Political Scandal: A Theory[1]

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Abstract

We study a model that characterizes the conditions under which past misbehavior becomes the subject of present scandal, with consequences for both the implicated politician and the parties that work with her. In the model, scandals arise endogenously within a political framework involving two parties that trade off benefits of continued collaboration with a suspect politician against the possibility of reputational fallout. Rising polarization between the two parties, we show, increases the likelihood of scandal while decreasing its informational value. Scandals that are triggered by only the opposing party, we also find, are reputationally damaging to both parties and, in some instances, reputationally enhancing to the politician. The model also reveals that jurisdictions with lots of scandals are not necessarily beset by more misbehavior. Under well-defined conditions, in fact, scandals can be a sign of political piety.

1 Introduction

American politics is awash in scandal. The most renowned of them – Teapot Dome, Watergate, Iran-Contra, Monica Lewinsky, Russian collusion – consumed presidents. But outside of the White House, thousands more transgressions, ill-gotten gains, moral lapses, lies, and crimes have derailed the political careers of politicians.[1] As Brandon Rottinghaus (2015, 161) observes, "by their nature, scandals are like prairie fires – easy to flare, difficult to control, and hard to stop once started." Indeed, outside of wars and economic downturns, scandals may be the most disruptive and damaging force in American politics.

As a pervasive and enduring fact of political life, scandals have become the subject of serious empirical scrutiny (for summaries, see Dewberry 2015, 4-12; Rottinghaus 2015, 3-7; Invernizzi 2016). Scholars also have begun to build theory that evaluates the strategic behavior of politicians amidst political scandal (Basinger and Rottinghaus 2012; Dewan and Myatt 2012; Gratton, Holden and Kolotilin forthcoming). None of the existing scholarship, however, identifies specific conditions under which past misbehavior, through public revelation, translates into present political scandal. The political incentives that undergird the production of scandal, as such, remain unclear. As Charles Cameron (2002, 655) laments, "The politics of scandal has not received the degree of serious scholarly attention it probably deserves. [If] scandal seeking and scandal mongering are normal political tactics... then political scientists need to learn their logic." Or as Giovanna Invernizzi (2016, 18) puts it, "we still lack a proper theoretical characterization which puts scandals in the broad context of political structures and strategic behavior of the actors involved."

To make headway on the problem, we study a model in which scandals are generated endogenously within a political framework involving two parties that trade off benefits of continued collaboration against the possibility of reputational fallout. In the model, the parties receive differential returns from working with a politician while also learning about whether this politician engaged in past misdeeds. The parties, then, must decide whether to reveal these misdeeds to a voter, recognizing that doing so will affect both their future gains from collaboration as well as their public reputations for honesty.

The model characterizes conditions under which different kinds of scandals arise in our politics, and their consequences both for the careers of politicians and the reputations of parties. A numbers of findings speak to the relevance of polarization for the politics of scandal.

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[1] Exact numbers are hard to come by, in no small part because definitions of "scandal" vary widely. One easily monitored benchmark, though, is public corruption cases. For such crimes, the Justice Department prosecuted 16,293 government officials nationwide between 1997 and 2016, of whom 14,644 were convicted. During this same period, 8,710 federal officials were charged with public corruption, 7,984 of whom were convicted. See: "Reports to Congress on the Activities and Operations of PIN." Public Integrity Section of the U.S. Department of Justice. https://www.justice.gov/criminal/file/1015521/download."

Increases in polarization, we find, encourage both parties to misrepresent the information that they receive about the politician's misbehavior, one by suppressing the information, the other by fabricating it. Consequentially, polarization incidence of scandals increases but at the same time reduces the informative value of scandal for the voter; and thereby encourages, when misbehavior is endogenized, the politician to misbehave.

Similar effects arise with respect to a party's hold on a political office. When an implicated politician is likely to be replaced by voters with a politician from the opposing party, both parties are more likely to misrepresent the information they receive, making it difficult for the voters to correctly infer misbehavior. Precisely when they are predisposed to hold politicians accountable for their misdeeds, voters find it most difficult to know whether they have cause to do so.

The model underscores challenges to discerning true levels of misbehavior from observed scandals. The model shows, for instance, that the aligned politician is increasingly prone to suppress information about misbehavior as its underlying incidence increases. The opposed politician's propensity to fabricate information about misbehavior, by contrast, changes nonmonotonically with increases in the incidence of misbehavior. Depending on parameter values, increases in misbehavior may coincide with either increases or decreases in the production of scandals. Hence, one need to be cautious when interpreting scandal incidence as a proxy for the level of misbehavior.

The model also clarifies the effects of scandals on the reputations of implicated parties and the careers of those politicians whose conduct stands in question. When an opposing party reveals misbehavior but an aligned party does not, triggering what we call a "partisan scandal," the voter knows with certainty that someone is acting dishonestly. Consequentially, both parties suffer reputationally, each according to the voter's assessment that they are lying. We identify conditions under which the implicated politician suffers reputationally, and show that under the same conditions it is the reputation of the opposing party that declines more. Moreover, we identify conditions under which a politician can actually benefit from a scandal, as the voter is more inclined to believe he did not misbehave after the aligned party sits in silence. Nevertheless, under those same conditions, the reputation of the aligned party declines more than the reputation of the opposing party. Loosely speaking, the aligned party takes one for the team and absorbs political repercussions that otherwise would have befallen the politician.

We proceed as follows. After summarizing the relevant empirical and theoretical literatures on scandal, we introduce the model. We then characterize the conditions under which parties will attempt to deceive the voter and the implications of their behavior for the incidence of scandal. Subsequent sections characterize the reputational and career effects of

different types of scandals and the inferential errors that voters make about them. We then endogenize misbehavior and analyze its consequences for the (now) strategic behavior of the politician as well as the parties and voter. The final section concludes.

2 Literature Review

Over the last two decades, a growing number of political scientists have sought to clarify the relevance of political scandal for contemporary American politics. Much of the resulting empirical scholarship focuses on the consequences of scandal, whether for its perpetrators, those implicated by the misbehavior, or the larger polity. In addition to negatively affecting a politician's public approval ratings (Simon and Ostrom 1989; Zaller 1998; Andolina and Wilcox 2000, Renshon 2002; Woessner 2005; Green, Zelizer, and iriby 2018), scandals have been shown to affect legislative voting patterns (Meinke and Anderson 2001), the strength of party identification (Chaffee and Becker 1975; Dunlap and Wisniewski 1978; Robinson 1974); the nation's policy agenda and inter-branch relations (Rottinghaus 2015), media coverage of politics (Sabato, Stencel, and Lichter 2001; Puglisi and Snyder 2011; Entman 2012), public trust in government and its assessments of political institutions (Lipset and Schneider 1983; Miller 1999; Bowler and Karp 2004; Green, Zelizer, and Kirby 2018), voter assessments of individual candidates (Lipset and Schneider 1983; Carlson, Ganiel, and Hyde 2000; Funk 1996; Banerjee et al 2014; Green, Zelizer, and Kirby 2018), and the outcome of subsequent elections (Welch and Hibbing 1997; Klasnja 2017; Peters and Welch 1980; Pereira and Waterbury 2018; Jocobson and Dimock 1994; Hirano and Snyder 2018; Chong et al 2015).

When are these various disruptions most likely to occur? For answers, scholars have scrutinized the underlying conditions under which past misbehavior turns to present scandal. Some, particularly journalists, emphasize the importance of individual politicians' characters and personal relations (see, for example, Woodward and Bernstein 1974; Coen and Chase 2012; Toobin 2000). Politics, though, also plays a part, and political scientists have documented numerous predictors of scandal frequency and duration, including the incidence of divided government (Sowers and Nelson 2016), poverty and political corruption (Nice 1983), the number of other topics vying for news coverage (Nyhan 2015), low approval ratings (Nyhan 2017), and a variety of cultural, historical, and bureaucratic forces (Meier and Holbrook 1992).

Diverse data support these empirical findings, including content analyses of media coverage (Rottinghaus 2015; Nyhan 2015, 2017), expert surveys about corruption perception (Mishler and Rose 2001; Anderson and Tverdova 2003; Boyland and Long 2003), and judi-

cial convictions (Hirano and Snyder 2018). The validity and reliability of such measures are matters of ongoing dispute, as scholars have raised concerns about the changing norms of scandal coverage over time (Adut 2005; Entman 2012), the correlations between convictions for and media perceptions of political corruption (Boylan and Long 2003), and competing definitions of what constitutes a scandal (see Rottinghaus 2015, pp. 18-20). For each of their individual strengths and weaknesses, however, all of these measures document publicly observed scandals. To do so, they rely upon the media, prosecutors, or experts to identify either specific public scandals or impressions of their general occurrence. And as purely descriptive exercises, this is fine and well. But to the extent that we are interested in using these data to make inferences about underlying transgressions, this reliance on publicly observed scandals is highly problematic. Scandals, after all, do not represent a random draw of political misbehavior. As we have learned from those rare instances when a randomized audit has been conducted (see, for example, Ferraz and Finan 2011), patterns of corruption do not map neatly onto patterns of scandal.

To make sense of these politics, it will not do to simply correlate measures of observed scandals against descriptors of the political environment. Politicians who are prone to misbehavior and those who would report their misdeeds, after all, can be expected to strategically adapt to changes in this environment. As Nyhan (2017, 33) aptly notes, "the media scandals that so often dominate the headlines are not exogenous but instead the result of a fundamentally political process. We cannot understand when and why [politicians] suffer from scandals without considering the role of strategic behavior and the context in which events take place."

To clarify this "fundamentally political process," we need theory that identifies specific conditions under which misdeeds are more or less likely to be publicly revealed, and the propensity of would-be perpetrators, a priori, to adjust accordingly. Just now, though, we know very little about the political logic that translates misbehavior (however defined) into scandal (however observed). Though a number of scholars have begun to build theories of political scandals (Basinger and Rottinghaus 2012; Dewan and Myatt 2012; Gratton, Holden and Kolotilin forthcoming), none answers a question of rudimentary importance in the politics of scandal: when, and with what consequence, is misbehavior likely to be exposed?

3   A Model

At its heart, scandal is the public revelation of previously concealed misconduct (Dewberry 2015, 4-6). Or as Theodore Lowi (1988, vii) puts it, "scandal is corruption revealed." Of

course, public accusations about past misdeeds need not be true, and the politics of scandal regularly features efforts to ascertain the veracity of accusations leveled against a politician. We therefore need theory that clarifies when "authentic" and "fake" scandals are likely to arise, and the political consequences for the associated parties and implicated politicians involved.

We envision a political setting that includes four actors: an aligned party ("it"), an opposing party (also "it"), a politician ("he"), and a voter ("she"). Both parties collaborate with the politician, though only the aligned party benefits from doing so. With probability π, the politician misbehaved—that is, committed an act that, if revealed, would constitute a scandal.[2] Let $m \in \{0, 1\}$ be a random variable denoting whether or not the politician misbehaved. If $m = 1$, then both parties learn about the misbehavior with probability p. Parameter p may assume different values depending on either the nature of the relationship between the parties and politician or the discoverability of the politician's misbehavior.[3]

Each of the parties can be one of two types: honest (probability γ) or strategic (probability $1 - \gamma$). If a party is honest, then it automatically and immediately reveals any information about the politician's misbehavior; and when it does not receive information about misbehavior, the honest party remains silent. The strategic party, of course, is free to behave as if it were honest. Alternatively, though, it may deceive the voter in one of two ways: first, by suppressing information it has received about the politician's misbehavior, or second, by fabricating information about misbehavior that it, in fact, has not received.

Independent of the information it learns about a politician's misconduct, each party $i \in \{align, opp\}$ chooses an action $a_i \in \{0, 1\}$. Action $a_i = 1$ is interpreted as unleashing a scandal and action $a_i = 0$ is interpreted as remaining silent. Hence, the choice sets of both parties are not constrained by the information they receive. Each party may choose to honestly report misbehavior when they learn about it ($a_i = 1$) or to honestly remain silent when they do not ($a_i = 0$). But both parties also are free to suppress information they have learned ($a_i = 0$) or to fabricate information in its absence ($a_i = 1$). Such fabrication reflects instances when mere rumors about a politician's misbehavior lead to calls for his dismissal, even though the parties involved have no corroborating information about the charges involved.[4]

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[2]As such, π can be interpreted as the latent probability that the partner would misbehave, the strength of a rumor about the partner's misbehavior, or the chances that the partner was involved in some publicly known scandal. We endogenize π in Section 5

[3]For ease of exposition, we assume p is common for both parties. All the main results reported below carry through if we instead assume that the probability that the aligned party is more likely to learn about misbehavior than the opposing party; and, moreover, that if the opposing party learns about the misbehavior, then so does the aligned party.

[4]Notice that in this model, only the parties are allowed to make claims about the incidence of misbehavior;

We make two assumptions about the processes of misbehavior revelation and the electorate's updating of beliefs. First, we assume that the voter knows whether or not each party revealed the politician's misbehavior. Either because the parties publicly announce the misbehavior themselves or because the (unmodelled) media coverage confers information about a scandal's source(s), the voter updates her views about the politician and parties differently depending on which parties are responsible for revealing the politician's misbehavior. We also assume that the electorate is fully Bayesian. The voter, as such, updates her views about the parties, the politician, and the incidence of misbehavior even if no scandal occurs.

We consider a one-period game with the following timing:

1. Nature reveals the random variable m.

2. If $m = 1$, then with probability $p \in (0, 1)$ both of the parties learn its value. With the remaining probability, or if $m = 0$, the parties learn nothing.

3. Each of the parties simultaneously chooses $a_i \in \{0, 1\}$.

4. Voter updates her beliefs about each party's type **and** the occurrence of misbehavior by the politician.

5. The politician is replaced with probability equal to the voter's beliefs that he misbehaved, and the respective benefits from collaboration are realized.

The strategic type obtains payoff from two sources. The first source is its reputation for honesty, which depends on the belief that the voter holds about its type at the end of the game.[5] Given the action of the aligned party a_{align} and the opposing party a_{opp}, let $\phi(a_{align}, a_{opp})$ denote the voter's beliefs about each party's type and $\Phi(a_{align}, a_{opp})$ denote the voter's beliefs about whether misconduct occurred. The second source of payoff concerns each party's benefits from continued collaboration, x. For the aligned party, we assume $x_{align} > 0$, and for the opposing party, $x_{opp} < 0$. In the analysis below, we assume symmetry between the two parties' collaborative gains and losses, $x_{align} = -x_{opp} \doteq x$. Increases in one quantity, therefore, necessarily imply equivalent decreases in the other.

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and, moreover, that only the politician's misbehavior is in question. Future work might allow accusations of misbehavior to be met with counterclaims. Rather than treat misbehavior as a one-sided phenomenon, these models might investigate the propensity of one party to reveal misbehavior by another, recognizing that this second party might counter with information of its own.

[5]Future iterations of the model might account for additional reputational concerns regarding, for instance, a party's judgment. Whereas honesty centers on concerns about the propensity of parties to truthfully reveal information they have acquired, judgement relates to prior (and in our case, unmodelled) decisions that parties make about who they choose to collaborate with.

If the politician is not dismissed, each party is guaranteed to receive its allotted collaboration payoff at the end of the game. If the politician is dismissed, however, the returns to each party depend on the identity of his replacement, which we capture with the parameter $c \in [-1, 1]$. If $c = 1$, then the new politician has the same political allegiance as the old. If $c = -1$, however, the new politician's political allegiances flip. Because the expected returns from collaboration depend on both x and c, in the analyses that follow we often focus on their joint product, $x(1 - c)$. We interpret x as the importance of the politician's position or as political polarization. The more polarized the parties are, the more they benefit from having their own member in power. We interpret c as political entrenchment of the party aligned with the politician. When the aligned party is entrenched, then voters replace politicians they perceive as dishonest with politicians from the same party, which is captured by $c = 1$. When the aligned party is not entrenched, then voters replace such politicians with politicians from the opposing party. Hence c also can be interpreted as the propensity of voters to punish the party of the implicated politician in that particular race.

The strategic parties' utility functions are defined by three quantities: their reputations, $\phi(a_{align}, a_{opp})$; their returns from collaborating with the current politician, x, weighted by the probability that the politician is not fired; and their returns from collaborating with the politician's replacement, xc, weighted by the probability that the politician is fired. That is:

$$\phi(a_{align}, a_{opp}) + (1 - \Phi(a_{align}, a_{opp})) x + \Phi(a_{align}, a_{opp}) xc \tag{1}$$

4 Analysis

From the outset, it is only natural to focus the analysis on equilibria in which the opposing party never suppresses information about misbehavior, and the aligned party never fabricates it. Hence, any equilibrium considered in this paper is fully characterized by the conditional probability that the strategic type of the aligned party who learns about misbehavior suppresses it, denoted by $s \in [0, 1]$, and by the conditional probability that the strategic type of the opposing party who does not learn about misbehavior fabricates a scandal, denoted by $f \in [0, 1]$.

Our first proposition stipulates the existence of an equilibrium, and shows that multiplicity of equilibria is limited. All proofs are collected in the appendix.

Proposition 1 *There exists an equilibrium. For any set of parameters for which in some equilibrium $f > 0$ or $s > 0$, there may exist at most one other equilibrium in which $f = s = 0$.*

In our analysis, whenever two equilibria coexist, we select the one with some level of

dishonesty of the parties. This equilibrium selection criterion, however, does not affect the qualitative findings that follow.

The following proposition stipulates key comparative statics on parties' dishonest behavior: the opposing party's propensity to fabricate information and the aligned party's propensity to suppress it.

Proposition 2 *In equilibrium,*

1. *f and s increase in $x\,(1-c)$;*

2. *f increases in p; s increases unless $f = 1$;*

3. *s decreases in π. f may increase or decrease in π.*

The proposition's first result is straightforward to see. As the respective gains and losses of collaboration increase, so too do the incentives to behave dishonestly. As x increases, the opposing party suffers greater collaborative losses from the sitting politician, and the aligned party collects greater collaborative benefits, and therefore the former is more inclined to claim to have received information about his misbehavior to force him out, and the latter is more inclined to suppress information to protect him. Similar incentives arise if c decreases, as the opposing party is more likely to benefit and the aligned party is more likely to suffer from the identity of the replacement.

We also find that fabrication f increases in p and suppression s decreases in π, but the remaining comparative statics can move in either direction. Here is why. As p or π increase, parties are more likely to have received information about the politician's misbehavior, and hence the voter expects a scandal. Consequentially, both parties have incentives to produce one, making suppression less likely and fabrication more likely. Another effect, however, cuts in the opposite direction. If the voter expects that the aligned party is unlikely to suppress information, then should the aligned party do so, the voter will interpret the opposing party's claims about misbehavior as fabrication, which decreases the opposing party's incentives to fabricate. Similarly, if the opposing party is expected to not fabricate scandals, the voter is inclined to interpret the aligned party's silence as suppression, which in turn increases this party's incentives to reveal information about misbehavior. In other words, there is a force in the model pushing f and s in the same direction. A priori, it is not obvious which effect should dominate, and Proposition 2 provides the answer.[6]

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[6]When π increases, there is an additional effect. The voter perceives the politician as corrupt, and hence she is inclined to vote him out of power even in the absence of a scandal, increasing incentives for both parties to behave more honestly. This effect further complicates the comparative statics in part 3.

Collectively, these results reveal that f and s tend to be complements, which helps explain why, with scandals looming, we so often see politicians on one side of a divide lobbing unfounded accusations, while politicians on the other fall in line behind the accused. When the opponent is prone to fabrication, the aligned party's decision to suppress does not result in much reputational loss, since the voter is inclined to think that the opponent lied. Similarly, when the aligned party is expected to suppress information, the opponent's decision to pretend to have received corroborating information about a scandal is not reputationally damaging, since the voter is inclined to think that the aligned party lied. In this way, deception begets deception.

4.1   Incidence of Scandals

Because both parties receive the same information about misbehavior, therefore, we will never observe a case where only the aligned party reveals its occurrence. In equilibrium, scandals may arise either because both parties reveal misbehavior (yielding "bipartisan" scandals) or because only the opposition does so (yielding "partisan" scandals).

Proposition 3 *The incidence of scandals:*

1. *increases in $x(1-c)$ and p;*

2. *may increase or decrease in π.*

To understand Proposition 3, note that the production of scandals partially follows from the two parties' propensities to deceive, albeit not symmetrically. For a scandal to be triggered, only one party needs to reveal misbehavior. Moreover, every time that the opposing party learns about misbehavior, regardless of whether it is honest or strategic, it will reveal the information to the voter. Hence, the aligned party's propensity to suppress information is irrelevant for the overall level of scandals, and it is the opposing party's propensity to fabricate scandals that drives scandal production. This means that factors that encourage the opposing party to fabricate scandals positively contribute to the emergence of scandal. Each of the comparative statics on scandal in Proposition 3 then flow reasonably straightforwardly from those observed on f in Proposition 2.

Proposition 3 underscores the dangers of equating scandals with misconduct. Two places with identical levels of misconduct but that differ in x or p may yield very different quantities of scandals. Holding x and p constant, meanwhile, does not necessarily solve the inference problem. Given the non-monotonicities in π, it is possible for one location to support less misbehavior than another and yet produce more overall scandals. The lesson for empirical

work is clear: scandals can be a poor proxy for actual misconduct; and efforts to ascertain the depth of an underlying problem on the basis of public accusations about it can be misleading.

Thus far, we have examined the effects of parameter changes on the total volume of scandals. Notice, though, that in a bipartisan scandal, the voter knows with certainty that the scandal concerns actual misbehavior. In the partisan scandal, though, the voter is left to wonder whether misbehavior occurred and the aligned party suppressed its information on whether the information is merely fabricated by the opposing party. As the next corollary stipulates, changes in x and c have very different effects on the production of these two types of scandals.

Corollary 1 *As $x(1-c)$ increase, incidence of bipartisan scandals decreases and the incidence of partisan scandals increases.*

The intuition behind both of these relations are readily identified. As x increases, the opposing party suffers greater collaborative losses from the sitting politician. And as c decreases, the chances that the sitting politician will be replaced by another more to the opposing party's liking also increases. As a result, the opposing party has greater incentives to fabricate news about the politician's misbehavior, with the hope that the voter will fire him, whereas the aligned party has greater incentives to act in ways that protect the sitting politician. As the opposing party fabricates more often and the aligned party suppresses more, bipartisan scandals surface less often while partisan scandals proliferate. In this way, heightened polarization and lower party entrenchment do not merely augment the production scandal. They also lend credence to charges of "fake news."

4.2   Political Consequences of Scandal

We turn now to identifying the political consequences of scandals. It will not do to simply estimate the average political consequences of scandals. We also must scrutinize their differential effects on the reputations of various political actors. As we show in this section, scandals can have a wide range of effects on both the parties that instigate them and the politicians who stand at their center. Depending on parameters and the type of scandal, parties or the politician may suffer reputationally, they may benefit, or they may be altogether unaffected.

Let's begin with the political consequences of bipartisan scandals. After both parties reveal misbehavior, the voter updates her beliefs as follows:

Proposition 4 *In equilibrium,*

$$\phi_{opp}(1,1) = \gamma \leq \phi_{align}(1,1);$$

$$\Phi(1,1) = 1,$$

where the inequality is strict if $s > 0$.

The voter knows that the opposing party always reveals misbehavior that it observes, and sometimes it fabricates information about its occurrence. The aligned party, by contrast, only reveals misbehavior after having learned about it. Having observed a bipartisan scandal, therefore, the voter knows with certainty that the politician misbehaved, and hence $\Phi(1,1) = 1$.[7] Because the strategic and honest types of the opposing party pool in this instance, however, the voter doesn't learn anything new about the opposing party's type, and hence $\phi_{opp}(1,1) = \gamma$, where γ, you will recall, is the voter's baseline belief that a party is honest. Bipartisan scandals, however, do cause the voter to update positively on the aligned party. The fact that the aligned party did not suppress information that it received about the politician's misbehavior makes the voter more inclined to believe that it is the honest type, and hence $\phi_{align}(1,1) > \gamma$, provided $s > 0$.[8]

When exposed to a partisan scandal, the voter is much less certain about the parties' types and the politician's behavior. It is possible that both parties learned about misbehavior but that the aligned party opted to suppress it. Alternatively, neither party may have learned about misbehavior, but the opposing party opted to fabricate information about its occurrence. And as the next proposition stipulates, the voter's updated beliefs about the politician's behavior and the relative blame she assigns to the parties both depend upon two key parameter values.[9]

Proposition 5 *Partisan scandals arise only if $2x(1-c) > \gamma\frac{1-\pi p}{1-\pi}$. For those parameters,*

$$\phi_{opp}(0,1) < \gamma$$

$$\phi_{align}(0,1) < \gamma$$

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[7]If we interpret π as the "the strength of the rumor" and the instigation of a scandal as the party withdrawing its support for one of its members, some inferences about recent scandals follow rather naturally. Consider, for example, the case of Senator Al Franken being accused of sexual misconduct, and allow π to capture the strength of the initial evidence against him. We know that the party that benefits from Franken's collaboration will never pretend to observe misbehavior. The fact that the Democratic Party did in fact force Franken to resign, then, should lead the voter to conclude that misbehavior did in fact occur.

[8]We have assumed that the voter dismisses the politician with the probability equal to her belief that the politician misbehaved, so if $\Phi(1,1) = 1$, then the politician is dismissed with probability 1. Alternatively, we could interpret a bipartisan scandal as a situation in which the aligned party dismisses the politician after an outcry from the opposing party.

[9]Ample examples of these "partisan" scandals have arisen during Donald Trump's tenure as president. Repeatedly, Democrats levy charges of misbehavior, Republicans either refute these charges or remain entirely silent, and the electorate is left wondering what, if anything, actually happened.

$$\phi_{opp}\left(0,1\right) + \phi_{align}\left(0,1\right) = \gamma.$$

If $\pi p < \frac{1}{2}$, then

1. $\phi_{opp}\left(0,1\right) < \phi_{align}\left(0,1\right)$;

2. $\Phi\left(0,1\right) \geq \pi$.

If $\pi p > \frac{1}{2}$, then

3. $\phi_{opp}\left(0,1\right) > \phi_{align}\left(0,1\right)$;

4. $\Phi\left(0,1\right) \leq \pi$,

where all inequalities are strict if $sf < 1$.

Notice, first, that partisan scandals always damage both parties' reputations. Having observed a partisan scandal, the voter can be sure that one of the two parties is the strategic type; and as a consequence, she is half as likely to believe that both parties are honest.

The damage brought by partisan scandals, however, is not equally distributed across the two parties. Rather, the reputational fallout for each of the parties depends upon the voter's baseline beliefs about the incidence of misbehavior and the probability that the parties learn about it. To understand the intuition for Proposition 5, consider first the case in which $p\pi < \frac{1}{2}$, when parties are unlikely to have information about misbehavior, either because misbehavior is rare or hard to detect. Here, the voter does not expect to see scandals, and so she is inclined to believe that a partisan scandal is triggered by fabrication rather than suppression, causing her to penalize the opposing party more than the aligned one. Knowing the voter's calculus, the opposing party fabricates fewer scandals, but not to the extent that the inference is wiped out. To understand why the implicated politician suffers reputationally, note that the voter's inference from a partisan scandal depends on whether a partisan scandal is more likely when the politician misbehaved or when he did not. The former is higher when suppression s is higher than fabrication f and vice versa. Since the opposing party curtails its dishonesty to mitigate the reputation fallout, indeed $s > f$, and hence $\Phi\left(0,1\right) \geq \pi$.

When $p\pi > \frac{1}{2}$, the voter expects that parties are privy to information on misbehavior, and hence she expects a scandal. As a result, she is inclined to interpret a partisan scandal as a result of suppression and not fabrication, and she therefore penalizes mainly the aligned party for dishonesty. The aligned party responds by decreasing s, which leads to $s < f$. When suppression is lower than fabrication, a partisan scandal is more likely when no misbehavior

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occurred than when it did. Remarkably, then, the politician's reputation benefits from a partisan scandal.

In this way, we can see how the subjects of political scrutiny can actually benefit from partisan scandal. While both parties suffer reputationally, albeit not equally, the politician himself comes out looking better than he did before. This finding has particular resonance in contemporary American politics, wherein the prevalence of partisan scandals routinely damages the reputations of both the Democratic and Republican parties, with perhaps larger damage to Republicans, whereas the public approval ratings of these scandals' primary subject–Donald Trump–appear noticeably resilient.

The next proposition clarifies how rising levels of partisan polarization affect the political consequences of partisan scandal.

Proposition 6 *As $x(1-c)$ increases, $|\phi_{opp}(0,1) - \phi_{align}(0,1)|$ increases and $|\Phi(0,1) - \pi|$ decreases.*

When polarization rises, the reputational fallout of partisan scandals falls disproportionately on one party, and the consequences of partisan scandals for the politician, whether positive or negative, attenuate. Similarly, and consistent with Hirano and Snyder's (2018) empirical findings on the subject, the political consequences of scandals vary according to a party's entrenchment in a political office. On net, when polarization is high, and when an accused politician's replacement is likely to come from the opposite party, the difference in political fallout for the parties is large whereas the consequences for the implicated politician tend to be small.

4.3 Errors of Inference

With rising polarization, we have seen, comes rising scandals. Increasingly, moreover, the scandals that emerge are instigated by the opposing party alone. These facts have implications not only for the inferences that the voter draws, but also for their accuracy.

Proposition 7 *The probability that the voter makes a wrong decision (keeping a misbehaving politician or firing a well-behaved one) increases in $x(1-c)$ and decreases in p.*

That the probability the voter commits either a Type I or Type II error is increasing in $x(1-c)$ flows directly from Proposition 3. As the returns from collaborating with a politician and his possible replacement increasingly differ for the two parties, the more likely it is that the parties will behave dishonestly. Consequentially, the scandals that arise are less informative, which increases the chances that the voter will either conclude that politician

did not misbehave, when in fact he did, or that the voter did misbehave, when in fact he did not.

The relationship between the likelihood that misbehavior will be discovered and the incidence of inferential errors is less straightforward. On the one hand, we know from Proposition 2 that as as p increases, the dishonesty of both parties increases and, consequentially, scandals become less informative. On the other hand, as p increases, the parties are more likely to learn about misbehavior; and as a consequence, they are in a position to deliver more information to the voters. Proposition 7 says that the latter effect dominates.

We omit comparative statics with respect to π, which are rather obviously nonmonotonic. Even without strategic considerations, the voter is most likely to make a mistake when π is intermediate. When π approximates 1 or 0, after all, the voter proceeds with justified confidence that the politician either did or did not misbehave.

It should now be clear that the informational value of scandals varies dramatically. Amidst rising levels of polarization and weakening information networks, partisan scandals proliferate. This, though, also is when voters are most likely to draw the wrong conclusions about the politician in question. Rather than strengthening informational channels and the possibilities for democratic accountability, polarization and the fracturing of political relationships undermine them both.

5   Endogenous Misbehavior

Up until now, we have treated misbehavior exogenously. The results, as such, speak to the class of scandals in which the commission of a politically damaging act is uninformed by political considerations.[10] We now endogenize misbehavior, which renders both the parties and politician as strategic actors. The politician's willingness to misbehave, as such, depends upon the likelihood that the parties will reveal it and the voter will remove him from office. Overall, the main qualitative findings about the incidence of scandals and their reputational consequences carry through this extension, but we recover new insights about the politician's propensity to misbehave.

The order of the game proceeds exactly as before, except that now the politician, rather than nature, chooses m in the first stage. Suppose that the politician receives benefit b from misbehavior, where $b \sim U\left[-\left(1-B\right), B\right]$ with $B \in (p, 1)$, and benefit 1 from being in office. If he knew he would get away with it, the politician would misbehave and thereby recover this b whenever positive. Given the possibility of either party revealing the misbehavior,

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[10]The results of the previous section also apply if we interpret π not as the incidence of misbehavior but as the strength of rumors about a particular politician.

however, the politician must weigh b against the expected costs of scandal.

Given the voter's beliefs about π, the politician with a particular b decides whether to misbehave or not, which determines the actual π. An equilibrium, therefore, identifies the optimal incidence of misbehavior, π^*, given the voter's beliefs are π^*.

Proposition 8 *There exists an equilibrium. If there exist multiple equilibria, for each set of parameters consider equilibria with the lowest (highest) equilibrium level of misbehavior π^*. Then*

1. *π^* weakly increases in $x\left(1-c\right)$;*

2. *π^* weakly decreases in p.*

From Proposition 2 , we know that as $x\left(1-c\right)$ increases, parties are more likely to either fabricate or suppress information. Consequentially, voters' decisions are less informed about the politician's actual misconduct, which encourages the politician to misbehave. Given their limited informational content, Proposition 8 states, threats of revelation are less damaging in expectation, which makes the guaranteed benefits of misconduct more attractive.

The comparative statics with respect to p are more involved. Again from Proposition 2 we know that parties are more likely to act deceptively as their probability of learning about misbehavior increases. Because they also are more likely to observe misbehavior when it occurs, however, the voter simultaneously is more likely to become informed. Proposition 8 states that this latter effect dominates. As p increases, voters' decisions are more closely related to misbehavior, and the politician's incentives to misbehave accordingly decline.

The comparative statics on scandal incidence is more nuanced. From Proposition 3 we know that as $x\left(1-c\right)$ and p increase, the incidence of scandals increases via an increase in f. Having endogenized misbehavior, however, an additional effect comes into play via π^*, and from Proposition 3 we know that this effect has an ambiguous sign. As a result, the total effects of $x\left(1-c\right)$ and p on the incidence of scandals also are ambiguous. Still, as the next proposition states, some non-intuitive relationships can be observed in equilibrium.

Proposition 9 *There exist parameters for which the incidence of scandals increases in p.*

Combining Proposition 8 with 9, we see that there exist parameters for which increasing p decreases misbehavior and at the same time increases the production of scandals. This finding provides further reason to exercise caution when inferring misconduct from scandal. Indeed, legislative bodies, districts or countries with lower rates of misbehavior may experience more scandals than those with higher rates.

The findings on the political consequences of scandal that were presented in Proposition 5 carry through when misbehavior is endogenized. Moreover, Proposition 8 implies that we are likely to be in the $p\pi^* < \frac{1}{2}$ regime when $x(1-c)$ is relatively small, and in $p\pi^* > \frac{1}{2}$ otherwise. Hence, when the consequences of a politician's dismissal are large for the parties, scandals have little impact on the politician but do substantial reputational damage to the aligned party. [11]

Lastly, identifying conditions under which voters make inferential errors is even more complex than previously recognized in Section 4.3. For example, Proposition 7 says that as $x(1-c)$ increases, voters are more likely to make a wrong decision about a politician's fate. But since an increase in $x(1-c)$ increases π^*, a second effect arises–namely, the probability of making the wrong decision first increases then decreases in π^*. Hence, if we start in an environment with low levels of misbehavior, then as in the exogenous misbehavior case, increases in $x(1-c)$ compromise the voter's ability to correctly infer misbehavior. We cannot rule out that the reverse holds, however, if we start in an environment with high levels of misbehavior.

6   Conclusion

Details about political scandals intermittently baffle and astound. Often, no rationale would seem to account for the immoral, illegal, or unethical acts at their center. The reasons why politicians do things that endanger their and their associates' careers seem incomprehensible. And perhaps they are. But the occurrence of scandals is not. The transformation of private misbehavior into public scandal is a deeply political process.

The model we study yields some results that are perfectly intuitive. For example, as the returns from collaboration improve, parties are less likely to reveal a politician's misbehavior. Similarly, higher returns from collaboration also affect the reputational gains from revealing a politician's misbehavior and the reputational losses from not doing so. And no wonder. When a party discloses the misbehavior of a close associate, the voter is especially likely to conclude that it must be the honest type. And if it does not do so, the voter is prone to conclude that the party knew about the misbehavior all along but opted to stay quiet in order to reap the gains of continued collaboration, as only the strategic type would do.

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[11]Since π^* is decreasing in p, the set of p for which $p\pi^* < \frac{1}{2}$ is likely to be more complex, and we refrain from characterizing such a set recognizing that our results would depend upon the distributional assumptions we make about b. The distributional assumptions are unlikely to affect the compartive statics results that we present in this section. However, they could affect the set of p for which we have $p\pi^* < \frac{1}{2}$. If benefits from misconduct are likely to be large, for instance, then π^* will be large for many values of p. If not, $p\pi^* < \frac{1}{2}$ may obtain for all values of p

We also find that polarization accelerates the production of political scandals. Because these scandals tend to be partisan in nature, however, the voter does not learn very much about the politician in question. Remarkably, scandals in this setting can redound to the benefit of the offending politician. When only the opposing party reveals misbehavior, the voter may infer that the politician did not misbehave after all, even as she downgrades her assessment of both parties—a finding, we suggest, that is consistent with Trump maintaining steady approval ratings amidst widespread accusations of scandal, while the reputations of the two major parties founder.

The model also clarifies why higher numbers of scandal do not necessarily imply higher levels of misbehavior. Fixing existing levels of misbehavior, one may observe very different levels of scandals depending on the benefits parties receive from working with a politician, the probability that the parties will learn about his misbehavior, and the likelihood that he will be replaced by someone with different partisan commitments. Moreover, discrete changes in misbehavior do not necessarily yield equivalent changes in scandal. Indeed, marginal increases in misbehavior sometimes decrease the number of scandals that arise.

In various ways, the logic of revelation varies according to the acts and relationships that characterize different scandals. The Trump presidency provides representative examples of each. The baseline model captures the logic of scandals that involve acts of compulsion or ignorance, such as Trump's alleged dalliances with porn stars and *Playboy* models. When endogenizing misbehavior, meanwhile, we turn our attention to scandals that arise from calculated misbehavior, which broadly characterizes the subject of Robert Mueller's investigations into the Russian government's interactions with the Trump campaign. As we have seen, some of the comparative statics on both scandal and reputation attenuate across these models. When conducting empirical work on scandals, then, it will not do to simply count their occurrence or measure their general significance. Attention must be paid to the nature of the acts and the structure of relationships between the implicated politicians. Scandals are decidedly not idiosyncratic or arbitrary–but nor are they of a piece.

7 Appendix

7.1 Preliminaries

Using Bayes' rule, the following formulas hold

$$\phi_{align}(1,1) = \frac{\gamma}{\gamma + (1-s)(1-\gamma)},$$

$$\phi_{opp}(0,0) = \frac{\gamma}{\gamma + (1-f)(1-\gamma)},$$

$$\Phi(1,1) = 1 \text{ and } \Phi(0,0) = \pi \frac{1-p}{1-\pi p},$$

and as long as $f + s \neq 0$, we have

$$\phi_{align}(0,1) = f\gamma \frac{1-\pi p}{f(1-\pi p) + \pi ps},$$

$$\phi_{opp}(0,1) = \pi p\gamma \frac{s}{f(1-\pi p) + \pi ps},$$

$$\Phi(0,1) = \pi \frac{f(1-p) + ps}{f(1-\pi p) + \pi ps}.$$

7.2 Proofs for Section 4

Notation 1 *Let $z \equiv 2(1-c)x$.*

Proof for Proposition 1. To prove Proposition 1, we prove Lemma 1 below, which describes equilibria in more detail. Those details will be useful in the subsequent proofs. ∎

Lemma 1 *The following describes all equilibria.*

1. *There exists a fully honest equilibrium in which $f = s = 0$ if and only if*

$$z \leq 2\frac{\gamma(1-p\pi)}{1-\pi}. \tag{2}$$

2. *There exists an equilibrium in which $f = 1$ and*

$$s = z\frac{1-\pi}{(1-\gamma)(1-\pi)z + \gamma(1-\gamma+\pi p\gamma)} \tag{3}$$

if and only if $\pi p > \frac{1}{2}$ and $z \in \left(\frac{1-\pi p}{\pi p}\frac{1-\gamma+\pi p\gamma}{(1-\pi)}, \frac{1-\gamma+\pi p\gamma}{1-\pi}\right).$

3. *There exists an equilibrium in which $s = 1$ and*

$$f = \pi p z \frac{1 - \pi}{\pi p (1 - \gamma)(1 - \pi) z + \gamma (1 - \pi p)(1 - \pi p \gamma)} \tag{4}$$

if and only if $\pi p < \frac{1}{2}$ and $z \in \left(\frac{1 - \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \pi p \gamma}{1 - \pi} \right)$.

4. *There exists a fully mixing equilibrium in which*

$$s = \frac{(1 - \pi) z - (\gamma - \pi p \gamma)}{(1 - \gamma)((1 - \pi) z + \pi p \gamma)} \tag{5}$$

$$f = \pi p \frac{(1 - \pi) z - \gamma (1 - \pi p)}{\left(\gamma (\pi p - 1)^2 + \pi p (1 - \pi) z\right)(1 - \gamma)} \tag{6}$$

if and only if

$$\frac{\gamma (1 - \pi p)}{(1 - \pi)} < z < \min \left\{ \frac{1 - \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \gamma + \pi p \gamma}{1 - \pi} \right\}. \tag{7}$$

5. *There exists a fully dishonest equilibrium with $f = s = 1$ if and only if*

$$\max \left\{ \frac{(1 - \gamma (1 - \pi p))}{(1 - \pi)}, \frac{1 - \pi p \gamma}{1 - \pi} \frac{1 - \pi p}{\pi p} \right\} \leq z. \tag{8}$$

Proof of Lemma 1. Consider the incentives of the aligned party who knows $m = 1$ occurred. It knows $a_{opp} = 1$, and hence its payoffs as a function of its decision are:

$$[a_{align} = 1] \quad : \quad \phi_{align}(1, 1) + cx + (1 - c)(-x),$$
$$[a_{align} = 0] \quad : \quad \phi_{align}(0, 1) + (1 - \Phi(0, 1))x + \Phi(0, 1)(cx + (1 - c)(-x)).$$

So the aligned party weakly prefers to suppress information if and only if

$$\phi_{align}(1, 1) - \phi_{align}(0, 1) \leq (1 - \Phi(0, 1))x2(1 - c). \tag{9}$$

The opposing party with no information knows $a_{align} = 0$, and hence its payoffs as a function of its decision are:

$$[a_{opp} = 1] \quad : \quad \phi_{opp}(0, 1) - (1 - \Phi(0, 1))x - \Phi(0, 1)xc + \Phi(0, 1)(1 - c)x,$$
$$[a_{opp} = 0] \quad : \quad \phi_{opp}(0, 0) - (1 - \Phi(0, 0))x - \Phi(0, 0)xc + \Phi(0, 0)(1 - c)x.$$

So the opposing party weakly prefers to fabricate if and only if

$$\phi_{opp}(0,1) - \phi_{opp}(0,0) \geq -\left(\Phi(0,1) - \Phi(0,0)\right) x2(1-c). \tag{10}$$

We will consider now all possible combinations of f and s. Note that parties' incentives depend on x and c only via $2x(1-c)$; hence, in the interest of space, we use Notation 1, $z \equiv 2x(1-c)$, in the remainder of the appendix.

Consider first $f = 0$ and $s = 0$, that is, a fully honest equilibrium. In this equilibrium, both parties' actions agree, so $\Phi(0,1)$, $\phi_{opp}(0,1)$ and $\phi_{align}(0,1)$ are not pinned down by Bayes' rule. But if this is an equilibrium, then from (9) and (10), together with the formulas from Section 7.1 it must be that

$$\frac{\gamma - \phi_{opp}(0,1)}{z} + \frac{(1-p)\pi}{(1-p)\pi + (1-\pi)} \geq \Phi(0,1) \geq \frac{-\gamma + \phi_{align}(0,1)}{z} + 1$$

The left-hand side (LHS) decreases in $\phi_{opp}(0,1)$, and the right-hand side (RHS) increases in $\phi_{align}(0,1)$, so the range of parameters for which an honest equilibrium exists is largest when we set $\phi_{opp}(0,1) = 0$ and $\phi_{align}(0,1) = 0$. So the existence of this equilibrium requires

$$\frac{\gamma}{z} + \frac{(1-p)\pi}{(1-p)\pi + (1-\pi)} \geq \Phi(0,1) \geq \frac{-\gamma}{z} + 1,$$

and hence we can find a nonempty set of $\Phi(0,1) \in (0,1)$ if and only if (2) is satisfied.

Consider now $f = 1$ and $s = 1$. From (9) and (10), this is an equilibrium if and only if

$$\phi_{align}(1,1) - \phi_{align}(0,1) \leq (1 - \Phi(0,1)) z,$$

$$\phi_{opp}(0,1) - \phi_{opp}(0,0) \geq -\left(\Phi(0,1) - \Phi(0,0)\right) z.$$

Plugging the formulas from Section 7.1 and using $f = s = 1$, we obtain that this is an equilibrium if and only if (8) holds.

Consider now $f = 1$ but $s \in (0,1)$. From (9) and (10), this equilibrium requires

$$\phi_{align}(1,1) - \phi_{align}(0,1) = (1 - \Phi(0,1)) z,$$

$$\phi_{opp}(0,1) - \phi_{opp}(0,0) \geq -\left(\Phi(0,1) - \Phi(0,0)\right) z.$$

Plugging the formulas from Section 7.1, we obtain that (3) solves the first equation and the inequality is satisfied if

$$z \geq \frac{(1-\pi p)}{\pi p} \frac{-\gamma + \pi p \gamma + 1}{(1-\pi)}.$$

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Condition $s \in (0, 1)$ requires that

$$\frac{1 - \gamma + \pi p \gamma}{(1 - \pi)} > z.$$

Combining these, we obtain the condition of part 2 of the lemma.

Consider now $s = 1$ and $f \in (0, 1)$. From (9) and (10), this equilibrium requires

$$\phi_{align}(1, 1) - \phi_{align}(0, 1) \leq (1 - \Phi(0, 1)) z,$$

$$\phi_{opp}(0, 1) - \phi_{opp}(0, 0) = -(\Phi(0, 1) - \Phi(0, 0)) z.$$

Plugging the formulas from Section 7.1, we obtain that (4) solves the second equation and the inequality is satisfied if

$$z \geq \frac{1 - \pi p \gamma}{(1 - \pi)}.$$

Condition $f \in (0, 1)$ requires that

$$z < (1 - \pi p) \frac{1 - \pi p \gamma}{\pi p (1 - \pi)}.$$

Combining these, we obtain the condition of part 3 of the lemma.

Consider now an equilibrium in which both parties mix, that is, $f \in (0, 1)$ and $s \in (0, 1)$. Plugging the formulas from Section 7.1 into (9) and (10) satisfied with equalities, and solving for f and s, we obtain (5) and (6). For this to be an equilibrium, we need that indeed $f \in (0, 1)$ and $s \in (0, 1)$, which delivers (7).

Consider now $f = 0$ and $s > 0$. From (9) and (10), this is an equilibrium only if

$$\phi_{opp}(0, 1) - \phi_{opp}(0, 0) \leq -(\Phi(0, 1) - \Phi(0, 0)) z, \tag{11}$$

but in this equilibrium there is no updating about the opposing party's type, and hence $\phi_{opp}(0, 1) = \phi_{opp}(0, 0) = \gamma$, while $(\Phi(0, 1) - \Phi(0, 0)) > 0$, so (11) cannot be satisfied. For similar reasons we can rule out an equilibrium in which $s = 0$ and $f > 0$. ∎

Lemma 2 *Define*

$$\bar{s}(z, p, \pi) = \begin{cases} 0 \text{ if } z < \frac{\gamma(1 - p\pi)}{(1 - \pi)} \\ \frac{(1 - \pi)z - (\gamma - \pi p \gamma)}{(1 - \gamma)((1 - \pi)z + \pi p \gamma)} \text{ if } z \in \left(\frac{\gamma(1 - p\pi)}{(1 - \pi)}, \min\left\{ \frac{1 - \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \gamma + \pi p \gamma}{(1 - \pi)} \right\} \right) \\ \frac{z(1 - \pi)}{(1 - \gamma)(1 - \pi)z + \gamma(1 - \gamma + \pi p \gamma)} \text{ if } z \in \left(\min\left\{ \frac{1 - \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \gamma + \pi p \gamma}{(1 - \pi)} \right\}, \max\left\{ \frac{1 - \gamma + \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \pi p \gamma}{1 - \pi} \right\} \right) \\ 1 \text{ if } z \geq \max\left\{ \frac{1 - \gamma + \pi p \gamma}{1 - \pi}, \frac{1 - \pi p}{\pi p} \frac{1 - \pi p \gamma}{1 - \pi} \right\} \end{cases}$$

and

$$\bar{f}(z,p,\pi) = \begin{cases} 0 \ \textit{if } z < \frac{\gamma(1-p\pi)}{(1-\pi)} \\ \frac{\pi p((1-\pi)z - \gamma(1-\pi p))}{\left(\gamma(\pi p - 1)^2 + \pi p z(1-\pi)\right)(1-\gamma)} \ \textit{if } z \in \left(\frac{\gamma(1-p\pi)}{(1-\pi)}, \min\left\{\frac{1-\pi p\gamma}{1-\pi}, \frac{1-\pi p}{\pi p}\frac{1-\gamma+\pi p\gamma}{(1-\pi)}\right\}\right) \\ \frac{\pi p z(1-\pi)}{\pi p(1-\gamma)(1-\pi)z + \gamma(1-\pi p)(1-\pi p\gamma)} \ \textit{if } z \in \left(\min\left\{\frac{1-\pi p\gamma}{1-\pi}, \frac{1-\pi p}{\pi p}\frac{1-\gamma+\pi p\gamma}{1-\pi}\right\}, \max\left\{\frac{1-\gamma+\pi p\gamma}{1-\pi}, \frac{1-\pi p}{\pi p}\frac{1-\pi p\gamma}{1-\pi}\right\}\right) \\ 1 \ \textit{if } z \geq \max\left\{\frac{1-\gamma+\pi p\gamma}{1-\pi}, \frac{1-\pi p}{\pi p}\frac{1-\pi p\gamma}{1-\pi}\right\} \end{cases}$$

For each two parameters fixed, $\bar{s}$ and $\bar{f}$ are absolutely continuous in the third.

Proof of Lemma 2. That $\bar{s}$ and $\bar{f}$ are continuous can be established by checking all possible discontinuity points. To show that $\bar{s}$ and $\bar{f}$ are absolutely continuous, we ignore the constraints, take the derivatives of each of the possible formulas for $\bar{s}$ and $\bar{f}$ with respect to the parameter of interest, and show that these derivatives are bounded. This is an easy exercise; hence, we demonstrate this only for z to illustrate the approach.

$$\left|\frac{\partial \bar{s}(z,p,\pi)}{\partial z}\right| = \begin{cases} 0 \\ \frac{\gamma(1-\pi)}{(1-\gamma)((1-\pi)z + \pi p\gamma)^2} < \frac{(1-\pi)}{(1-\gamma)\gamma(\pi p)^2} \\ \frac{(1-\pi)\gamma(1-\gamma+\pi p\gamma)}{(1-\gamma)(1-\pi)z + \gamma(1-\gamma+\pi p\gamma)} < (1-\pi) < \frac{(1-\pi)}{(1-\gamma)\gamma(\pi p)^2} \end{cases},$$

$$\left|\frac{\partial \bar{f}(z,p,\pi)}{\partial z}\right| = \begin{cases} 0 \\ \frac{\pi p\gamma(\pi-1)(\pi p - 1)}{\left(\gamma(\pi p - 1)^2 + \pi p z(1-\pi)\right)^2 (1-\gamma)} < \frac{\pi p(1-\pi)}{\gamma(1-\pi p)^3(1-\gamma)} \\ \frac{\pi p(1-\pi)\gamma(1-\pi p)(1-\pi p\gamma)}{(\pi p(1-\gamma)(1-\pi)z + \gamma(1-\pi p)(1-\pi p\gamma))^2} < \frac{\pi p(1-\pi)}{(\gamma(1-\pi p)(1-\pi p\gamma))} < \frac{\pi p(1-\pi)}{\gamma(1-\pi p)^3(1-\gamma)} \end{cases}.$$

So the Lipschitz constant for $\bar{s}$ is $\frac{(1-\pi)}{(1-\gamma)\gamma(\pi p)^2}$ and the Lipschitz constant for $\bar{f}$ is $\frac{\pi p(1-\pi)}{\gamma(1-\pi p)^3(1-\gamma)}$.
∎

Proof of Proposition 2. With our equilibrium selection, f and s are described by $\bar{f}$ and $\bar{s}$ from Lemma 2, and hence they are absolutely continuous. Hence, to establish any unconditional comparative statics of Proposition 2, it is sufficient to establish that this comparative statics holds within each equilibrium, and that it has the same sign as we move between equilibria types identified in Lemma 1. The comparative statics on f (and s) is trivially true for the set of parameters for which $f = 0$ or $f = 1$ ($s = 0$ or $s = 1$), so it suffices to focus on the remaining equilibria types.

Recall notation $z = 2(1-c)x$, and consider the comparative statics with respect to z, which immediately then implies the comparative statics with respect to x and c. For the range of parameters for which we are in the equilibrium with $f \in (0,1)$ and $s \in (0,1)$, we

totally differentiate (5) and (6) to obtain

$$\frac{ds}{dz} = \frac{\gamma}{(1-\gamma)} \frac{(1-\pi)}{(z(1-\pi)+\pi p\gamma)^2} > 0,$$

$$\frac{df}{dz} = \frac{1}{(1-\gamma)} \frac{\pi p\gamma(1-\pi)(1-\pi p)}{(\gamma(1+\pi^2 p^2 - 2\pi p) + \pi p z(1-\pi))^2} > 0.$$

For the set of parameters for which we are in the equilibrium with $s = 1$ and $f < 0$ we differentiate (4) to obtain

$$\frac{df}{dz} = \pi(1-\pi)p\frac{\gamma(1-\pi p)(1-\pi p\gamma)}{(\pi p(1-\gamma)(1-\pi)z + \gamma(1-\pi p)(1-\pi p\gamma))^2} > 0.$$

For the set of parameters for which we are in the equilibrium with $f = 1$ and $s < 0$ we differentiate (3) to obtain

$$\frac{ds}{dz} = (1-\pi)\frac{\gamma(-\gamma + \pi p\gamma + 1)}{((1-\gamma)(1-\pi)z + \gamma(1-\gamma+\pi p\gamma))^2} > 0.$$

This establishes part (1).

Consider now p. For the set of parameters for which we are in the equilibrium with $f \in (0,1)$ and $s \in (0,1)$, we totally differentiate (5) and (6) to obtain

$$\frac{ds}{dp} = \frac{\gamma}{(1-\gamma)} \frac{\pi\gamma}{(z-\pi z+\pi p\gamma)^2} > 0,$$

$$\frac{df}{dp} = \frac{\pi\gamma}{(1-\gamma)} \frac{(1-\pi)z - \gamma(\pi p - 1)^2}{(\gamma(1+\pi^2 p^2 - 2\pi p) + \pi p z(1-\pi))^2} > 0,$$

For the set of parameters for which we are in the equilibrium with $s = 1$ and $f < 1$ we differentiate (4) to obtain

$$\frac{df}{dp} = \pi z(1-\pi)\frac{-\gamma(\pi p - 1)(\pi p\gamma + 1)}{(\pi p(1-\gamma)(1-\pi)z + \gamma(1-\pi p)(1-\pi p\gamma))^2} > 0$$

For the set of parameters for which we are in the equilibrium with $f = 1$ and $s < 1$ we differentiate (3) to obtain

$$\frac{ds}{dp} = z\frac{-(1-\pi)\pi\gamma^2}{((1-\gamma)(1-\pi)z + \gamma(1-\gamma+\pi p\gamma))^2} < 0.$$

So f increases in p. From the above, we know that s decreases in p only if we are in

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$(f = 1, s < 1)$ equilibrium.

Consider now the comparative statics with respect to π. Let us start with s. For the set of parameters for which we are in the equilibrium with $f \in (0, 1)$ and $s \in (0, 1)$, we differentiate (5) to obtain

$$\frac{ds}{d\pi} = -\frac{\gamma}{(1-\gamma)} \frac{z - p\gamma}{(z - \pi z + \pi p\gamma)^2} < 0,$$

where this inequality follows from the fact that $z > \frac{\gamma(1-\pi p)}{(1-\pi)} > \gamma > p\gamma$ is required for this equilibrium. For the set of parameters for which we are in the equilibrium with $f = 1$ and $s < 0$ we differentiate (3) to obtain

$$\frac{ds}{d\pi} = z \frac{\gamma(\gamma - p\gamma - 1)}{((1-\gamma)(1-\pi)z + \gamma(1-\gamma+\pi p\gamma))^2} < 0.$$

Consider now the comparative statics on f with respect to π. Consider the fully mixing equilibrium. Differentiating (6), we obtain

$$\frac{df}{d\pi} = \frac{p\gamma}{(1-\gamma)} \frac{p(z-p\gamma)\pi^2 + (2p\gamma - 2z)\pi + (z - \gamma)}{(\gamma(1 + \pi^2 p^2 - 2\pi p) + \pi p z(1-\pi))^2} \begin{cases} > 0 \text{ if } \pi < \pi_0 \\ < 0 \text{ if } \pi > \pi_0 \end{cases}, \tag{12}$$

where

$$\pi_0 = \frac{1}{p(z - p\gamma)} \left(z - p\gamma - \sqrt{z(z - p\gamma)(1-p)} \right) \in (0, 1)$$

is the smaller root of the quadratic equation in the numerator. To show that f may increase or decrease in π, it suffices to show that there exists z such that full randomization is an equilibrium for this z for π in the neighborhood of π_0. Consider $p < \frac{1}{2}$. Using the formula for π_0, we obtain that $z > \frac{\gamma(1-\pi_0 p)}{(1-\pi_0)}$ as long as $z > \gamma$, and $z < \frac{1-\pi_0 p\gamma}{1-\pi_0}$ as long as $p\gamma < z < \frac{1}{2(1-p)} \left((2-\gamma)(1-p) + \sqrt{-(p-1)(-4\gamma - 4p\gamma + \gamma^2 + 3p\gamma^2 + 4)} \right)$, and these conditions do not contradict each other if $p < \frac{1}{2}$. So by part 4 of Lemma 1 one can find z for which full mixing is an equilibrium in the neighborhood of π_0. ∎

Proof of Proposition 3. The formula for the total number of scandals is

$$S = f(1 - \pi p)(1 - \gamma) + \pi p. \tag{13}$$

So S does not depend on s, and S increases in f. From Proposition 2, we know that f increases in z (and strictly so when $f \in (0, 1)$), hence S increases in z (and strictly so when $f \in (0, 1)$). Similarily, S strictly increases in p and weakly in f. From Proposition 2, f also increases in p, so S strictly increases in p. And finally, consider the fully mixing equilibrium.

Differentiating S with respect to π and using (12) and (6), we obtain

$$
\begin{aligned}
\frac{dS}{d\pi} &= p\left(1 - (1-\gamma)f\right) + (1 - \pi p)(1-\gamma)\frac{df}{d\pi} \\
&= pz\gamma(1 - \pi p)\frac{1 - 2\pi + \pi p}{\left(\gamma + \pi^2 p^2 \gamma - 2\pi p\gamma - \pi^2 pz + \pi pz\right)^2}
\begin{cases}
> 0 \text{ for } \pi < \frac{1}{2-p} \\
< \text{ for } \pi > \frac{1}{2-p}
\end{cases}
\end{aligned}
$$

So take z in the interior of the interval from part 4 of Lemma 1 for $\pi = \frac{1}{2-p}$. For all $\pi \in \left(\frac{1}{2-p} - \varepsilon, \frac{1}{2-p} + \varepsilon\right)$, z is still such that the equilibrium is fully mixing, and in this equilibrium, $\frac{dS}{d\pi} > 0$ for $\pi \in \left(\frac{1}{2-p} - \varepsilon, \frac{1}{2-p}\right)$ and $\frac{dS}{d\pi} < 0$ for $\pi \in \left(\frac{1}{2-p}, \frac{1}{2-p} + \varepsilon\right)$.

Consider bipartisan scandals. Since the opposing party reveals scandals whenever the aligned party does, the incidence of bipartisan scandals is $S_{bi} = \pi p\left(\gamma + (1-\gamma)(1-s)\right)$. S_{bi} decreases in s, and by Proposition 2, s increases in z, so S_{bi} decreases in z. Since S increases in z, the incidence of partisan scandals must increase in z. This proves Corollary 1. ∎

Proof of Proposition 4. This follows directly from the formulas in Section 7.1. ∎

Proof of Proposition 5. Partisan scandals can arise only if none of the parties is fully honest, which from Lemma 1 is when $z > \gamma\frac{1-\pi p}{1-\pi}$. From the formulas in Section 7.1, then we have $\phi_{align}(0,1) < \gamma$ and $\phi_{opp}(0,1) < \gamma$, and $\phi_{align}(0,1) + \phi_{opp}(0,1) = \gamma$. Using these formulas, we also obtain that $\phi_{opp}(0,1) < \phi_{align}(0,1)$ if and only if

$$
\frac{\pi p}{1 - \pi p} < \frac{f}{s}. \tag{14}
$$

Consider first the fully mixing equilibrium. Using (5) and (6), the inequality (14) is satisfied when $\pi p < \frac{1}{2}$ and violated when $\pi p > \frac{1}{2}$. When $\pi p > \frac{1}{2}$, we also may have equilibria with $(s \leq 1, f = 1)$, and using (3) we obtain that the inequality (14) is violated if

$$
z > \frac{(1 - \pi p)(1 - \gamma + \pi p\gamma)}{(1-\pi)\pi p}\frac{\gamma\pi p}{(\gamma + 2\pi p - \pi p\gamma - 1)},
$$

which is always satisfied for $z > \frac{(1-\pi p)(1-\gamma+\pi p\gamma)}{(1-\pi)\pi p}$, which is a perquisite for this equilibrium. When $\pi p < \frac{1}{2}$, we also may have equilibria with $(s = 1, f \leq 1)$, and using (4) we obtain that the inequality (14) is satisfied if

$$
\frac{(1 - \pi p\gamma)}{(1-\pi)}\frac{\gamma(1 - \pi p)}{(-2\pi p + \pi p\gamma + 1)} < z,
$$

which is always satisfied for $\frac{(1-\pi p\gamma)}{(1-\pi)} < z$, which is a perquisite for this equilibrium.

Using the formula for $\Phi(0,1)$, we obtain that $\Phi(0,1) > \pi$ if and only if $f < s$. This

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is true in the equilibrium $(s = 1, f < 1)$, which can arise if and only if $\pi p < \frac{1}{2}$, and this is violated in the equilibrium $(s < 1, f = 1)$, which can arise if and only if $\pi p > \frac{1}{2}$. In a fully mixing equilibrium, using (5) and (6) we can establish that this is true also if and only if $\pi p < \frac{1}{2}$. And in $(s = f = 1)$ equilibrium, we obtain $\Phi(0, 1) = \pi$. ∎

Proof for Proposition 6. From Proposition 5, since $\phi_{align}(0, 1) + \phi_{opp}(0, 1) = \gamma$, $|\phi_{opp}(0, 1) - \phi_{align}(0, 1)| = 2\phi_{opp}(0, 1) - \gamma$ if $p\pi > \frac{1}{2}$ and $|\phi_{opp}(0, 1) - \phi_{align}(0, 1)| = \gamma - 2\phi_{opp}(0, 1)$ if $p\pi < \frac{1}{2}$. So the comparative statics with respect to z holds if $\phi_{opp}(0, 1)$ decreases in z for $p\pi < \frac{1}{2}$ and increases in z for $p\pi > \frac{1}{2}$. In the fully mixing equilibrium,

$$\frac{d\phi_{opp}(0, 1)}{dz} = \pi p \gamma (1 - \pi p) \frac{\frac{ds}{dz} f - \frac{df}{dz} s}{(f(1 - \pi p) + \pi ps)^2}, \tag{15}$$

which using (5) and (6) can be rewritten as

$$\frac{d\phi_{opp}(0, 1)}{dz} = \frac{(\pi p \gamma)^2 (1 - \pi)^2 (z - \gamma - \pi z + \pi p \gamma)^2 (2\pi p - 1)}{(f(1 - \pi p) + \pi ps)^2 (\gamma - 1)^2 (\gamma + \pi^2 p^2 \gamma - 2\pi p \gamma - \pi^2 pz + \pi pz)^2 (z - \pi z + \pi p \gamma)^2},$$

so indeed the required comparative statics holds. For the equilibrium with $s < 1$ and $f = 1$, which can arise only if $\pi p > \frac{1}{2}$, $\frac{d\phi_{opp}(0,1)}{dz}$ has the same sign as $\frac{ds}{dz}$, which by Proposition 2 is positive. For the equilibrium with $s = 1$ and $f < 1$, which can arise only if $\pi p < \frac{1}{2}$, $\frac{d\phi_{opp}(0,1)}{dz}$ has the same sign as $-\frac{df}{dz}$, which by Proposition 2 is negative.

From Proposition 5, when $\pi p < \frac{1}{2}$, $|\Phi(0, 1) - \pi| = \Phi(0, 1) - \pi$, so $|\Phi(0, 1) - \pi|$ decreases when $\Phi(0, 1)$ decreases. When $\pi p > \frac{1}{2}$, $|\Phi(0, 1) - \pi| = \pi - \Phi(0, 1)$, so $|\Phi(0, 1) - \pi|$ decreases when $\Phi(0, 1)$ increases. Totally differentiating $\Phi(0, 1)$ from Section 7.1, we obtain

$$\frac{d\Phi(0, 1)}{dz} = \pi p (1 - \pi) \frac{f \frac{ds}{dz} - \frac{df}{dz} s}{(f(1 - \pi p) + \pi ps)^2}.$$

Comparing this to (15), we see that the sign of $\frac{d\Phi(0,1)}{dz}$ is the same as the sign of $\frac{d\phi_{opp}(0,1)}{dz}$, and hence the comparative statics follows. ∎

Proof of Proposition 7. The probability that a misbehaving politician is not fired is

$$\Pr(not\ fired|m = 1) = (1 - \Phi(0, 0))\Pr(0, 0|m = 1) + (1 - \Phi(0, 1))\Pr(0, 1|m = 1),$$

and the probability that the politician that does not misbehave is fired is

$$\Pr(fired|m = 0) = \Phi(0, 0)\Pr(0, 0|m = 0) + \Phi(0, 1)\Pr(0, 1|m = 0).$$

Plugging the formulas from Section 7.1 for any equilibrium other than the honest equilibrium,

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we obtain that the total probability of mistake is

$$
\begin{aligned}
M &= \pi \Pr\left(not\ fired|m=1\right) + (1-\pi)\Pr\left(fired|m=0\right) = &(16)\\
&= 2\pi(1-\pi)\left(\frac{1-p}{1-\pi p} + (1-\pi)p(1-\gamma)\frac{fs}{(1-\pi p)\left(f(1-\pi p)+\pi ps\right)}\right)
\end{aligned}
$$

Differentiating M with respect to z we obtain

$$
\frac{dM}{dz} = 2\pi(1-\pi)^2 p(1-\gamma)\frac{\frac{df}{dz}\pi ps^2 + f^2(1-\pi p)\frac{ds}{dz}}{(1-\pi p)\left(f(1-\pi p)+\pi ps\right)^2},
$$

so by Proposition 3, $\frac{dM}{dz} \geq 0$ in every equilibrium, with strict inequality if $fs < 1$.

In the fully mixing equilibrium, using (5) and (6) in (16), we obtain

$$
M = 2\pi(1-\pi)\frac{z(1-\pi)+\gamma(1-2p+\pi p)}{z(1-\pi)+\gamma(1-\pi p)},
$$

so

$$
\frac{dM}{dp} = -2\pi(1-\pi)\frac{2\gamma(1-\pi)\left(z(1-\pi)+\gamma\right)}{\left(z(1-\pi)+\gamma(1-\pi p)\right)^2} < 0.
$$

When $s=1$ and $f<1$, plugging $s=1$ and (4) into (16), we obtain

$$
M = 2\pi(1-\pi)\frac{\left(\pi p\gamma - p\gamma - \pi + 1\right)z + \left(\pi p^2\gamma^2 - \pi p\gamma^2 - p\gamma + \gamma\right)}{\left(1-\pi p\gamma\right)\left(z(1-\pi)+\gamma(1-\pi p)\right)},
$$

so

$$
\frac{dM}{dp} = -2\pi(1-\pi)^2\gamma\frac{\left(\pi-1\right)^2 z^2 + (1-\pi)\left(1+\gamma-2\pi p\gamma\right)z + \gamma\left(\pi p\gamma - 1\right)^2}{\left((1-\pi p\gamma)\left(z(1-\pi)+\gamma(1-\pi p)\right)\right)^2} < 0
$$

as this equilibrium requires $2p\pi < 1$. When $s < 1$ and $f = 1$, then plugging $f = 1$ and (3) into (16), we obtain

$$
M = 2\pi(1-\pi)\left(\frac{1-p}{1-\pi p}\gamma + (1-\gamma)\frac{1-p+ps}{1-\pi p+\pi ps}\right),
$$

so

$$
\frac{dM}{dp} = 2\pi(1-\pi)\left(\frac{-(1-\pi)}{(1-\pi p)^2}\gamma - (1-\gamma)\frac{(1-s)(1-\pi)}{(1-\pi p+\pi ps)^2} + (1-\gamma)\frac{p(-\pi+1)}{(1-\pi p+\pi ps)^2}\frac{ds}{dp}\right) < 0,
$$

where $\frac{ds}{dp} < 0$ for the equilibrium with $(s < 1, f = 1)$ was established in the proof of Proposition 2.

For the honest equilibrium, the total probability of mistake is

$$
\begin{aligned}
M &= \pi \Pr\left(not\ fired | m = 1\right) + (1 - \pi) \Pr\left(fired | m = 0\right) = \tag{17}\\
&= 2\pi (1 - \pi) \frac{(1 - p)}{1 - \pi p},
\end{aligned}
$$

so M is constant in z and decreasing in p. ∎

7.3 Proofs for Section 5

Proof of Proposition 8. The payoff of the politician that does not misbehave is

$$
(\gamma + (1 - \gamma)(1 - f))(1 - \Phi(0, 0)) + (1 - \gamma) f (1 - \Phi(0, 1)),
$$

and the payoff of the politician that misbehaves is

$$
b + (1 - p)((\gamma + (1 - \gamma)(1 - f))(1 - \Phi(0, 0)) + (1 - \gamma) f (1 - \Phi(0, 1))) + p(1 - \gamma) s (1 - \Phi(0, 1)).
$$

So the politician engages in misbehavior if and only if

$$
b \geq p\left[(\gamma + (1 - \gamma)(1 - f))(1 - \Phi(0, 0)) + (1 - \gamma)(1 - \Phi(0, 1))(f - s)\right]. \tag{18}
$$

Consider first a putative equilibrium in which both parties are honest, $f = s = 0$. Then (18) becomes $b \geq p(1 - \Phi(0, 0)) = p\left(1 - \pi \frac{1-p}{1-\pi p}\right)$, so the equilibrium incidence of misbehavior is a solution to

$$
\pi = B - p\frac{1 - \pi}{1 - \pi p} \equiv RHS_h(\pi). \tag{19}
$$

There is a unique solution to (19) satisfying $\pi \in [0, 1]$, and let us call this solution π_h. Note that $RHS_h(\pi = 0) = B - p > 0$ and $RHS_h(\pi = 1) = B < 1$, so the right-hand side of (19) crosses the left-hand side from above. This, together with $\frac{\partial RHS_h(\pi)}{\partial p} < 0$ and $\frac{\partial RHS_h(\pi)}{\partial z} = 0$, implies $\frac{d\pi_h}{dp} < 0$ and $\frac{d\pi_h}{dz} = 0$. By Lemma 1, π_h and $f = s = 0$ constitute an equilibrium if and only if $z \leq 2\frac{\gamma(1 - p\pi_h)}{(1 - \pi_h)}$.

For any equilibrium other than the honest equilibrium, plugging the formulas for $\Phi(0, 0)$ and $\Phi(0, 1)$ into (18), we obtain that the politician engages in misbehavior if and only if

$$
b \geq p(1 - \pi) \frac{\bar{f}(\gamma + (1 - \bar{s})(1 - \gamma)) + \pi p(\bar{s} - \bar{f})}{(1 - \pi p)(\bar{f}(1 - \pi p) + \pi p \bar{s})},
$$

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where $\bar{f}$ and $\bar{s}$ are defined in Lemma 2. So the incidence of misbehavior solves the following equation

$$\pi = B - p(1-\pi) \frac{\bar{f}(\gamma + (1-\bar{s})(1-\gamma)) + \pi p(\bar{s} - \bar{f})}{(1-\pi p)(\bar{f}(1-\pi p) + \pi p \bar{s})} \equiv RHS(\pi). \tag{20}$$

Note that $RHS(\pi = 1) = B < 1$ and $RHS(\pi = 0) = B - p(\gamma + (1 - \bar{s}(\pi = 0))(1-\gamma)) > 0,$[12] and since $\bar{f}$ and $\bar{s}$ are continuous functions of π (Lemma 1), $RHS(\pi)$ is a continuous function in π mapping $[0,1]$ into $[0,1]$. By Theorem 1 of Villas-Boas (1997), the smallest and the largest fixed points of (20) increase in z and decrease in p if $RHS(\pi)$ increases in z and decreases in p. By Lemma 2, $\bar{f}$ and $\bar{s}$ are absolutely continuous in p and z, so $RHS(\pi)$ is absolutely continuous in p and z, and hence to establish that $RHS(\pi)$ increases in z and decreases in p, it suffices to establish that $\frac{\partial RHS(\pi)}{\partial z} \geq 0$ and $\frac{\partial RHS(\pi)}{\partial p} < 0$ whenever $\bar{f}$ and $\bar{s}$ are differentiable. By Proposition 2, $\bar{f}$ and $\bar{s}$ are weakly increasing in z, and

$$\frac{\partial RHS(\pi)}{\partial \bar{f}} = p(1-\pi) \frac{\pi p \bar{s}^2 (2-\gamma)}{(1-\pi p)(\bar{f}(1-\pi p) + \pi p \bar{s})^2} > 0,$$

$$\frac{\partial RHS(\pi)}{\partial \bar{s}} = p(1-\pi) \frac{\bar{f}^2(1-\gamma)(1-\pi p)}{(1-\pi p)(\bar{f}(1-\pi p) + \pi p \bar{s})^2} > 0,$$

so $RHS(\pi)$ indeed increases in z. Moreover, comparing (19) with (20), we see that for any π, $RHS(\pi) > RHS_h(\pi)$ whenever $\bar{f}$ and $\bar{s} > 0$, so any solution of (20) that constitutes an equilibrium (that is, delivers $\bar{f}$ and $\bar{s} > 0$) will be higher than π_h. This completes the proof of part (1).

To prove part (2), we need to establish that $\frac{\partial RHS_h(\pi)}{\partial p} < 0$ and $\frac{\partial RHS(\pi)}{\partial p} < 0$ whenever $RHS(\pi)$ is differentiable in p. Differentiating (19) with respect to p we obtain $\frac{\partial RHS_h(\pi)}{\partial p} = -\frac{1-\pi}{(1-\pi p)^2} < 0$. Consider now a putative equilibrium in which both parties are mixing. Plugging (5) and (6) into (20), we obtain that the equilibrium π solves

$$\pi = B - 2p\gamma \frac{1-\pi}{z(1-\pi) + (1-\pi p)\gamma}, \tag{21}$$

so for the range of parameters for which this equilibrium exist, $\frac{\partial RHS(\pi)}{\partial p} < 0$. Consider now a putative equilibrium with $f = 1$ and $s < 1$. Plugging $f = 1$ and (3) into (20), we obtain

$$\pi = B - p(1-\pi)\gamma \frac{\pi p(1-\pi)z + (1-\pi p)(1-\gamma(1-\pi p))}{(1-\pi p)(-\gamma + \pi p\gamma + 1)(z(1-\pi) + \gamma(1-\pi p))}.$$

---

[12] Note that for $\pi = 0$, $s > 0$ as long as $z > \gamma$, but that must be true in any not honest equilibrium.

Differentiating the right-hand side, we obtain that for the range of parameters for which this equilibrium exists,

$$
\begin{aligned}
\frac{\partial RHS(\pi)}{\partial p} &= \frac{-(1-\pi)^3 \gamma \pi p \left(2 (1-\pi p)(1-\gamma) + \pi p\right)}{\left((1-\pi p)(-\gamma + \pi p \gamma + 1)(z + \gamma - \pi z - \pi p \gamma)\right)^2} z^2 \\
&\quad - \frac{(1-\pi)^2 \gamma (1-\pi p)\left(2 p^2 \gamma (2\gamma - 1)\pi^2 + p (5\gamma - 1)(1-\gamma)\pi + (\gamma - 1)^2\right)}{\left((1-\pi p)(-\gamma + \pi p \gamma + 1)(z + \gamma - \pi z - \pi p \gamma)\right)^2} z \\
&\quad - \frac{(1-\pi)\gamma^2 (\pi p - 1)^2 (-\gamma + \pi p \gamma + 1)^2}{\left((1-\pi p)(-\gamma + \pi p \gamma + 1)(z + \gamma - \pi z - \pi p \gamma)\right)^2}
\end{aligned}
$$

which is negative as all coefficients in this quadratic equation are negative[13]. Consider now a putative equilibrium with $s = 1$ and $f < 1$. Plugging $s = 1$ and (4) into (20), we obtain

$$
\pi = B - p\gamma \left(z(1-\pi) - \pi p \gamma + 1\right) \frac{1-\pi}{(1-\pi p \gamma)(z(1-\pi) + \gamma(1-\pi p))}.
$$

Differentiating the right-hand side, we obtain that for the range of parameters for which this equilibrium exists,

$$
\frac{\partial RHS(\pi)}{\partial p} = -\gamma(1-\pi) \frac{(\pi - 1)^2 z^2 + (1-\pi)(1 + \gamma - 2\pi p \gamma) z + \gamma (\pi p \gamma - 1)^2}{\left((1-\pi p \gamma)(z(1-\pi) + \gamma(1-\pi p))\right)^2} < 0
$$

where the last inequality follows from the fact that all coefficients in the quadratic equation in the numerator are positive, so this quadratic equation must be positive for any $z > 0$. And finally, consider $f = s = 1$. Then (20) becomes $\pi = B - p\gamma \frac{1-\pi}{1-\pi p}$, so again $\frac{\partial RHS(\pi)}{\partial p}$. ∎

Proof of Proposition 9. Suppose we are in fully mixing equilibrium. Plugging (5) and (6) into (13), we obtain

$$
S = \pi^* pz \frac{1 - \pi^*}{\gamma + (\pi^*)^2 p^2 \gamma - 2\pi^* p\gamma - (\pi^*)^2 pz + \pi^* pz}.
$$

Totally differentiating S with respect to p, we obtain

$$
\frac{dS}{dp} = \frac{\gamma(1-\pi^* p) z \left(\pi^* (1-\pi^*)(1+\pi^* p) + p(1-(2-p)\pi^*) \frac{d\pi^*}{dp}\right)}{\left(\gamma + (\pi^*)^2 p^2 \gamma - 2\pi^* p\gamma + \pi^* pz(1-\pi^*)\right)^2}
$$

Since from the proof of Proposition 8, in the fully mixing equilibrium $\frac{d\pi^*}{dp} < 0$, a sufficient condition for $\frac{dS}{dp} > 0$ is that $\pi^* > \frac{1}{2-p}$. From the proof of Proposition 8 we also know that

---

[13]To see that $2p^2\gamma(2\gamma - 1)\pi^2 + p(5\gamma - 1)(1-\gamma)\pi + (\gamma - 1)^2 > 0$, note that this is positive if $2\gamma > 1$, and if $2\gamma < 1$, then this concave quadratic equation is positive for $\pi = 0$ and $\pi = 1$, so it is positive for all π.

the misbehavior incidence π^* in the fully mixing equilibrium is higher than the misbehavior incidence in the fully honest equilibrium π_h, so a sufficient condition for $\frac{dS}{dp} > 0$ is $\pi_h > \frac{1}{2-p}$, which requires

$$\frac{1}{2p} \left(Bp + 1 - p - \sqrt{p^2 B^2 - 2p\,(p+1)\,B + (5p^2 - 2p + 1)} \right) > \frac{1}{2-p}$$

which in turn requires that

$$B > \frac{2p - p^2 + 2}{2\,(2-p)},$$

and this is possible as long as the right-hand side is smaller than 1, which is true for $p < 2 - \sqrt{2}$. So it remains to show that the fully mixing equilibrium can exist for $B > \frac{2p-p^2+2}{2(2-p)}$. To show that, first note that the solution to (20) in the fully mixing equilibria is

$$\pi_r\,(z) = \frac{1}{2z + 2p\gamma} \left(z\,(1 + B) + \gamma - 2p\gamma + Bp\gamma - \sqrt{\Delta} \right), \tag{22}$$

where

$$\Delta = (B-1)^2\,z^2 + 2\gamma\,(B-1)\,(-2p + Bp - 1)\,z + \gamma^2 \left(-4p - 4Bp^2 + B^2 p^2 - 2Bp + 12p^2 + 1 \right).$$

By Lemma 1, it is sufficient to show that there exists z' such that $\frac{\gamma(1-\pi_r(z')p)}{(1-\pi_r(z'))} = z'$ and $\frac{\gamma(1-\pi_r(z)p)}{(1-\pi_r(z))} < z$ for all $z > z'$. Using (22), we see that $\frac{\gamma(1-\pi_r(z)p)}{(1-\pi_r(z))} \leq z$ if and only if

$$(B-1)\,z^2 - \gamma\,(5p - 3)\,z + \gamma^2 p\,(2p - Bp + 1) < (z - \gamma p)\,\sqrt{\Delta}$$

We know that both sides are equal for $z = \gamma \frac{1-p\pi_h}{1-\pi_h}$, and that the left-hand side is a negative and right left-hand side is positive for z high enough, so either $\frac{\gamma(1-\pi_r p)}{(1-\pi_r)} < z$ is satisfied for $z \in (z_h, z_h + \varepsilon)$, or not, in which case there exists $z' > z_h$ for which $\frac{\gamma(1-\pi_r(z')p)}{(1-\pi_r(z'))} = z'$ and $\frac{\gamma(1-\pi_r(z)p)}{(1-\pi_r(z))} < z$ for all $z > z'$. ∎

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