Transparency of Campaign Contributions

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Abstract

Do campaign donors benefit from regulatory loopholes allowing them to make donations in secret? Despite public discourse often asserting they do, we provide one strategic rationale for why they may not. We present a theory of informative campaign finance in which contributions may influence public policy by affecting who wins elections or influencing the choices of politicians in office. Contributions can affect electoral fortunes and signal policy information to politicians. By allocating contributions so that the probability a political adversary is elected, which is costly, the donor can credibly signal good news regarding his preferred policy, which is beneficial. We compare donor welfare when contributions reveal information across different campaign finance transparency regimes. Our main results illustrate how donors may sometimes benefit from regulations requiring full disclosure when contributions signal information.

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Campaign finance disclosure is one of the few campaign finance regulations that is still largely supported by American courts. Judicial decisions in the last decade have deregulated other domains of spending such as limits on donations to independent expenditure-only groups (e.g., *Citizens United v. FEC*),[1] while simultaneously upholding disclosure requirements.[2] Nonetheless, regulatory loopholes have given rise to rising levels of undisclosed contributions: "Hundreds of millions of dollars in undisclosed money (dark money) have paid for ads in hundreds of political and judicial races" (Wood 2018, 12). Much of the subsequent debate in political science regarding the benefits of campaign finance transparency has focused on improving voter information,[3] while one prominent argument against requiring disclosure argues that politicians observing contributions places donors at risk for political retribution (Primo 2011).[4] Less discussed is how disclosure regulations affect donors providing policy-relevant information to politicians through campaign finance. Relative to full transparency, how does allowing for undisclosed contributions affect donors' ability to convey policy-relevant information to policymakers? Does the ability to contribute secretly benefit donors in such a setting?

We develop a theory of informative campaign finance to study how transparency of campaign contributions affects donor and politician behavior. We study a game-theoretic model that isolates one strategic consideration relevant to the debate: the impact of transparency on the ability of donors to provide information through campaign finance to politicians. Contrary to most public discourse, we show that donors may sometimes be better off when full disclosure is mandatory. In this environment donors can benefit from transparent campaign finance because the public nature of their contributions improves their credibility, which then influences politicians. This is because transparency requires all donors to publicly commit support to campaigns, which can be highly informative when donation patterns run counter to expectations (e.g., donating across the aisle). Allowing undisclosed contributions raises the costs required to establish credibility through

[1] *Citizens United v. FEC*, 558 U.S. 310 (2010).

[2] For example, see *SpeechNOW.org v. FEC*, 599 F.3d 686 (D.C. Cir. 2010).

[3] See, for example, Wood (2019).

[4] Previous research has also studied whether disclosure reduces or facilitates corruption, promotes or deters political speech and participation, unduly curtails free speech, improves or harms trust in government, and/or leads to negative special interest influence. See Dawood (2015) and Wood (2018) for comprehensive reviews.

campaign finance, which opens the door for donor welfare to be harmed.

Building on existing models of informative campaign finance,[5] we contribute to the debate surrounding campaign finance transparency by providing a novel perspective of the consequences of disclosure rules, focusing on the relationship between politicians and donors specifically. Though it is often assumed that allowing undisclosed contributions benefits donors like special interest groups by providing paths for influence without social repercussions, we provide one rationale for why these 'dark money' loopholes may actually prove costly to the donors they are purported to benefit. Our model relates most closely to previous research studying how campaign finance may provide politicians information (e.g. Gordon and Hafer 2005). We study equilibria where donations convey information, similar to the separating equilibria in Schnakenberg and Turner (2020). In contrast to that study, we compare donor welfare within separating equilibria across campaign finance disclosure regimes to highlight the effects of transparency on strategic campaign donating.

Consequently, this paper also contributes to political economy literature on transparency.[6] This research shows that increasing transparency of agent actions (e.g., policymaker choices) can counter-intuitively harm principal (e.g., voter) welfare by leading agents to make choices they would not have made if their actions were not observed. We complement this literature by providing a novel argument supporting transparency in campaign finance, an increasingly important aspect of electoral politics. Making all contribution behavior public reduces the costs borne by donors attempting to use their donations to signal information to politicians.

A model of informative campaign finance

We study a model in which a campaign donor can allocate contributions to influence the outcome of a two-candidate election. The donor can be thought of as an interest group, firm, or individual with a political agenda. In *transparent elections* all campaign contributions are publicly observable whereas in *non-transparent elections* the donor can allocate contributions secretly. There is a moderate candidate M, an ally candidate A, and a donor D. There is a state of the world $\theta \sim U[0,1]$

[5] See, for example, Austen-Smith (1995), Cotton (2016), Prato and Wolton (2017), and Wolton (2020).
[6] See, for example, Fox (2007), Fox and Van Weelden (2012), and Prat (2005).

and corresponding set of possible policies $X = [0,1]$, spanning the status quo $x = 0$ to extreme policy change $x = 1$.

First, the donor receives a private, noisy signal $s_D \in \{G, B\}$ about θ, where $\Pr[s_D = B|\theta] = \theta$. A signal of G (B) represents a 'good' ('bad') signal from the donor's perspective in that it is favorable (unfavorable) to her interests. Second, the donor chooses contributions (c^M, c^A), where c^M (c^A) denotes a contribution to the moderate (ally) candidate. In transparent elections, these contributions are observed by the candidates. In non-transparent elections, the donor can divide donations to the ally candidate between transparent (t) and non-transparent (n): $c^A = c^A_t + c^A_n$ with only c^A_t observed by the candidates.[7] Third, the winner of the election is selected. The probability that the moderate candidate wins is given by a function $p(c^M, c^A)$ that is strictly increasing (decreasing) in c^M (c^A), twice differentiable, and concave over the set of feasible contributions. The winning candidate $j \in \{M, A\}$ receives a signal $s_j \in \{G, B\}$ with $\Pr[s_j = B|\theta] = \theta$ and chooses a policy $x \in X$.

The donor prefers a policy as close as possible to 0 but pays a cost for contributions, $k > 0$. The ally's policy preferences are aligned with those of the donor while the moderate desires final policy to match the state of the world.[8] Accordingly, players' utility functions are given by:

$$u_D(x, c^M, c^A) = -x - k \cdot (c^M + c^A), \qquad u_A(x) = -x, \qquad u_M(x, \theta) = -(x - \theta)^2.$$

We analyze pure strategy perfect Bayesian equilibria (PBE). A strategy for the donor maps signals $\{G, B\}$ into contributions (c^M, c^A). A strategy for each candidate, $x_j(c^M, c^A, s_j)$, maps all triples (c^M, c^A, s_j) into policies X. A PBE is a profile of strategies and beliefs such that all players make optimal choices given their beliefs and other players' strategies, and beliefs are consistent with Bayes' rule on the equilibrium path. We focus on separating equilibria to directly study how campaign finance transparency affects information dynamics between donors and politicians.

[7] The donor would never secretly contribute to the moderate so this choice is omitted.

[8] So long as the ally's preferences are relatively more aligned with the donor the results are similar qualitatively (see Schnakenberg and Turner 2020).

Information sets: s_D, $\hat{s}_D$, and s_j	**Conditional expectations:** $\mathbb{E}[\theta\|\cdot]$
Donor:	
$s_D = G$	$\mathbb{E}[\theta\|s_D = G] = \frac{1}{3}$
$s_D = B$	$\mathbb{E}[\theta\|s_D = B] = \frac{2}{3}$
Candidates:	
$\hat{s}_D = s_j = G$	$\mathbb{E}[\theta\|\hat{s}_D = s_j = G] = \frac{1}{4}$
$\hat{s}_D \neq s_j$	$\mathbb{E}[\theta\|\hat{s}_D \neq s_j] = \frac{1}{2}$
$\hat{s}_D = s_j = B$	$\mathbb{E}[\theta\|\hat{s}_D = s_j = B] = \frac{3}{4}$

Table 1: Conditional expectations of θ and moderate candidate policy choice given separating equilibrium
Note: $(\hat{s}_D = G, s_j = B)$ and $(\hat{s}_D = B, s_j = G)$ are exchangeable and are represented by $\hat{s}_D \neq s_j$. The moderate's policy choice is equal to her conditional expectation of θ. The ally's policy choice is always zero.

Equilibrium analysis

Donor beliefs. The donor observes his own signal s_D but not actions of other players. This implies that the donor forms beliefs about θ using s_D. Beliefs about the signals that other players will receive also follow from these beliefs about the state. The donor's posterior beliefs about θ are distributed Beta$(s_D + 1, 2 - s_D)$, which yields the expected value of θ: $\mathbb{E}[\theta|s_D] = \frac{s_D+1}{3}$. Thus, when the donor receives a good signal then $\mathbb{E}[\theta|s_D = G] = 1/3$ and if he receives a bad signal then $\mathbb{E}[\theta|s_D = B] = 2/3$. The donor uses this information to predict the likelihood that politician j, upon taking office, receives signal $s_j = B$. The probability assigned to candidates receiving a bad signal, from the donor's perspective, is simply the donor's posterior expectation of θ given his signal s_D.

Candidate beliefs. The candidate who wins office observes the donor's contributions and her own signal s_j. Since we focus on pure strategy separating equilibrium the donor's contributions reveal s_D. Let $\hat{s}_D(c^M, c^A)$ denote candidate j's inference about s_D given donor contributions (c^M, c^A). Candidates' posterior beliefs about θ are distributed Beta$(s_j + \hat{s}_D + 1, 3 - s_j - \hat{s}_D)$ with θ's expected value given by $\mathbb{E}[\theta|s_j, \hat{s}_D] = \frac{s_j+\hat{s}_D+1}{4}$. The expectation of θ is increasing in the number of B signals observed or inferred. Players' conditional expectations about θ are displayed in Table 1.

Policy choices. Whichever politician wins office sets policy. If the ally candidate wins office then he simply sets $x_A(c^M, c^A, s_A) = 0$ for any set of signals he receives since prefers $x = 0$ regardless of θ. The moderate politician's policy strategy depends on the state, and therefore depends on his posterior beliefs about θ discussed above. The best a moderate politician can do is follow his information, s_M and $\hat{s}_D(c^M, c^A)$, and set policy equal to his conditional expectation of θ. This means that $x_M(c^M, c^A, s_M) = \mathbb{E}[\theta | s_M, \hat{s}_D]$ in equilibrium, which implies that when the moderate is elected policy is better for the donor when there are more favorable (G) signals.

Donor expectations about policy choices. The donor's expectations about what policies each candidate would pick upon taking office is central to our analysis. The donor correctly infers that the ally candidate will always set $x_A(c^M, c^A, s_A) = 0$, but the expected policy choices of the moderate depend on the donor's information s_D. The expected moderate policy choice form the perspective of a type-s_D donor whose contributions reveal $\hat{s}_D = s_D$ is given by,

$$\begin{aligned} \mathbb{E}[x_M | \hat{s}_D, s_D] &= Pr[s_M = B | s_D] x_M(B, \hat{s}_D) + Pr[s_M = G | s_D] x_M(G, \hat{s}_D), \\ &= \mathbb{E}[\theta | s_D] \mathbb{E}[\theta | s_M = B, \hat{s}_D] + (1 - \mathbb{E}[\theta | s_D]) \mathbb{E}[\theta | s_M = G, \hat{s}_D]. \end{aligned} \quad (1)$$

Table 2 presents the donor's expectations about the moderate's policy choice should she win office, conditional on his own information s_D and how his contributions impact politician inferences, $\hat{s}_D$. Good donors always expect more favorable policy from the moderate than bad donors because both s_D and s_M are positively correlated with θ, which means $s_D = G$ implies it is more likely that $s_M = G$ than when $s_D = B$. This holds even if both good and bad donor contributions send the same signal and induce the same politician inference, $\hat{s}_D$ ($\mathbb{E}[x_M | \hat{s}_D, s_D = G] < \mathbb{E}[x_M | \hat{s}_D, s_D = B]$). Thus, good and bad donors have different signaling incentives, due solely to their private information, even though they have the same preferences and their contributions affect candidate beliefs similarly.

Informative campaign finance. Whether or not campaign finance is transparent a separating equilibrium takes the following form. Good donors make contributions (c_G^M, c_G^A) while bad donors make (different) contributions (c_B^M, c_B^A) with the property that good donor contributions raise the probability of the moderate being elected: $p(c_G^M, c_G^A) > p(c_B^M, c_B^A)$. In order to support such an equilibrium the good donor must be willing to raise the probability of electing the moderate enough

Information sets: s_D and $\hat{s}_D$	**Expected moderate policy:** $\mathbb{E}[x_M \vert \hat{s}_D, s_D]$
$s_D = \hat{s}_D = G$	$\frac{1}{3} \cdot \frac{1}{2} + \left(1 - \frac{1}{3}\right) \frac{1}{4} = \frac{1}{3}$
$s_D = G$, $\hat{s}_D = B$	$\frac{1}{3} \cdot \frac{3}{4} + \left(1 - \frac{1}{3}\right) \frac{1}{2} = \frac{7}{12}$
$s_D = B$, $\hat{s}_D = G$	$\frac{2}{3} \cdot \frac{1}{2} + \left(1 - \frac{2}{3}\right) \frac{1}{4} = \frac{5}{12}$
$s_D = \hat{s}_D = B$	$\frac{2}{3} \cdot \frac{3}{4} + \left(1 - \frac{2}{3}\right) \frac{1}{2} = \frac{2}{3}$

Table 2: Expected moderate politician policy choices from the donor's perspective

Note: The first row is when a good donor reveals his type, inducing $\hat{s}_D = G$. The second row is when a good donor contributes as if he is a bad donor, inducing $\hat{s}_D = B$. The third row is when a bad donor imitates a good donor, inducing $\hat{s}_D = G$. The final row is when a bad donor reveals his type, inducing $\hat{s}_D = B$.

to deter the bad type from imitating. Lemma 1 shows this is satisfied in our model.

Lemma 1 (Sorting condition)**.** *Let* (c^M, c^A) *and* $(\tilde{c}^M, \tilde{c}^A)$ *denote different donor contribution choices with the property that* $p(c^M, c^A) > p(\tilde{c}^M, \tilde{c}^A)$*. In any equilibrium, if the bad donor weakly prefers to donate* (c^M, c^A) *over* $(\tilde{c}^M, \tilde{c}^A)$ *then the good donor strictly prefers to do so.*

Lemma 1 follows from the fact that electing the moderate is less risky from a policy perspective when the donor's private information is good ($s_D = G$) than when it is bad ($s_D = B$). As outlined above, a good donor expects more favorable policy from the moderate because s_D and s_M are both positively correlated with θ, which implies that she believes it is more likely the politician will receive $s_M = G$ relative to a bad donor. Thus, good donors are always willing to contribute so that the probability of electing the moderate is increased enough to deter the bad donor from imitation, which allows him to credibly reveal s_D and influence the moderate's policy choices. The bad donor, since he cannot persuade the moderate that $s_D = G$ in equilibrium, maximizes electoral benefits by never contributing to the moderate: $(c_B^M, c_B^A) = (0, c_B^A)$. We can now turn to comparing donation behavior based on the transparency of campaign finance.

Transparent campaign finance

When disclosure is required the intuition for the equilibrium is driven by two potential benefits of public contributions: money might help elect allies or it might persuade moderates to choose more favorable policies. Bad donors expect to be less successful at influencing moderate policy choices and, as a result, the good donor can reveal his signal by reducing contributions to the ally or, if need be, donating money 'across the aisle' and supporting the moderate.

Proposition 1. *In a transparent election, there exists a separating equilibrium in which: (1) The bad donor contributes nothing to the moderate candidate* $c_B^M = 0$ *and contributes some positive amount* $c_B^A > 0$ *to the ally candidate; (2) The good donor chooses contributions that deter the bad donor from imitating, which may involve donating less to the ally candidate than the bad donor,* $c_G^A < c_B^A$ *and* $c_G^M = 0$*, or positive contributions to the moderate candidate,* $c_G^M > 0$*; (3) Candidates perfectly infer* s_D *from contributions and choose policy accordingly.*

In elections where all contributions are transparent the good donor can separate from bad donors in different ways. If simply reducing contributions to the ally increases $p(0, c_G^A)$ enough to deter the bad donor then the good donor need not donate to the moderate to reveal favorable information. However, sometimes the good donor needs to contribute to support the moderate's campaign directly in order to raise $p(c_G^M, c_G^A)$ enough to distinguish himself from a bad donor. We will see that non-transparent elections eliminate the possibility of the good donor credibly revealing favorable information without donating publicly to the moderate.

Non-transparent campaign finance

The regulatory environment in this section allows donors to make undisclosed donations that affect the outcome of the election but go unobserved by politicians. It might seem intuitive that the prospect of non-disclosure would harm the information content of contributions. However, Proposition 2 shows that while the ability to donate secretly does affect behavior it does not preclude the good donors' ability to differentiate from bad donors.

Proposition 2. *In a non-transparent election, there exists a separating equilibrium in which: (1) The bad donor contributes nothing to the moderate* $c_B^M = 0$ *and contributes positively to the ally either transparently, non-transparently, or some mix of both,* $c_{B,t}^A \geq 0$ *and* $c_{B,n}^A \geq 0$*; (2) The good donor chooses contributions that deter the bad donor from imitating, which requires that he contribute positively to the moderate* $c_G^M > 0$*, and he may also contribute to the ally either transpar-*

ently, non-transparently, or some mix of both $c^A_{G,t} \geq 0$ *and* $c^A_{G,n} \geq 0$*; (3) Candidates perfectly infer* s_D *from contributions and choose policy accordingly.*

Proposition 2 highlights how contribution behavior required for separation differs under non-transparent elections. The key difference in non-transparent elections is that now the good donor *must* donate publicly to the moderate in order to differentiate himself from a bad donor and have any persuasive effect on policy choices. In contrast to transparent elections, there is no longer a possibility that the good donor can separate from the bad donor by simply reducing public donations to the ally, while avoiding donation to the moderate. Such a strategy would be easy for bad donors to emulate since they could simply make all donations to the ally secretly. Thus, there can be no separating equilibrium in non-transparent elections without the good donor contributing to the moderate. The good donor publicly contributes the minimum amount possible to the moderate that will still deter the bad donor from imitation. Any remaining contributions the good donor would be willing to make will be made in support of the ally.[9]

More generally, this highlights an interesting affect of relaxing transparency of campaign finance in this environment: The key impact of non-transparency is off the path of play. When elections are non-transparent the good donor has to allocate public funding to the moderate in order to credibly reveal policy information to the candidates *whether or not the bad donor ultimately makes any undisclosed contributions*. Since both types of donors, in a separating equilibrium, are indifferent over how their contributions to the ally are allocated between disclosed and undisclosed we can support an equilibrium in which the bad donor makes all contributions to the ally publicly while the good donor contributes publicly to both the moderate and the ally. Thus, in terms of observed donor behavior the *possibility* of making undisclosed contributions is sufficient to alter equilibrium behavior when the goal is to influence policy choices through the credible transmission of private information. This dynamic has implications for donor welfare across transparency regimes.

[9]Note that because the marginal costs of contributing publicly and privately to the ally are equivalent the good and bad donor are both indifferent in how their contributions are divided to the ally, conditional on being in a separating equilibrium.

Donor welfare

We characterize the effects of disclosure regulation on donor welfare by comparing separating equilibria across the transparent and non-transparent elections. Proposition 3 suggests that the donor is better off when disclosure is required and the environment is such that he plays a separating strategy independent of transparency regime.

Proposition 3. *The donor is weakly better off in a separating equilibrium under transparent elections than in a separating equilibrium under non-transparent elections. When contributions differ between transparency regimes, the donor is strictly better off with full transparency.*

Bad donors make the same contributions and expect the same policy under either disclosure system. However, good donors can only reveal themselves by making more electorally costly contributions in non-transparent elections since deterring the bad donor now *requires* contributing to the moderate. Thus, from an ex ante perspective, conditional on playing a separating contribution strategy in both transparent and non-transparent elections, the donor would prefer all campaign contributions be publicly disclosed. Though it is often assumed that allowing undisclosed contributions benefits donors by providing them another path to influence without the risk of political retribution, we provide one rationale for why such policies may prove costly for some donors.

Discussion

Arguments for increasing campaign finance transparency often focus on improved voter information. We provide a complementary argument that focuses on the policy information contributions provide politicians. Our theory focuses on one strategic rationale that suggests that donors may not always benefit from loopholes enabling dark money. When politicians can glean information from contributions transparent campaign finance may sometimes reduce the costs for donors to establish credibility and, in turn, influence public policy compared to a regulatory environment that allows for undisclosed donations. The fact that *all politicians*, both allies and adversaries, observe contribution behavior is exactly what reduces the threshold for credible signaling.

While our results highlight one way donors might benefit from transparency requirements we certainly do not claim that all groups benefit from transparency requirements in practice. For example, some donors fear social retribution if their contributions were made public. This could be incorporated into the model by allowing differential costs for transparent and non-transparent contributions and Proposition 3 could be reversed if transparent contributions to the ally were sufficiently costly. We also only compare separating equilibria and do not analyze pooling equilibria here. It may be the case that donors benefit from non-transparency in pooling equilibria or when changing the policy affects equilibrium selection. Finally, we model politicians' reactions to contributions as purely rational responses to policy information. If these reactions instead reflect vindictiveness or reciprocity then incentives for secrecy may be stronger.

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Online Supplemental Appendix
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A Online Appendix

A.1 Posterior beliefs

We first derive players' posterior beliefs about θ following their signals. First, note that each player's prior belief is given by $\mathbb{E}[\theta] = \frac{1}{2}$ (from $\theta \sim U[0,1]$). Now consider the Donor's beliefs following observation of $s_D \in \{G, B\}$. Posterior beliefs are distributed Beta$(s_D + 1, 2 - s_D)$ so the Donor's beliefs are then given by,

$$\begin{aligned} \mathbb{E}[\theta|s_D] &= \frac{s_D+1}{3}, \\ \mathbb{E}[\theta|s_D = G] &= \frac{1}{3}, \\ \mathbb{E}[\theta|s_D = B] &= \frac{2}{3}. \end{aligned}$$

In a separating equilibrium the candidates receive their own signal (conditional on taking office) and are also able to infer s_D from the donor's contribution schedule. Accordingly, their posteriors are distributed Beta$(s_j + s_D + 1, 3 - s_j - s_D)$. Since the ally's utility is $u_A(x) = -x$ it follows that regardless of s_j and s_D the ally sets policy to $x_A = 0$ so we can focus on the moderate's posterior

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beliefs following s_M:

$$\begin{aligned}
\mathbb{E}[\theta|s_M, s_D] &= \frac{s_M + s_D + 1}{4}, \\
\mathbb{E}[\theta|s_M = G, s_D = G] &= \frac{1}{4}, \\
\mathbb{E}[\theta|s_M = G, s_D = B] &= \frac{1}{2}, \\
\mathbb{E}[\theta|s_M = B, s_D = G] &= \frac{1}{2}, \\
\mathbb{E}[\theta|s_M = B, s_D = B] &= \frac{3}{4}.
\end{aligned}$$

Thus, the moderate beliefs about θ are higher the more 'bad' signals she receives.

A.2 Proof of results

We now prove Lemma A.1, which establishes optimal policy choices made by each candidate given her beliefs.

Lemma A.1 (Candidate best responses)**.** *In any separating equilibrium, if (c_B^M, c_B^A) are contributions chosen by bad types of donors and (c_G^M, c_G^A) are contributions chosen by good types of donors then the moderate candidate's optimal policy choices are $x_M(c_G^M, c_G^A, s_M = G) = \frac{1}{4}$, $x_M(c_G^M, c_G^A, s_M = B) = x_M(c_B^M, c_B^A, s_M = G) = \frac{1}{2}$, and $x_M(c_B^M, c_B^A, s_M = B) = \frac{3}{4}$. The ally candidate's optimal policy choice is given by $x_A(c^M, c^A, s_A) = 0$ for all $(c^M, c^A), s_A \in \{G, B\}$.*

Proof of Lemma A.1. First, since the ally's preferences are independent of the state it is optimal to set $x_A(c^M, c^A, s_A) = 0$ for all contributions and signals. The moderate's utility is given by $u_M(x, \theta) = -(x-\theta)^2$, which implies that she wants to match policy to θ. Thus, given her information, she optimally sets $x_M(c^M, c^A, s_M) = \mathbb{E}[\theta|c^M, c^A, s_M]$ to minimize her losses. ■

Lemma 1. *Let (c^M, c^A) and $(\tilde{c}^M, \tilde{c}^A)$ denote different donor contribution choices with the property that $p(c^M, c^A) > p(\tilde{c}^M, \tilde{c}^A)$. In any equilibrium, if the bad donor weakly prefers to donate (c^M, c^A) over $(\tilde{c}^M, \tilde{c}^A)$ then the good donor strictly prefers to do so.*

Proof of Lemma 1. Let $\hat{s}_D(c^M, c^A)$ denote the politicians' beliefs about s_D given (c^M, c^A). First assume that (c^M, c^A) induces the belief that $\hat{s}_D(c^M, c^A) = G$ and $(\tilde{c}^M, \tilde{c}^A)$ induces the belief that $\hat{s}_D(\tilde{c}^M, \tilde{c}^A) = B$. Given the sequentially rational strategies from Lemma A.1 we have the moderate politician policy choices from the Donor's perspective conditional on her own signal s_D and the moderate's induced beliefs about her type, $\hat{s}_D$, given contribution schedule:

$$\mathbb{E}[x_M|\hat{s}_D, s_D] = \mathbb{E}[\theta|s_D]\mathbb{E}[\theta|s_M = B, \hat{s}_D] + (1 - \mathbb{E}[\theta|s_D])\mathbb{E}[\theta|s_M = G, \hat{s}_D]$$

$$\mathbb{E}[x_M|\hat{s}_D = G, s_D = G] = \frac{1}{3}\cdot\frac{1}{2} + \left(1 - \frac{1}{3}\right)\frac{1}{4} = \frac{1}{3},$$

$$\mathbb{E}[x_M|\hat{s}_D = B, s_D = G] = \frac{1}{3}\cdot\frac{3}{4} + \left(1 - \frac{1}{3}\right)\frac{1}{2} = \frac{7}{12},$$

$$\mathbb{E}[x_M|\hat{s}_D = G, s_D = B] = \frac{2}{3}\cdot\frac{1}{2} + \left(1 - \frac{2}{3}\right)\frac{1}{4} = \frac{5}{12},$$

$$\mathbb{E}[x_M|\hat{s}_D = B, s_D = B] = \frac{2}{3}\cdot\frac{3}{4} + \left(1 - \frac{2}{3}\right)\frac{1}{2} = \frac{2}{3}.$$

For a type-s_D donor to prefer (c^M, c^A) to $(\tilde{c}^M, \tilde{c}^A)$ the following must hold:

$$\begin{aligned}
-p(c^M, c^A)\mathbb{E}[x_M|\hat{s}_D = G, s_D] - (1 - p(c^M, c^A))\mathbb{E}[x_A|\hat{s}_D = G, s_D] - k(c^M + c^A) &\geq \\
-p(\tilde{c}^M, \tilde{c}^A)\mathbb{E}[x_M|\hat{s}_D = B, s_D] - (1 - p(\tilde{c}^M, \tilde{c}^A))\mathbb{E}[x_A|\hat{s}_D = B, s_D] - k(\tilde{c}^M + \tilde{c}^A),
\end{aligned}$$

which simplifies since $\mathbb{E}[x_A|\hat{s}_D, s_D] = 0$:

$$-p(c^M, c^A)\mathbb{E}[x_M|\hat{s}_D = G, s_D] - k(c^M + c^A) \geq -p(\tilde{c}^M, \tilde{c}^A)\mathbb{E}[x_M|\hat{s}_D = B, s_D] - k(\tilde{c}^M + \tilde{c}^A) \quad (1)$$

If $s_D = G$ then the constraint becomes,

$$\begin{aligned}
-p(c^M, c^A)\mathbb{E}[x_M|\hat{s}_D = G, s_D = G] - k(c^M + c^A) &> -p(\tilde{c}^M, \tilde{c}^A)\mathbb{E}[x_M|\hat{s}_D = B, s_D = G] - k(\tilde{c}^M + \tilde{c}^A), \\
-p(c^M, c^A)\frac{1}{3} - k(c^M + c^A) &> -p(\tilde{c}^M, \tilde{c}^A)\frac{7}{12} - k(\tilde{c}^M + \tilde{c}^A), \\
k(\tilde{c}^M + \tilde{c}^A) - k(c^M + c^A) &> p(c^M, c^A)\frac{1}{3} - p(\tilde{c}^M, \tilde{c}^A)\frac{7}{12}. \quad (2)
\end{aligned}$$

If instead $s_D = B$ then the constraint is given by,

$$\begin{aligned}
-p(c^M, c^A)\mathbb{E}[x_M|\hat{s}_D = G, s_D] - k(c^M + c^A) &\geq -p(\tilde{c}^M, \tilde{c}^A)\mathbb{E}[x_M|\hat{s}_D = B, s_D] - k(\tilde{c}^M + \tilde{c}^A), \\
-p(c^M, c^A)\frac{5}{12} - k(c^M + c^A) &\geq -p(\tilde{c}^M, \tilde{c}^A)\frac{2}{3} - k(\tilde{c}^M + \tilde{c}^A), \\
k(\tilde{c}^M + \tilde{c}^A) - k(c^M + c^A) &\geq p(c^M, c^A)\frac{5}{12} - p(\tilde{c}^M, \tilde{c}^A)\frac{2}{3}. \quad (3)
\end{aligned}$$

We need to show that both Inequalities (2) and (3) hold simultaneously, which is equivalent to showing that $p(c^M,c^A)\frac{1}{3}-p(\tilde{c}^M,\tilde{c}^A)\frac{7}{12}<p(c^M,c^A)\frac{5}{12}-p(\tilde{c}^M,\tilde{c}^A)\frac{2}{3}$:

$$\begin{aligned}
p(c^M,c^A)\frac{1}{3}-p(\tilde{c}^M,\tilde{c}^A)\frac{7}{12} &< p(c^M,c^A)\frac{5}{12}-p(\tilde{c}^M,\tilde{c}^A)\frac{2}{3},\\
p(\tilde{c}^M,\tilde{c}^A)\frac{2}{3}-p(\tilde{c}^M,\tilde{c}^A)\frac{7}{12} &< p(c^M,c^A)\frac{5}{12}-p(c^M,c^A)\frac{1}{3},\\
p(\tilde{c}^M,\tilde{c}^A)\frac{1}{12} &< p(c^M,c^A)\frac{1}{12},\\
p(\tilde{c}^M,\tilde{c}^A) &< p(c^M,c^A),
\end{aligned}$$

which holds by construction. ■

A.2.1 Transparent elections

Proposition 1. *In a transparent election, there exists a separating equilibrium in which: (1) The bad donor contributes nothing to the moderate candidate $c_B^M=0$ and contributes some positive amount $c_B^A>0$ to the ally candidate; (2) The good donor chooses contributions that deter the bad donor from imitating, which may involve donating less to the ally candidate than the bad donor, $c_G^A<c_B^A$ and $c_G^M=0$, or positive contributions to the moderate candidate, $c_G^M>0$; (3) Candidates perfectly infer s_D from contributions and choose policy accordingly.*

Proof of Proposition 1. First we find the following optimal contributions:

$$\begin{aligned}
c^A_{\max}(G) &= \arg\max_{c^A\geq 0} EU_D(c^M=0,c^A|s_D=G), \text{ and}\\
c^A_{\max}(B) &= \arg\max_{c^A\geq 0} EU_D(c^M=0,c^A|s_D=B).
\end{aligned}$$

Note that the donor should never donate positively to the moderate candidate $c^M_{s_D}>0$ when doing so does not change the moderate's policy choice. Thus, the solutions to these expressions represent the optimal contributions when s_D is publicly known. That is, $c^A_{\max}(G)$ and $c^A_{\max}(B)$ are the contributions the donor would make based solely on electoral considerations, given s_D. The first- and second-order conditions for $c^A_{\max}(G)$ are given by,

$$\frac{\partial EU_D(0,c^A|s_D=G)}{\partial c^A}=\frac{\partial\left(-p(0,c^A)\mathbb{E}[x_M|s_D=G,\hat{s}_D=G]\right)}{\partial c^A}=-\frac{1}{3}\frac{\partial p(0,c^A)}{\partial c^A}-k=0, \tag{4}$$

$$\frac{\partial^2 EU_D(0,c^A|s_D=G)}{\partial (c^A)^2}=\frac{\partial^2\left(-p(0,c^A)\mathbb{E}[s_D=G,\hat{s}_D=G]\right)}{\partial (c^A)^2}=-\frac{1}{3}\frac{\partial^2 p(0,c^A)}{\partial (c^A)^2}<0. \tag{5}$$

Concavity of $p(\cdot)$ implies that $\frac{\partial^2 p(0,c^A)}{\partial c^A}>0$ since $p(c^M,c^A)$ is decreasing in c^A, which means that the second-order condition in (5) is satisfied for all c^A. Further, since $\frac{\partial p(c^M,c^A)}{\partial c^A}<0$ we have that

$-\frac{1}{3}\frac{\partial p(0,c^A)}{\partial c^A} > 0$. Thus, $c^A_{\max}(G) = 0$ if $-\frac{1}{3}\frac{\partial p(0,0)}{\partial c^A} < k$, $c^A_{\max}(G) = k$ if $-\frac{1}{3}\frac{\partial p(0,k)}{\partial c^A} \geq k$, and otherwise there exists some $c^A_{\max}(G) \in (0,k)$ satisfying the first-order condition in (4).

The analogous first- and second-order conditions for finding $c^A_{\max}(B)$ are given by,

$$\frac{\partial EU_D(0,c^A|s_D = B)}{\partial c^A} = \frac{\partial\left(-p(0,c^A)\mathbb{E}[x_M|s_D = B, \hat{s}_D = B]\right)}{\partial c^A} = -\frac{2}{3}\frac{\partial p(0,c^A)}{\partial c^A} - k = 0, \tag{6}$$

$$\frac{\partial^2 EU_D(0,c^A|s_D = B)}{\partial (c^A)^2} = \frac{\partial^2\left(-p(0,c^A)\mathbb{E}[s_D = B, \hat{s}_D = B]\right)}{\partial (c^A)^2} = -\frac{2}{3}\frac{\partial^2 p(0,c^A)}{\partial (c^A)^2} < 0. \tag{7}$$

The same logic as above applies to the solutions. Comparing the first-order conditions in (4) and (6) shows that $c^A_{\max}(B) > c^A_{\max}(G)$ if $c^A_{\max}(B)$ is an interior solution.

We consider three cases: (1) Each type of donor contributing $c^A_{\max}(G)$ and $c^A_{\max}(B)$ is enough to deter the bad type from imitating the good type; (2) the good type of donor reduces his contribution to the ally, which reduces the probability the ally is elected, enough to deter bad type imitation; (3) even reducing ally contributions to zero will not deter the bad type from imitating so the good type of donor contributes positively to the moderate to deter the bad type.

1. Suppose $EU_D(0,c^A_{\max}(G)|\hat{s}_D = G, s_D = B) \leq EU_D(0,c^A_{\max}(B)|\hat{s}_D = B, s_D = B)$ and $c^A_{\max}(B) > 0$. In this case, a signaling strategy where good types of donors contribute $(0,c^A_{\max}(G))$ and bad types of donors contribute $(0,c^A_{\max}(B))$ can be supported as a separating PBE by setting candidate beliefs to place full mass on $s_D = B$ if $c^A > c^A_{\max}(G)$ and on $s_D = G$ otherwise. In this case, both types are choosing optimally given the candidates' beliefs, and the low type of donor does not have a strict incentive to decrease spending enough to imitate the good type of donor. Since $c^A_{\max}(B) > c^A_{\max}(G)$ this implies that s_D can be inferred from contributions.

2. Suppose $EU_D(0,c^A_{\max}(G)|\hat{s}_D = G, s_D = B) \leq EU_D(0,c^A_{\max}(B)|\hat{s}_D = B, s_D = B)$ and $EU_D(0,0|\hat{s}_D = G, s_D = B) \leq EU_D(0,c^A_{\max}(B)|\hat{s}_D = B, s_D = B)$ and $c^A_{\max}(B) > 0$. By continuity of of the donor's expected utility and the Intermediate Value Theorem there exists a contribution $\tilde{c}^A < c^A_{\max}(G)$ such that $EU_D(0,\tilde{c}_A|s_D = B) = EU_D(0,c^A_{\max}(B)|s_D = B)$. For reasons similar to above, a signaling strategy in which the good type of donor contributes $(0,\tilde{c}^A)$ and the bad type of donor contributes $(0,c^A_{\max}(B))$ can be supported as a separating PBE by setting candidates beliefs to place full mass on $s_D = B$ if $c^A > \tilde{c}^A$ and on $s_D = G$ otherwise. By Lemma A.1, indifference of the donor when $s_D = B$ implies that the donor strictly prefers not to deviate when $s_D = G$. Since $\tilde{c}^A < c^A_{\max}(G) < c^A_{\max}(B)$ this implies that s_D is inferred perfectly from contributions.

3. Suppose $EU_D(0,0|\hat{s}_D = G, s_D = B) > EU_D(0,c^A_{\max}(B)|\hat{s}_D = B, s_D = B)$ or $c^A_{\max}(B) = 0$. Since $\lim_{c^M\to\infty} EU_D(c_M,0|\hat{s}_D = G, s_D = B) = -\infty$, continuity of $EU_D(\cdot|\hat{s}_D, s_D)$ and the Intermediate Value Theorem imply that there is some $\tilde{c}^M$ such that $EU_D(\tilde{c}^M,0|\hat{s}_D = G, s_D = B) =$

$EU_D(0, c^A_{\max}(B)|\hat{s}_D = B, s_D = B)$. A contribution strategy in which the good type of donor contributes $(\tilde{c}^M, 0)$ and the bad type of donor contributes $(0, c^A_{\max}(B))$ can be supported by beliefs placing full mass on $s_D = B$ when $c^M < \tilde{c}^M$ or $c^A > 0$ and on $s_D = G$ otherwise. By Lemma A.1, since the bad type of donor is indifferent between contributions, the good type of donor strictly prefers the equilibrium contribution strategy. Since $c^M = 0$ for bad types of donors and $c^M > 0$ for good types of donors, s_D can be inferred from contributions.

Thus, there exists a separating equilibrium in which the bad type of donor contributes $c^M = 0$ and $c^A > 0$ while the good type of donor contributes to deter imitation as outlined above. Candidate policy choices follow from Lemma A.1. ■

A.2.2 Non-transparent elections

Proposition 2. *In a non-transparent election, there exists a separating equilibrium in which: (1) The bad donor contributes nothing to the moderate $c^M_B = 0$ and contributes positively to the ally either transparently, non-transparently, or some mix of both, $c^A_{B,t} \geq 0$ and $c^A_{B,n} \geq 0$; (2) The good donor chooses contributions that deter the bad donor from imitating, which requires that he contribute positively to the moderate $c^M_G > 0$, and he may also contribute to the ally either transparently, non-transparently, or some mix of both $c^A_{G,t} \geq 0$ and $c^A_{G,n} \geq 0$; (3) Candidates perfectly infer s_D from contributions and choose policy accordingly.*

Proof of Proposition 2. First, note that any separating equilibrium when non-transparent contributions to the ally are available must involve the good donor contributing positively to the moderate. As opposed to the transparent election, now the good donor cannot deter the bad donor from imitating by reducing his public contributions to the bad donor. Any reduction in public donations to the ally from the good donor can be mimicked by the bad donor through shifting contributions from transparent to non-transparent. Importantly, this means the bad donor can mimic the good donor without reducing the probability the ally is elected since the same total amount of contributions go to the ally. The only difference is that now some, or all, of them can be made non-transparently. Even if the good donor were to reduce public contributions to the ally to zero the bad donor could still imitate by shifting all his donations to the ally to non-transparent. Thus, any equilibrium with the good donor separating from the bad donor must involve the good donor contributing to the moderate (i.e., the first two cases in the proof of Proposition 1 are eliminated in non-transparent elections so only the third case manifests).

Second, suppose $c^M_G > 0$. We can compute the bad donor's optimal contributions to the ally as a function of any positive contributions to the moderate from the good donor:

$$c^A_{\max}(B, c^M_G) = \underset{c_A \geq 0}{\arg\max}\; EU_D(c^M_G, c^A_B | s_D = B) \tag{8}$$

Note that, conditional on being in a separating equilibrium, the ally is indifferent between making all contributions publicly or privately to the ally (or any mix) since the marginal costs across transparent and non-transparent contributions are equivalent. The first- and second-order conditions are given by,

$$\frac{\partial EU_D(c_G^M, c_B^A | s_D = B)}{\partial c^A} = -\frac{2}{3}\frac{\partial p(c^M, c^A)\mathbb{E}[x_M | s_D = B, \hat{s}_D = B]}{\partial c^A} = -\frac{2}{3}\frac{\partial p(c^M, c^A)}{\partial c^A} - k = 0, \quad (9)$$

$$\frac{\partial^2 EU_D(c_G^M, c_B^A | s_D = B)}{\partial (c^A)^2} = -\frac{2}{3}\frac{\partial^2 p(0, c^A)\mathbb{E}[x_M | s_D = B, \hat{s}_D = B]}{\partial (c^A)^2} = -\frac{2}{3}\frac{\partial^2 p(0, c^A)}{\partial (c^A)^2} < 0. \quad (10)$$

The conditions for satisfying these conditions are equivalent to the proof of Proposition 1. Per the argument above separation requires positive contributions to the moderate in this environment. Suppose $EU_D(c_G^M, c_{\max}^A(B, c_G^M) | \hat{s}_D = G, s_D = B) > EU_D(0, c_{\max}^A(B) | \hat{s}_D = B, s_D = B)$ (where $c_{\max}^A(B)$ is defined as in the proof of Proposition 1) so that imitating the good donor is better for the bad donor than contributing nothing to the moderate and instead maximizing the electoral impact of his donations, as defined in Proposition 1. Since $\lim_{c^M \to \infty} EU_D(c_G^M, 0 | \hat{s}_D = G, s_D = B) = -\infty$, continuity of $EU_D(\cdot | \hat{s}_D, s_D)$ and the Intermediate Value Theorem imply that there is some $\tilde{c}_G^M$ such that $EU_D(\tilde{c}_G^M, 0 | \hat{s}_D = G, s_D = B) = EU_D(0, c_{\max}^A(B) | \hat{s}_D = B, s_D = B)$. A contribution in which the good donor contributes $(\tilde{c}_G^M, c_G^A)$ (where $c_G^A = (c_{G,t}^A, c_{G,n}^A)$ captures any remaining contributions the good donor might make to the ally after $\tilde{c}_G^M$ is made to deter the bad donor; note that the good donor would also be indifferent, conditional on being in the separating equilibrium, between transparent and non-transparent allocations of donations to the ally since the marginal costs of each are equivalent) and the bad donor contributes $(0, c_{\max}^A(B))$ can be supported by beliefs placing full mass on $s_D = B$ when $c^M < \tilde{c}_G^M$ and on $s_D = G$ otherwise. Lemma 1 the good donor strictly prefers this equilibrium contribution strategy since the bad donor is made indifferent between contribution strategies. Since $c^M > 0$ for the good donor and $c^M = 0$ for the bad donor the candidates can perfectly infer s_D from observed contributions. ■

A.2.3 Donor welfare

Proposition 3. *The donor is weakly better off in a separating equilibrium under transparent elections than in a separating equilibrium under non-transparent elections. When contributions differ between transparency regimes, the donor is strictly better off with full transparency.*

Proof of Proposition 3. The bad donor makes the same total level of contributions to the ally candidate regardless of whether the election is transparent or non-transparent, given separating equilibria. Moreover, the bad donor expects the same policy outcome – either the ally wins and implements $x_A = 0$ or the moderate wins and sets $x_M = \mathbb{E}[\theta | \hat{s}_D, s_M]$. Thus, the bad donor is indifferent over transparency regimes.

The good donor can never be made better off by allowing for non-transparent donations. In one scenario donating nothing to the moderate and either contributing $c^A_{\max}(G)$ (see Proposition 1) or reducing c^A_G enough to deter the bad donor is enough whereas in non-transparent elections he must donate positively to the moderate. In this scenario the good donor is worse off since policy outcomes are the same but the probability the moderate is elected is higher in non-transparent elections which harms his expected utility. In another scenario the good donor must contribute positively to the moderate candidate to deter the bad donor but that amount is equivalent across transparency regimes. In this case the good donor is clearly indifferent. Finally, in some cases he may need to contribute more to the moderate when elections are non-transparent since now the bad donor is able to contribute to the moderate secretly. In that case the donor is also worse off with non-transparency since policy outcomes are the same but the probability the moderate is elected is higher. Thus, when contributions are the same in either transparency regime the good type is indifferent, but when those contributions differ across regimes he is made strictly worse off. ■