this paper is also a signaling model. However, we depart from the above models in that we study two-stage elections, in which candidates face electorates with different preferences in the primary and in the general election. This crucial difference raises the natural question of how much information about candidates' ideologies can be revealed in two-stage elections.

There are several papers that investigate how primary elections affect candidates' and voters' behavior. Coleman (1972) and Owen and Grofman (2006) discuss the polarizing effect of primaries when candidates are constrained to offer the same platform in the general election as they have in the primary. Callander (2007) explores the sequential nature of primaries and shows under what conditions momentum is observed and bandwagon effects emerge. Adams and Merrill (2008) demonstrate that candidates who have stronger campaign abilities are more likely to get elected in primaries. Hirano, Snyder and Ting (2009) study a model of distributive politics and show that when the nominee of the party is elected through a primary election, core voters receive positive transfers, whereas they receive nothing when only the general election matters. This result is reminiscent of pandering behavior of candidates we characterize in the current paper.[17]

The two most closely related papers to ours are Hummel (2010) and Meirowitz (2005), which we discuss here in detail. Our model shares several common features with the model of Hummel (2010). Both models consider two-stage election competitions with forward-looking voters. Moreover, both models characterize an equilibrium, in which candidates pander towards the median of the primary to obtain the nomination and then shift to the center towards the position of the population median to increase their chances of winning the general election stage. However, the mechanisms behind flip-flopping behavior of candidates are very different. In Hummel (2010), voters dislike when candidates run on different platforms in the primary and in the general election. To motivate this assumption, the author suggests that the mere fact of changing platforms may be indicative of a candidate's personal valence characteristics, which voters value in addition to the ideological positions. The disutility that voters experience from candidates changing positions serves as a disciplining device for candidates' behavior in the general election stage and together with the uncertainty about population median determines the extent of candidates' divergence in the general election stage. On the contrary, the mechanism proposed in the current paper explores the asymmetry of information between candidates and voters: candidates know their own policy preferences, while voters try to infer those from the campaign. The ability

[17]There are many noticeable differences between the current model and that of Hirano et al including the main question under investigation. We focus on the information transmission and the selection of candidates in the two-stage elections, while Hirano et al study how the existence of primary elections affects the distribution of public resources.

of voters to detect the candidates' true types depends on the campaign visibility. So, in the current model, the extent of flip-flopping is determined by the optimal amount of information that candidates reveal about themselves taking into account how this information will affect their chances of winning the general election race.

Meirowitz (2005) studies the model of two-stage electoral competition which like the current model incorporates the incomplete information and explores the informational function of the primary elections.[18] However, the information asymmetry in Meirowitz's model is on the different side of political arena: candidates' policy preferences are common knowledge while the distribution of voters' ideal points is uncertain at the time of the primary race. As a consequence, all candidates running in the primary election prefer to remain vague and not to commit to a policy platform because when they do they become vulnerable in the general election stage and are likely to be defeated by a candidate from the opposing party. This happens because the opposing candidate in this case is able to choose the winning platform since (a) platforms chosen during the primary race are known and cannot be altered at this stage and (b) the distribution of the voters' ideal points is known with certainty at this moment. On the contrary, in the model presented in this paper, it is voters that don't know the types of the candidates and try to infer them by observing how the candidates campaign. Instead of being vague as in Meirowitz's model, some candidates lie during the primary, which makes the inference problem of voters rather difficult. While the results of Meirowitz's model and the current paper have some similar flavor in the sense that not all information is revealed in the primary stage, the mechanisms of information revelation and the forces that influence the amount of information revealed are completely different. To see this recall that while in Meirowitz's model *all* candidates prefer to remain vague in the primary race, in the current model candidates of different types have very different incentives. The extremists would like to reveal their type in the primary stage even though it lowers their chances of winning the general election stage conditional on winning the nomination. But extremists can't exactly achieve that goal because moderates mimic their behavior and voters take this into account when they observe a candidate campaigning on an extreme platform during the primary. In other words, incomplete information about candidates' types creates an interesting dynamics between different types of candidates which affects how well voters can scrutinize candidates by observing the primary campaign.

Finally we note that to our knowledge this is the first paper that explores the divisive-primary hypothesis in a purely informational context. Furthermore, the current model

[18] See also Alesina and Holden (2008) for a model of electoral competition with campaign contributions, in which candidates announce a range of a policy preferences rather than a single point in attempt to balance median voter preferences and those of campaign contributors.

provides a unified framework that accounts for flip-flopping behavior of candidates and the divisive-primary effect in the same setup and shows that both effects originate from the trade-offs related to the timing of information transmission.

6 Conclusions

In this paper we develop a signaling model of two-stage elections in which candidates must obtain their party's nomination before competing in the general election. Candidates can choose different campaign platforms in every stage of the election, and a candidate who misrepresents his true type and wins the election incurs costs (of lying). We allow different stages of the election to have different prominence or visibility levels and demonstrate that these play an important role in the selection process of candidates.

This model provides a unified framework that allows us to examine two commonly observed patterns about primaries: (1) the "post-primary moderation effect," in which candidates pander to the party base during the primary and shift to the center once the nomination is secured and (2) the "divisive-primary effect," which refers to the detrimental effect of hard-fought and prominent primaries on a party's general-election prospects.

We finish by noting that the timing of information revelation is important in two-stage elections, as it affects who gets elected and which policies are implemented. While prominent primaries allow primary voters to make a more informative choice, they are also dangerous for the party in the sense that they reveal too much information about their candidates too early, and this then hurts the party's chances of winning general elections.

References

[1] Abramowitz, A. 1988. "Explaining Senate Election Outcomes." *American Political Science Review* 82(2): 385-403.

[2] Adams, J. and S.M. Merrill. 2008. "Candidate and Party Strategies in Two-Stage Elections Beginning with a Primary." *American Journal of Political Science* 52(2): 344-359.

[3] Alvarez, R. M., Canon, D.T. and P. Sellers. 1995. "The Impact of Primaries on General Election Outcomes in the U.S. House and Senate." California Institute of Technology. *Social Science Working Paper* 932.

[4] Alesina, A. 1988. "Credibility and Policy Convergence in a Two-Party System with Rational Voters." *American Economic Review* 78(4): 796-805.

[5] Alesina, A. and R. Holden. 2008. "Ambiguity and Extremism in Elections." Harvard Institute of Economic Research Discussion Paper No. 2157.

[6] Atkeson, L. R. 1998. "Divisive Primaries and General Election Outcomes: Another Look at Presidential Campaigns." *American Journal of Political Science* 42: 256-71.

[7] Banks, J. 1990. "A Model of Electoral Competition with Incomplete Information." *Journal of Economic Theory* 50: 309-25.

[8] Bernhardt, M.D. and D.E. Ingberman. 1985. "Candidate Reputations and the 'Incumbency Effect'." *Journal of Public Economics* 27: 47-67.

[9] Bernstein, R. A. 1977. "Divisive primaries do hurt: U.S. Senate races, 1956-1972." *American Political Science Review* 71: 540-545.

[10] Born, R. 1981. "The Influence of House Primary Election Divisiveness on General Election Margins, 1962-76." *Journal of Politics* 43: 640-661.

[11] Burden, B. 2001. "The Polarizing Effects of Congressional Elections," in Galderisi, Ezra and Lyons, ed., *Congressional Primaries and the Politics of Representation.* New York: Rowman and Littlefield.

[12] Callander, S. 2007. "Bandwagons and Momentum in Sequential Voting." *Review of Economic Studies* 74: 653-84.

[13] Callander, S. and S. Wilkie. 2007. "Lies, Damned Lies, and Political Campaigns." *Games and Economic Behavior* 60: 262-86.

[14] Calvert, R. 1985. "Robustness of the Multidimensional Voting Model: Can- didate Motivations, Uncertainty, and Convergence,"*American Journal of Political Science*, 29: 69-95.

[15] Coleman, J.S. 1972. "The Position of Political Parties in Elections", in Niemi, R.G. and H.F. Weisberg, ed., *Probability Model of Collective Decision Making.* Charles E. Merrill Publishing Company: Columbus Ohio.

[16] Downs, A. 1957. *An Economic Theory of Democracy.* New York: Harper and Row.

[17] Hirano, S., Snyder, J.M. and M. Ting. 2009. "Distributive Politics with Primaries." *Journal of Politics*, forthcoming.

[18] Hogan, R.E. 2003. "The Effects Of Primary Divisiveness On General Election Outcomes In State Legislative Elections." *American Political Research* 31: 27-47.

[19] Hummel, P. 2010 "Flip-Flopping from Primaries to General Elections Patrick Hummel." *Journal of Public Economics.*

[20] Kartik, N. and R.P. McAfee. 2007. "Signaling Character in Electoral Competition." *American Economic Review* 97: 852-70.

[21] Kenney, P. J. 1988. "Sorting Out the Effects of Primary Divisiveness in Congressional and Senatorial Elections." *Western Political Quarterly* 41:756-777.

[22] Key, V.O. 1953. *Politics, Parties and Pressure Groups.* New York: Thomasy Crowell.

[23] Kreps, D. and R. Wilson. 1982. "Sequential Equilibria." *Econometrica* 50 (4): 863-94.

[24] Lengle, J. I., Owen, D. and M.V. Sonner. 1995. "Divisive Nominating Mechanisms and Democratic Party Electoral Prospects." *Journal of Politics* 57(2): 370-383.

[25] Maisel, S. and W.J. Stone. 1998. The Candidate Emergence Study.

[26] Meirowitz, A. 2005. "Informational Party Primaries and Strategic Ambiguity." *Journal of Theoretical Politics* 17: 107–36.

[27] Owen, G. and B. Grofman. 2006. "Two-Stage Electoral Competition in Two-Party Contests: Persistent Divergence of Party Positions." *Social Choice and Welfare* 26: 547–69.

[28] Westlye, M. C. 1991. *Senate Elections and Campaign Intensity.* Baltimore: Johns Hopkins University Press.

[29] Wittman, D. 1983. "Candidate Motivation: A Synthesis of Alternatives." *American Political Science Review* 77(1): 142-157.