Who emerges from smoke-filled rooms? Political parties and candidate selection

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Political Parties and Candidate Selection

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Abstract

This paper presents a model of candidate selection through political parties where politicians differ in terms of their quality and their favored policies. The central assumption is that political parties are better informed about their potential candidates than voters are. Questions of interest include whether voters can gain information about candidates by observing the party's choice and to what extent parties select the candidates preferred by the median voter. The results depend crucially on how competitive the race is. Under strong competition, nominating a politically more extreme politician is a signal of high quality. Sufficient competition also induces parties to act in the interest of the median voter most of the time, even when parties attach very little intrinsic value to quality. As ideological alignment between the median voter and a party reduces the degree of competition that this party faces, the median voter can be better off when parties are polarized.

Keywords: Political parties, electoral competition, valence, candidate selection, primaries.

JEL Classification: D72.

1 Introduction

Before the emergence of primary contests, US presidential candidates were selected by the leadership of their respective parties. The popular cliche of the nominee being chosen in "smoke-filled rooms" by men in black suits with big cigars captures the sentiment that this process was undemocratic, intransparent, and ultimately to the disadvantage of voters. In the face of expensive and drawn-out primary elections, other observers have held that party establishments consist of professional politicians who know their potential candidates well and can judge which politician has the best chances of getting into office. Indeed, parties should typically have more information about their potential candidates than outsiders do. The question is whether they use this superior information to make informed decisions on behalf of voters or to further their own interests.

This paper tries to shed some light on these issues through constructing a theoretical model of candidate selection through party elites. As hinted at above, the focus of attention will be on the informational advantage of the party leadership over outsiders. Combined with the assumption that parties are special interest groups that pursue political goals that differ from the interest of the (median) voter, this makes it more difficult for electoral incentives to discipline parties to select good candidates. While they might attach little weight to the quality of their candidates[1], the main interest of parties is to select candidates that are well aligned with the party line. From the perspective of voters this creates a problem of hidden information: Did the party select a more politically extreme candidate because that candidate has high quality or simply because the candidate shares the political goals of the party?

The trade-off between quality and policy arises because voters and party members care about the policy preferences that differ from politician to politician even within one party. For example, voters in Republican primary elections in the United States are often concerned whether a potential nominee is actually a "true conservative". From a theoretical perspective such a concern arises perhaps because full policy commitment is not possible. Knowing the policy preferences of a politicians could help to predict her behavior in the case of unforseen contingencies, for example. In the model this dimension of candidate

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[1] Quality here describes a characteristic of politicians that is valued by voters independently of the implemented policy, such as honesty or competence. The political economics literature often uses the term "valence" instead of quality.

selection is emphasized through the assumption that politicians cannot commit to any policy and will implement their most preferred one.

The elite centered approach to candidate selection is of more than historical interest, as it is still used today even in well-established democracies. For example, in France the responsibility for the nomination of candidates for the National Assembly rests largely with central parties. In Germany, candidates for the office of prime minister are formally elected at national party conventions. However, there is typically only one candidate, namely the candidate previously announced by the party leadership. This example also fits well with another assumption of the model: Voters know who the potential nominees are and possess at least some partial information about them. In Germany, public discussions about who could become the next candidate start well in advance of the actual nomination. Here, the assumption that will be maintained throughout most of the paper is that voters are well informed about the policies a politician stands for while they know little about quality. It could be argued that the careers of politicians prior to being considered for a nomination are more informative about policy than quality. After all, politicians make political decisions along similar ideological fault lines throughout their career. On the other hand, higher offices may require skills that a politician was not able to demonstrate before. This argument notwithstanding, a later chapter suggests that the results are robust to some uncertainty along the policy dimension as well.

This paper is not the first to analyze how parties generate candidates for elections. In a seminal paper by Snyder & Ting (2002) voters initially have no information about individual politicians. By joining a party politicians can reveal their policy preferences to some extent, as parties impose costs on politicians who are located too far from the party platform. This model seems most appropriate for politicians in early stages of their career who voters know little about. Papers where parties play a more active role in nominating candidates have considered how different methods of selecting candidates induce homogenous candidates to supply effort (Caillaud & Tirole 2002, Castanheira et al. 2010) or have focused exclusively on either the quality/valence dimension or the policy dimension. Quality is the center of attention in Mattozzi & Merlo (2007, 2010), and Snyder & Ting (2011), while Cadigan & Janeba (2002) and Jackson et al. (2007) are concerned with policy.[2] Contributions that feature both quality

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[2]These last two papers are quite similar to the current one in that they extend a citizen-candidate model by candidate nomination through parties. Compared to those contributions,

and policy are Adams & Merrill (2008) and Serra (2011). However, politicians in these papers are office motivated and do not have policy preferences. In equilibrium all politicians within a party propose the same policy.

A concurrent paper by Boleslavsky & Cotton (2012) develops a model that features many of the assumptions made here. The crucial difference is that in their paper parties have the same information as voters at the time the nomination is decided. This precludes that the choice of candidate could reveal any information to voters. The common feature is that the introduction of imperfectly observed quality softens competition over policies.

Among the papers given above, Adams & Merrill (2008), Serra (2011), and Snyder & Ting (2011) investigate the question of why parties may choose to adopt primaries to select their candidates. They take the benefit from primaries to be that they reveal information about the quality of politicians, with the most competent one going on to win the nomination. This makes the party more competitive. The benchmark that this is compared to, however, is that the party has only one potential candidate or chooses randomly. As Snyder & Ting (2011) point out (p. 783, footnote 8), "Naturally, introducing a primary would benefit a party less electorally if it had an alternative selection mechanism that more frequently generated the voter's preferred candidate."

The answer that this paper provides to the point raised by Snyder and Ting is that even undemocratic nomination of candidates through the party leadership can serve the voter surprisingly well. The condition required for this to hold is that the race is not skewed in favor of one of the competing parties. If there is too little competition, the likely winner will select candidates according to her political preferences. The probable loser, on the other hand, might be forced to select candidates that are closer to the preferred policy of the median voter. Both sides will place to little weight on quality. With the right degree of competition, in contrast, parties nominate the preferred candidates of the median voter based both on policy and quality in almost all cases. In fact, it can be optimal for the median voter to rely on the better informed party's choices rather than collecting additional information about politicians herself. Remarkably, even the gap between the political interests of the median voter and the party leadership can work to the advantage of the median voter. This is because a party who shares the same political goals is more likely to select candidates that are ex-ante attractive to the median voter.

the results here show that there is less policy convergence when candidates also differ in quality.

This weakens competition and reduces the incentives of the party to select high quality candidates.

The basic model will be presented in the next section. Section 3 describes the different shapes that equilibrium takes depending on the degree of competition. In addition, results on welfare and some comparative statics are presented. Subsequently, section 4 relaxes some of the assumptions made in the basic version of the model. Section 5 concludes.

2 The Model

N voters (N odd) care about two characteristics of politicians. The first is their policy preference: Each politician has an ideal policy $i \in \mathbb{R}$. The second characteristic is quality. A politician can either be of low or high quality $q \in \{0, 1\}$.[3] While the quality of the policy maker enters the utility function of voters directly, they care about policy preferences because it is assumed that elected politicians implement their ideal policy. In the tradition of citizen-candidate models, committing to any other policy is not possible. The utility of a voter with ideal policy x from a policy i implemented by a policy maker with quality q is

$$u_x(i, q) = -(i - x)^2 + q \ .$$

The distribution of ideal points x is assumed to be such that the median ideal point lies at zero.

Politicians belong to either one of two parties. The current incumbent belongs to party I and through acting as policy maker has already revealed her quality q_I and ideal policy, which is also denoted by I and assumed to be smaller than zero.[4] Denote by

$$\mathcal{I} \equiv -I^2 + q_I$$

the utility that the median voter would receive from reelecting the incumbent.

The second party, party C, has a party leader whose role it is to nominate one of two politicians as the party's candidate for the election. The ideal policies of these two politicians lie in the interval $[0, 1]$. The politician located further away from zero is referred to as the extremist and her most preferred policy

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[3] It would also be possible to let quality be a continuous variable. The binary representation of quality is chosen for simplicity.

[4] An incumbent is introduced purely to simplify the exposition. It would also be possible to let two parties compete by choosing candidates, which would yield qualitatively very similar results.

is given by $E \in (0,1]$. Her competitor for the party nomination is called the moderate, with ideal policy given by M with $0 \leq M < E$. Politicians are identified by their ideal policies. Voters know that their respective qualities, q_M and q_E, independently take the value one with probability π, which is also the unconditional expectation of quality. The party leader, on the other hand, observes qualities directly. All other variables are common knowledge.

The party leader can be thought of as representing the group at the top of the party hierarchy, which controls the nomination process. The ideal policy of the party leader is different from the one preferred by the median voter and assumed to be equal to one. The utility function of the leader is given by

$$u_C(i, q) = -(i-1)^2 + \mathbb{1}_{\omega \in \{M,E\}} (w \cdot q + Y),$$

where ω indicates the winner of the election and $Y \geq 1$ is a payoff that the leader receives if the winner belongs to her party. Y is introduced to make sure that the party leader never prefers the reelection of the incumbent over the election of one of the politicians belonging to party C. Finally, w is a function that determines the weight that the party leader attaches to nominating a candidate of high quality. While w will be defined formally below after some additional notation has been introduced, it captures the idea that the party leader does not intrinsically care about the quality of candidates but only because candidates of higher quality are more likely to be reelected. Accordingly, the party leader should care less about quality when her party faces weaker competition.

It is worth pausing here for a moment to further discuss some of the features of the model. The assumption that the ideal policy of the party leader is one is made for simplicity. What is actually crucial for the results is that the party leader is located closer to the extremist than to the moderate. Regarding the politicians of party C, a noteworthy assumption is that the moderate and the extremist are never at a distance greater than one. This implies that competition takes place in a range where quality trumps policy: Voters always prefer any high quality politician over any low quality politician. Allowing politicians to be further away from each other would not add any equilibria.

The strategic players in this game are the party leader and the median voter. After observing the quality of her politicians the party leader nominates one of them as the party's candidate for the election. The party leaders strategy is given by the function $\eta_M(q_M, q_E)$, which gives the probability that the leader will nominate the moderate given the realization of the qualities of both politi-

cians. While this is generally sufficient, it will be convenient to directly refer to the probability of nomination of the extremist as well, which is given by $\eta_E(q_M, q_E) = 1 - \eta_M(q_M, q_E)$. After the nomination decision has been made, voters update their priors and vote for the incumbent or the challenger nominated by party C. The outcome of the election is driven by the median voter and it is therefore sufficient to focus on her behavior. Let $r(p)$ be the probability that the median voter elects the candidate of party C given that politician p has been nominated.

The function w, which determines the weight that the party leader places on quality, can now be defined as a mapping from to the election probabilities of both politicians of party C to the nonnegative real numbers: $w : [0,1]^2 \to \mathbb{R}_+$. The only restriction placed on this function is that $w(r(M), r(E)) = 0$ if and only if $r(M) = r(E) = 1$: The party leader does not care about the quality of his candidates when both of them would be elected with certainty, but attaches some weight to it otherwise.

The structure of the game is that of a signaling game, where the party leader is the sender and the median voter is the receiver. Messages are of the form "You see I had a choice between these two politicians and I decided to nominate this one." In the language of signaling games, the type $q_C \equiv (q_M, q_E)$ of the party leader is the combination of qualities she observes and the type-space is $Q \equiv \{0,1\}^2$. The posterior probability that the nominated politician is of high quality is denoted by $\bar{\pi}_p$.

Signalling games typically have many perfect Bayesian equilibria, as it is possible to assign any belief that supports an equilibrium at information sets that are off the equilibrium path. The same is true here: For example, if voters believe that the extremist has quality zero, always nominating the moderate independent of actual qualities is an equilibrium. To be able to make sharper predictions it is therefore imposed that beliefs off the equilibrium path satisfy the refinement of Universal Divinity due to Banks & Sobel (1987). To give an informal description of the requirements of Universal Divinity, suppose that voters observe that the party leader unexpectedly nominates a certain politician. Voters then believe with certainty that the quality of the unexpectedly nominated politician must be such that it makes the leader most likely to gain from this move. The notion of "the type that is most likely to gain" is formalized as the type of leader that gains in utility for the greatest set of voter responses: Let $\rho(p|q_C)$ be the set of election probabilities such that the party leader of type q_C receives a greater expected utility from nominating politician

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p rather than her competitor. If politician p never gets nominated then $\bar{\pi}_p$ is restricted to be consistent with the belief that $q_C = q^*$, where q^* satisfies $\rho(p|q^*) \supset \rho(p|q') \; \forall q' \in Q \setminus q^*$.

An additional issue more specific to this particular model is that the party leader is indifferent between all possible strategies once neither politician belonging to party C can get elected. As a consequence the party leader could be playing the strategy "always nominate the politician with the lowest quality", which in turn could make it a best response for the median voter to reelect the incumbent with certainty. However, it seems implausible that voters would expect the party leader to behave in this way. In order to circumvent this issue all equilibria that feature weakly dominated strategies are excluded. As intended this requirement only affects equilibria where both the extremist and the moderate get defeated by the incumbent with certainty.

Universal Divinity is a strong refinement that does not have a behavioral justification. However, it is not essential for the analysis. Given the exclusion of weakly dominated strategies, it would also be possible to use a different restriction on beliefs that would yield the same results: Let (η^n) be a sequence of weakly undominated nomination strategies such that under each element of the sequence both politicians of party C get nominated with positive probability. Let $(\bar{\pi}_p^n)$ be the sequence of beliefs over the quality of politician p implied by the sequence of strategies. A posterior belief $\bar{\pi}_p$ is admissible only if it is possible to find a sequence (η^n) such that $\bar{\pi}_p$ is the limit of the beliefs implied by the strategy sequence, i.e. $\bar{\pi}_p = \lim_{n \to \infty} (\bar{\pi}_p^n)$.

3   Results

Whether or not a candidate nominated by the leader of Party C stands a chance of getting elected depends on her political position as well as the expectation of voters regarding the quality of that candidate. Candidates that are very close to the median voter's most preferred policy can get elected even if they are perceived as being of low quality. Conversely, even a candidate far from the center can be appealing to the median voter if her expected quality is high enough. However, this expectation of high quality is difficult to maintain. Suppose that the extremist gets elected with certainty once nominated, because voters believe that the party leader nominates the moderate if the extremist turns out to be of low quality. Given this high probability of winning, the leader then

actually prefers to nominate the extremist even when she is of low quality, since the extremist is politically closer to the leader. This undermines the initial expectation that the extremist is of high quality.

The exact shape of equilibrium therefore depends on the positions of both potential candidates of party C. If both are located close enough to the median the incumbent never gets reelected. This case is referred to as "No Competition". The case labeled "Limited Competition" describes the situation where only the moderate can get elected. This requires that the moderate is close to the center while the extremist is indeed too extreme and the median voter can never be persuaded to elect her. The most interesting case, called "Full Competition", features a positive probability of election for either politician belonging to party C as well as the incumbent. The next three sections explore each case in more detail. Finally, it is also possible that neither the moderate nor the extremist stands a chance of being elected. Obviously, this requires that both politicians are relatively far from the center. Determining the exact conditions under which this is an equilibrium, however, is a rather technical exercise, which is therefore relegated to the appendix.

3.1   No Competition

Characterizing this equilibrium is straightforward: If both politicians of party C are located close enough to the median voter the incumbent never gets reelected: $r(M) = r(E) = 1$. As this implies that the party leader places zero weight on quality, she always prefers to nominate the extremist. Accordingly, voters expect that the extremist has average quality: $\bar{\pi}_E = \pi$. This equilibrium exists as long as the median voter at least weakly prefers the extremist over the incumbent, which is equivalent to the condition $E \leq \sqrt{\pi - \mathcal{I}}$.

In this equilibrium the median voter has no means to discipline the party leader who chooses her preferred politician without having to worry about electability. Consequently, the median voter would be better off if the ideal policy of the party leader was closer to her own ideal policy. The threshold on the position of the party leader at which her nomination strategy changes is the point at which she is equidistant from both politicians: A party leader who is located closer to the moderate than to the extremist would always nominate the moderate. The quality of the nominated politicians, however, is average in either case.[5]

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[5]To give a complete description of equilibrium the belief of voters over the quality of the

3.2 Limited Competition

When only one politician in Party C can successfully challenge the incumbent this is also the only politician that can get nominated. Nominating the candidate that loses for sure could only be optimal for the party leader if the utility from the other candidate getting elected was lower than the utility from the incumbent being reelected. Due to the assumption that the payoff Y from winning the election is at least one this is impossible. It follows that the party leader must always be nominating the politician that wins with positive probability.

In this situation voters cannot use Bayes' rule to update their belief over the quality of the politician that never gets nominated. The restrictions imposed on this off-equilibrium path belief by Universal Divinity are given by the following Lemma.

Lemma 1. *Fix some $p \in \{M, E\}$. An equilibrium in which $\eta_p(q_C) = 0$ for all $q_C \in Q$ satisfies Universal Divinity if and only if $\bar{\pi}_p = 1$.*

Proof. It needs to be shown that the party leader gains from nominating politician p for a strictly greater set of election probabilities when $q_p = 1$ rather than $q_p = 0$. Let p' denote the competitor for the party nomination of politician $p \in \{M, E\}$. The interim utility of the party leader under a strategy profile $\sigma = (\eta_p, r)$ where $\eta_p(q) = 0$ for all $q \in Q$ (politician p is nominated only off the equilibrium path) is given by

$$r(p')[-(p'-1)^2 + w(r(p), r(p')) \cdot q_{p'} + Y] + (1 - r(p'))[-(I-1)^2] . \qquad (1)$$

The interim utility of the party leader from deviating to nominating politician p would be

$$r(p)[-(p-1)^2 + w(r(p), r(p')) \cdot q_p + Y] + (1 - r(p))[-(I-1)^2] .$$

Since this last expression is weakly increasing in q_p, the party leader must gain from nominating politician p when $q_p = 1$ whenever she gains from nominating politician p when $q_p = 0$. It remains to be shown that there exists at least one pair of election probabilities such that the party leader gains from nominating politician p when $q_p = 1$ but not when $q_p = 0$. Suppose $q_p = q'_p = 0$. The difference between the two utilities above is then a continuous function of $r(p)$ and $r(p')$ that maps from the unit square to the real numbers. Call this function $F(r(p), r(p'))$. Due to the restrictions on parameters, F is negative for $r(p') = 0$ and $r(p) > 0$, while it is positive for $r(p') > 0$

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moderate would have to be specified as well. According to lemma 1 below, Universal Divinity implies $\bar{\pi}_M = 1$, which makes $r(M)$ the best response of the median voter to the nomination of the moderate: As the median voter prefers an extremist of average quality over the incumbent, she must also prefer a moderate of high quality over the incumbent.

and $r(p) = 0$. Fix a point in $[0,1]^2$ such that F is negative and a second point such that F is positive and restrict F to the line connecting these points. Due to the intermediate value theorem, there must be a pair (r_1, r_2) such that $F(r_1, r_2) = 0$. Furthermore, as $(r_1, r_2) \neq (0,0)$ it follows that $w(r_1, r_2) \neq 0$ by assumption. Accordingly, the party leader gains from nominating politician p at $(r(p), r(p')) = (r_1, r_2)$ for $q_p = 1$ but not for $q_p = 0$. $\qquad\square$

Intuitively, as the party leader prefers to nominate candidates of high quality, she is most likely to gain from deviating to nominating a different candidate if that candidate has high quality. Universal Divinity accordingly requires that voters believe that unexpectedly nominated politicians have high quality. The politician that never gets elected must consequently be the extremist. Otherwise the median voter would strictly prefer an unexpectedly nominated moderate over the incumbent and $r(M) = 0$ would not be a best response to the nomination of the moderate.

As the moderate is always nominated she is expected to be of average quality: $\bar{\pi}_M = \pi$. The median voter has to at least weakly prefer her over the incumbent in order to elect her with positive probability, which is equivalent to the condition $M \leq \sqrt{\pi - \mathcal{I}}$. Whenever this holds as a strict inequality the moderate is elected with certainty. In addition, not electing the extremist must be a best response. This requires that the median voter at least weakly prefers the incumbent over an extremist of high quality, which again is the posterior implied by Universal Divinity. This implies the condition $E \geq \sqrt{1 - \mathcal{I}}$.

Limited Competition is the exact opposite of No Competition in the sense that in the former case the party leader is completely constrained in her choice of which politician to nominate. Accordingly, the preferences of the party leader over policies are of no consequence for the outcome of the nomination process.

3.3 Full Competition

The discussion now turns to the case where both potential candidates of party C as well as the incumbent ex-ante stand a chance of winning the election. This type of equilibrium exists when the median voter prefers the extremist over the incumbent only if she believes the extremist to be of high enough quality. The choice of the party leader to nominate the extremist must then be a credible signal that this is indeed the case. This requires that the median voter elects the moderate more frequently than the extremist. Intuitively, this will make the moderate a more attractive option for the party leader, and given that

competition induces the party leader to care about quality, the extremist will then be less likely to get nominated when she is of low quality.

That the moderate is elected more frequently than the extremist implies that the extremist is elected with probability strictly between zero and one. In other words, the median voter must be playing a mixed strategy. This in turn implies that the median voter must be indifferent between electing the extremist and reelecting the incumbent. The following theorem states that this is only possible if the extremist is located such that the median voter would prefer her over the incumbent if she had high quality but not if she had average quality. In addition, the moderate cannot be located too far from the median either.

Theorem 1. *An equilibrium where both politicians belonging to party C and the incumbent get elected (i.e. $r(M) > 0$, $r(E) > 0$, and $r(M) + r(E) < 2$) exists whenever $\sqrt{\pi - \mathcal{I}} \leq E \leq \sqrt{1 - \mathcal{I}}$ and*

$$M \leq \sqrt{\frac{\pi(\mathcal{I} + E^2)}{\mathcal{I} + E^2 - \pi(1 - \pi)} - \mathcal{I}} \ .$$

Furthermore, $r(M) = 1$ in any such equilibrium.

Proof. First of all, it is stated without formal proof that it is impossible that $0 < r(M) < 1$ and $0 < r(E) < 1$ simultaneously. This would require that the median voter is indifferent between all candidates, which in turn would require that the party leader plays a mixed strategy under more than one combination of politician qualities. Otherwise it is impossible to generate the posterior beliefs that make the median voter indifferent. As should become clear below, however, indifference of the party leader between her pure strategies can only hold for one pair of politician qualities at a time.

Next, assume that the politician getting elected with certainty was the extremist. This would imply that the moderate either never gets nominated or is chosen only in the case $q_C = (1, 0)$, depending on the value of $w(r(M), r(E))$. Both cases lead to the posterior belief $\bar{\pi}_M = 1$. But if the median voter is willing to elect the extremist then she must certainly prefer a moderate of high quality over the incumbent as well, contradicting that $r(M) + r(E) < 2$.

It must therefore be true that $r(M) = 1$ and $r(E) < 1$. This can only hold if the median voter is indifferent between the incumbent and the extremist, which requires

$$\bar{\pi}_E = \mathcal{I} + E^2 \ . \tag{2}$$

To generate this posterior expected quality of the extremist the party leader must be playing a mixed strategy. In equilibrium mixing is only possible for one particular realization of qualities as different combinations of qualities require different election

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probabilities to achieve indifference of the party leader as long as $w(r(M), r(E)) > 0$, which is the case here. As the moderate gets elected with certainty the expected utility of the party leader from nominating the moderate is

$$-(M-1)^2 + w(1, r(E)) \cdot q_M + Y$$

while nominating the extremist gives

$$r(E)[-(E-1)^2 + w(1, r(E)) \cdot q_E + Y] + (1 - r(E))[-(I-1)^2] .$$

Equating the two utilities it is possible to derive the following identity:

$$r(E) = \frac{[-(M-1)^2 + w(1, r(E)) \cdot q_M + Y] - [-(I-1)^2]}{[-(E-1)^2 + w(1, r(E)) \cdot q_E + Y] - [-(I-1)^2]} . \tag{3}$$

Given the restrictions on parameters the expression on the righthand side is always positive. In the case of $q_M = q_E = 0$ the numerator is smaller than the denominator and accordingly there exists an election probability $r(E)$ that leaves the party leader indifferent between nominating either a moderate or an extremist of low quality.

Indifference between politicians of low quality implies that under the quality combinations $(1,0)$ and $(0,1)$ the party leader nominates the politician of high quality, while in the case of both having high quality the party leader strictly prefers to nominate the moderate. The last point can be seen by recognizing that in this case the utility from nominating the moderate is equal to the utility of nominating a moderate of low quality plus $w(1, r(E))$ and the utility from nominating the extremist equal to the utility of nominating an extremist of low quality plus $w(1, r(E)r(E))$. Hence, indifference in the $(0,0)$-case implies that the difference in utilities from nominating the moderate and the extremist is equal to $w(1, r(E))(1 - r(E))$ in the $(1,1)$-case, which is positive. Given this strategy of the party leader, posterior expectations are given by

$$\bar{\pi}_M = \frac{\pi}{\pi + (1-\pi)^2(1 - \eta_E(0,0))} \tag{4}$$

and

$$\bar{\pi}_E = \frac{\pi}{\pi + (1-\pi)\eta_E(0,0)} .$$

Solving this last equality for $\eta_E(0,0)$ and using equation (2) to substitute for $\bar{\pi}_E$ gives

$$\eta_E(0,0) = \frac{\pi(1 - \mathcal{I} - E^2)}{(1-\pi)(\mathcal{I} + E^2)} . \tag{5}$$

For this expression to be no greater than 1, it must be true that $\mathcal{I} \geq -E^2 + \pi$. This first necessary condition for the existence of this equilibrium implies that the denominator is positive. The second condition, which ensures that the numerator is nonnegative, is $\mathcal{I} \leq -E^2 + 1$. Finally, it has to be true that the median voter weakly prefers the

moderate over the incumbent: $\mathcal{I} \leq -M^2 + \bar{\pi}_M$. After substituting equation (6) into equation (4) this condition can be written as

$$\mathcal{I} \leq -M^2 + \frac{\pi(\mathcal{I} + E^2)}{\mathcal{I} + E^2 - \pi(1 - \pi)} \ .$$

For any case other than $q_M = q_E = 0$ it is not guaranteed that condition (3) can be satisfied, as w has not been assumed to be continuous in $r(E)$. All further derivations are therefore conditional on the existence of a value of $r(E)$ as required.

If the election strategy of the median voter was such that the party leader was indifferent if $q_M = 0$ and $q_E = 1$, then the party leader would strictly prefer to nominate the moderate whenever the quality of the extremist is zero. This implies $\bar{\pi}_E = 1$ and contradicts that the median voter could be indifferent between the incumbent and the extremist.

Indifference under $q_M = 1$ and $q_E = 0$, on the other hand, would result in the nomination of the extremist whenever she has high quality and when both politicians have low quality. The posterior beliefs are then

$$\bar{\pi}_M = 1$$

and

$$\bar{\pi}_E = \frac{\pi}{\pi + (1 - \pi)^2 + (1 - \pi)\pi \eta_E(1, 0)} \ .$$

Solving this last equality for $\eta_E(1, 0)$ and using equation (2) to substitute for $\bar{\pi}_E$ gives

$$\eta_E(1, 0) = \frac{\pi - [\pi + (1 - \pi^2)](\mathcal{I} + E^2)}{(1 - \pi)\pi(\mathcal{I} + E^2)} \ . \tag{6}$$

The necessary and sufficient conditions for this expression to be positive and no greater than one are

$$-E^2 + \pi \leq \mathcal{I} \leq -E^2 + \frac{\pi}{\pi + (1 - \pi^2)}.$$

The requirement that the median voter at least weakly prefers the moderate over the incumbent in this case is equivalent to the condition $\mathcal{I} \leq -M^2 + 1$.

Finally, suppose the party leader is indifferent between nominating either politician if both are of high quality. Proceeding as before, an equilibrium with this feature can be shown to exists under the same conditions as in the previous paragraph □

As the preceding proof shows, there are up to three equilibria that satisfy the definition of Full Competition. In one the party leader is indifferent between nominating either politician if both are of low quality ("low quality indifference") while in the other two cases - whose existence is not guaranteed - indifference holds for other combinations of qualities. The equilibrium with low quality

Figure 1: Equilibrium for different positions of politicians
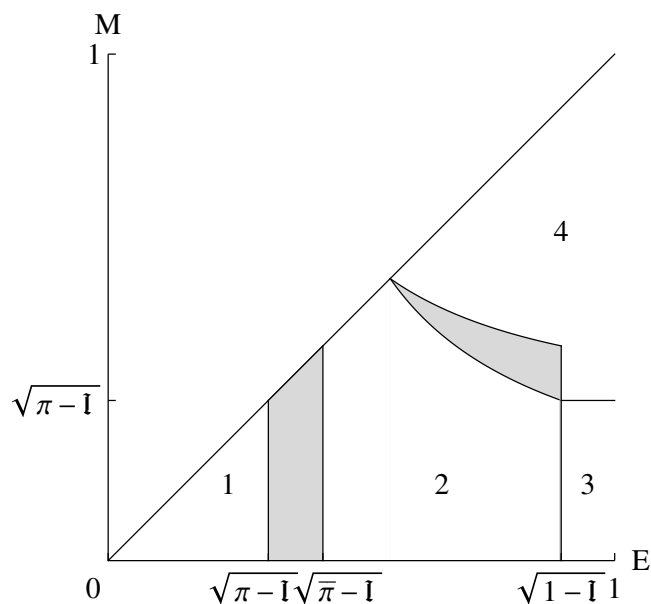
indifference exists more widely, as can be seen in figure 1, which exemplifies the existence conditions for the different types of equilibria for given characteristics of the incumbent and a specific average quality. The possible combinations of M and E lie below the 45-degree line, as $M < E$. All areas where more than one equilibrium exists are shaded. The No Competition equilibrium exists in area 1, when both politicians are relatively close to zero. Full Competition occurs in area 2 and both shaded areas. Within this area, the equilibrium with low quality indifference exists everywhere while the other two cases are confined to the shaded region bordering on area 1. In area 3, where the extremist is located far from the median, the Limited Competition equilibrium is the unique equilibrium. Finally, in area 4 and the bordering shaded region equilibria exist where no politician of party C can get elected as both of them are too far from zero.[6]

Given that the equilibrium with low quality indifference exists more generally it will from here on be the equilibrium referred to when discussing the Full

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[6]The boundaries on this region are derived in the appendix.

Competition case. In this equilibrium electoral incentives work very well in disciplining the party leader. The only case where the party leader does not always nominate the politician preferred by the median voter is the case of both politicians having low quality. Importantly, the fact that the party leader otherwise follows the preference of the median voter in her nomination choice is not driven by the party leader's own preference for politicians of high quality. In fact, $w(r(M), r(E))$ can be arbitrarily small as long as it remains positive. This is because in equilibrium the ideological appeal of the extremist is weighed up by her lower electability. The party leader's decision is therefore driven by quality even when she attaches little value to quality in general.

While the expected quality of the extremist is always such that the median voter is indifferent between the extremist and the incumbent, the relationship between the expected quality of the moderate and of the extremist depends on the utility that the median voter gets from reelecting the incumbent, $\mathcal{I}$, which can be interpreted as the degree of competition. If $\mathcal{I}$ is relatively low and there is only moderate competition, expected quality is higher for the moderate than for the extremist as in the No Competition case described above. As $\mathcal{I}$ becomes larger and competition intensifies this relationship reverses. In short, it is electability that determines which choice of nominee signals higher quality. The ideological preferences of the party have a tendency to make the extremist look like the weaker candidate, but this is not true if this nomination choice implies a significant drop in the chance of winning the election.

The mixed strategy that the median voter plays when the extremist is nominated reflects the difficulty in maintaining the expectation that the extremist has high quality. Electing her any more frequently would make the extremist too attractive from the perspective of the party leader, which in turn would lower her expected quality and render this candidate a sure loser. A second interpretation of the mixed strategy is that the party leader is uncertain over the exact position of the median voter, which shows that the assumption of full information about the distribution of voters can be relaxed. It is also in this interpretation that the tradeoff in terms of electability and ideology that the party leader faces becomes clearest: The party leader knows that increasing the probability of nominating the extremist when she is of low quality will reduce the chance that the median voter will be willing to vote for her. An equilibrium is only reached, however, when the higher chance of winning of the moderate and the ideological advantage of the extremist balance out. Even though the reelection of the incumbent is certainly the worst outcome for the party leader,

she does not always nominate the politician who is most likely to defeat the incumbent.

3.4 Welfare and comparative statics

As has been pointed out in the previous section, parties do a pretty good job at selecting high quality candidates under Full Competition. In fact, parties maximize the average quality of their candidates in this equilibrium. This is simply a consequence of the fact that the party leader never nominates a politician of low quality when a politician of high quality is available.[7] The maximal average quality is equal to the probability that at least one politician has high quality, which is $1 - (1 - \pi)^2$.

Using this result, it is possible to derive a simplified expression of the utility of the median voter under Full Competition, which is generally given by

$$\tilde{\eta}_M(-M^2 + \bar{\pi}_M) + \tilde{\eta}_E[r(E)(-E^2 + \bar{\pi}_E) + (1 - r(E))\mathcal{I}] \ ,$$

where $\tilde{\eta}_p$ denotes the ex-ante probability that politician p gets nominated. In the Full Competition case the median voter is indifferent between the extremist and the incumbent: $-E^2 + \bar{\pi}_E = \mathcal{I}$. The previous expression can therefore be written as

$$\tilde{\eta}_M(-M^2 + \bar{\pi}_M) + \tilde{\eta}_E(-E^2 + \bar{\pi}_E) \ .$$

Using the fact that average quality is equal to $1 - (1 - \pi)^2$ yields

$$\tilde{\eta}_M(-M^2) + \tilde{\eta}_E(-E^2) + 1 - (1 - \pi)^2 \ . \tag{7}$$

This expression will be useful in the welfare comparisons below.

3.4.1 Increasing Competition

A crucial determinant of the shape that equilibrium takes is the strength of the incumbent, as given by the utility $\mathcal{I}$ that the median voter experiences in the

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[7]Proof: The average posterior quality of the moderate and the extremist is equal to the sum of their posterior qualities weighted by their respective nomination probabilities. The posterior quality of each candidate is given by the probability of being nominated conditional on having high quality divided by the unconditional nomination probability. The nomination probability therefore cancels out and the average quality is given simply by the sum of the nomination probabilities conditional on having high quality. This is maximized when no low quality candidate is nominated whenever a high quality candidate is available.

case of reelection of the incumbent. A natural interpretation of $\mathcal{I}$ is that it represents the degree of electoral competition that the party of the challenger faces. From this perspective the model generates a prediction about the relationship between electoral competition and the expected quality of politicians. This can be seen by fixing a combination of political positions for the moderate and the extremist, i.e. a point in figure 1. For low enough values of $\mathcal{I}$ any such point will lie in region 1, where party C faces No Competition. Increasing $\mathcal{I}$ (increasing competition) shifts the boundaries that separate the different types of equilibria towards the origin. Therefore, eventually the "Full Competition"-case applies. This is connected with an increase in the quality of nominated politicians, as higher competition forces the incumbent to select candidates of higher quality. Increasing competition even further can have either one of two effects. If the moderate and the extremist are located close to each other (their position generate a point close to the 45-degree line in figure 1) increasing $\mathcal{I}$ will make the incumbent the certain winner of the election. If, on the other hand, there is a clear political difference between the moderate and the extremist, there exists an interval for values of $\mathcal{I}$ in which equilibrium takes the shape of what was labeled Limited Competition, where only the moderate has a chance of defeating the incumbent. The step from Full Competition to Limited Competition leads to a reduction in the quality of the nominated politicians, as the party leader effectively has a smaller set of politicians to choose from.

Taken as a whole, the model predicts a nonlinear relationship between competition and quality. Starting from a low level, increasing competition is beneficial as it disciplines parties to select high quality candidates. In contrast, more intense competition can force parties to select candidates more on policy and less on quality when the election is already fiercely contested.

It should be noted that competition has been framed from the perspective of one party in this discussion. More generally speaking, one would actually consider the most competitive situation to be the one in which both parties face equal chances. In this perspective the model indeed predicts higher competition to lead to the nomination of candidates of higher quality. The unexpected result here is that reduced competition leads to worse outcomes both on the advantaged and the disadvantaged side.

3.4.2 Comparison to Full Information Equilibrium

The introduction raised the question of whether the party leader can act as a better informed agent who selects candidates on behalf of the voter. As was already discussed above, in the case of Full Competition electoral incentives work very well in disciplining the party leader. One way to make this point even more forcefully is to compare the outcomes described so far to the case where the voter has full information about politicians. In any case other than Full Competition having more information must work to the benefit of the median voter: Under No Competition the party leader nominates her optimal candidate, which she might not be able to do under full information. In the case when no candidate of party C can get elected, the median voter receives the lowest possible expected utility under asymmetric information by always reelecting the incumbent. Consequently, she must at least be weakly better off under full information. Under Limited Competition even an extremist of high quality will lose against the incumbent, implying that the party leader has no leeway to nominate other politicians than before.

The last point is not true in the case of Full Competition. When choosing between two politicians of high quality the party leader picks the moderate here, as long as the median voter does not observe quality. However, under full information an extremist of high quality would also get elected, as otherwise the median voter could never be indifferent between the extremist and the incumbent. It follows that the median voter is worse off if she observes the quality of candidates than if she does not in the case where both are of high quality.

To see that this effect may be strong enough to also lower the expected utility of the median voter ex-ante, before politician qualities are realized, suppose that the incumbent is relatively weak: $\mathcal{I} \leq -M^2$. Under asymmetric information the extremist always gets nominated if $q_C = (0, 1)$ and with probability $\eta_E(0, 0)$ if both politicians have low quality, i.e. $\tilde{\eta}_E = \pi(1 - \pi) + (1 - \pi)^2 \eta_E(0, 0)$. Using expression (7) the expected utility of the median voter is therefore

$$[1 - \pi(1 - \pi) - (1 - \pi)^2 \eta_E(0, 0)](-M^2)$$
$$+ [\pi(1 - \pi) + (1 - \pi)^2 \eta_E(0, 0)](-E^2) + 1 - (1 - \pi)^2 .$$

In the case of full information the extremist gets nominated whenever she has high quality, but not when she has low quality. The expected utility of the

median voter in this case is

$$(1 - \pi)(-M^2) + \pi(-E^2) + 1 - (1 - \pi)^2 ,$$

as it was assumed that when both politicians of party C are of low quality the moderate can still get elected. The difference between the two utilities is

$$[-\pi^2 + (1 - \pi)^2 \eta_E(0,0)](M^2 - E^2) .$$

As $M^2 - E^2$ is always smaller than zero, the sign of this expression is determined by the sign of the term in brackets. If

$$-\pi^2 + (1 - \pi)^2 \eta_E(0,0) < 0$$

then the median voter is worse off under full information. Using equation (6) to substitute for $\eta_E(0,0)$ this condition can be seen to be equivalent to $-E^2 + 1 < \mathcal{I} + \pi$, which is neither implied nor contradicted by the existence conditions of the Full Competition equilibrium. However, as $-E^2 < \mathcal{I}$ must hold in this equilibrium the median voter is worse off under full information for values of π close to one.

If the incumbent is stronger and $\mathcal{I} \leq -M^2$ does not hold the utility of the median voter is higher under full information than in the previous case. It is then even less likely that having more information could be harmful. Nevertheless, that this effect occurs at least in some cases certainly illustrates how well electoral incentives work under Full Competition.

3.4.3 Common interests

A second central question raised in the introduction was whether the special interests of the party imply that it will select "bad" candidates. As was pointed out in previous sections, in the case of No Competition the median voter would indeed be better off if the party leader shared her political interests. In the case of Limited Competition, on the other hand, the preferences of the party leader over policies were of no consequence. What has not been taken into account so far though is that the existence conditions for the different types of equilibria also depend on the preferences of the party leader. These boundaries are shown

Figure 2: Equilibrium under common interests
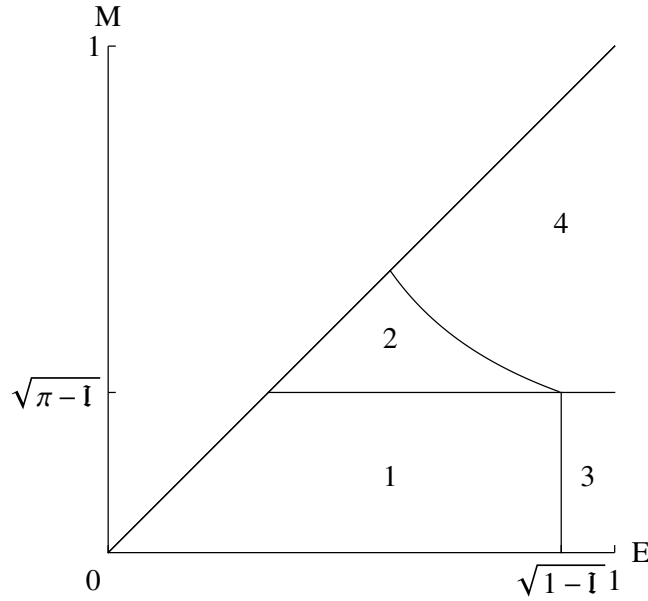
in figure 2, which is the equivalent of figure 1 for a party leader located at zero.[8] The boundaries on the equilibrium where the incumbent always gets reelected (area 4) and the Limited Competition equilibrium (area 3) are unchanged. In contrast, the equilibrium where both the moderate and the extremist get elected with certainty exists much more widely, namely in area 1 in figure 2. Previously, the binding constraint on the existence of the No Competition equilibrium was that the median voter had to prefer an extremist of average quality over the incumbent. A party leader with the same preferences as the median voter, in contrast, always selects the moderate while the extremist is believed to be of high quality according to lemma 1. This shifts the boundary on the existence of this equilibrium outwards. Full Competition occurs in area 2.[9]

The change of the welfare of the median voter in the area where under diverging interests Full Competition applies while under common interests the

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[8]The derivation of the equilibria in the $C = 0$-case will not be given here as it proceeds exactly as in the case of $C = 1$.

[9]More precisely, Full competition with low quality indifference occurs in area 2. As before, other equilibria that satisfy the definition of Full Competition might exist as well, but are not further considered here, in line with the discussion above.

moderate is always nominated is not immediately clear. Diverging interests lead to the nomination of higher quality candidates, while common interests result in the nomination of the preferred politician in terms of policy. In the latter case, the utility of the median voter is $-M^2 + \pi$. Under diverging interests, expression (7) shows that the expected utility of the median voter is given by

$$[\pi + (1-\pi)^2(1-\eta_E(0,0))](-M^2)$$
$$+ [\pi(1-\pi) + (1-\pi)^2\eta_E(0,0)](-E^2) + 1 - (1-\pi)^2 .$$

Using equation (6) to substitute for $\eta_E(0,0)$, some tedious but straightforward algebra shows that the difference in the utilities can be written as $-\mathcal{I} - M^2$. Therefore, the median voter is better off under common interests in this particular case if and only if $-M^2 > \mathcal{I}$. In words, the median voter has to prefer a moderate of low quality over the incumbent - a rather strong condition.

Similarly, common interests can work to the advantage or the disadvantage of the median voter in the case where Full Competition applies both under common and diverging interests, which will not be shown formally here. Without knowing the distributions that the characteristics of politicians are drawn from, it is therefore not clear whether the special interests of the party make the median voter better or worse off. However, there seems to be substantial possibility of the former. The reason for this is that a party leader is more likely to nominate a candidate who is ex-ante attractive to the median voter if they share the same political interests. This, however, reduces competition and therefore leads to the selection of candidates of worse quality.

4 Robustness

The model features a number of assumptions that can be relaxed. First of all, the results are robust to adding some uncertainty over the position of the median voter. As was already stated in the discussion of the case of Full Competition, it is possible to interpret the mixed strategy that the median voter is playing in this vein. In contrast, all other equilibria do not feature mixing by the median voter but are nevertheless robust in a similar way. Here the differences between the possible candidates are so large that uncertainty over the position of the median voter would not translate into uncertainty over the outcome of the election.

Two further assumptions that will be discussed in more detail in the following two subsections are the additive separability of quality in the utility function of

the median voter and the discrepancy between full information over politicians' positions and uncertainty over their quality.

4.1 Non-additive quality

Specifying quality as additively separable from policy has received criticism in the past. The main argument is that it seems implausible that, for example, a left-wing voter would want a right-wing candidate to be very effective at implementing policy. Put differently, quality should become a bad for a sufficiently high political distance. Indeed, a recent paper by Gouret et al. (2011) lends empirical support to this argument. Using data from the French presidential election of 2007 the authors find that a utility function that allows for said interaction between quality and policy fits the data well while the simple additive utility function is rejected. However, this result seems to be mainly driven by voters away from the center. The parameter estimates indicate that the main candidates are well within the range in which higher quality is beneficial to the median voter. While the policy space in the analyzed survey data ranges from zero to 10, the distance at which quality becomes a bad is estimated to be slightly above five. The main candidates, on the other hand, are no further away from each other than roughly three. The different potential candidates available to each party should be even closer together. As the outcomes of the model presented here are driven by the preferences of the party leader and the median voter, the results of Gouret et al. (2011) should therefore not raise too many concerns.

4.2 Uncertainty about politicians' policy preferences

The distribution of information imposed in the model may seem to lack a strong justification. While voters know much about the policies a candidate stands for they know little about quality. Furthermore, many of the findings seem to rest on this skewed information structure: Voters observe policy preferences and are able to make inferences about the quality of candidates based on this observation. This section will argue that it is possible to introduce uncertainty about the policy positions of politicians while leaving the main results intact.

To this end, suppose that the policy positions of the candidates of party C, M and E, are drawn from the distributions functions F_M and F_E respectively. For the moment these will not be specified any further. A party leader confronted with a particular draw of positions and qualities will decide whom to nominate

based on a comparison of the expected utility resulting from either choice. This utility depends on the chance of each politician of winning the election. To keep things reasonably simple, the disutility from policy will now be given by the absolute value, rather than the square, of the difference between policy and ideal position of an agent. Furthermore, assume that the party leader expects that the moderate would get elected with certainty while the extremist would get elected with probability $r(E)$, as in the Full Competition case above. The decision rule of the party leader is then to nominate the moderate if and only if

$$-|M-1| + w(1, r(E))q_M + Y \ \geq r(E)[-|E-1| + w(1, r(E))q_E + Y] + $$
$$(1 - r(E))[-|I-1|]$$

or equivalently

$$M - r(E)E \ \geq r(E)[w(1, r(E))q_E + Y] \ + \ (1 - r(E))I - w(1, r(E))q_M - Y$$
$$\equiv K(q_C) \ .$$

This choice rule implies that under different quality combinations politicians will be nominated with different probabilities and the nomination choice can therefore still be a signal of quality. The expected quality of a moderate nominated according to this rule is

$$\bar{\pi}_M = \frac{\sum_{q \in \{0,1\}} \pi \ Pr[q_E = q] \ Pr[M - r(E)E \geq K(q_C)|q_C = (q, 1)]}{\sum_{q \in Q} Pr[q_C = q] \ Pr[M - r(E)E \geq K(q_C)|q_C = q]} \ ,$$

which is simply the probability that the moderate gets nominated conditional on being of high quality divided by the unconditional nomination probability. One way to find an expression for $Pr[M - r(E)E \geq K(q_C)]$ is to first derive the density of the random variable $M - r(E)E$. This is given by

$$\int_{\text{supp}(F_E)} f_E(e) f_M(\tau + r(E)e) \ de \ .$$

Appropriately integrating over this density one obtains the desired probability. The expression for the posterior quality of the extremist can be derived analogously.

Beyond quality the nomination choice can now also be a signal of the policy position of a candidate. Considering the decision rule of the party leader, one

observation is immediate: If all possible candidates are closer to the median than the party leader, then it is impossible that the expectation of the posterior distribution of the policy position of a nominated politician is below the expectation of the prior distribution. If the party leader prefers to nominate the moderate for a given M then she must ceteris paribus prefer to nominate the moderate for any higher M as well, implying that the posterior distribution first order stochastically dominates the prior distribution. The same holds for the extremist. Therefore, if a nomination tells voters anything about the policies a candidate stands for then that these are more extreme than previously thought. In other words, politically extreme parties are bad for the median voter in terms of the political views of the candidates they select.

To find an expression for the expected policy position of a moderate nominated according to the decision rule above, first note that according to Bayes' Rule the posterior probability density over M conditional on a certain quality combination q is given by

$$f_{M|q}(m) \equiv f_M(m) \frac{Pr[M - r(E)E \geq K(q_C)|M = m, q_C = q]}{Pr[M - r(E)E \geq K(q_C)|q_C = q]}$$

with

$$Pr[M - r(E)E \geq K(q_C)|M = m, q_C = q] = F_E\left([m - K(q_C)]/r(E)\right) .$$

The unconditional expected policy position of a nominated moderate is then given by the weighted sum of the conditional expectations:

$$\frac{\sum_{q \in Q} Pr[q_C = q]\ Pr[M - r(E)E \geq K(q_C)|q_C = q] \int_{\text{supp}(F_M)}\ m\ f_{M|q}(m)\ dm}{\sum_{q \in Q} Pr[q_C = q]\ Pr[M - r(E)E \geq K(q_C)|q_C = q]} .$$

Again, the expected policy position of the extremist follows analogously.

Giving a general description of equilibrium is beyond the scope of this paper. Instead, a specific example will be given to illustrate that the characteristics of the Full Competition equilibrium emphasized above remain unchanged in the extended model. It is assumed that both M and E are uniformly distributed with support $[0.2, 0.5]$ and $[0.4, 0.7]$, respectively. The moderate is expected to be closer to the median than the extremist, but the opposite might actually be the case. In addition, the probability of a politician being of high quality is taken to be equal to 0.5 and the functional form of $w(r(M), r(E))$ is assumed

Figure 3: Expected utilities with uncertain policy positions
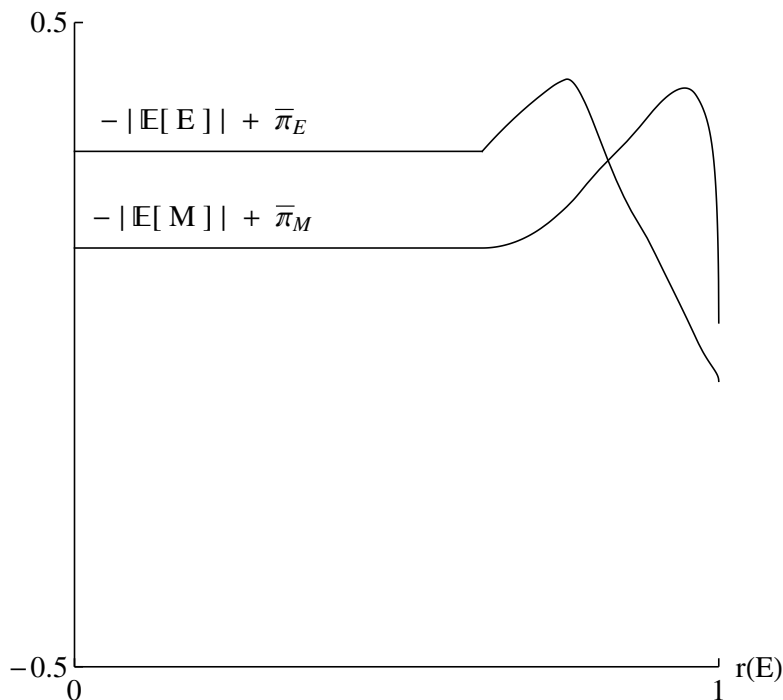
to be

$$w(r(M), r(E)) = 0.5(1 - r(M))^{1/2} + 0.5(1 - r(E))^{1/2} \ .$$

Figure 3 plots the expected utility of the median voter from electing either politician of party C, which can be calculated using the expressions above, as a function of the probability $r(E)$ that the extremist will get elected. For low values of $r(E)$ the party leader always selects the moderate and both expected utilities are flat in this region.[10] As $r(E)$ increases the party leader finds it worthwhile to nominate the extremist for high values of E in the case where the extremist has high quality and the moderate has low quality, and eventually also for lower values of E. This makes the extremist less extreme in expectation and explains the initial increase in the expected utility from electing her. For

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[10]In the extended model Universal Divinity implies that an unexpectedly nominated politician p is of high quality and located as close to the party leader as possible given the distribution F_p.

even higher values of $r(E)$ the extremist gets nominated under other quality combination as well, which lowers her expected quality and results in a decrease in utility for the median voter. The increase in the expected utility from electing the moderate, on the other hand, stems from the fact that her expected quality increases as it becomes more attractive to nominate the extremist. For values of $r(E)$ close to one the weight that the party leader attaches to quality becomes very low and selection is based more and more on which candidate is politically closer to the party leader, leading to an eventual decrease in both utilities.

Figure 3 shows that there is a range of utilities $\mathcal{I}$ from reelecting the incumbent for which it is possible to find an election probability of the extremist such that the median voter is indifferent between the extremist and the incumbent while strictly preferring the moderate. This is equivalent to the Full Competition equilibrium described above.

5 Conclusion

This paper has shown that under sufficiently strong competition the median voter can rely to a large extent on parties to select "good" candidates even when parties pursue special political interests and value the quality of their politicians only very little. As more extreme candidates are less likely to get elected, the nomination of such candidates serves as a signal of above average quality. This enables parties to get politicians into office who stand for policies that are closer to the interests of the party, but given their higher expected quality this is also beneficial for the median voter.

The downside is that parties prioritize ideology and select low quality candidates when competition fails. Such failure is common at sub-national levels of government where often only one party stands a realistic chance of holding office. This seems to happen in districts where the electorate is politically more aligned with one particular party than at the national level. It is not entirely clear why this does not cause existing parties to alter their positions or results in the entry of additional parties or independent candidates. A better understanding of the role of political parties is likely to provide an answer.

Appendix

This appendix derives bounds on the existence of equilibria where the incumbent is reelected with certainty. When no politician of party C is elected with positive probability the party leader is indifferent between any of her pure strategies. Given the restrictions on equilibrium strategies, whether this case can be an equilibrium crucially depends on which posterior beliefs can be generated by weakly undominated strategies.

Fix an arbitrary nomination strategy η and let $m(\eta)$ be the ex-ante probability that the moderate gets nominated under η. A second strategy η' weakly dominates η only if $m(\eta) = m(\eta')$: In the case $m(\eta) > m(\eta')$ the expected utility of the party leader under η would be strictly higher under η than under η' given that $\varepsilon(M) = 1$ and $\varepsilon(E) = 0$, i.e. the median voter elects the moderate for sure and never elects the extremist. Similarly, if $m(\eta) > m(\eta')$ η gives a strictly higher utility for $\varepsilon(M) = 0$ and $\varepsilon(E) = 1$.

Given this first result, the intuition for which strategies are weakly dominated can be given as follows: A strategy η is weakly dominated if and only if it is possible to find a second strategy η' such that $m(\eta) = m(\eta')$ and η' nominates politician p more frequently when this politician is of high quality and less frequently when this politician is of low quality, relative to η. The remainder of the proof formalizes this idea.

It is claimed that any nomination strategy that features $\eta_M(0,1) > 0$ and $\eta_M(1,1) < 1$ is weakly dominated. Construct a second strategy η'_M by setting $\eta'_M(1,1) = \eta_M(1,1) + \varepsilon$ and $\eta'_M(0,1) = \eta_M(0,1) - \frac{\pi}{1-\pi}\varepsilon$ with $\varepsilon > 0$ and leaving all other nomination probabilities unchanged relative to η_M. Choosing ε sufficiently small ensures that all probabilities in the new strategy η'_M are well defined. By construction, both politicians ex-ante get nominated with the same probability under η_M and η'_M. The only difference between the two strategies is that for the quality combination $(1,1)$ the moderate is nominated more frequently under η'_M than under η_M, while for the quality combination $(0,1)$ the moderate is nominated less frequently. The expected utility of the party leader under the

strategy η_M can be written as

$$\sum_{q \in Q} Pr[q_C = q] \ \Big\{ \eta_M(q) \big[r(M)(-(M-1)^2 + Y + w(r(M), r(E))q_M)$$

$$+ (1 - r(M))(-(I-1)^2) \big]$$

$$+ (1 - \eta_M(q)) \big[r(E)(-(E-1)^2 + Y + w(r(M), r(E))q_E)$$

$$+ (1 - r(E))(-(I-1)^2) \big] \ \Big\}.$$

Define $U_M \equiv -(M-1)^2 + Y$, $U_E \equiv -(E-1)^2 + Y$, and $U_I \equiv -(I-1)^2$. The difference in the expected utilities under η_M' and η_M is

$$\pi^2 \ \varepsilon \ \Big\{ r(M)(U_M + w(r(M), r(E))) + (1 - r(M))U_I$$

$$- r(E)(U_E + w(r(M), r(E))) - (1 - r(E))U_I \Big\}$$

$$-\pi(1-\pi)\frac{\pi}{1-\pi} \ \varepsilon \ \Big\{ r(M)U_M + (1 - r(M))U_I$$

$$- r(E)(U_E + w(r(M), r(E))) - (1 - r(E))U_I \Big\} \ ,$$

which is equal to $\pi^2 \ \varepsilon \ r(M) \ w(r(M), r(E))$ and nonnegative for any election strategy r. This shows that η_M' weakly dominates η_M.

By analogous arguments any strategy such that either $\eta_M(0,0) > 0$ and $\eta_M(1,0) < 1$, $\eta_M(0,0) < 1$ and $\eta_M(0,1) > 0$, or $\eta_M(1,0) < 1$ and $\eta_M(1,1) > 0$, is weakly dominated as well. Now consider a strategy such that $\eta_M(1,0) < 1$. For this strategy not to be weakly dominated it must be true that $\eta_M(0,0) = 0$ and $\eta_M(1,1) = 0$ by the second and fourth rule above, which in turn leads to the requirement $\eta_M(0,1) = 0$ by the third rule. Any resulting strategy is not weakly dominated, as the construction of a weakly dominating strategy would require reducing the probability of nominating a high quality moderate.

Next, consider a strategy such that $\eta_M(1,0) = 1$ and $\eta_M(0,1) > 0$. By the first and third rule given above it must hold that $\eta_M(1,1) = 1$ and $\eta_M(0,0) = 1$ for this strategy to not be weakly dominated. Similar to before, to find a strategy that could weakly dominate this strategy it would be necessary to reduce the probability of nominating a high quality extremist, which would reduce utility against most strategies of the party leader.

Finally, let $\eta_M(1,0) = 1$ and $\eta_M(0,1) = 0$. None of the conditions above

imposes any restrictions on $\eta_M(0,0)$ and $\eta_M(1,1)$. Furthermore, any strategy of this kind is not weakly dominated. Raising the probability of nominating a high quality politician while keeping the ex-ante nomination probabilities constant necessarily implies reducing the probability of nominating the second politician when she is of high quality by an equivalent amount.

To summarize, there are only three different types of nomination strategies that are not weakly dominated:

- $\eta_M(1,0) = 1$, $\eta_M(0,1) = 0$, $0 \leq \eta_M(0,0) \leq 1$, $0 \leq \eta_M(1,1) \leq 1$

- $\eta_M(1,0) = 1$, $\eta_M(0,1) > 0$, $\eta_M(0,0) = 1$, $\eta_M(1,1) = 1$

- $\eta_M(1,0) < 1$, $\eta_M(0,1) = 0$, $\eta_M(0,0) = 0$, $\eta_M(1,1) = 0$

The second of these strategies nominates the extremist only if she has high quality and consequently $\bar{\pi}_E = 1$ in this case. For the moderate this strategy implies
$$\bar{\pi}_M = \frac{\pi}{\pi + \pi(1-\pi)\eta_M(0,1) + (1-\pi)^2} \ .$$
This expression achieves its minimum of π for $\eta_M(0,1) = 1$. The conditions $\mathcal{I} > -M^2 + \pi$ and $\mathcal{I} > -E^2 + 1$ are therefore jointly sufficient for the existence of an equilibrium where $r(M) = r(E) = 0$. Similarly, the third strategy nominates the moderate only if she has high quality and $\bar{\pi}_M = 1$ must hold, while the lowest posterior expectation over the quality of the extremist that this strategy can generate is π for $\eta_M(1,0) = 0$. This implies the joint sufficient conditions $\mathcal{I} > -M^2 + 1$ and $\mathcal{I} > -E^2 + \pi$, where the second condition is satisfied whenever the first condition holds.

For the first of the weakly undominated strategies given above the posterior expectations are

$$\bar{\pi}_M = \frac{\pi(1-\pi) + \pi^2\eta_M(1,1)}{\pi(1-\pi) + \pi^2\eta_M(1,1) + (1-\pi)^2\eta_M(0,0)} \tag{8}$$

and
$$\bar{\pi}_E = \frac{\pi(1-\pi) + \pi^2(1-\eta_M(1,1))}{\pi(1-\pi) + \pi^2(1-\eta_M(1,1)) + (1-\pi)^2(1-\eta_M(0,0))} \ . \tag{9}$$

This strategy generates $\bar{\pi}_E = 1$ if and only if $\eta_M(0,0) = 1$ and the lowest value of the posterior expectation $\bar{\pi}_M$ that can be achieved in this case is π, which implies the same sufficient conditions as the first set of conditions given in the previous paragraph. On the other hand, the lowest value that the righthand

side of equation (9) can take is π. Together with the previous results this shows that no undominated strategy can lead to a posterior expected quality below π for any politician. It remains to show which sufficient conditions the current strategy yields if E is such that $-E^2 + \pi \leq \mathcal{I} \leq -E^2 + 1$. This requires for any such E to find the lowest M such that the median voter is indifferent between the incumbent and both politicians of party C. This M satisfies $\mathcal{I} = -M^2 + \bar{\pi}_M^*$, where $\bar{\pi}_M^*$ is the solution to the minimization problem

$$
\min_{0 \leq x, y \leq 1} \quad \frac{\pi(1-\pi) + \pi^2 x}{\pi(1-\pi) + \pi^2 x + (1-\pi)^2 y}
$$
$$
s.t. \quad -E^2 + \frac{\pi(1-\pi) + \pi^2(1-x)}{\pi(1-\pi) + \pi^2(1-x) + (1-\pi)^2(1-y)} = \mathcal{I}
$$

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