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A Median Voter Theorem with Primary Elections

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Abstract

It is commonly assumed that primaries induce candidates to adopt extremist positions. However the empirical evidence is mixed. A theoretical investigation is thus warranted. This paper develops a general model introducing the fundamental elements of primary elections in the well-known spatial voting model by Downs (1957). In spite of significant incentives for candidates to diverge, I find the surprising result that they will all converge to the median voter's ideal point. The result in this paper suggests that primaries are not sufficient to create polarization by themselves. Rather, for candidates to diverge from the center, other complementary features must be present.

Keywords: Primary elections, polarization, divergence, voting, Downs

Resumen

Comunmente se cree que las elecciones internas de los partidos (a veces llamadas "primarias") inducen a los candidatos a adoptar plataformas de campaña extremistas. Sin embargo la evidencia empírica es ambigua. Por lo tanto se justifica investigar esta cuestión teóricamente. Este ensayo desarrolla un modelo general introduciendo los elementos fundamentales de las elecciones primarias en el conocido modelo espacial de votación de Anthony Downs (1957). A pesar de los fuertes incentivos para divergir, encuentro el sorprendente resultado que los candidatos van convergir al punto ideal del votante mediano. El resultado en este ensayo sugiere que las primarias no son suficientes por si mismas para crear polarización. Más bien, para que los candidatos diverjan del centro, otros factores complementarios deben estar presentes.

Palabras clave: Elecciones primarias, polarización, divergencia, votación, Downs

A median voter theorem with primary elections

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Abstract

It is commonly assumed that primaries induce candidates to adopt extremist positions. However the empirical evidence is mixed. A theoretical investigation is thus warranted. This paper develops a general model introducing the fundamental elements of primary elections in the well-known spatial voting model by Downs (1957). In spite of significant incentives for candidates to diverge, I find the surprising result that they will all converge to the median voter's ideal point. The result in this paper suggests that primaries are not sufficient to create polarization by themselves. Rather, for candidates to diverge from the center, other complementary features must be present.

1 Primaries and policy divergence

Do primaries create polarization? It has long been argued that competing inside a political party for its nomination might induce candidates to take extremist positions to get the approval of the partisan ideologues in charge of selecting them. This would counteract, it is claimed, the incentives for these candidates to converge toward centrist policies that would get them elected. According to this logic, while the general election between parties creates the incentive for candidates to converge toward the median voter, the primary elections within parties create the opposite incentive to diverge toward extremist party activists. Should this mechanism be true, moderate voters would be facing an unfortunate cost from primary elections: a loss in the representativeness of candidates running for office.

These claims are worth investigating rigorously, not least given the importance that primaries have acquired around the world. They are already prevalent in the United States, where they have seen a spectacular increase in recent decades. The number of states holding presidential primaries went from sixteen in 1968 to forty-three in 1996 (Morton 2006). Actually in America, primaries are not confined to presidential elections but are also mandated in a large number of states for congressional and gubernatorial races. Primaries have also expanded noticeably in Latin America in the past two decades.[1] The use of primaries in this region has recently attracted the attention of scholars specializing in Argentina,[2] Chile,[3] and Mexico.[4] Scholars studying other regions around the world have also begun documenting the adoption of competitive nomination processes in Australia,[5] Ghana,[6] Iceland,[7] Romania,[8]

[1] As documented by Carey and Polga-Hecimovich (2006), Kemahlioglu, Weitz-Shapiro and Hirano (2009), and Aragón (2013, 2014).
[2] Jones (2012).
[3] Field and Siavelis (2009), Hinojosa (2012).
[4] Baldez (2008), Hinojosa (2012), Bruhn (2013, 2014).
[5] Abjorensen, Horiuchi and Sato (2012).
[6] Ichino and Nathan (2012, 2013).
[7] Indriði and Sigurjónsdóttir (2014).
[8] Gherghina (2013).

Spain,[9] and Sweden.[10]

Much of the existing literature has studied the effects that primary elections may have on the behavior of candidates and parties, in particular their choice of policy platforms. Scholars have often presumed that primaries cause these platforms to diverge. In particular, primaries have been cited by several authors as a possible explanation for the rise in partisan polarization in the U.S. Congress in the last three decades. In addition to scholars, this view is frequently expressed by pundits and the media.[11] While this view has partly been based on intuition and anecdotal observation, a few statistical studies have also provided support.[12] Following up on these common empirical hypotheses, a number of theoretical papers have been developed predicting this presumed effect of primaries on polarization.[13]

Yet, there are grounds to doubt such a direct connection between primaries and polarization. Despite the previous arguments, some recent empirical research has found a weak or inexistent effect of primaries on the policies implemented by elected officials. Notably, Hirano et al. (2010) find little to no effect of primaries on polarization in the U.S. Congress. They find no evidence that the introduction of primaries is associated with more polarized roll call voting records in Congress; and insignificant evidence that fear of primary competition induces legislators to take more extreme roll call voting positions. In reviewing the literature, these authors considered previous empirical evidence connecting primaries and the polarization of elected officials to be "rather modest." Using different data, Peress (2013) coincides in refuting the hypothesis that primaries have a strong polarizing effect. He finds that the extremism of primary electorates in each district does not have a statistically significant effect on candidates' positions on policy. In sum, the existing evidence is ambiguous about whether primaries increase polarization or not. This chapter suggests a possible interpretation for the conflicting empirical results. My interpretation is that primaries are not sufficient to create polarization by themselves. Rather, for candidates to diverge from the center, other additional conditions would need to interact with primaries.

[9] Field and Siavelis (2009).

[10] Folke, Persson and Rickne (2013).

[11] For example Schumer (2014) in the New York Times.

[12] For notable examples see Gerber and Morton (1998) and Burden (2001, 2004).

[13] Adams and Merrill (2008); Padró i Miquel and Snowberg (2012); Amorós González, Martínez and Puy Segura (2013); Casas (2013); Hummel (2013); Adams and Merrill (2014).

In light of this empirical controversy, my chapter investigates theoretically the effect that we should expect from primary elections. In a simple model with only essential elements, I investigate if competition within parties to get the nomination should be expected to increase the ideological distance between parties in the election. To be concrete, I analyze the consequences of adding a nomination stage to the well-known spatial voting model developed by Downs (1957). The basic assumptions of this benchmark model are well established and have been used for decades in numerous models. Policy is understood as a line representing the left-right political spectrum; two candidates who are ambitious and care only about winning office compete with each other by announcing platforms in the policy dimension; whatever candidate wins the election will implement the platform she promised; voters are located according to some distribution along the political spectrum; and a median voter exists which both candidates have clearly identified. The canonical result in this literature is that, in general, there exists a unique equilibrium whereby both candidates are predicted to converge fully to the median voter's ideal policy.

The main goal of this paper is studying whether this median-voter result still holds after adding a nomination process within two parties that candidates need to go through before competing in the general election. In short, to the benchmark Downsian model I add two political parties that candidates need to compete in before being able to run for office. These two parties will have opposite ideologies, meaning they have ideal policies on opposite sides of the median voter, one preferring right-wing policies and the other preferring left-wing policies. Additionally, I will assume that neither party cares about winning the election *per se*, but rather they care only about the policy implemented by the candidate who wins the election. Once a candidate promises a policy to her party, this promise will become binding for the rest of the election. These assumptions are stacking the deck in favor of obtaining a polarizing effect from primaries.

In line with the most recent empirical literature, however, I do not find that primaries significantly increase polarization. In fact, in this model they do not increase polarization at all, which contradicts the traditional view. The main theorem finds that all candidates still converge completely to the median voter's ideal point. The reason is the rationality of

parties: even if they have extremist ideal points, parties understand the importance of being flexible in their nomination decisions by choosing someone moderate who can prevent the other party from winning. As the model will demonstrate, fear of letting the other party's platform become policy drives each party to nominate centrist candidates who can win the election.

The paper proceeds as follows. After briefly reviewing the existing literature, I lay out the elements for a basic model adding primary elections to the Downsian framework. Then I state the main results. The theorem in this paper states that a unique equilibrium exists, in which all candidates in both parties converge fully to the median voter's ideal policy. After describing the dynamics in the election to build intuition, I conclude with a brief discussion of the relevance for future theoretical and empirical research on this topic. The appendix contains the proofs of all results.

2 Previous Theoretical Literature on Candidate Selection

Reflecting an increasing interest in recent years, a number of formal models have been written about primary elections, nomination processes, and candidate-selection methods. Several consequences of democratizing the candidate selection method have been modeled. The effects of primaries studied by scholars include revealing information that was unobservable;[14] increasing the valence of nominees;[15] unifying party factions in dispute;[16] inducing more citizens to enter the race as candidates;[17] and improving the effort and expertise of policy-making.[18] Another strand of the literature has explored the origin of primary elections by asking when and why political parties would democratize their nomination process.[19]

[14] Adams and Merrill (2008); Castanheira, Crutzen and Sahuguet (2010); Serra (2011); Evrenk, Lambie-Hanson and Xu (2013); Mutlu-Eren (2013); Serra (2013); Adams and Merrill (2014); Kselman (2014).

[15] Adams and Merrill (2008); Serra (2011); Casas (2013); Evrenk, Lambie-Hanson and Xu (2013); Hummel (2013); Mutlu-Eren (2013); Serra (2013); Adams and Merrill (2014); Kselman (2014).

[16] Hortala-Vallve and Mueller (2009); Mutlu-Eren (2013).

[17] Casas (2013); Hummel (2013).

[18] Crutzen (2013); Buisseret and Wantchekon (2014).

[19] Hortala-Vallve and Mueller (2009); Serra (2011); Snyder and Ting (2011); Zudenkova (2012); Serra (2013).

A frequent concern of this literature has been whether primary elections create polarization by inducing candidates to adopt extremist policy platforms. Most previous models find such divergence one way or another.[20] A few find that primaries may in fact lead to less polarization than other likely methods.[21] But to my knowledge, there is no previous model with full-blown primary elections that do not lead to any polarization whatsoever.

3 Structure of the election

3.1 Timing

The election is modeled as a three-stage game between voters, parties and candidates. The three stages correspond to the *platform announcement by candidates*, the *nomination* and the *general election,* in this order. The goal of this election is to decide a policy to be implemented. Each policy platform is represented by a point x in the policy space $\mathbb{R}$, where $\mathbb{R}$ is the real line. There are two parties, labeled R for the right-wing party and L for the left-wing party. Each party needs to nominate a candidate for office among those who are competing inside the party, often called *precandidates*. There are four such precandidates, which are labeled r_1, r_2 for those in party R and l_1 and l_2 for those in party L. The only distinguishable characteristic of each candidate is the policy platform she adopts. Indeed, throughout the paper I will make no distinction between a candidate and her platform, referring to r_1, r_2, l_1, l_2,when talking about the candidates' platforms or the candidates themselves.

In the first stage, the four candidates announce their platforms simultaneously. A candidate's strategy consists on announcing a policy platform in $\mathbb{R}$. We denote a profile of candidate strategies by S_c, with $S_c = (l_1, l_2, r_1, r_2)$. The platform that a candidate adopts is the policy she would implement if she was elected, and it represents a binding commitment.

In the second stage, for given a set of platforms announcements (l_1, l_2, r_1, r_2), party L

[20] Adams and Merrill (2008); Hirano, Snyder and Ting (2009); Padró i Miquel and Snowberg (2012); Amorós González, Martínez and Puy Segura (2013); Casas (2013); Hirano, Snyder and Ting (2013); Hummel (2013); Adams and Merrill (2014).

[21] Jackson, Mathevet and Mattes (2007); Serra (2011, 2013).

must choose a candidate l_i and party R must choose a candidate r_j to compete against each other in the general election. Both parties observe (l_1, l_2, r_1, r_2); then party L nominates either l_1 or l_2 while R nominates either r_1 or r_2. Both parties nominate their candidates simultaneously. We denote by S_L the strategy of L and by S_R the strategy of R. A party's strategy consists of a complete plan of action contingent on every possible situation in which it might be called upon to act. In the present context this implies specifying an action for each possible configuration of platforms that it may observe. Since every set of candidate platforms (l_1, l_2, r_1, r_2) forms a subgame of this game, a strategy for a party specifies a nomination for each of those configurations.

Lastly, in the third stage, voters elect a candidate for office from one of the parties. We will assume that a median voter exists whose decision is pivotal. This being the basic structure of the election, here are details about the preferences of voters, parties and candidates.

3.2 Voters' preferences

We will assume voters' preferences to be single-peaked and quadratic with ideal points in $\mathbb{R}$. A median voter exists whose preferences are decisive.[22] We call the median voter M and we normalize her ideal point to zero. M's utility function is given by

$$U_M(x) = -x^2$$

Given such preferences, the behavior of voters is trivial: they will always vote for the party whose candidate has a platform closest to their ideal points. Given that M is pivotal, the party whose candidate announced a platform closest to her ideal point will win the election. In other words, the party closest to zero will win. If the platforms of parties yield the same utility to M, then she will randomize her vote such that either party will win the election with equal probability. So, for example, if party R and party L were equidistant from zero, they would tie having each a $\frac{1}{2}$ probability of winning.

[22] All the results would hold for any symmetric and single-peaked utility function for voters. The quadratic is used as an illustration.

3.3 Parties' preferences

Parties L and R care about the policy implemented by the elected official. In other words, they are *policy-motivated* meaning that they have ideal points over policy.[23] Here I will abstract from explicitly modeling the thousands, sometimes millions, of party sympathizers that attend a primary election. Instead, I will treat each party as unitary actor, meaning that it possesses a unique ideal point and will make strategic decisions based on this ideal point. One possible interpretation for treating a party as having a unique ideal point is assuming that primary elections have a median party member with such ideal point. Indeed, in parallel research I have proved that, as long as all primary voters have single-peaked preferences, they will behave as a group exactly as their median member would behave alone.[24] A corollary of this result is that parties can be treated as unitary actors behaving strategically based on the ideal point of their median member.

I will assume the ideal points of both parties to be on opposite sides of the median voter, such that we genuinely have a left-wing party and a right-wing party. For concreteness, I will assume that R's ideal point is 1 while L's ideal point is -1. Both parties have have single-peaked and quadratic preferences.[25] Their utility functions are given by

$$\begin{aligned} U_R(x) &= -(1-x)^2 \\ U_L(x) &= -(-1-x)^2 \end{aligned}$$

Both parties are rational and forward looking, meaning they will try anticipating the other player's reactions. Using jargon we say that parties are *strategic* rather than *sincere*. As a consequence, a party will not blindly nominate the candidate closest to its ideal point. On the contrary, a party will often be willing to nominate moderate candidates if they have a higher chance of winning the election. In essence, each party must find the candidate that best balances its desire for a partisan platform with its fear of letting the other party win.

[23] This follows the tradition of Wittman (1973) and Calvert (1985).

[24] This unpublished proof is available upon request.

[25] All the results would hold for any strictly concave utility function for parties. They would also hold if the parties' ideal points were not equidistant from the median voter.

Finally, if both hopefuls in the primary adopt identical platforms becoming indistinguishable, the party is forced to randomize equally between them.

3.4 Candidates' preferences

All candidates are office-motivated. They have a unique goal: to maximize their probability of being elected. In particular, the candidates do not derive utility from the policy implemented, or from winning the nomination per se without winning the election. Not caring about policy per se, gives each candidate the freedom to announce any platform best suiting her goal of winning the nomination to later win the election. She will do so rationally, meaning she will take into account the reactions of other players. In particular, all candidates will try outguessing one another such that platform announcements form a Nash equilibrium between the four of them. They are also forward looking, meaning that they will calculate the consequences of their announcements down the line, when it is the parties' turn to nominate a candidate, and then the voters' turn to elect a party. This structure implies that candidates will try balancing their need to please their parties who have extremist ideal points, with the subsequent need, if they are nominated, to appeal to the median voter who has a centrist ideal point. They must find this balance recalling that whatever platform they announce in the primary will remain her platform in the general election as well.

One immediate implication is that rational candidates would only consider adopting platforms in the following intervals. Candidates r_1 and r_2 in party R will restrict themselves to the interval $[0, 1]$ while candidates l_1 and l_2 in party L will restrict themselves to the interval $[-1, 0]$. This assertion can be easily proved as any announcement outside these intervals is a weakly dominated strategy for candidates. For expediency, I will simply assume this result instead of proving it explicitly.

3.5 Equilibrium concept

Our best prediction for the election result is an equilibrium of this game. We thus need to solve for all the equilibrium strategies of candidates, parties and voters. The game is solved

by backward induction, and the type of equilibrium that we are looking for is *subgame-perfect Nash equilibrium* (SPNE). A SPNE must induce a Nash Equilibrium (NE) in every subgame of the game, and therefore we need to find strategies S_c^*, S_L^* and S_R^* that induce a NE at every stage of the election. We will only consider pure strategies that are not weakly dominated.

Special focus will be placed on the location of the platforms that candidates will choose. We are particularly interested in exploring whether *complete convergence* or *large divergences* can be sustained in equilibrium. Will candidates adopt extremist platforms pandering to their parties, or will they announce centrist policies catering to the median voter? Will parties nominate moderate candidates to win the election, or will they prefer partisans close to their ideal points? The following section provides answers in the context of this basic model.

4 The effect of nominations on polarization

4.1 Main result

We can now state a theorem about the effect of competitive nominations on polarization. In this model there is no effect at all. Complete convergence is the only equilibrium, such that all candidates adopt centrist platforms before the nominations take place. The proof of this theorem comes in the appendix.

Theorem In this election, there exists a unique outcome that can be sustained in a subgame-perfect equilibrium. In this outcome, all the candidates converge to the median voter's ideal point such that $r_1 = r_2 = l_1 = l_2 = 0$. Party L randomizes between l_1 and l_2. Party R randomizes between r_1 and r_2. Voters randomize between party L and party R. And the policy implemented is 0, the ideal point of the median voter.

This theorem is a generalization to primary elections of the classic median voter theorem. In this new context, all hopefuls are expected to adopt centrist platforms to compete both in the primaries and the general election.[26]

[26] It must be noted that other models of primary elections, some of them withe quite different assumptions, reach similar conclusions. See for example Proposition 2 of Kselman (2014) which finds convergence as a

This result is far from trivial given the centrifugal forces that exist in the game. As I will discuss below, there exist significant incentives for parties to request partisan platforms from their candidates. What the theorem above shows is that such centrifugal forces are more than compensated by centripetal forces incentivizing those same parties to converge to the center. It should be noted that this result does not depend on specific functional forms but will actually hold for very general preferences.[27] Although the formal proof comes in the appendix, I give an intuitive proof in the following lines to gain insight into this type of elections.

4.2 Election dynamics

Insight can come from analyzing the different forces in this election. In particular, it is worth understanding all the options that players in this game had, and why none of these options was an equilibrium save for the ones described in the theorem. Throughout the analysis, bare in mind that candidates only have one shot at announcing a platform, which is before the primary election. As is standard in the literature, I am assuming that such announcements become a binding commitment for each candidate, meaning that a promise in the primary campaign will have to be maintained in the general election, and will have to be kept upon winning the election.[28]

Knowing this, each candidate will think strategically about the best platform to adopt, trying to anticipate the platforms that other candidates will announce as well as the subsequent reactions of parties and voters. Our best prediction for the behavior of players in this game is a subgame perfect equilibrium, that is, a set of decisions where all players are correctly anticipating each other. To find these equilibria, we need to analyze all the possible combinations of strategies to discard those not forming an equilibrium, namely those where at least one player could benefit from unilaterally changing her decision. In particular, we

corner solution.

[27] As I mentioned above, the exact same result would be obtained with any strictly concave utility function for parties and voters. Complete convergence can also be proved to be the only possible outcome with strictly risk loving parties. And the parties' ideal points could take any value on opposite sides of the median voter.

[28] We are thus discarding the possibility of flip-flopping during the election season. One way to justify this assumption is that, in this election, flip-flopping would hurt the candidate's credibility so much that it would never be an optimal strategy.

must analyze all the possible configurations of four platforms, two in the left-wing party and two in the right-wing party, to see whether rational candidates could conceivably announce them. Broadly, there are four possible configurations where candidates could be located.[29]

- **Configuration 1**: $0 \leq r_1 < r_2 < -l_1 < -l_2 \leq 1$
  - Profitable deviation: $r_1 \rightarrow r_2 + \varepsilon$
  - Is it an equilibrium? No

In this configuration, all candidates have announced platforms with different levels of extremism, both left-wing candidates being more extremist than the right-wing candidates. If candidates were considering this configuration, there would be a strong *centrifugal* force in the election incentivizing candidates to move even further away from the median voter. To see this, consider the incentives of candidate r_1. Should this become the actual configuration of platforms, party R would be sure to win the election with either of its candidates r_1 or r_2. It could thus safely nominate the candidate closest to its ideal point, r_2, and still win the election. In this case, the centrifugal incentives would dominate inside party R such that the most moderate candidate r_1 would lose the nomination in favor of the relatively more partisan candidate r_2. Being rational and forward looking, r_1 would want to avoid this outcome by moving towards its party's ideal point in order to steal the nomination from r_2. All things equal, r_1 would benefit from adopting a platform $r_2 + \varepsilon$ where ε is a small positive number, such that her platform is larger than r_2 to be more appealing to R, while still being more moderate than l_1 in the eyes of the median voter. Given that r_1 has this profitable unilateral deviation, this configuration cannot be an equilibrium.

- **Configuration 2**: $0 < r_1 < -l_1 < r_2 < -l_2 \leq 1$
  - Profitable deviation: $l_2 \rightarrow r_1 - \varepsilon$
  - Is it an equilibrium? No

[29] This is not an exhaustive list of all the possible configurations. In this section, I only analyze the cases that build an interesting intuition. The proof in the appendix gives the exhaustive list of configurations and determines whether each of them is an equilibrium or not.

This configuration would create *centripetal* forces in the election, meaning that candidates would have an incentive to become more moderate than they were planning. To see this, consider how nominations would play out in parties L and R. In principle, party L would find candidate l_2 most attractive as she is located close the its ideal point. This is the candidate that party L would nominate if it was sincere instead of strategic. However, we postulated that both parties are rational hence anticipating each other's strategies. If party L was planning to nominate l_2, R's best response would be to nominate r_2, but then L's best response would be to nominate l_1, in which case R's best response would be to nominate r_1. Hence both parties will "race towards the center". With rational parties, the two moderate precandidates will be nominated at the expense of the two partisan ones. What incentives does this create for candidate l_2? Given that she would lose the nomination given this configuration of announcements by the other candidates, she would prefer to adopt a drastically more moderate platform, namely $r_1 - \varepsilon$ where ε is a small positive number. If she did so, competition with R would force L to nominate her in order to win the election. This incentive for the most partisan candidate to become the most moderate one illustrates the strong centripetal force in this election, and discards this configuration as a possible equilibrium.

- **Configuration 3**: $0 < r_1 = r_2 = -l_1 = -l_2 \leq 1$
  - Profitable deviation: $r_1 \rightarrow r_1 - \varepsilon$
  - Is it an equilibrium? No

In this configuration all candidates would be equally partisan. A possibility for this configuration to arise is a negotiated agreement between candidates, whereby they all agree to locate at the same distance from the median voter to make her indifferent. The advantage of such an agreement is giving each candidate a chance at winning the election. Parties would face identical precandidates such that R would not be able to distinguish between r_1 and r_2, and L would not be able to distinguish between l_1 and l_2. Parties would not really have a substantive choice, so they would simply randomize between their precandidates giving

them an equal chance to be nominated. After the nominations, both parties will have candidates whose platforms are on opposite sides but exactly equidistant from the median voter, hence tying in the election with an equal chance of winning. Candidates would thus have been successful at granting each other an equal probability of winning the election. If no candidate deviated from this agreement, each one would have a probability of $\frac{1}{4}$ of wining the election, corresponding to $\frac{1}{2}$ probability of being nominated times $\frac{1}{2}$ probability of winning the election conditional on being nominated. Unfortunately for them, such an agreement would not be honored. In fact each one has an incentive to renege on her promise by announcing a more moderate platform. If r_1, for example, decided to deviate unilaterally to a slightly more moderate platform, she would give party R the opportunity to nominate her to subsequently win the election with certainty. This incentive to deviate unilaterally shows that such an agreement between candidates cannot be sustained as an equilibrium.

- **Configuration 4**: $0 = r_1 = r_2 = l_1 = l_2$
  - Profitable deviation: None
  - Is it an equilibrium? Yes

In this configuration, all the candidates have converged fully to the median voter. Neither party has a choice for the nomination given that all precandidates are indistinguishable. Party R has no choice but to randomize between r_1 and r_2, while party L has no choice but to randomize between l_1 and l_2. Following the primaries, the median voter will face parties with identical platforms, and will hence randomize between the two. The policy implemented after the election will be 0, the ideal point of M. If no candidate deviates from this configuration, each candidate has a probability of $\frac{1}{4}$ of wining the election, corresponding to $\frac{1}{2}$ probability to be nominated times $\frac{1}{2}$ probability to win the election conditional on being nominated. If any candidate, say r_2, deviated unilaterally to become slightly more partisan, she would either loose the nomination, or win the nomination but lose the election, making here worse off than having a $\frac{1}{4}$ of actually winning. Therefore, there is no profitable deviation for any of the candidates. This represents an equilibrium, the only one in this election.

5 Discussion

It is commonly assumed that primaries motivate hopefuls to diverge away from moderate positions. The conventional wisdom is that while candidates would prefer to adopt centrist platforms helping them win the general election, in fact they need to design partisan platforms to win their primary election first. However the empirical evidence is mixed: while some early studies have supported this view,[30] recent research has found the connection between the ideological extremism of primary electorates and the partisanship of elected officials to be weak or null.[31] Further investigation on the effect of nominations on polarization is thus warranted, both theoretically and empirically.

To obtain theoretical predictions about nomination processes, a sensible step is analyzing them in the context of the well established model of spatial elections. Such was the goal of this chapter, which developed a general model studying the fundamental elements of primary elections in the Downsian framework. To the standard model introduced in Downs (1957), this paper has added two parties with ideological preferences where candidates need to compete to be nominated before running in the general election. Notably, I assumed that neither party cares about winning the election for the sake of winning it – they only care about influencing the policy platform that will be chosen by voters. These assumptions should capture the alleged centrifugal effects of nomination processes, if any.

As it turns out, in this setting, complete convergence of parties and candidates is still the only equilibrium. Surprisingly, all hopefuls will adopt centrist platforms to compete both in the primaries and the general election, with the consequence that no divergence whatsoever arises. This outcome is driven by the competition between parties: while neither one derives any direct payoff from being in office, they do care indirectly about winning to prevent the other party from setting an unfavorable policy. As postulated in the theorem above, the rational desire to prevent the rival's platform from winning is enough to induce both parties to converge to the center.[32]

[30] Gerber and Morton (1998); Burden (2001, 2004).

[31] Hirano et al. (2010); Peress (2013).

[32] I should note how reminiscent this result is to the one found by Calvert (1985). In his seminal model with two policy-motivated parties with extremist ideal points, he famously proved that both parties will completely converge to the median voter's ideal point. The logic of his result is similar to the one here, and

One possible interpretation for these results is that primaries do not have a universal but rather a conditional effect on polarization. Only if certain conditions are present will they increase it, while they might have a weak or null effect in the absence of those conditions. This chapter illustrates that a bare-bones model including only essential elements of nominations will predict a full convergence of platforms in spite of significant incentives to diverge. So the theorem proved in this chapter is a "median voter result" in the sense of predicting that candidates in both parties will be promising to implement the exact policy preferred by the median voter in the electorate. However, it is still possible that including additional features to the nomination process would trigger divergence. As mentioned before, there exist a number of formal results in the literature predicting that primaries will lead to polarization. What my results suggest is that other factors must be interacting with primaries in those models to produce such polarization. Future research should endeavor to disentangle these factors. Primaries by themselves might not be sufficient to induce high levels of partisanship, but they may have this effect if they interact with other institutional features.

6 Appendix

Without loss of generality, the configurations in Table 1, along with their symmetric counterparts, are an exhaustive list of all the possible configurations of platforms that candidates may adopt. All cases are mutually exclusive.

thus my model can be thought of as a generalization of Calvert (1985) to a situation where a nomination process is added in each party. The fact that a convergence to the median still holds in my model illustrates what Calvert called the "robustness" of the spatial voting model.

Configuration. 1	$0 = r_1 = r_2 = -l_1 = -l_2$
Configuration. 2	$0 < r_1 = r_2 = -l_1 = -l_2$
Configuration. 3	$0 = r_1 = r_2 = -l_1 < -l_2$
Configuration. 4	$0 < r_1 = r_2 = -l_1 < -l_2$
Configuration. 5	$0 = r_1 = r_2 < -l_1 = -l_2$
Configuration. 6	$0 < r_1 = r_2 < -l_1 = -l_2$
Configuration. 7	$0 = r_1 < r_2 = -l_1 = -l_2$
Configuration. 8	$0 < r_1 < r_2 = -l_1 = -l_2$
Configuration. 9	$0 = r_1 = r_2 < -l_1 < -l_2$
Configuration. 10	$0 < r_1 = r_2 < -l_1 < -l_2$
Configuration. 11	$0 = r_1 < r_2 = -l_1 < -l_2$
Configuration. 12	$0 < r_1 < r_2 = -l_1 < -l_2$
Configuration. 13	$0 = r_1 < r_2 < -l_1 = -l_2$
Configuration. 14	$0 < r_1 < r_2 < -l_1 = -l_2$
Configuration. 15	$0 = r_1 < r_2 < -l_1 < -l_2$
Configuration. 16	$0 < r_1 < r_2 < -l_1 < -l_2$
Configuration. 17	$0 = r_1 = -l_1 < r_2 = -l_2$
Configuration. 18	$0 < r_1 = -l_1 < r_2 = -l_2$
Configuration. 19	$0 = r_1 = -l_1 < r_2 < -l_2$
Configuration. 20	$0 < r_1 = -l_1 < r_2 < -l_2$
Configuration. 21	$0 = r_1 < -l_1 < r_2 = -l_2$
Configuration. 22	$0 < r_1 < -l_1 < r_2 = -l_2$
Configuration. 23	$0 = r_1 < -l_1 < r_2 < -l_2$
Configuration. 24	$0 < r_1 < -l_1 < r_2 < -l_2$
Configuration. 25	$0 = -l_1 < r_1 = r_2 < -l_2$
Configuration. 26	$0 < -l_1 < r_1 = r_2 < -l_2$
Configuration. 27	$0 = -l_1 < r_1 < r_2 < -l_2$
Configuration. 28	$0 < -l_1 < r_1 < r_2 < -l_2$

Table 1

With this list in mind, I proceed to prove the theorem in this paper.

Proof. The game must be solved by backwards induction. The procedure will be the following: we start by solving the game at its last stage –the general election– and we find the median voter's strategy profile S_v^* that forms a NE in every situation in which she might be called upon to act. Given S_v^*, we consider the reduced game at the second stage –the nominations by each party– and we find the strategies S_L^* and S_R^* that form a NE for the parties in every possible subgame in which they might be called upon to act. Finally, for each S_v^*, S_L^* and S_R^*, we consider the reduced game at its first stage –the platform adoption– and we find all the strategies S_c^* that form a NE for the candidates. At this stage (the platform adoption), we know that a NE of the reduced game will be a SPNE of the game as a whole.

Third stage

First we prove that sincere voting is a weakly dominant strategy for voters. When casting her vote, a voter is either pivotal or not. If she is pivotal, then voting other than sincerely will make her worse off (or no better off if she is indifferent between both parties). If her vote is not pivotal then any strategy leads to the same outcome. Therefore, sincere voting is never worse and sometimes better than not voting sincerely. Sincere voting weakly dominates every other strategy for voters. Since we have assumed that a player will never choose a weakly dominated strategy, all voters will vote sincerely. Given that the preferences of voters are symmetric and single peaked, the electorate will behave according to the preferences of the

median voter. There are two possible subgames: either $r_i = -l_j$ or $r_i \neq -l_j$. In the latter case, the candidate closer to zero will win the election. In the former case, there is a tie between the candidates, and the median voter will decide by flipping a coin.

Second stage

Without loss of generality, the configurations in Table 2, along with their symmetric

counterparts, are an exhaustive list of all the possible subgames that parties may face, along with their corresponding NE (considering only the NE in pure strategies and non-weakly dominated strategies). In this list, the pair of strategies (l_i, r_j) refers to the decision of party L to nominate l_i in conjunction with the decision of party R to nominate r_j. The strategy "*randomize*" stands for the decision of the party to randomize equally between its two candidates

Nash Equilibria		
Subg. 1	$0 = r_1 = r_2 = -l_1 = -l_2$	$(randomize, randomize)$
Subg. 2	$0 < r_1 = r_2 = -l_1 = -l_2$	$(randomize, randomize)$
Subg. 3	$0 = r_1 = r_2 = -l_1 < -l_2$	$(l_1, randomize)$ and $(l_2, randomize)$
Subg. 4	$0 < r_1 = r_2 = -l_1 < -l_2$	$(l_1, randomize)$
Subg. 5	$0 = r_1 = r_2 < -l_1 = -l_2$	$(randomize, randomize)$
Subg. 6	$0 < r_1 = r_2 < -l_1 = -l_2$	$(randomize, randomize)$
Subg. 7	$0 = r_1 < r_2 = -l_1 = -l_2$	$(randomize, r_1)$
Subg. 8	$0 < r_1 < r_2 = -l_1 = -l_2$	$(randomize, r_1)$
Subg. 9	$0 = r_1 = r_2 < -l_1 < -l_2$	$(l_1, randomize)$ and $(l_2, randomize)$
Subg. 10	$0 < r_1 = r_2 < -l_1 < -l_2$	$(l_1, randomize)$ and $(l_2, randomize)$
Subg. 11	$0 = r_1 < r_2 = -l_1 < -l_2$	(l_1, r_1)
Subg. 12	$0 < r_1 < r_2 = -l_1 < -l_2$	(l_1, r_1)
Subg. 13	$0 = r_1 < r_2 < -l_1 = -l_2$	$(randomize, r_2)$
Subg. 14	$0 < r_1 < r_2 < -l_1 = -l_2$	$(randomize, r_2)$
Subg. 15	$0 = r_1 < r_2 < -l_1 < -l_2$	(l_1, r_2) and (l_2, r_2)
Subg. 16	$0 < r_1 < r_2 < -l_1 < -l_2$	(l_1, r_2) and (l_2, r_2)
Subg. 17	$0 = r_1 = -l_1 < r_2 = -l_2$	(l_1, r_1)
Subg. 18	$0 < r_1 = -l_1 < r_2 = -l_2$	(l_1, r_1)
Subg. 19	$0 = r_1 = -l_1 < r_2 < -l_2$	(l_1, r_2)
Subg. 20	$0 < r_1 = -l_1 < r_2 < -l_2$	(l_1, r_1)
Subg. 21	$0 = r_1 < -l_1 < r_2 = -l_2$	(l_1, r_1)
Subg. 22	$0 < r_1 < -l_1 < r_2 = -l_2$	(l_1, r_1)
Subg. 23	$0 = r_1 < -l_1 < r_2 < -l_2$	(l_1, r_1)
Subg. 24	$0 < r_1 < -l_1 < r_2 < -l_2$	(l_1, r_1)
Subg. 25	$0 = -l_1 < r_1 = r_2 < -l_2$	$(l_1, randomize)$
Subg. 26	$0 < -l_1 < r_1 = r_2 < -l_2$	$(l_1, randomize)$
Subg. 27	$0 = -l_1 < r_1 < r_2 < -l_2$	(l_1, r_2)
Subg. 28	$0 < -l_1 < r_1 < r_2 < -l_2$	(l_1, r_2)

To be part of a SPNE, any strategy profile S_L^* and S_R^* must induce these NE in the corresponding subgames. Note that subgames 3, 9, 10, 15 and 16 allow two NE in pure strategies, while all the other subgames allow a unique NE. To illustrate how this table was derived, I will prove the NE in subgame 3. Party R does not have a real choice since both of its candidates have adopted indistinguishable platforms. Its unique available strategy is to randomize between r_1 and r_2. On the other hand, party L has a choice between $l_1 = 0$ and $l_2 > 0$. If L nominates l_1 it will tie with R and the policy implemented will be 0 for sure. If L nominates l_2 it will lose against R and the policy implemented will be 0 for sure. Hence, both nominations lead to the same policy outcome and give L the same utility. Therefore, L is indifferent between l_1 and l_2 and the Nash equilibria are $(l_1, randomize)$ and $(l_2, randomize)$. Analysis of the other 27 subgames follows a similar logic.

First stage

Without loss of generality, the configurations in Table 3, along with their symmetric counterparts, are an exhaustive list of all the possible configurations of platforms that candidates may adopt, along with a profitable deviation, if any. Below, ε is some small positive number.

		Profitable deviation	NE
Conf. 1	$0 = r_1 = r_2 = -l_1 = -l_2$	None	Yes
Conf. 2	$0 < r_1 = r_2 = -l_1 = -l_2$	$r_1 \to 0$	No
Conf. 3	$0 = r_1 = r_2 = -l_1 < -l_2$	$l_2 \to l_1$	No
Conf. 4	$0 < r_1 = r_2 = -l_1 < -l_2$	$l_2 \to l_1$	No
Conf. 5	$0 = r_1 = r_2 < -l_1 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 6	$0 < r_1 = r_2 < -l_1 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 7	$0 = r_1 < r_2 = -l_1 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 8	$0 < r_1 < r_2 = -l_1 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 9	$0 = r_1 = r_2 < -l_1 < -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 10	$0 < r_1 = r_2 < -l_1 < -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 11	$0 = r_1 < r_2 = -l_1 < -l_2$	$l_1 \to 0$	No
Conf. 12	$0 < r_1 < r_2 = -l_1 < -l_2$	$l_1 \to 0$	No
Conf. 13	$0 = r_1 < r_2 < -l_1 = -l_2$	$l_1 \to 0$	No
Conf. 14	$0 < r_1 < r_2 < -l_1 = -l_2$	$l_1 \to 0$	No
Conf. 15	$0 = r_1 < r_2 < -l_1 < -l_2$	$l_1 \to 0$	No
Conf. 16	$0 < r_1 < r_2 < -l_1 < -l_2$	$l_1 \to 0$	No
Conf. 17	$0 = r_1 = -l_1 < r_2 = -l_2$	$r_2 \to r_1$	No
Conf. 18	$0 < r_1 = -l_1 < r_2 = -l_2$	$r_2 \to r_1$	No
Conf. 19	$0 = r_1 = -l_1 < r_2 < -l_2$	$r_2 \to r_1$	No
Conf. 20	$0 < r_1 = -l_1 < r_2 < -l_2$	$r_2 \to r_1$	No
Conf. 21	$0 = r_1 < -l_1 < r_2 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 22	$0 < r_1 < -l_1 < r_2 = -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 23	$0 = r_1 < -l_1 < r_2 < -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 24	$0 < r_1 < -l_1 < r_2 < -l_2$	$r_2 \to r_1 + \varepsilon$	No
Conf. 25	$0 = -l_1 < r_1 = r_2 < -l_2$	$l_2 \to l_1 - \varepsilon$	No
Conf. 26	$0 < -l_1 < r_1 = r_2 < -l_2$	$l_2 \to l_1 - \varepsilon$	No
Conf. 27	$0 = -l_1 < r_1 < r_2 < -l_2$	$l_2 \to l_1 - \varepsilon$	No
Conf. 28	$0 < -l_1 < r_1 < r_2 < -l_2$	$l_2 \to l_1 - \varepsilon$	No

I will prove why configuration 1 is a NE for the candidates. Suppose none of the candidates deviated. Then parties would face subgame 1, and we can see from Table 2 that each party randomizes between their candidates. Each candidate has a probability of $\frac{1}{4}$ of winning the election ($\frac{1}{2}$ probability to be nominated times $\frac{1}{2}$ probability to win the election conditional on being nominated). Suppose, on the other hand, that one of the candidates deviated *unilaterally*. Then parties would face subgame 3 or its symmetrical counterpart, and we can see that the candidate who deviated would either lose the nomination or win the nomination but lose the election for sure, depending on which of the two equilibria in subgame 3 was selected. Such a deviation is therefore not profitable, and the configuration is a NE.

Now I prove why configuration 2 is not a NE. Suppose none of the candidates deviated. Then the parties would face subgame 2, and we can see from Table 2 that each party randomizes between their candidates. Each candidate has a probability of $\frac{1}{4}$ of winning the election. Suppose, on the other hand, that one of the candidates, say r_1, deviated *unilaterally* to zero. Parties would face subgame 7 and r_1 would win both the nomination and the election. Since this is a profitable deviation for r_1 this configuration is not a NE.

In a similar way it can be proved that configurations 3 to 28 are not NE (see the profitable deviations in each case). Thus configuration 1 is the unique NE of the reduced game, and it is the unique strategy profile of candidates that can be part of a SPNE. Therefore in any strategy profile S_c^*, S_L^* and S_R^*, S_v^* that forms a SPNE, the outcome will be the same: candidates adopt the platforms in configuration 1, which are $0 = r_1 = r_2 = -l_1 = -l_2$, parties have no choice but to select the strategies $(randomize, randomize)$, and voters have no choice but to randomize between the two parties. This is exactly what the theorem says.

■

References

[1] Abjorensen, Norman, Yusaku Horiuchi, and Meg Sato (2012), "Decomposition of Valence and Paradox of Primary Election." *Crawford School Research Paper,* 15 (2012).

[2] Adams, James, and Samuel Merrill. "Candidate and party strategies in two-stage elections beginning with a primary." *American Journal of Political Science* 52.2 (2008): 344-359.

[3] Adams, James, and Samuel Merrill III. "Candidates' policy strategies in primary elections: does strategic voting by the primary electorate matter?." *Public Choice* 160.1-2 (2014): 7-24.

[4] Amorós González, Pablo, Ricardo Martínez, and M. Socorro Puy Segura. (2013) "The closed primaries versus the top-two primary." Universidad Carlos III de Madrid, Departamento de Economía, Working paper 13-19, September 2013

[5] Aragón, Fernando M. (2013), "Political parties, candidate selection, and quality of government," *The B.E. Journal of Economic Analysis & Policy*. Volume 13, Issue 2, Pages 783–810, August 2013

[6] Aragón, Fernando M. (2014), "Why do parties use primaries?: Political selection versus candidate incentives." *Public Choice* 160, no. 1-2 (2014): 205-225.

[7] Baldez, Lisa. "Cuotas versus primarias: la nominación de candidatas mujeres en México." *Mujer y política. El impacto de las cuotas de género en América Latina*, Chile: IDEA/FLACSO/Catalonia (2008): 157-177.

[8] Bruhn, Kathleen. "Electing Extremists? Party Primaries and Legislative Candidates in Mexico." *Comparative Politics* 45.4 (2013): 398-417.

[9] Bruhn, Kathleen (2014). "Choosing How to Choose: From Democratic Primaries to Unholy Alliances in Mexico's Gubernatorial Elections." *Mexican Studies/Estudios Mexicanos* 30.1 (2014).

[10] Buisseret, Peter, and Leonard Wantchekon (2014) "Communicating and Investing in Policy Expertise: A Case for Primaries." manuscript.

[11] Burden, B. C. 2001. "The Polarizing Effects of Congressional Primaries." In *Congressional Primaries in the Politics of Representation*, eds. P. F. Galderisi, M. Lyons, and M. Ezra. Lanham, MD: Rowman and Littlefield.

[12] Burden, B. 2004. "Candidate Positioning in US Congressional Elections." *British Journal of Political Science 34: 211–227.*

[13] Calvert, Randall L. (1985), "Robustness of the Multidimensional Voting Model: Candidate Motivations, Uncertainty, and Convergence," *American Journal of Political Science*, Vol. 29, p. 69-95.

[14] Carey, John M. and John Polga-Hecimovich (2006), "Primary Elections and Candidate Strength in Latin America," *Journal of Politics*, Vol. 68, No. 3,August 2006, pp. 530-543.

[15] Casas, Agustín (2013). "Partisan politics: parties, primaries and elections." UC3M Working papers. Economics 13-15. Universidad Carlos III de Madrid. Departamento de Economía. 2013-07 (July 2013)

[16] Castanheira, Micael, Benoit S.Y. Crutzen and Nicolas Sahuguet (2010), "Party Organization and Electoral Competition," *The Journal of Law, Economics, and Organization*, 26 (2): 212-242.

[17] Crutzen, Benoit SY (2013). "Keeping Politicians on Their Toes: Does the Way Parties Select Candidates Matter?." manuscript

[18] Downs, Anthony (1957), *An Economic Theory of Democracy*, Harper and Brothers Publishers, New York.

[19] Evrenk, Haldun, Timothy Lambie-Hanson, and Yourong Xu. 2013 "Party-bosses vs. party-primaries: Quality of legislature under different selectorates." *European Journal of Political Economy* 29 (2013): 168-182.

[20] Field, Bonnie N., and Peter M. Siavelis (2009). "The Determinants of Candidate Selection Procedures in New Democracies: Evidence from Spain (1977-1982) and Chile

(1989-2005)." Estudio/Working Paper 109/2009, Departamento de Ciencia Política y Relaciones Internacionales, Universidad Autónoma de Madrid.

[21] Folke, Olle, Torsten Persson, and Johanna Rickne. 2013. "Preferential voting and the selection of party leaders: Evidence from Sweden." manuscript.

[22] Gherghina, Sergiu (2013). "One-Shot Party Primaries: The Case of the Romanian Social Democrats." *Politics* (2013).

[23] Hinojosa, Magda (2012), *Selecting Women, Electing Women: Political Representation and Candidate Selection in Latin America*, Philadelphia, Temple University Press.

[24] Hirano, Shigeo, James M. Snyder Jr., Stephen Daniel Ansolabehere, and John Mark Hansen. 2010. Primary elections and partisan polarization in the U.S. Congress. *Quarterly Journal of Political Science* 5(2): 169-191

[25] Hirano, Shigeo, James M. Snyder Jr., and Michael M. Ting. "Distributive politics with primaries." *Journal of Politics* 71.4 (2009): 1467-1480

[26] Hirano, Shigeo, J. M. Snyder, and Michael M. Ting. "Primary elections and the provision of public goods." (2013), manuscript.

[27] Hortala-Vallve, Rafael, and Hannes Mueller (2009). "Primaries: the unifying force." London School of Economics, manuscript.

[28] Hummel, Patrick. "Candidate strategies in primaries and general elections with candidates of heterogeneous quality." *Games and Economic Behavior* 78 (2013): 85-102.

[29] Ichino, Nahomi, and Noah L. Nathan. 2012. "Primaries on Demand? Intra-Party Politics and Nominations in Ghana." *British Journal of Political Science* 42(4): 769–91.

[30] Ichino, Nahomi, and Noah L. Nathan. 2013. "Do Primaries Improve Electoral Performance? Evidence from Ghana." *American Journal of Political Science* 57(2): 428–41.

[31] Indriðason, Indriði H., and Ásdís J. Sigurjónsdóttir. 2014 "Girls against boys: Primaries in a proportional representation system." *Representation* 50.1 (2014): 27-40.

[32] Jackson, Matthew O., Laurent Mathevet, and Kyle Mattes. "Nomination processes and policy outcomes." *Quarterly Journal of Political Science* 2.1 (2007): 67-92.

[33] Jones, Mark (2012), "Presidentialism and Legislatures," in *Routledge Handbook of Latin American Politics*, eds. Peter Kingstone and Deborah Yashar, Routledge, pp. 21-32 (2012)

[34] Kselman, Daniel, (2014) "Median Activists or Median Voters, the Contingent impact of Primary Elections," manuscript, IE Business School.

[35] Kemahlioglu, Ozge, Rebecca Weitz-Shapiro and Shigeo Hirano (2009), "Why Primaries in Latin American Presidential Elections?", *Journal of Politics*, Vol. 71, No. 1, January 2009, pp. 339-352.

[36] Morton, Rebecca B. (2006), *Analyzing Elections: New Institutionalism in American Politics*, W. W. Norton & Company.

[37] Mutlu-Eren, Hande (London School of Economics and Political Science). "(De)Selection of Prime Ministers by Party Members", February 20, (2013), manuscript.

[38] Peress, Michael. "Candidate positioning and responsiveness to constituent opinion in the US House of Representatives." *Public Choice* 156, no. 1-2 (2013): 77-94.

[39] Padró i Miquel, Gerard, and Erik Snowberg (2012). "The lesser evil: Executive accountability with partisan supporters." *Journal of Theoretical Politics* 24.1 (2012): 19-45.

[40] Schumer, Charles E. (2014), "End Partisan Primaries, Save America: Adopt the Open Primary," The New York Times, Opinion Pages, July 21, 2014.

[41] Serra, Gilles (2011), "Why Primaries? The Party's Tradeoff between Policy and Valence," *The Journal of Theoretical Politics*, January, 23 (1), pp. 21-51.

[42] Serra, Gilles (2013), "When will Incumbents Avoid a Primary Challenge? Aggregation of Partial Information About Candidates' Valence," in *Advances in Political Economy:*

Institutions, Modelling and Empirical Analysis, eds. Norman Schofield, Gonzalo Caballero and Daniel Kselman, Springer, March, pp. 217-248.

[43] Snyder Jr., J. M., & Ting, M. M. (2011). Electoral selection with parties and primaries. *American Journal of Political Science*, 55(4), 782-796.

[44] Wittman, Donald (1973), "Parties as Utility Maximizers", *American Political Science Review,* Vol. 67, p. 490-498.

[45] Zudenkova, Galina. 2012 "A rationale for intra-party democracy." (2012)., University of Mannheim manuscript.