# Electoral Imbalances and their Consequences

Prato, Carlo and Wolton, Stephane

26 March 2014

# Electoral Imbalances and their Consequences*

Carlo Prato — Georgetown

Stephane Wolton — LSE

First Draft: March 26, 2014; This Version: November 26, 2015

**Abstract**

This paper studies the consequences for the electoral process of reputational and partisan imbalance; that is, asymmetries in voters' evaluations of candidates' quality (for example, due to incumbency) and of party labels (for example, due to ideology). Our theory is predicated on the notion that voters are "rationally ignorant" as they face cognitive constraints on their ability to acquire and process political information. Our model rationalizes key empirical regularities identified in the literature: the strong effect of incumbency on electoral outcomes, the existence of an incumbency spending advantage, as well as the moderate electoral impact of partisan redistricting. We explain why current methods used to identify the sources of the incumbency advantage are likely to produce biased estimates, and suggest ways to resolve this issue. We also highlight how campaign finance reforms should be precisely tailored to the type and level of imbalance they are meant to address.

**JEL Classification:** D72, D78, D83.

**Keywords:** Elections, Attention, Imbalance, Reputation, Incumbency Advantage, Partisanship.

*We thank Avi Acharya, Scott Ashworth, Mike Bailey, Ethan Bueno de Mesquita, Steve Callander, Dominik Duell, Andy Eggers, Anthony Fowler, Andy Hall, Carlo M. Horz, Marko Klasjna, Nick Mastrorocco, as well as seminar and conference participants at USC, Caltech, Stanford, Georgetown University, PECA Conference, EITM Institute 2015, MPSA, APSA, and EPSA Annual Conferences for comments and conversations. All remaining errors are the authors' responsibility. Emails: cp747@georgetown.edu and s.wolton@lse.ac.uk.

Competitive elections are a necessary condition for the good functioning of the democratic system (Schumpeter, 1942). In practice, however, many electoral races experience very little competition. This phenomenon has often been attributed to asymmetries in voters' evaluation of the political options available to them, which we refer to as electoral imbalances. Two types of imbalances, in particular, have received considerable attention from empirical researchers: 'reputational imbalance' (defined as ex-ante asymmetries in voters' beliefs about candidates' quality) and 'partisan imbalance' (defined as ex-ante asymmetries in voters' opinion of party labels). Overall, two key findings emerge from the literature. First, the effect of reputational imbalance is large: a candidate's greater reputation (often associated with incumbency) translates into a sizable electoral advantage (e.g., Gelman and King, 1990; Cox and Morgenstern, 1993; Ansolabehere et al., 2000). Second, the impact of partisan imbalance is moderate: the electoral benefit of greater partisan alignment between a party and the electorate (measured through redistricting) is positive, but limited (e.g., Abramowitz, 1983; Niemi and Winsky, 1992; Gelman and King, 1994).

This paper provides a unified theoretical framework to study the consequences of reputational and partisan imbalances on candidates' behavior and electoral outcomes. Unlike previous works which focus on candidates' behavior and thus reduce voters' role to their electoral decision, our theory is predicated on the notion that voters are also active participants during electoral campaigns. We consider 'rationally ignorant' voters (Downs, 1957) who face cognitive constraints on their ability to acquire and process political information: voters need to pay costly attention to candidates to learn their platform.[1] In equilibrium, reputational and partisan imbalances affect how much attention voters allocate to each candidate. Due in great part to voters' strategic behavior, campaigns exacerbate reputational imbalance and mitigate partisan imbalance. Consequently, empirical evaluations of the effects of electoral imbalances which do not properly control for voter attention potentially suffer from severe omitted variable bias.

Our model features a representative voter (to whom we reserve the pronoun 'she') and two candidates (1 and 2). Candidates are office-motivated and commit either to a partisan policy (e.g., prohibiting the use of federal funding for abortion) or a common value policy (e.g., reforming the education system). The common value policy maximizes the voter's payoff, but is costly to

[1]The importance of voter attention to politicians' promises and actions, especially when it comes to common value issues, is documented in Bidwell et al. (2015) and (indirectly) in Snyder and Strömberg (2010).

implement for politicians. We assume that this implementation cost is such that 'low-quality' candidates always prefer to propose the partisan policy, whereas 'high-quality' candidates are willing to commit to the common value policy when the electoral reward for such commitment is sufficiently high.

At first, the voter observes only candidates' party label. She does not know whether candidates are of high or low quality, but holds initially a higher opinion of candidate 1 (for example, due to his status as incumbent). During the electoral campaign, the voter can learn a candidate's policy commitment. As in Prato and Wolton (2015), electoral communication requires attention by the voter *and* campaign expenditures by the candidate. Attention and expenditures are complement and positively correlated with the probability the voter learns the candidate's platform. Absent new information, the voter's electoral decision depends on the realization of a partisan swing, which is systematically more likely to favor candidate 1's party (e.g., the voter leans Democrat).

To use the wordings in Lee et al. (2004), in our framework, reputational imbalance thus corresponds to the asymmetry in the voter's belief regarding her ability to *affect* candidates' policies. In contrast, partisan imbalance represents her preference when she can only *elect* policies. As both imbalances favor candidate 1, we henceforth refer to 1 (2) as the leading (trailing) candidate.

The probability that the voter's preferred policy is implemented is maximized when both candidates commit to the common value policy when high quality. In this 'responsive equilibrium', the voter pays attention to candidates in order to reduce the probability of an electoral mistake: electing a low-quality candidate when a high-quality candidate is in the race.

In the case of reputational imbalance, the leading candidate 1 is more likely to be high-quality, while the trailing candidate 2 is more likely to be low-quality. The most likely electoral mistake therefore is to fail to elect a high-quality candidate 1. As a result, the voter pays more attention to the leading candidate. Anticipating a more attentive electorate, and thus a higher return on campaign expenditures, candidate 1 then outspends candidate 2. Consequently, the voter is always more likely to learn candidate 1's platform: this is the *exacerbating* effect of electoral campaign. As a result, reputational imbalance translates into a sizable electoral and spending advantages for the leading candidate.

A direct implication of this result is that incumbents (who tend to be of higher quality than their challengers—e.g., Carson et al., 2007; Hirano and Snyder, 2009) win with greater probability.

Importantly, this incumbency advantage is in significant part caused by the voter's strategic choice of attention. Consequently, our theory predicts that the incumbency advantage cannot be fully explained by incumbents' higher quality (as documented by Erikson and Titiunik, 2015; Hall and Snyder, 2014) and spending advantages (as documented by Gerber, 1998).

Our results also have important implications for the identification of the *sources* of the incumbency advantage. In our theory, voter attention is positively correlated with the incumbent's winning probability, reputation, and spending. Consequently, estimates of the effect of money or quality on electoral outcomes are likely to suffer from an upward omitted variable bias when voter attention is not properly controlled for. While the use of regression discontinuity (RD) designs—which focus on races where voter attention is less likely to vary systematically across candidates—lessens the severity of this issue, it does not necessarily eliminate it. Since our theory predicts that any asymmetry in reputation is a significant source of bias, RD designs would produce unbiased estimators only if voters hold the exact same opinion of closely elected incumbents and their challengers, a condition unlikely to be satisfied given the electorate's low political knowledge (e.g., Campbell et al., 1960; Fowler, 2015).

In the case of partisan imbalance, the voter ex-ante favors candidate 1's party and, everything else equals, is more likely to elect him. Consequently, the most likely electoral mistake is to wrongly elect a low-quality candidate 1. The voter thus pays more attention to the trailing candidate 2 who, in turn, engages in greater campaign spending. The voter is then always more likely to learn the trailing candidate 2's platform: this is the *mitigating* effect of electoral campaign. The electoral benefit generated by partisan imbalance is, therefore, limited. The leading candidate 1 is always more likely to win, but his electoral gain is always smaller than the underlying level of partisan imbalance.

Both reputational and partisan imbalances decrease electoral competition by improving the standing of the leading candidate. However, this paper shows that, as long as the responsive equilibrium exists, imbalances increase the (ex-ante) probability that the common value policy is implemented. A decline in electoral competition need not reduce electoral accountability. The voter is hurt by the presence of electoral imbalances only when the level of reputational or partisan imbalance is large and the responsive equilibrium does not exist. While the consequence of large level of either type of imbalance is the same, the causes are markedly different. When reputational

imbalance is large, the responsive equilibrium does not exist because the voter pays too little attention to the *trailing* candidate 2, who has little incentive to commit to the common value policy. When partisan imbalance is large, the responsive equilibrium does not exist because the voter pays too little attention to the *leading* candidate. Our theory highlights that the impacts of electoral imbalances for electoral accountability depend on their type and level, and so should the design of any regulatory solution (e.g., caps on campaign spending, non-partisan redistricting) aimed at reducing electoral imbalances.

The rest of the paper proceeds as follows. In Section 1 we review the relevant formal literature. In Section 2, we describe the model. We present some important preliminary results in Section 3. Section 4 studies the effect of reputational imbalance, while Section 5 considers partisan imbalance. Section 6 examines the joint consequences of both types of electoral imbalance. Section 7 concludes. All proofs are collected in a supplemental appendix available on the authors' website.[2]

# 1 Formal literature on electoral imbalances

Most of the formal literature on electoral imbalance examine the source of the incumbency advantage. Ashworth and Bueno de Mesquita (2008) show how the incumbency advantage can emerge as a result of the voter's higher opinion of the incumbent and the scare-off of talented challengers. Recent empirical findings, however, have called into question the importance of the scare-off effect (Hall and Snyder, 2015).[3] In a similar vein, Bernhardt and Ingerman (1985) explain why incumbents, who are well-known due to their past record, are often preferred to unknown challengers by risk-adverse voters. Gordon and Landa (2009) examine different sources of the incumbency advantage and discuss whether they advantage all incumbents. In like manner, Kartik and Van Weelden (2015) consider how term limits can benefit or hurt incumbents depending on whether voters are primarily concerned about ideological congruence or corruption. None of these papers, however, incorporates campaign expenditures and thus cannot explain the incumbency spending advantage. In contrast, Meirowitz (2008), Pastine and Pastine (2012), and Werner and Mayer (2012) suppose that incumbents have a greater ability to collect campaign funds which serve to persuade voters.

[2]https://sites.google.com/site/carloprato1982/research and http://home.uchicago.edu/ swolton/Research.html

[3]See Cox and Katz (1996) and Levitt and Wolfram (1997) for a more positive assessment of the impact of the scare-off effect.

The resulting incumbency spending advantage is then the key determinant of incumbents' electoral advantage. Our paper complements these studies by providing a theoretical foundation for the persuasive role of campaign expenditures and shows that the incumbency spending advantage can arise even in the absence of a competitive edge in fund-raising.

Few theoretical works analyze the consequence of partisan imbalance in a political agency setting.[4] Among these, Ashworth and Bueno de Mesquita (2006) study a legislator's allocation of effort between policy-making and constituency service. As in our paper, a low level of imbalance can benefit the voter by increasing the provision of constituency service. They do not consider, however, the consequences of partisan imbalance on electoral outcomes.

Each of these papers studies one type of imbalance in isolation[5] and mostly focuses on candidate's incentives. In contrast, voters' strategic behavior plays a critical role in our set-up. Following the approach developed by Dewatripont and Tirole (2005) and Hafer and Landa (2007), we assume that voters' (receivers') information is endogenous to their level of attention and to candidates' expenditures (sender's effort) during the electoral campaign. Prato and Wolton (2015) use this communication technology to highlight that voters' lack of attention does not always imply a lack of interest in politics. As they study a fully symmetric setting, imbalances play no role in their analysis. Other models of electoral campaigns are unidirectional: with either candidates informing voters (e.g., Prat, 2002; Coate, 2004; Ashworth, 2006; Dewan and Hortala-Vallve, 2013) or voters learning about candidates (e.g., Martinelli, 2006; Svolik, 2013; Hortala-Vallve et al., 2013).

# 2 The model

We analyze a one-period, three-player game with two candidates (1 and 2 from party 1 and 2, respectively) and a representative voter. Candidates compete for an elected office which they value. Before the campaign, candidate $j \in \{1, 2\}$ privately observes his quality $t_j \in \{h, l\}$, where $h$ denotes high-quality and $l$ denotes low-quality. It is common knowledge that the ex-ante probability that candidate $j$ is high-quality is $q_j = Pr(t_j = h)$. After observing his quality, candidate $j$ chooses

[4] It is well known that in a Downsian framework, partisan imbalance can induce candidates to take more extreme positions (Wittman, 1985; Groseclose, 2001; Aragonés and Palfrey, 2002).

[5] Ashworth and Bueno de Mesquita (2008) include partisan imbalances in their model, but limit their analysis to their effect on the incumbency advantage rather than candidates' strategic behaviour.

whether to commit to a common value policy $p_j = 1$ or a partisan policy $p_j = 0$. The cost of implementing the common value policy depends on a candidate's quality ($t \in \{h, l\}$) and is equal to $k_t$. At the end of the campaign, the voter elects one of the two candidates $e \in \{1, 2\}$.

At the beginning of the campaign, the voter does not know candidates' quality and platform. Consistent with empirical evidence (e.g., Alvarez, 1997; Peterson, 2009), the voter, however, can learn candidates' policy commitment during the electoral campaign. The likelihood that the voter learns the platform of candidate $j \in \{1, 2\}$ depends on his campaign expenditures ($y_j$) and her attention to candidate $j$'s messages ($x_j$).[6] Both are endogenous in our theory. They are also costly. For candidate $j$, this cost corresponds to the cost of raising money for political advertising or campaign meetings (for empirical evidence, see Schuster, 2015); it is parametrized by the function $C(y) = y^{2+\lambda}/(2+\lambda)$, $\lambda > 0$. For the voter, this cost captures cognitive constraints and/or the opportunity cost of paying attention to politics; it is parametrized by $C_v(x_j) = x_j^{2+\lambda}/(2+\lambda)$.[7] For tractability reason, we assume that the probability that the voter learns candidate $j$'s platform at the end of the campaign is $x_j y_j$.[8]

Our approach to electoral campaign has three important features. First, in line with the concept of rational ignorance (e.g., Downs, 1957), the voter needs to pay costly attention to become informed.[9] Second, voter's level of attention and candidates' campaign expenditures are complement. Candidates' campaign spending is more effective when the voter pays high attention, and vice versa. Lastly, the voter can pay different levels of attention to different candidates. Only the first feature is crucial: assuming weaker forms of complementarity and directed communication, albeit complicating the analysis, does not affect our results.

The voter values the common-value policy, but also has preferences over candidates' partisan policies.[10] When the elected politician implements the common value policy, the voter receives

[6]Importantly, we focus exclusively on campaign expenditures meant to inform the voter about a candidate's platform and hold constant other potentially relevant types of campaign spending, such as negative advertising or get-out-of-the-vote activities.

[7]The choice of a specific cost function is mostly to simplify the analysis as most of our results carry through under more general assumptions. In the Appendix, we prove Propositions 1, 2, as well as Properties 4.1, 4.2, and 4.4 for a larger class of cost functions.

[8]The main results of this paper are unchanged if the voter also receives a sufficiently noisy signal of the candidate's quality during the electoral campaign.

[9]Prato and Wolton (2015) show that the assumption of a representative voter plays no substantive role (despite the presence of free-riding). Introducing multiple voters, however, makes the analysis significantly more complicated.

[10]For a similar formulation of the voter's payoffs, albeit with a different justification, see Galasso and Nannicini (2011).

a payoff of 1.[11] When the elected politician implements the partisan policy, the voter's payoff is $u_v(\theta, e)$, where $\theta$ is a partisan swing affecting the voter's evaluation of partisan policies. The partisan swing $\theta$ is revealed to the voter after the electoral campaign, but before her electoral decision (as in probabilistic voting models—e.g., Lindbeck and Weibull, 1987). For ease of exposition, we suppose that $\theta \in \{1, 2\}$ and $u_v(1, 1) = u_v(2, 2) = \xi > 0$, while $u_v(1, 2) = u_v(2, 1) = 0$. It is common knowledge that $Pr(\theta = j) = \pi_j,\ j \in \{1, 2\}$. The voter's utility also includes the cost of attention $(x_1, x_2)$ described above and assumes the following form:

$$U_v(p_e, x_1, x_2) = p_e + (1 - p_e)u_v(\theta, e) - \frac{x_1^{2+\lambda} + x_2^{2+\lambda}}{2 + \lambda} \tag{1}$$

Candidates are office-motivated. We normalize their utility from being out of office to 0. When in office, the elected candidate gets a payoff of 1. In addition, if elected on a common value platform $(p = 1)$, he must pay the 'implementation cost' $k_t,\ t \in \{h, l\}$. This cost corresponds to time spent doing constituency service, or assembling coalitions and bargaining with veto players in order to pass legislation beneficial to the voter (Hall and Deardoff, 2006). We assume $0 < k_h < 1 < k_l$: only high-quality candidates can implement the common value policy.[12] As described above, candidate $j \in \{1, 2\}$ can also incur costly campaign expenditures $(y_j)$ to inform the voter. Candidate $j$'s utility can thus be expressed as:

$$U_j(p_j, y_j; t) = \begin{cases} 1 - k_t p_j - \frac{y_j^{2+\lambda}}{2+\lambda} & \text{if elected} \\ -\frac{y_j^{2+\lambda}}{2+\lambda} & \text{otherwise} \end{cases} \tag{2}$$

To summarize, the timing of the game is:

1. Nature draws the candidates' quality: $t_j \in \{h, l\},\ j \in \{1, 2\}$.

[11] Examples of common-value policies include attracting public and private investments into the district (e.g., revamping a disaffected shipyard), or a commitment to reform a relatively non-ideological policy domain (e.g., trade treaty pledge, energy independence, reforming the National Health Service in the U.K.). As explained by Aldrich (1995, p.250 emphasis added), "voters are very likely to support the presidential nominee of the party they believe is better able to solve the problem they consider most serious at the time of election. Far fewer today think it matters *which party* holds power at least in term of addressing their most important concerns."More succinctly, as former NYC mayor Fiorello La Guardia reportedly said, "there is no Republican or Democratic way of picking up the garbage."

[12] This cost could also correspond to a politician's willingness to compromise on his ideology. Consider an alternative formulation of the policy space as $p \in \{0, 1, 2\}$. Suppose that candidate 1's (2's) office and policy payoffs satisfy $1 - k_t(0 - p)^2$ $(1 - k_t(2 - p)^2)$, where 0 (2) is candidate 1's (2's) ideal point. A high-quality candidate is then a moderate politician willing to implement the voter's preferred policy if given the proper electoral incentives.

2. Candidate $j \in \{1,2\}$ observes (only) his quality and chooses whether to credibly commit to the common value ($p_j = 1$) or partisan ($p_j = 0$) policy.

3. The electoral campaign takes place. Candidates 1 and 2, and the voter choose, respectively, campaign expenditures and attention $y_1$, $y_2$, and $(x_1, x_2)$. With probability $x_j y_j$, the voter observes candidate $j$'s platform, otherwise she does not learn $p_j$.

4. The partisan swing $\theta \in \{1,2\}$ is realized and the voter elects one of the two candidates: $e \in \{1,2\}$.

5. The elected candidate $e$ implements $p_e$ and payoffs are realized.

The equilibrium concept is Perfect Bayesian Equilibrium (PBE) in pure strategies (allowing the voter to toss a fair coin when indifferent), excluding weakly-dominated strategies.[13] Henceforth, 'equilibrium' refers to this class of equilibria.

To conclude the description of the model, we introduce our definition of reputational and partisan imbalances, assuming (without loss of generality) that candidate 1 is the leading candidate. In our set-up, reputational imbalance corresponds to the voter's a priori favorable evaluation of candidate 1's quality: $Pr(t_1 = h) = q_1 \geq Pr(t_2 = h) = q_2$. For ease of exposition, we assume that $q_1 = \frac{1+\phi}{2}$ and $q_2 = \frac{1-\phi}{2}$ so $\phi \geq 0$ represents the level of reputational imbalance.[14] Partisan imbalance corresponds to the voter's a priori favorable evaluation of candidate 1's party label: $Pr(\theta = 1) = \pi_1 \geq Pr(\theta = 2) = \pi_2$. For ease of exposition, we assume that $\pi_1 = \frac{1+\delta}{2}$ and $\pi_2 = \frac{1-\delta}{2}$ so $\delta \geq 0$ represents the level of partisan imbalance. Using the wording in Lee et al. (2004), reputational imbalance captures asymmetries in the voter's belief about her ability to affect candidates' policies, whereas partisan imbalance corresponds to asymmetries in her evaluation of a party when she only elects policies.

Reputational imbalance can have several possible origins. A prominent source (especially in the context of the U.S.) is a candidate's incumbency status. Indeed, incumbents tend to be more productive and of higher quality than challengers (Erikson, 1971; Carson et al., 2007; Cox and Katz, 1996; Hirano and Snyder, 2009) due, among other things, to selection effects (Zaller, 1998; Ashworth and Bueno de Mesquita, 2008). Reputational imbalance can also arise as a result of a candidate's seniority or leadership position in the legislature or of endorsements by important politicians or

[13] A formal definition of equilibrium can be found in Appendix A.

[14] All our results hold for $q_1 = q + \phi/2$ for $q$ not too large (but strictly greater than 1/2).

celebrities (Garthwaite and Moore, 2013). Assuming that the voter cares primarily about outcomes rather than policies, reputational imbalance can also reflect a party's advantage when it comes to the most important issue faced by the voter. Indeed, it is well known that parties have owned issues, defined as a "reputation for greater competence on handling" these issues (Petrocik, 1996; p.825). Examples include health care reforms for Democrats or inflation for Republicans.

In contrast, partisan imbalance arises from the notion that parties are informative labels (Downs, 1957; Aldrich, 1995; Snyder and Ting, 2002) associated with well-defined policy positions on certain issues such as gun controls, abortion rights, public signs in the public sphere. The function $u_v(\theta, j)$ thus corresponds the voter's payoff from the policy bundle traditionally associated with party $j \in \{1, 2\}$ and depends on factors beyond candidates' control. Ex-ante, however, candidates have some expectations about voters' partisan leaning (e.g., due to the partisan composition of the candidates' constituency) and use this knowledge to inform their platform and communication choices. To make the model interesting, we assume that the voter prefers the common value policy ($\xi < 1$), but absent any additional information, voters use party labels to evaluate candidates ($\xi > q_1 \Leftrightarrow \phi \leq 2\xi - 1$).[15]

# 3 Preliminary results

Due to the implementation cost $k_t$, the voter and candidates have conflicting preferences. A high-quality candidate is willing to commit to the common value policy only when this commitment is appropriately rewarded by an increase in his wining probability.

The electoral reward for committing to the common value policy depends critically on the probability that the voter learns a candidate's platform during the campaign ($x_j y_j$). Intuitively, in any equilibrium, only candidates promising $p = 1$ incur campaign expenditures. A candidate who proposes the partisan policy has no interest in revealing his platform since it never improves his electoral appeal: the voter would only learn that the candidate proposes a suboptimal platform. Voter attention, in turn, is driven by the possibility of detecting a high-quality candidate who commits to the common value policy. This reasoning directly implies that there always exists an 'unresponsive equilibrium' in which candidates always propose the partisan policy, do not engage

[15]The last inequality is only a sufficient condition for all our results to carry through. A necessary condition is that the voter always bases her electoral decision on her partisan payoff $u_v(\theta, j)$ when she does not learn candidates' platforms.

in campaign spending, and the voter pays no attention to the campaign.

In this unresponsive equilibrium, the probability that the voter's preferred policy is implemented is minimized, and so is her welfare. In contrast, voter welfare is maximized when candidates from both parties commit to the common value policy when high quality.[16] For this 'responsive equilibrium' to exist, high-quality candidates' electoral reward for committing to the common value policy must dominate the communication and implementation costs. To determine when this condition holds, we first characterize the voter's choice of attention and candidates' campaign expenditures in the responsive equilibrium (assuming it exists).

**Proposition 1.** *In the responsive equilibrium,*
*(i) low-quality candidates do not incur campaign expenditure:* $y_j^*(l) = 0,\ j \in \{1,2\}$
*(ii) high-quality candidates' campaign expenditures and the voter's levels of attention are determined by the unique solution to the following system:*

$$y_1^*(h)^{1+\lambda} = \frac{\left[(1-\delta) + \frac{1-\phi}{2}\frac{\delta}{2}y_2^*(h)x_2^*\right]}{2}(1-k_h)x_1^* \tag{3}$$

$$y_2^*(h)^{1+\lambda} = \frac{\left[(1+\delta) - \frac{1+\phi}{2}\frac{\delta}{2}y_1^*(h)x_1^*\right]}{2}(1-k_h)x_2^* \tag{4}$$

$$(x_1^*)^{1+\lambda} = \left(\frac{1+\phi}{2}\right)^2 \frac{1-\delta}{2}(1-\xi)y_1^*(h) \tag{5}$$

$$(x_2^*)^{1+\lambda} = \left(\frac{1-\phi}{2}\right)^2 \frac{1+\delta}{2}(1-\xi)y_2^*(h), \tag{6}$$

A low-quality candidate does not incur campaign expenditures since he always commits to the partisan policy. A high-quality candidate's spending equalizes his marginal cost ($C'(y_j^*(h)) = y_j^*(h)^{1+\lambda},\ j \in \{1,2\}$) with his marginal benefit. The marginal benefit corresponds to the increase in the probability that the voter learns his platform (taking into account that she might also learn his opponent's) times the payoff from being in office and implementing $p = 1$.

Voter attention towards candidate $j \in \{1,2\}$ equalizes her marginal cost ($C_v'(x_j^*) = (x_j^*)^{1+\lambda}$) with her marginal benefit. The marginal benefit corresponds to the gain from avoiding an electoral mistake, which can be decomposed as follows: (i) the probability that $j$ is high-quality and his opponent $-j$ is low-quality ($q_j(1-q_{-j})$, with $q_1 = \frac{1+\phi}{2} = 1 - q_2$), (ii) the probability that the

[16] This equilibrium constitutes the voter's constrained first best equilibrium, as formally shown in Appendix F.

partisan swing does not favor candidate $j$ ($\pi_{-j}$, with $\pi_1 = \frac{1+\delta}{2} = 1 - \pi_2$), and (iii) the expected gain from detecting a high-quality candidate $(1 - \xi)$. Components (i) and (ii), which depend on reputational and partisan imbalances, play a critical role in the analyses that follow.

The next proposition shows that as long as the implementation cost is not too large, the responsive equilibrium always exists for moderate level of reputational imbalance (i.e., $\phi$ below some threshold $\underline{\phi}$) or partisan imbalance (i.e., $\delta$ below some threshold $\underline{\delta}$).[17] When imbalance is low, the electoral reward for committing to the common value policy induced by voter attention is greater than the (relatively) low implementation and campaign costs. When either type of imbalance is large, this is no longer true. In the following sections, we analyze in detail how each type of imbalance affects voters' incentives to pay attention to candidates. We show that electoral imbalances generate an asymmetry in the voter's level of attention towards the two candidates, which in turns generates an asymmetry in candidates' electoral reward for committing to the common value policy. When either type of imbalance is too large ($\phi$ above some threshold $\overline{\phi}$ or $\delta$ above some threshold $\overline{\delta}$), voter attention is too skewed towards one of the two candidates, and his opponent no longer finds it profitable to commit to the common value policy.[18]

**Proposition 2.** *There exists $\overline{k}^0 > 0$ such that for all $k_h < \overline{k}^0$:*

1. *Assuming no partisan imbalance ($\delta = 0$), there exists $\underline{\phi}, \overline{\phi} \in (0, 2\xi - 1] \times [\underline{\phi}, 2\xi - 1]$ such that:*
   - *(i) for all $\phi \leq \underline{\phi}$, the responsive equilibrium exists;*
   - *(ii) for all $\phi > \overline{\phi}$, the responsive equilibrium does not exist.*
2. *Assuming no reputational imbalance ($\phi = 0$), there exists $\underline{\delta}, \overline{\delta} \in (0, 1) \times [\underline{\delta}, 1)$ such that*
   - *(i) for all $\delta \leq \underline{\delta}$, the responsive equilibrium exists;*
   - *(ii) for all $\delta > \overline{\delta}$, the responsive equilibrium does not exists.*

In what follows, we assume that the implementation cost satisfies $k < \overline{k}^0$ and turn our attention to the analysis of the consequences of reputational and partisan imbalances.

[17] To match the exposition of the results that follows, we state Proposition 2 for reputational and partisan imbalances separately. In Section 6, we consider the case of positive levels of both reputational and partisan imbalances.

[18] While in general we cannot guarantee a unique threshold for each type of imbalance, in Appendix B, we show that when the implementation cost $k_h$ is small enough, then the responsive equilibrium exists if and only if $\phi \leq \overline{\phi} = \underline{\phi}$ (Corollary B.1) and if and only if $\delta \leq \overline{\delta} = \underline{\delta}$ (Corollary B.2).

# 4 The consequences of reputational imbalance

In this section, we study the effect of reputational imbalance, fixing the level of partisan imbalance to zero: $\delta = 0$ so $\pi_1 = \pi_2 = 1/2$. In view of Proposition 2, we discuss separately the cases of moderate and large levels of reputational imbalance.

## 4.1 Moderate level of reputational imbalance

By Proposition 2, the responsive equilibrium exists and this subsection characterizes its properties (formally derived in Appendix C). An increase in reputational imbalance has no effect on candidates' platform choices, but it affects voter's choice of attention and candidates' campaign expenditures.

**Property 4.1.** *The voter always pays more attention to the leading candidate* 1 *than the trailing candidate* 2*:* $x_1^* > x_2^*$ *whenever* $\phi > 0$*. Furthermore, voter attention towards the leading (trailing) candidate increases (decreases) with reputational imbalance.*

As explained above, the voter pays attention to avoid an electoral mistake: electing a low-quality candidate $j \in \{1, 2\}$ when his opponent is high quality. Since candidate 1 is more likely to be high quality and candidate 2 low quality, the most likely electoral mistake is to fail to elect a high-quality candidate 1. The voter thus pays more attention to the leading candidate 1, who thus benefits from an 'attention advantage.'

Absent partisan imbalance, high-quality candidates' marginal benefit of campaign expenditures does not directly depend on reputational imbalance, but only through voter attention (Equation 3 and Equation 4 become $y_j^*(h)^{1+\lambda} = \frac{1-k_h}{2} x_j^*,\ j \in \{1, 2\}$ after imposing $\delta = 0$). Since voter attention increases the return on campaign spending and the voter pays more attention to the leading candidate 1, 1 outspends the trailing candidate 2 (as illustrated in Figure 2a, to the left of $\overline{\phi}$).

**Property 4.2.** *The leading candidate* 1 *always incurs higher campaign expenditures than the trailing candidate* 2*:* $y_1^*(h) > y_2^*(h)$ *whenever* $\phi > 0$*. Furthermore, the leading (trailing) candidate's expenditures increase (decrease) with reputational imbalance.*

In our theoretical framework, reputational imbalance translates into a sizable spending advantage. Our theory thus predicts that a candidate spends more when his personal characteristics align with the most important issue(s) of an election (such as being a war hero when national security

is a top priority, or having a successful record as a reformer when government inefficiency is of paramount importance). It also provides a new rationale for the incumbency spending advantage documented in copious empirical studies (e.g., Green and Krasno, 1990; Jacobson, 1990; Gerber, 1998).[19] In our set-up, this advantage emerges simply as a result of an incumbent's higher quality; introducing a competitive edge in fund-raising (as assumed in previous studies) would only reinforce our result (see footnote 21 for more details). Finally, in line with Bidwell et al.s' (2015) empirical findings, Property 4.2 indicates that candidates who experience a positive (resp., negative) reputation shock increase (resp., decrease) their campaign expenditures.

Since reputational imbalance has opposite effects on the leading and trailing candidates' spending, it is a priori unclear how total campaign expenditures vary with $\phi$. The next property establishes that, in line with empirical evidence, campaign expenditures are highest in ex-ante competitive races (that is, races with little or no reputational imbalance) whenever the cost function $C(\cdot)$ is sufficiently convex (so 1's campaign expenditures do not increase too fast).

**Property 4.3.** *For all $\lambda > \sqrt{3} - 1$, total campaign expenditures $(y_1^*(h) + y_2^*(h))$ decrease with reputational imbalance.*

Since the voter pays more attention to the leading candidate 1, who also outspends his opponent, she is more likely to detect a high-quality candidate 1 than a high-quality candidate 2. Electoral campaigns have an exacerbating effect which translates reputational imbalance into a significant electoral advantage (see Figure 2b for $\phi \leq \overline{\phi}$).

**Property 4.4.** *The leading candidate 1's (ex-ante) winning probability is strictly greater than $1/2$ for $\phi > 0$. Furthermore, his winning probability is strictly increasing with reputational imbalance.*

A candidate always benefits electorally when his personal characteristics align with the electorate's main concerns. Further, it also shows how an incumbent's greater reputation can translate into an incumbency advantage—defined as the expected difference between the probability that candidate $j$ wins the election as an incumbent (i.e., $\phi > 0$) and the probability he wins an open seat election (i.e., $\phi = 0$). Our comparative statics is consistent with the empirical finding that the

[19] While measures of incumbent spending advantage consider total campaign expenditures, Schuster (2015) shows that this advantage is still present when restricting the sample to advertising expenditures.

growth in the incumbency advantage is due to an increase in incumbent's quality (Carson et al., 2007).

Properties 4.1, 4.2, and 4.4 allow us to decompose the leading candidate's electoral advantage into three different components (represented in Figure 1): (i) the direct effect of reputational imbalance (higher probability that candidate 1 is high-quality), (ii) the spending advantage, and (iii) the attention advantage. Higher (expected) quality explains a significant part, but not all of candidate 1's electoral advantage. Indeed, the exacerbating effect of campaigns plays an important role (compare in Figure 1 the plain black line representing the equilibrium winning probability and the dotted purple line representing the counterfactual winning probability absent the exacerbating effect). Our theory therefore rationalizes empirical evidence that the incumbency advantage cannot be fully explained by incumbents' better reputation (Erikson and Titiunik, 2015; Hall and Snyder, 2014).

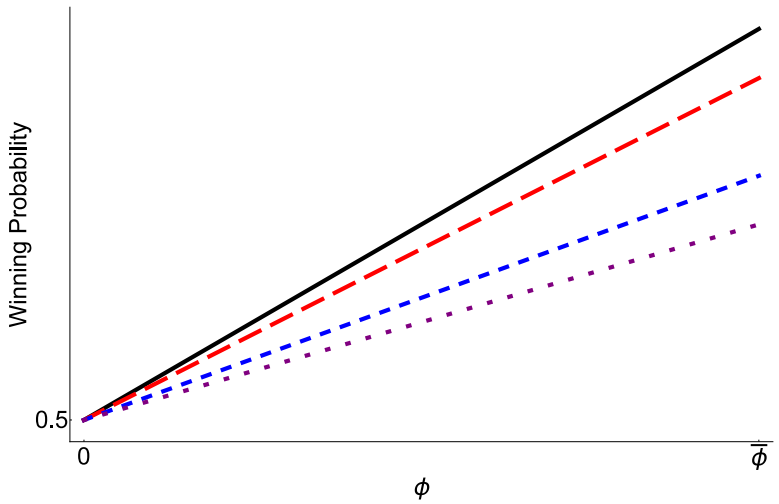



Figure 1: Counterfactual analysis

The dark plain line corresponds to the leading candidate's ex-ante equilibrium winning probability. The long-dashed red line corresponds to his winning probability when campaign expenditures are held constant at their no imbalance ($\phi = 0$) level. The short-dashed blue line corresponds to candidate 1's winning probability when voter's levels of attention are held constant at their no imbalance level. The dotted purple line corresponds to candidate 1's winning probability when campaign expenditures and attention are left at their no imbalance level. Parameter values: $k_h = 0.075$, $k_l = 1$, $\xi = 3/4$, $\lambda = 2$.

Furthermore, most of the exacerbating effect comes from the attention advantage. Candidate 1's counterfactual winning probability when campaign expenditures are fixed at their level with no reputational imbalance ($\phi = 0$) and voter attention is left at its equilibrium value is only slightly

smaller than the equilibrium winning probability (compare the black and red dashed lines in Figure 1). As documented by Gerber (1998), the incumbent's spending advantage can only explain a portion of the incumbency advantage.

Conversely, candidate 1's counterfactual winning probability when voter attention is fixed at its level with no reputational imbalance and campaign expenditures are left at their equilibrium values is significantly lower than the equilibrium winning probability (compare the black and short-dashed blue lines in Figure 1). As the next Property shows, the electoral impact of the attention advantage is always larger than the effect of the spending advantage.

**Property 4.5.** *The effect of candidate* 1*'s greater campaign expenditures on his winning probability is strictly lower than the effect of greater level of attention towards him.*

The key intuition behind Property 4.5 is that voter attention directly depends on reputational imbalance, whereas campaign expenditures depend on $\phi$ only through voter attention. As a result, candidates' campaign expenditures are less responsive to reputational imbalance than the voter's levels of attention.

The role of voter attention in the leading candidate's electoral advantage uncovered in this paper has important implications for the empirical analysis of the *sources* of the incumbency advantage. Suppose that a researcher were to estimate the following model:

$$V = \beta_0 + \beta_1 Quality + \beta_2 Money + \eta, \tag{7}$$

where $V$ is the incumbent's vote share, $Quality$ is a proxy for candidates' quality, and $Money$ is candidates' campaign expenditures. The results above suggest that Equation 7 is likely to be mis-specified. Interpreting candidate 1's interim winning probability (i.e., after candidates 1 and 2's types have been realized) as his realized vote share and the ex-ante winning probability (i.e., before types' realization) as leading candidates' average vote share observed in the data,[20] a more appropriate specification according to our theoretical framework is:

$$V = \beta_0 + \beta_1 Quality + \beta_2 Money + \beta_3 Attention + \epsilon, \tag{8}$$

[20]Since our set-up includes a representative voter, the realized vote share in our model is always zero or one.

Consequently, our theory predicts that naive estimates (i.e., Equation 7) of the sources of the incumbency advantage suffers from omitted variable bias. Furthermore, this bias is positive since voter's levels of attention are positively correlated with the vote share, candidates' perceived quality, and campaign expenditures.

This omitted variable bias poses a strong challenge to correctly estimate the electoral return on campaign expenditures. Controlling for candidates' quality (as in Green and Krasno, 1988) is not sufficient. An instrumental variable (IV) approach requires that the instrument be uncorrelated with candidates' quality *and* voter attention. To illustrate the severity of these exclusion restrictions, consider candidates' wealth, used in Gerber (1998). Since wealth is negatively correlated with the cost of fund-raising, our theory implies that (everything else constant) the voter would pay more attention to the candidate with the lowest cost of fund-raising.[21] While the use of wealth as an instrument for spending alleviates the omitted variable bias (the voter only reacts to the leading candidate's fund-raising edge), it does not eliminate it.

Another approach to eliminate this bias consists in developing a measure of ex-ante closeness of a race and focus on the closest races, as asymmetries in the voter's levels of attention should be minimal. Notice, however, that even small level of imbalance can generate a significant exacerbating effect (see Figure 1). As such, our theoretical framework suggests that the estimates in Erikson and Palfrey (2000)—who do not focus exclusively on $50-50$ races, but on a subsample close to that threshold—are likely to be upwardly biased.[22]

In the absence of proper control for voter attention, our theoretical results suggest that a more promising avenue for empirical research may be to measure the *equilibrium effect* of greater campaign spending (e.g., using exogenous changes in regulation as in Hall, 2015).

Our findings also have implications for the identification of the personal incumbency advantage; that is, the electoral benefit of simply being an incumbent (due, for example, to greater media

[21] In this case, candidate $j$'s campaign expenditures and voter attention towards $j$ are defined by $\tau_j y_j^*(h)^{1+\lambda} = \frac{1-k_h}{2} x_j^*$ and $(x_j^*)^{1+\lambda} = \frac{1-\xi}{8} y_j^*(h)$, with $\tau_1 = 1 < \tau_2$ so 1 has a competitive hedge in fund-raising. It can be checked that the voter pays more attention to the leading candidate 1, which exacerbates the benefit of lower fund-raising cost.

[22] One might wonder whether the small return on campaign expenditures found in Levitt (1997) and (to a lesser extent) Stratmann (2009) also suffers from upward omitted variable bias (Stratmann controls for the price of advertising and finds bigger estimates than Levitt). Levitt and Stratmann control for candidates' quality with candidates fixed effects and changes in fund-raising ability with time fixed effect. As they do not control for change in the electorate's opinion of candidates, their estimate are also likely to be upwardly biased. However, since the sample is restricted to repeated races, change in perceived candidates' qualities is likely to be minimal and so is the bias.

coverage or franking privileges). This source of the incumbency advantage is usually estimated by an RD design exploiting close elections. This methodological approach might seem at first immune from our theoretical critique. However, if one assumes that an incumbent's past vote share is correlated with present reputational imbalance, our theory suggest that RD designs provide an unbiased estimate of the personal incumbency advantage only if two conditions are satisfied.

First, it is necessary that researchers approximate as closely as possible conditions at the $50-50$ threshold to avoid the upward omitted variable bias generated by the exacerbating effect of campaigns. This condition is unlikely to be satisfied when researchers use a naive optimal bandwidth approach. As such, our theory points to the importance of adopting a flexible polynomial approach in RD design (for empirical results consistent with our conclusion, see Hyytinen et al., 2014).

A second necessary condition is that at the $50-50$ threshold, the electorate has the same *opinion* of the incumbent and challenger since the exacerbating effect depends on *perceived* rather than actual candidates' quality. Recent empirical evidence and theoretical advances suggest that this condition is unlikely to be satisfied.[23] Fowler (2015) documents that the electorate has little information about past electoral outcomes and thus tends to over-estimate the incumbent's quality. Furthermore, as Eggers (2014) and Folwer (2015) demonstrate, even under perfect recall of past electoral margin, a voter would hold the same opinion of a closely elected incumbent and his challenger only if the distribution of candidates' characteristics is perfectly symmetric.[24] In other words, our theory suggests that RD designs are likely to be misidentified because the necessary assumption that the electorate's opinion of candidates is smooth at the threshold is likely to be violated.

Lastly, we show that reputational imbalance has a positive effect on the performance of the electoral process, as measured by the probability the voter obtains her preferred policy (see Figure 2c for $\phi \leq \overline{\phi}$).

**Property 4.6.** *The probability the common value policy is implemented increases with reputational imbalance.*

[23] Our critique of RD design holds even in the absence of concerns about sorting around the threshold (Grimmer et al., 2010; Caughey and Sekhon, 2011; Eggers et al., 2015).

[24] In our model, a $50-50$ outcome (measured by the interim winning probability) occurs when both candidates are either low quality or high quality. Conditioning *only* on this event, the voter believes that the incumbent and his challengers have the same probability of being high quality due to our assumption that $Pr(t=h)=1/2$. If $Pr(t=h)=q>1/2$, then the voter would update positively on the incumbent's quality following a close election.

The voter conditions her level of attention on the pivotal event that a high-quality candidate faces a low-quality candidate. When it comes to the leading candidate 1, this probability is $q_1(1-q_2) = \left(\frac{1+\phi}{2}\right)^2$. It is increasing and convex in the level of reputational imbalance ($\phi$). When it comes to the trailing candidate 2, the probability of the pivotal event is $q_2(1-q_1) = \left(\frac{1-\phi}{2}\right)^2$. It is decreasing and convex in the level of imbalance; hence, it does not decrease too fast. As a result, the increase in the likelihood to detect a high-quality candidate 1 more than compensates the decrease for candidate 2.

As reputational imbalance increases, the voter becomes on average better able to detect high-quality candidates and her ex-ante welfare increases (voter welfare is an affine transformation of the probability the common value policy is implemented). Our theory suggests that less competitive elections (Property 4.4) can improve voter welfare (Property 4.6). As a consequence, whenever the level of reputational imbalance is low, measures meant to improve the degree of electoral competition (e.g., caps on campaign expenditures) can reduce accountability.

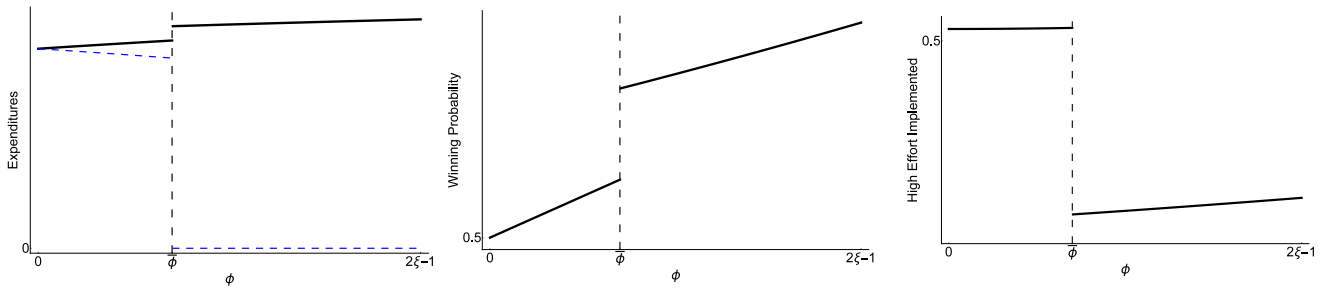
## 4.2 High level of reputational imbalance

For high level of reputational imbalance, the responsive equilibrium does not exist (Proposition 2). Consequently, a high $\phi$ always hurts the voter (see the drop around $\overline{\phi}$ in Figure 2c). The reason is that the voter pays too little attention to the trailing candidate to induce him to choose the common value policy. The voter cannot do better than a semi-responsive equilibrium when only one candidate commits to the common value policy when high-quality. As the voter wants to maximize the probability that her preferred policy is implemented, the best semi-responsive equilibrium features the leading candidate proposing $p = 1$ when high-quality. The next proposition establishes that this equilibrium is always attainable when the implementation cost is not too high.

**Proposition 3.** *There exists $k_h^{A1} \in (0,1)$ such that, when $k_h \leq k_h^{A1}$, there exists for all $\phi \geq 0$ a semi-responsive equilibrium in which the leading candidate 1 commits to the common value policy when high quality and the trailing candidate always commits to the partisan policy.*

In the best semi-responsive equilibrium, the leading candidate spends significantly more than his opponent (Figure 2a for $\phi > \overline{\phi}$) and wins with a large probability (Figure 2b for $\phi > \overline{\phi}$). Our theory

thus predicts that a large level of reputational imbalance is associated with a lopsided election (as documented by Abramowitz et al., 2006).




(a) Campaign expenditures (b) 1's winning probability (c) Probability of $p = 1$

Figure 2: Equilibrium outcomes with reputational imbalance

In Figures 2a, the black plain lines correspond to the leading candidate 1, the dashed blue line to the trailing candidate 2. In Figure 2b, the black line corresponds to the leading candidate's ex-ante winning probability. In Figure 2c, the black line is the (ex-ante) probability that the common value policy is implemented. Parameter values: $k_h = 0.075$, $\xi = 3/4$, $\lambda = 2$.

The analysis above establishes that candidates' behaviors and electoral outcomes are markedly different for moderate ($\phi \leq \overline{\phi}$) and high ($\phi > \overline{\phi}$) levels of reputational imbalance (see Figure 2). Consequently, our theory highlights that local average treatment effect of the electoral consequences of reputational imbalance might differ significantly from average treatment effect. In particular, the external validity of RD design based on close elections might be limited.

# 5 The consequences of partisan imbalance

We now turn attention to the effect of partisan imbalance, fixing the level of reputational imbalance to zero: $\phi = 0$ so $q_1 = q_2 = 1/2$. As for reputational imbalance, we discuss separately the cases of moderate and high levels of partisan imbalance.

## 5.1 Moderate level of partisan imbalance

By Proposition 2, the responsive equilibrium exists for moderate level of partisan imbalance. An increase in partisan imbalance does not affect candidates' platform choices, but changes voter's

choice of attention and candidates' campaign expenditures. As Property 5.1 establishes, the voter pays more attention to the *trailing* candidate 2.

**Property 5.1.** *The voter always pays more attention to the trailing candidate* 2 *than the leading candidate* 1*:* $x_2^* > x_1^*$ *whenever* $\delta > 0$*. Furthermore, voter attention towards the trailing (leading) candidate increases (decreases) with partisan imbalance.*

Absent any additional information, the voter's electoral decision is based on the partisan swing. Since the partisan swing favors candidate 1, the risk of wrongly electing a low-quality candidate 1 is higher than wrongly electing a low-quality candidate 2. Consequently, the voter pays more attention to the trailing candidate 2.

As a result of greater voter attention, the trailing candidate 2 has greater incentive to incur campaign expenditures. But candidates' marginal benefit from campaign expenditures also depend directly on partisan imbalance (see (3) and (4) when $\delta > 0$). Partisan imbalance implies that a high-quality candidate 1's electoral chances are high even in the absence of successful communication. This diminishes his marginal benefit of campaign spending. The reverse holds true for the trailing candidate 2. Consequently, the direct effect of partisan imbalance and the indirect effect through voter attention go in the same direction and the leading candidate's campaign expenditures are always lower than his opponent's (see Figure 3a for $\delta \leq \overline{\delta}$).

**Property 5.2.** *The trailing candidate* 2 *always incurs higher campaign expenditures than the leading candidate* 1*:* $y_2^*(h) > y_1^*(h)$ *whenever* $\delta > 0$*. Furthermore, the trailing (leading) candidate's campaign expenditures increase (decrease) with partisan imbalance.*

Since the trailing candidate 2 outspends his opponent and the voter pays more attention to candidate 2, she is more likely to learn candidate 2's platform. This is the mitigating effect of electoral campaigns. This mitigating effect implies that the electoral gain due to partisan imbalance is limited: the difference in (ex-ante) winning probabilities is always smaller than the underlying level of partisan imbalance ($\delta$). Partisan imbalance, however, always generates an electoral advantage for the leading candidate: his winning probability is always strictly greater than 1/2 as the mitigating effect benefits only a high-quality candidate 2, whereas partisan imbalance improves the electoral chances of all types of candidate 1.

**Property 5.3.** *The leading candidate's (ex-ante) winning probability is strictly greater than* $1/2$ *for all* $\delta > 0$*. However, the difference in ex-ante winning probabilities between the leading and trailing candidate is strictly lower than* $\delta$ *for all* $\delta > 0$*.*

Property 5.3 provides a theoretical foundation for the small impact of partisan redistricting—arguably, a major source of partisan imbalance[25]—on electoral outcomes documented in the empirical literature (Gelman and King, 1994; Niemi and Abramowitz, 1994). Gelman and King argue that this moderate effect is due to the uncertainty associated with the redistricting process. This paper provides an alternative explanation based on voter's strategic response to partisan imbalances.

Voter's strategic choice of attention can also help explain why empirical researchers (e.g., Kendall and Rekkas, 2012; Fowler and Hall, 2014; da Fonseca, 2015) have consistently documented a stronger personal incumbency advantage than partisan incumbency advantage—the electoral benefit of a candidate arising simply from belonging to the incumbent party. This difference may be due to the exacerbating effect of campaigns generated by reputational imbalance (which, as we argued above, constitutes part of the estimated personal incumbency advantage) and the mitigating effect of campaigns caused by partisan imbalance.

While our theory explains several key empirical regularities identified in the literature, the analysis of the consequences of partisan imbalance suggests ways to test it further. First, campaign expenditures should be negatively correlated with partisan imbalance (Property 5.2). Second, as a result of Properties 5.1 and 5.2, voters should know more about the trailing candidate's policy stance than the leading candidate's.[26]

Lastly, we show that partisan imbalance improves the performance of the electoral process.

**Property 5.4.** *The probability the common value policy is implemented increases with partisan imbalance.*

An increase in partisan imbalance has two first-order effects: it decreases the leading candidate's campaign expenditures and increases the trailing candidate's. These changes trigger two second-order effects. First, the leading candidate 1's marginal benefit of campaign expenditures increases

[25]For empirical evidence, see Campagna and Grofman (1990). For a theoretical foundation, see Gül and Pesendorfer (2010).

[26]Notice that in order to test this prediction, one needs to hold reputational imbalance constant, since it has the opposite effect on candidates' campaign spending, voter attention and learning.

(there is a greater chance that successful electoral communication determines the outcome of the election). Second, the trailing candidate's marginal benefit of campaign expenditures increases as well due to the decrease in his opponent's spending. Consequently, the leading candidate's campaign spending is less responsive to partisan imbalance than the trailing candidate's and the voter is on average more likely to detect high-quality candidates.

As for reputational imbalance, a decrease in electoral competition (Property 5.3) can be associated with an increase in the voter welfare (Property 5.4). Consequently, partisan redistricting does not necessarily impede accountability. Moving to a more neutral process (as advocated by several organizations, e.g. Redrawing the Lines) might have negative unintended consequences. While not arguing against non-partisan redistricting, this paper shows that the effect of such policy is conditional on the pre-existing level of partisan imbalance.

## 5.2 High level of partisan imbalance

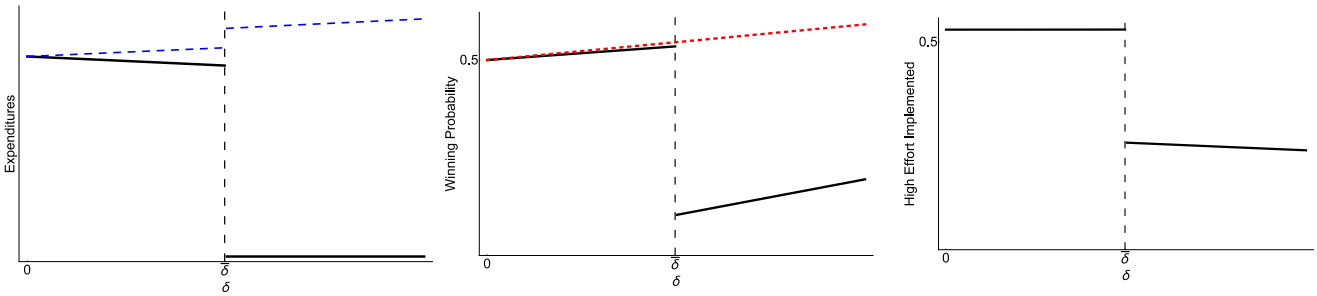
For high level of partisan imbalance, the responsive equilibrium does not exist (Proposition 2). Consequently, the probability the voter obtains her preferred policy (and her welfare) decreases (see the drop around $\overline{\delta}$ in Figure 3c). This implies that partisan and reputational imbalances have a similar reduced form effect on political accountability. However, this similarity masks a very different structural relationship. For large level of reputational imbalance, the responsive equilibrium does not exist because the voter pays too little attention to the *trailing* candidate. For large level of partisan imbalance, the responsive equilibrium does not exist because the voter pays too little attention to the *leading* candidate. Our theory highlights the challenge of designing all-encompassing regulatory solutions for different types of electoral imbalances. Regulation must be sensitive to the level of imbalance (Properties 4.6 and 5.4) as well as the type of imbalance it is meant to address.

When the responsive equilibrium does not exist, the voter prefers a semi-responsive equilibrium with the leading candidate committing to the common value policy when high quality.[27] The reason is that, due to partisan imbalance, the voter is always more likely to elect the leading candidate (hence less likely to make an electoral mistake). The leading candidate 1, however, has little incentive to commit to the common value policy because of the electoral advantage (independent

[27]See Appendix F for a formal proof.

of his policy commitment) generated by partisan imbalance.[28] The voter then might be unable to do better than a semi-responsive equilibrium with the trailing candidate proposing $p = 1$ when high quality. In this equilibrium, the trailing candidate's winning probability can be significantly larger than 50%. Partisan imbalance can thus have negative electoral consequences for the leading candidate 1 (see Figure 3b, which is right censored, for $\delta > \overline{\delta}$). The following proposition, however, shows that (sufficiently) high level of partisan imbalances always generates an electoral advantage for the leading candidate.

**Proposition 4.** *There exists* $\delta^{W1} \in [\overline{\delta}, 1)$ *such that in any equilibrium, the leading candidate* 1*'s ex-ante winning probability is greater than* $1/2$ *for all* $\delta \geq \delta^{W1}$.




(a) Campaign expenditures (b) 1's winning probability (c) Probability of $p = 1$

Figure 3: Equilibrium outcomes with partisan imbalance

In Figures 3a, the black plain lines correspond to the leading candidate 1, the dashed blue line to the trailing candidate 2. In Figure 3b, the black line is the leading candidate's ex-ante winning probability (the dotted red line corresponds to $(1 + \delta)/2$). In Figure 3c, the black line is the (ex-ante) probability that the common value policy is implemented. Parameter values: $k_h = 0.075$, $\xi = 3/4$, $\lambda = 2$.

# 6 Combining reputational and partisan imbalances

The previous sections study separately reputational and partisan imbalances. Here, we briefly discuss the joint consequences of moderate levels of both imbalances (i.e., focusing on the responsive equilibrium). All claims are formally derived in Appendix E.

As pointed out above, electoral campaigns mitigate the effect of partisan imbalance: the voter is more likely to learn the trailing candidate's platform. This result holds in the presence of reputa-

[28] In addition, the voter pays little attention to candidate 1 since she is likely to elect him absent new information. This means a low electoral reward for committing to the common value policy.

tional imbalance. Consequently, partisan imbalance tends to diminish the exacerbating effect and electoral advantage caused by reputational imbalance. Partisan imbalance reduces the incumbency advantage, in line with empirical evidence in Ansolabehere et al. (2000).

Moderate levels of electoral imbalance (whether reputational or partisan) always improve political accountability by increasing the probability the common value policy is implemented. The beneficial effect of reputational imbalance, however, is primarily driven by voter attention (the upward change in her attention towards the leading candidate dominates her reduction in attention towards the trailing candidate). In contrast, the positive impact of partisan imbalance is due to candidates' behavior (candidate 1 is less responsive than candidate 2). Consequently, both types of imbalance have a complementary effect on accountability. Adding partisan imbalance to reputational imbalance increases the likelihood the voter obtains her preferred policy.

# 7 Conclusion

This paper provides a unified theoretical framework to study the consequences of reputational and partisan imbalances. Our theory can account for several empirical regularities: the significant electoral premium resulting from reputational imbalance (e.g., caused by incumbency), the existence of an incumbency spending advantage, and the limited impact of partisan imbalance (e.g., caused by partisan redistricting). We show that these different empirical regularities are caused in a significant part by voter's strategic choice of attention. As a result, empirical studies of the consequences of electoral imbalance which do not properly control for voter attention, including RD designs, potentially suffer from a severe omitted variable bias.

Moderate levels of electoral imbalances decrease the degree of electoral competition, but also increase the likelihood that the electorate's preferred policy is implemented. Large levels of partisan and reputational imbalances, however, always hurt voter welfare, but for very different reasons. Any reform meant to address the negative consequences of electoral imbalances must be precisely tailored to their level and their type.

Our theory assumes a common value policy and unmediated communication between candidates and the electorate. Future research would do well to study the performance of the electoral process in ideological domains as well as the role of the media when voters face significant cognitive constraints.

# References


Abramowitz, Alan I. 1983 "Partisan redistricting and the 1982 congressional elections." The Journal of Politics 45(3): 767-770.

Aldrich, John H. 1995. *Why parties? The origin and transformation of party politics in America.* Chicago, IL: University of Chicago Press.

Alvarez, R. Michael. 1997. *Information and Elections.* Ann Arbor: University of Michigan Press.

Ansolabehere, Stephen, James M. Snyder Jr, and Charles Stewart III. 2000. "Old voters, new voters, and the personal vote: Using redistricting to measure the incumbency advantage." American Journal of Political Science, 44(1): 17-34.

Aragones, Enriqueta, and Thomas R. Palfrey. 2002. "Mixed equilibrium in a Downsian model with a favored candidate." Journal of Economic Theory, 103(1): 131-161.

Ashworth, Scott. 2006. "Campaign finance and voter welfare with entrenched incumbents." American Political Science Review 100(1): 55-68.

Ashworth, Scott, and Ethan Bueno de Mesquita. 2006. "Delivering the Goods: Legislative Particularism in Different Electoral and Institutional Settings." Journal of Politics 68 (1): 168-179.

Ashworth, Scott, and Ethan Bueno De Mesquita. 2008. "Electoral selection, strategic challenger entry, and the incumbency advantage." Journal of Politics 70 (4): 1006-1025.

Bernhardt, M. Daniel, and Daniel E. Ingerman. 1985. "Candidate reputations and the incumbency effect." Journal of Public Economics 27(1): 47-67.

Bidwell, Kelly, Katherine E. Casey, and Rachel Glennerster. 2015. "Debates: Voting and Expenditure Responses to Political Communication." Paper presented at the London School of Economics Political Science and Political Economy Seminar on November, 17 2015.

Campagna, Janet, and Bernard Grofman. 1990. "Party control and partisan bias in 1980s congressional redistricting." The Journal of Politics 52(4): 1242-1157.

Campbell, Angus, Philip E. Converse, Warren E. Miller, and Donald E. Stokes. 1980 [1960]. *The American Voter. Unabridged Edition.* Chicago: The University of Chicago Press.

Carson, Jamie L., Erik J. Engstrom, and Jason M. Roberts. 2007. "Candidate quality, the personal vote, and the incumbency advantage in congress." American Political Science Review, 101(2): 289-301.

Caughey, Devin and Jasjeet S. Sekhon. 2011. "Elections and the regression discontinuity design: Lessons from close us house races, 19422008." Political Analysis 19(4): 385-408.

Coate, Stephen. 2004. "Political Competition with Campaign Contributions and Informative Advertising." Journal of the European Economic Association: 772-804.

Converse, Philip. E. 1964. "The Nature of Belief Systems in Mass Publics" in *Ideology and discontent*, Apter edited by David Ernest. Glencoe: Free Press of Glencoe.

Cox, Gary W., and Scott Morgenstern. 1993. "The increasing advantage of incumbency in the US states." Legislative Studies Quarterly, 18(4): 495-514.

Cox, Gary W., and Jonathan N. Katz. 1996. "Why did the incumbency advantage in US House elections grow?" American Journal of Political Science, 478-497.

da Fonseca, Mariana Lopes. 2015. "Identifying the Source of Incumbency Advantage through an Electoral Reform." Center for European Governance and Economic Development Research, Discussion Papers No. 239.

Dewan, Torun and Rafael Hortala-Vallve. 2013. "Electoral Competition, Control and Learning." Presentation at the Political Economy Seminars, Stanford University Graduate School of Business, Stanford, California. June 13.

Dewatripont, Matthias and Jean Tirole. 2005. "Modes of Communication." Journal of Political Economy, 113 (6): 1217-1238.

Downs, Anthony. 1985 [1957]. *An Economic Theory of Democracy.* Boston: Addison Wesley.

Eggers, Andrew C., Anthony Fowler, Jens Hainmueller, Andrew B. Hall, and James M. Snyder. 2015. "On the validity of the regression discontinuity design for estimating electoral effects: New evidence from over 40,000 close races." American Journal of Political Science 59(1): 259-274.

Eggers, Andy. 2014. "Quality-Based Explanations of Incumbency Effects." Paper presented at the 72nd MPSA Annual Conference, Chicago.

Erikson, Robert S. 1971. "The advantage of incumbency in congressional elections." Polity, 3: 395-405.

Erikson, Robert S., and Thomas R. Palfrey. 2000. "Equilibria in Campaign Spending Games: Theory and Data." American Political Science Review 94(3): 595-609.

Erikson, Robert S. and Roco Titiunik. 2015. "Using Regression Discontinuity to Uncover the Personal Incumbency Advantage." Quarterly Journal of Political Science 10(1): 101-119.

Fowler, Anthony, and Andrew B. Hall. 2014. "Disentangling the Personal and Partisan Incumbency Advantages: Evidence from Close Elections and Term Limits." Quarterly Journal of Political Science 9(4): 501-531.

Fowler, Anthony. 2015. "A Bayesian Explanation for Incumbency Advantage." Paper presented at the 111th APSA Annual Conference, San Francisco.

Galasso, Vincenzo, and Tommaso Nannicini. 2011. "Competing on good politicians." American Political Science Review 105(1): 79-99.

Garthwaite, Craig, and Timothy John Moore. 2013. "Can Celebrity Endorsements Affect Political Outcomes? Evidence from the 2008 US Democratic Presidential Primary." Journal of Law, Economics and Organization 29(2): 355-384.

Gelman, Andrew, and Gary King. 1990. "Estimating incumbency advantage without bias." American Journal of Political Science, 34(4): 1142-1164.

Gelman, Andrew, and Gary King. 1994. "Enhancing Democracy Through Legislative Redistricting." American Political Science Review, 88(3): 541-559.

Gerber, Alan. 1998. "Estimating the effect of campaign spending on senate election outcomes using instrumental variables." American Political Science Review, 92(2): 401-411.

Gordon, Sanford C., and Dimitri Landa. 2009. "Do the advantages of incumbency advantage incumbents?." The Journal of Politics 71(4): 1481-1498.

Green, Donald Philip, and Jonathan S. Krasno. 1988. "Salvation for the spendthrift incumbent: Reestimating the effects of campaign spending in House elections." American Journal of Political Science, 32(4): 884-907.

Green, Donald Philip, and Jonathan S. Krasno. 1990. "Rebuttal to Jacobson's 'New Evidence for Old Arguments'." American Journal of Political Science, 34(2): 363-372.

Grimmer, Justin, Eitan Hersh, Brian Feinstein, and Daniel Carpenter. 2010. "Are Close Elections Random?." Paper presented at the 68th MPSA Annual Conference, Chicago.

Groseclose, Tim. 2001. "A Model of Candidate Location When One Candidate Has a Valence Advantage," American Journal of Political Science, 45(4): 862-886.

Gül, Faruk, and Wolfgang Pesendorfer. 2010. "Strategic redistricting." The American Economic Review 100(4): 1616-1641.

Hafer, Catherine, and Dimitri Landa. 2007. "Deliberation as self-discovery and institutions for political speech." Journal of Theoretical Politics 19(3): 329-360.

Hall, Richard L. and Alan V. Deardorff. 2006. "Lobbying as Legislative Subsidy," American Political Science Review, 100(1):69-84.

Hall, Andrew B. 2015. "Systemic Effects of Campaign Spending: Evidence From Corporate Contribution Bans in U.S. State Legislatures." Political Science Research and Methods, forthcoming.

Hall, Andrew B., and James M. Snyder Jr. 2015. "How Much of the Incumbency Advantage is Due to Scare-Off?." Political Science Research and Methods, forthcoming.

Hirano, Shigeo, and James M. Snyder Jr. 2009. "Using multimember district elections to estimate the sources of the incumbency advantage." American Journal of Political Science, 53(2): 292-306.

Hortala-Vallve, Rafael, Valentino Larcinese, and Stephanie Rickard. 2013. "The Perverse Consequences of Policy Restrictions in the Presence of Asymmetric Information." London School of Economics, Discussion Paper EOPP 048.

Hyytinen, Ari, Jaakko Meriläinen, Tuukka Saarimaa, Otto Toivanen, and Janne Tukiainen. 2014. "Does Regression Discontinuity Design Work? Evidence from Random Election Outcomes." Government Institute for Economic Research Working Papers 59.

Jacobson, Gary C. 1990. "The effects of campaign spending in House elections: New evidence for old arguments." American Journal of Political Science, 34(2): 334-362.

Kartik, Navin, and Richard Van Weelden. 2015. "Reputation, Term Limits, and Incumbency (Dis)Advantage." Columbia University typescript.

Kendall, Chad, and Marie Rekkas. 2012. "Incumbency Advantages in the Canadian Parliament." Canadian Journal of Economics/Revue canadienne d'économique 45(4): 1560-1585.

Lee, David S., Enrico Moretti, and Matthew J. Butler. 2004. "Do voters affect or elect policies? Evidence from the US House." The Quarterly Journal of Economics 119(3): 807-859.

Lindbeck, Assar, and Jrgen W. Weibull. 1987. "Balanced-budget redistribution as the outcome of political competition." Public choice 52(3): 273-297.

Levitt, Steven D. 1994. "Using repeat challengers to estimate the effect of campaign spending on election outcomes in the US House." Journal of Political Economy 102(4): 777-798.

Levitt, Steven D., and Catherine D. Wolfram. 1997. "Decomposing the sources of incumbency advantage in the US House." Legislative Studies Quarterly, 22(1) 45-60.

Martinelli, César. 2006. "Would rational voters acquire costly information?." Journal of Economic Theory 129(1): 225-251. bibitemmeiiro08 Meirowitz, Adam. 2008. "Electoral contests, incumbency advantages, and campaign finance." The Journal of Politics, 70(3): 681-699.

Niemi, Richard G., and Laura R. Winsky. 1992. "The persistence of partisan redistricting effects in congressional elections in the 1970s and 1980s." The Journal of Politics 54(2): 565-572.

Niemi, R. G., and Abramowitz, A. I. 1994. "Partisan redistricting and the 1992 congressional elections." Journal of Politics, 56(3): 811-17.

Pastine, Ivan, and Tuvana Pastine. 2012. "Incumbency Advantage and Political Campaign Spending Limits." Journal of Public Economics 96(1): 20-32.

Peterson, David A.M. 2009 "Campaign learning and vote determinants." American Journal of Political Science 53(2): 445-460.

Petrocik, John R. 1996. "Issue Ownership in Presidential Elections, with a 1980 Case Study." American Journal of Political Science 40(3): 825-850.

Prat, Andrea. 2002. "Campaign advertising and voter welfare." The Review of Economic Studies 69 (4): 999-1017.

Prato, Carlo and Stephane Wolton. 2015. "The Voters' Curses: Why we Need Goldilocks Voters." American Journal of Political Science, forthcoming.

Schuster, Steven S. 2015. "What We Talk about When We Talk about Campaign Spending." Paper presented at SASE 27th Annual Meeting, London.

Schumpeter, Joseph Alois. 1942. "Socialism, capitalism and democracy." Harper and Brothers.

Snyder Jr, James M., and David Strömberg. 2010. "Press Coverage and Political Accountability." Journal of Political Economy 118(2): 355-408.

Stratmann, Thomas. 2009. "How prices matter in politics: The returns to campaign advertising." Public Choice 140(3-4): 357-377.

Svolik, Milan W. 2013. "Learning to Love Democracy: Electoral Accountability and the Success of Democracy." American Journal of Political Science 57(3): 685-702.

Werner, Timothy, and Kenneth R. Mayer. 2012. "Public Campaign Finance and the Incumbency Advantage." Working paper, Department of Business, Government and Society, University of Texas at Austin.

Zaller, John. 1998. "Politicians as prize fighters: Electoral selection and incumbency advantage." In *Politicians and party politics*, ed. John G. Greer. Baltimore, MD: John Hopkins University Press: 125-85.