Dynamic Political Investigations: Obstruction and the Optimal Timing of Accusations*

Alice Gindin† and Ephraim Shimko‡

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Abstract

This paper explores how an opposition party strategically times evidence-backed accusations against a political candidate, knowing that their accusation will trigger a formal investigation which the candidate may obstruct. Obstruction is costly but slows down the arrival rate of incriminating information. The candidate's probability of election is decreasing in voters' belief that the candidate is guilty, and if the investigation uncovers evidence of wrongdoing, he may face legal penalties. We first characterize how the optimal obstruction strategy changes over the course of an investigation. We next determine when the opposition releases evidence to trigger an investigation. When the election is close and evidence is credible or the opposition is the clear front-runner, they wait until right before the election to release evidence—an October Surprise—leaving the investigation no time to search for additional evidence before voting occurs. In contrast, when the election is close and evidence is weak or the candidate is the clear front-runner, the opposition releases evidence immediately to allow time for a full investigation. Obstruction interacts with this timing decision by making investigations less informative and inducing more October Surprises, which reduce voter information and welfare. Finally, we consider two policies aimed at reducing obstruction: plea-bargaining and extending the investigation past election day.

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†PhD Candidate in Economics, University of Pennsylvania

‡PhD Candidate in Politics, Princeton University

1 Introduction

Free and fair elections require that voters are informed about the politicians they elect. Voters learn about candidates from many information sources, including campaign advertising, speeches, debates, opposition research, and journalism. In addition to informing voters of candidates' policy positions and qualifications, these sources also often provide negative information about the candidate such as evidence of past misdeeds, failures and dishonest behavior. Because candidates are public-facing figures, suggestive evidence of a scandal often leads to a formal investigation, and the outcome of such an investigation can have a large impact on voter behavior. For example, both the 2016 and 2020 United States presidential election cycles contained long formal investigations where officials vetted allegations against a candidate seeking office. During the 2016 election cycle, the FBI investigated Hillary Clinton's handling of classified materials, and during the 2020 election cycle, special council Robert Mueller investigated Donald Trump's potential association with Russian interference in the 2016 election. The outcomes of these investigations were indeed anticipated to impact voter behavior, as evidenced by FBI director James Comey's public statement at the initial conclusion of the Clinton investigation: "I am going to include more detail about our process than I ordinarily would, because I think the American people deserve those details in a case of intense public interest" (Comey 2016).

Investigations into potential wrongdoing are not limited to those running for President. Members of the executive and legislative branches at the national, state, and local levels are also often investigated. In fact, the US House of Representatives has a dedicated House Ethics Committee whose mandate is to investigate members accused of wrongdoing.[1] At the gubernatorial level, Andrew Cuomo faced two concurrent investigations by the Office of the New York State Attorney General, one into allegations that he sexually harassed members of his staff, and the other into allegations that he under-counted nursing home deaths during the early stages of the pandemic to conceal policy failings.

[1] "During the 116th Congress, the [House Ethics] Committee conducted fact-gathering in 50 separate investigative matters; authorized 11 subpoenas; conducted 110 voluntary witness interviews; publicly addressed 16 matters; filed five reports with the House representing over 3,300 pages; and reviewed over 420,000 pages of documents. Throughout the 116th Congress, the Committee received 13 referrals from OCE and impaneled investigative subcommittees for investigations of six Members" (Covington and Burlington LLP).

Given the high stakes involved in an election, politicians may have large incentives to obstruct the investigation in order to decrease the chance that incriminating evidence is uncovered. For example, Cuomo's under-counting of deaths can itself be considered a form of obstruction. His policy requiring nursing homes to readmit COVID-19 patients led to excessive deaths within those nursing homes, and under-counting deaths was a mechanism to hide this. We can also interpret Cuomo's subsequent public denials of involvement (even after admissions leaked from his aides) as an obstruction strategy. Politicians have multiple motivations for obstructing investigations. First, if the investigation finds a politician guilty it can substantially hurt voter opinion.[2] Second, being found guilty in a formal investigation can lead to legal penalties, impeachment, and for sufficiently large wrongdoing, potential jail time. Obstruction is beneficial to the candidate because it curtails voter's ability to learn about the candidate's potential guilt and lowers their probability of facing legal penalties.

In this paper, we study how obstruction impacts voter welfare in a dynamic model where a politician is investigated during the lead-up to an election. In the baseline model a candidate knows whether or not he is guilty, while an investigator and a median voter are uncertain but share a common prior. The investigator can acquire costly information about the candidate's guilt and reveal it to voters. The candidate can obstruct the investigation by slowing down the arrival of evidence that he is guilty. Obstruction reduces the likelihood that the candidate's guilt is revealed, which increases the likelihood that the median voter votes for the candidate and reduces the chance that the candidate faces legal penalties. There is uncertainty over the preferences of the median voter, meaning investigation outcomes do not directly map into electoral outcomes.

The analysis begins by considering how an investigation proceeds after an allegation is released, and which factors most impact obstruction. First, we characterize the unique Perfect Bayes Equilibrium. In this equilibrium, the candidate's optimal level of obstruction is increasing over the course of the investigation. This is because as the investigation proceeds, the value to the candidate of not getting caught in the moment increases since it becomes more likely the candidate can make it through the full investigation without getting caught.

[2] Ultimately the findings of guilt in both Cuomo investigations caused voter opinion to drop so low politicians from his own party encouraged him to step down.

The investigator acquires information until either she reaches a threshold belief in the candidate's innocence or election day arrives. The candidate obstructs more as legal penalties for wrongdoing increase, but obstruction is non-monotonic in "voter distaste" for wrongdoing. Inconsequential charges receive little obstruction, as do charges so damning that even a successful defense leaves too much doubt in voters' minds. We demonstrate that increased obstruction damages voter welfare by increasing the frequency with which a guilty candidate is elected.

Next, we use this framework to consider how an agent opposed to the candidate could strategically time the release of an accusation of wrongdoing in order to minimize the probability that the candidate wins the election. The opposition, like the candidate and investigator, is uncertain about the preferences of the median voter, which endows the opposition with risk preferences that govern their preferences over voter learning. When the candidate is more likely than not to lose the election, the opposition is in a strong position and as a result is risk averse. This means the opposition wants to curtail voter learning so they release the accusation close to the date of the election (e.g. an October Surprise). Releasing evidence close to the election means that the claims cannot be effectively scrutinized and there is not sufficient time to launch an investigation before the election. Instead voters have to vote using their initial impressions of the likelihood the accusation is true. If the candidate is very likely to win the race, the opposition is in a weak position and becomes risk loving and wants the voter to learn as much as possible. This means that the opposition releases the evidence immediately so that it can be fully vetted in the hope that damning information is discovered.

When the election is close, the opposition releases more credible evidence as an October Surprise, aware that the "taint" of the accusation could be enough to harm the candidate's chance of winning. Since releasing credible evidence is so damaging to the candidate, the opposition does not want to risk allowing the voters to learn more and in some cases determine that it is actually unlikely the accusation is true. On the other hand, less credible accusations have little impact on the candidate's chance of winning, but if the investigation reveals wrongdoing, it could substantially damage the candidate. For this reason, opposition is risk loving and wants the voters to learn as much as possible about the accusation.

Hence the opposition releases less credible evidence as soon as possible. In terms of voter welfare, October Surprises are harmful because they curtail voter learning. Moreover, as obstruction increases, the threshold for an accusation to be 'credible enough' to release as an October Surprise decreases. Hence more obstruction leads to more October Surprises and fewer investigations - an additional channel by which obstruction damages voter welfare.

To illustrate these forces in the most recent presidential election, consider the release and analysis of Trump's tax returns by the New York Times (who had recently endorsed Joe Biden) five weeks before the 2020 election. At this time, the candidates were polling within 3.5 percentage points of one another (Quinnipiac Polling, 09/23/20). There were no claims of outright illegality, but the returns conveyed that, at the very least, Trump didn't fully square with the successful business persona he had cultivated among his base.[3] Polling taken in the week following the Times' release found that 47% of voters felt that the reporting had revealed that Trump "misled Americans about his previous success" and that this was a 'major' issue, while an additional 13% of voters agreed with the statement and found it to be a 'minor issue' (Yokley, 2020). If released earlier, Trump may have been able to frame this information a way that allowed him to maintain his image of success. By releasing this information close to the election, the Times was able to more effectively utilize relatively credible evidence to damage Trump before the election.

Given that obstruction damages voter welfare, we next explore policies that might reduce obstruction. We first consider plea-bargaining, where the candidate faces a smaller legal penalty if he admits guilt immediately than if he denies guilt and is caught later. We show that the impact of plea-bargaining on voter welfare depends on whether the investigation has sufficient time to complete its examination, or if it is forced to conclude before the election. If the election deadline is not binding for the investigation, then plea-bargaining decreases voter welfare. This is because it causes the investigator to end the investigation early since the candidate sometimes confesses. Although the extra confessions improved voter welfare, this benefit was outweighed by a shorter investigation and increased obstruction by the guilty candidate when he failed to confess. Conversely, if the election deadline terminates

[3]The New York Times reported that in 2016 and 2017 Trump had paid only $750 in federal income tax and that he had experienced substantial business loses over the years (Buettner, Craig, and McIntire, New York Times, 9/27/20).

the investigation, then plea-bargaining improves voter welfare as it induces confessions and does not cause the investigator to shorten the investigation.

Second, we relax the constraint that the investigator must end the investigation by the election. Voters still rely on the information revealed by Election Day, but even if the candidate is elected, there is still a chance he faces legal repercussions after assuming office. When the election deadline is binding, extending the investigation past Election Day improves voter welfare. This is because the advantage the candidate gains from not being caught by Election Day is lower since he can still face legal penalties. As a result, the candidate's level of obstruction during the election cycle decreases, which improves the voters information and hence welfare. When applied to the strategic timing of accusations, the decreased obstruction makes the opposition more willing to release accusations about the candidate early, further improving voter welfare.

We also consider extending the election in the context of weak political institutions, where the candidate can fire the investigator should he win the election. In this case although voter welfare is not as high as under stronger institutions, voters still have better information at the time of the election than they do under the requirement that the investigation terminates by the election. This is because ultimately, the value to the candidate of not getting caught by the date of the election is higher when the investigation ends at the election than when it can continue past Election Day if the candidate loses. This means that there are stronger incentives for the candidate to confess when the election has to end by Election Day.

1.1 Literature Review

Our model of investigations relates to the growing literature on political scandals. Themes include the effects of scandals on voter preferences (Banerjee, Green, and McManus 2014; Green, Zelizer, and Kirby 2018), electoral outcomes (Hirano and Snyder 2012; Howell and Dziuda 2021; Ogden and Medina 2020), party reputation (Howell and Dziuda 2021), and trust in political institutions (Bowler and Karp 2004). Observational studies have shown that the link between voter preferences and the existence of scandals is not as straightforward as one might expect. Real world factors like low voter information (Klasjna 2017) and partisanship (Klasjna 2017; Klar and McCoy (2021)) can lead to voter insensitivity to wrongdoing.

Nyhan (2015) explicitly considers the link between the existence/intensity of scandals and the ex-ante popularity of US Presidents. Our model suggests that this relationship may also depend on the timing of scandals. Furthermore, our model predicts the stark distribution of scandals presented empirically in Nyhan (2015) – occurring mostly at the beginning or end of an election cycle.

Several recent models have pointed out that scandals themselves can be manufactured, or at least, the presence of a scandal is affected by opposing interests (Howell and Dziuda 2021; Ogden and Medina Working Paper 2020; Gratton, Holden and Kolotilin 2018). As in Gratton, Holden and Kolotilin (2018), we specifically consider *when* opposing interests choose to release damning information. However, this paper differs from these recent models in two ways. First, we consider an environment in which private information by opposition candidates can be communicated to investigators (and voters), whereas the aforementioned models all consider opposition parties with asymmetric information and cheap talk. This means that we do not consider manufactured scandals but rather ones where to some extent, the evidence can speak for itself. Second, we explicitly consider the distribution of the median voter's preferences in order to highlight a novel trade-off between releasing information early versus late in an election cycle. In this paper, both the candidate and the opposition are uncertain about voter preferences, meaning they only have beliefs over how investigation outcomes map to win probabilities. This gives rise to risk-lovingness and risk aversion of the candidate and opposition over voter learning which is crucial to the timing of accusations and is absent in previous models. Similarly

The specific risk behavior the opposition exhibits is similar to the incumbent risk preferences identified by Downs and Rocke (1994), who find that if an incumbent thinks he likely to lose an upcoming election he is willing to start a war (a risky policy choice) to 'gamble for resurrection' and potentially recover his popularity. If the incumbent thinks he is sufficiently far ahead, he chooses peace which carries less risk. Canes-Wrone, Herron, and Shotts (2001) demonstrate that when a weak candidate faces a strong challenger, he may act against his information and take risky actions (fake leadership), leading to a higher probability of re-election. The risky action has the potential to convince the voter that the candidate is strong, while a safer option can't sufficiently persuade the voter. In more recent work, Bils and Izzo (2022) find that if a candidate is leading, he wishes to stifle voter learning to maintain his position. By contrast, if a candidate is behind, he takes actions which allow voters to learn more. In this paper we extend this logic to the *opposition's* risk preferences which ultimately guide the release of accusations. In line with Bils and Izzo, we find that when the opposition is ahead, they curtail voter information by releasing accusations close to the election so that claims cannot be fully vetted. When they are behind, they 'gamble' and allow voters to learn by releasing accusations early, in the hopes that the accusations will be confirmed. Kolotilin, Mylovanov, and Zapachelnyuk (2022) consider media censorship and find that as a partially benevolent government becomes more risk averse regarding pro-government sentiment, the government curtails citizens' ability to learn by engaging in more censorship.

Our model also relates to a large body of theoretical work on the importance of voter information in elections. A common feature of models of electoral accountability is that voters must make inferences about candidate quality based on information generated by various institutions. This information can come from various monitors including the media (Besley and Prat 2006, Duggan and Martinelli 2011, Gentzkow and Shapiro 2013, Woltane 2019, Li, Raiha and Shotts 2022), third party auditors (Streim 1994, Warren 2012), or even the opposition (Shotts and Ashworth 2011). We consider the dual role of the opposition and a neutral investigator in providing information to voters about the candidate. The opposition selects when to accuse the candidate, which can either encourage or discourage voter learning by setting an upper limit on how much voters can learn before election day. The investigator then chooses when to stop exerting costly effort, which determines how much voters ultimately learn. Like the auditors in Streim (1994) and Warren (2012), our investigator has a moral hazard problem and may choose to exert sub-optimal effort. In our paper, the investigator's moral hazard problem causes plea-bargaining deals to often have a negative effect on voter learning and welfare.

From a technical perspective, our notion of an investigation shares similarities with communication games where a privately informed sender, and a less informed receiver exert effort that results in an observable signal for the receiver (Dewatripont and Tirole 2005; Shimko Working Paper 2021). The technology we use to model obstruction is very similar to Gieczewski and Li (2020) who consider a model of "policy sabotage". They consider an opposition party who continuously exerts effort in order to slow down the arrival of a potentially successful policy, also modeled as a Poisson process.[4] The main difference in our setting is that the obstructor (the candidate) knows his own type, whereas Gieczewski and Li (2020) assume common beliefs. Furthermore, learning (i.e. investigating) is endogenous. Our functional form assumptions provide a tractable solution to this "asymmetric information" setting. This allows us to study a rich environment in which candidates have uncertainty over voter preferences, who themselves have idiosyncratic preferences that depend crucially on the (endogenous) level of information they have at the time of the election.

Because the opposition doesn't have additional private information about the quality of the accusation, this paper has similarities to the literature on Bayesian Persuasion (Kamenica and Gentzkow 2011). In Bayesian Persuasion, instead of sending specific messages to a receiver, a sender selects an information strategy that generates a distribution over messages for the receiver. Thus the sender commits to a distribution over receiver posteriors. In this paper the opposition has some control over the median voter's distribution of posteriors via the choice of when to accuse the candidate and trigger an investigation. The opposition strategically times her information release in order to induce the posteriors that lead to the highest ex-ante probability the candidate loses. However, in Bayesian Persuasion the sender has full control over the distribution of posteriors, whereas in this paper, the posteriors the opposition can generate are constrained to be beliefs which result from a perfect bad news Poisson process.

2 Baseline Model

Players and actions: There are three players - a candidate (he), an investigator (she), and a median voter (they). Time is continuous, $t \in [0, T^E]$, where T^E is the date of the election. At each time, t, the investigator decides whether or not to irreversibly end the investigation, $s_t \in \{stop, continue\}$. The investigator must stop at T^E if he has not already. At each t

[4] The Poisson learning model is first introduced by Keller, Rady and Cripps (2005), and Klein and Rady (2011)

until the end of the investigation, the candidate picks an obstruction level $k_t \in [0, \infty)$ which will slow the arrival of damning information. At time T^E, the median voter votes for either the candidate or the opposition, $v \in \{C, A\}$.

Information: The state of the world, $\omega \in \{G, N\}$, reflects whether or not the candidate is guilty of the wrongdoing he is being investigated for. Let $p_0 = Pr(\omega = N)$. The candidate knows ω at time 0. The investigator and median voter hold prior belie p_0, and update this belief according to the results of the investigation. The publicly observable investigation is a Poisson process with bad news shocks that arrive at rate $\lambda_t = \frac{\lambda}{k_t} > 0$ when $\omega = G$, and never arrive when $\omega = N$.[5] Hence observing the bad news shock implies the candidate must be guilty (this is what Board and Meyer-ter-Vehn (2013) refer to as 'perfect bad news'). We further assume that if a bad news shock arrives, the investigation is automatically terminated[6].

The candidate's obstruction choice is unobservable to the investigator and voters. The investigator's choice to stop investigating is publicly observed, as is the median voter's voting choice. Because the investigator and the median voter observe the same information, we denote their common interim belief that the candidate is not guilty as p_t.

Payoffs: The candidate is risk neutral and receives office benefits B if he is elected ($v = C$) and 0 benefits otherwise ($v = A$). Additionally if the bad news shock arrived during the investigation, he is "found guilty of wrongdoing" and subject to legal penalty, ℓ. Finally, the candidate incurs an instantaneous cost of obstruction, βk_t for obstruction at rate k_t, where $\beta > 0$.

The investigator wishes to match the state. If $\omega = G$ the investigator gets utility $\chi > 0$ if the bad news shock arrives, and 0 if it doesn't. Conversely, if $\omega = N$ the investigator gets

[5] We use this functional form because it generates a linear obstruction strategy which improves the tractability of subsequent results. If we instead use the form $\lambda_t = \frac{\lambda}{k_t+1}$, which doesn't have the property that a guilty candidate who sets $k_t = 0$ causes an immediate arrival of the bad news shock, the results are similar in essence.

[6] This ensures the investigator's strategy is well defined. Since investigating is costly and has no additional value once the bad news shock arrives, the investigator would like to end the investigation immediately following the arrival of the bad news shock. If the bad news shock arrived at time t, there is no well defined time 'immediately following' t and thus, the investigator cannot use a well defined strategy where she could stop 'immediately following' the arrival of the shock. Preventing the investigation from continuing once the shock arrives circumvents this issue.

utility 0 if the bad news shock arrives[7], and χ if it doesn't. The investigator also has an instantaneous cost of investigating, $c > 0$.

The median voter gets utility ν_C from voting for the candidate when $\omega = N$ and utility $\nu_C - \alpha$ when $\omega = G$. Thus the median voter's expected utility for voting for the candidate when they have posterior belief p is $\nu_C - (1-p)\alpha$. We assume $\alpha > 0$ and interpret α as the median voter's distaste for wrongdoing. The median voter's utility from voting for the opposition is $\nu_A + \varepsilon$, where ν_A is common knowledge, but $\varepsilon \sim N(0,1)$ is an idiosyncratic preference shock known only by the median voter. Notice that although we only perturbed the median voter's preference for the opposition, the median voter makes decisions based off of the *difference* in utility between the candidate and the opposition. Thus ε can also be thought of as uncertainty about the relative position of the candidate and the opposition in the eyes of the voter.

2.1 Perfect Bayes Equilibrium

Public histories: A public signal history at time t is $h_t = \{\tau_t^b, \tau_t^s\}$ where $\tau_t^b \in \emptyset \cup [0,t)$ is the arrival time of the bad news shock before time t and $\tau_t^s \in \emptyset \cup [0,t)$ is the first time the investigator chose to stop before time t.[8] Let $\tau_t^b = \emptyset$ denote that the bad news shock has not arrived by time t, and $\tau_t^s = \emptyset$ denote that the investigator. We also require that the investigator plays a right continuous stopping strategy so that τ_t^s is well defined. Next notice that the investigation is only ongoing at time t when $h_t = \{\emptyset, \emptyset\}$ because both the arrival of the bad news shock and the investigator picking *stop* automatically terminate the investigation. This means that the investigator only gets the choice to stop or continue and the candidate only gets the choice to obstruct following $h_t = \{\emptyset, \emptyset\}$. We define the singleton set, $H_t^\emptyset := \{h_t | h_t = \{\emptyset, \emptyset\}\}$ as the set of all histories at time t that the candidate and investigator can take actions following. Finally let $H_t = \{h_t\}$ be the set of all possible histories at time t.

Strategies: Because the investigator can only make a choice at each time following

[7]The bad news shock cannot arrive when $\omega = N$ by our assumption of perfect bad news so this payoff is irrelevant to subsequent analysis.

[8]Formally, a history should report whether or not a signal or a choice to stop occurred at each $\tau < t$, however the first bad news shock and choice to stop is sufficient for this setting.

a unique history, in practice the investigator is making a single ex-ante stopping decision conditional on no shock arriving. Formally their strategy is $\sigma : H_t^{\emptyset} \times [0, T^E] \rightarrow \Delta(\{continue, stop\})$. The candidate observes the public history, h_t, along with their private obstruction k_t. Like the investigator, the candidate only has the opportunity to obstruct if the investigation is ongoing, so the candidate's strategy is $\kappa : H_t^{\emptyset} \times [0, T^E] \rightarrow \Delta(\mathbb{R}^+)$. We also will require that any realized path of $\{\kappa_\tau\}_{\tau \in [0, T^E]}$ be continuous at all but a finite number of points. The median voter makes a single decision at time T^E following any history up to that point. This choice can also depend on their idiosyncratic shock $\epsilon \in \mathbb{R}$. Hence, their strategy can be written as $v : H_{T^E} \times \mathbb{R} \rightarrow \Delta(\{c, a\})$.

Perfect Bayesian Equilibrium: A Perfect Bayesian Equilibrium consists of a stopping strategy, $\{\sigma_t\}_{t \leq T^E}$, for the investigator, an obstruction strategy, $\{\kappa_t\}_{t \leq T^E}$, for the candidate, a voting strategy, v, for the median voter, and belief p_t for the investigator and median voter such that: (1) given beliefs p_t, stratgeies $\{\sigma_t\}_{t \leq T^E}$, $\{\kappa_t\}_{t \leq T^E}$, and v form a mutual best response, and (2) belief p_t is derived via Bayes Rule both on and off the path of play.

Perfect Bayesian Equilibrium imposes sequential rationality off the path of play which is what prevents non-credible threats of high obstruction levels. Otherwise the candidate could use a strategy with $k_t = \infty$ for all $t > \tau$ to force the investigator to end the investigation at time τ. Imposing sequential rationality off the path of play means that if the investigator were to continue past τ, k_t would need to be an optimal response to being investigated at time t. This rules out the excessive levels of obstruction.

3 Baseline Equilibrium

We find a unique Perfect Bayesian Equilibria and consider factors which effect the equilibirum level of obstruction.

3.1 Equilibrium Characterization

A Perfect Bayes Equilibrium consists of strategies for the investigator, candidate, and median voter, as well as beliefs about the candidate's guilt for the investigator and median voter.

Beliefs: The investigator and median voter form their belief about the candidate using the same public history and share a common prior. Hence they must share the same belief p_t at all times t. To characterize p_t first we fix an obstruction strategy $\{k_t\}_{t\in[0,T^E]}$. Using Bayes Rule, the investigator and median voter's posterior p_t is 0 if the bad news shock arrives. If the shock hasn't arrived and the investigation is still ongoing the posterior is

$$p_t = \frac{p_0}{p_0 + (1-p_0)e^{-\int_0^t \frac{\lambda}{k_\tau} d\tau}}. \tag{1}$$

If the investigation ended at some $T < t$ and the bad news shock never arrived, then $p_t = p_T$ as defined by Equation 1.

Median Voter's Strategy: The median voter selects whichever candidate gives them higher expected utility given their belief about the candidate at the time of the election, p_{T^E}. More formally if the expression $(\nu_C - (1-p)\alpha) - (\nu_A + \varepsilon)$ is positive then the median voter selects the candidate and if it is negative, they select the opposition. Note the expression is positive whenever $\varepsilon < \nu_C - \nu_A - (1-p)\alpha$, and negative whenever $\varepsilon > \nu_C - \nu_A - (1-p)\alpha$.

Definition 3.1. *The **candidate advantage** under belief p is*

$$\Delta(p) \equiv \nu_C - \nu_A - (1-p)\alpha \tag{2}$$

We interpret the candidate advantage as the expected difference in the median voter's utility between the candidate and the opposition. Notice that the median voter selects the candidate when $\varepsilon < \Delta(p)$ and selects the opposition when $\varepsilon > \Delta(p)$. Since $\varepsilon \sim N(0,1)$, the probability that the candidate wins when the median voter has belief p is $q(p) \equiv \Phi(\Delta(p))$ where Φ is the standard normal CDF.

Candidate's Strategy: The continuation value to a guilty candidate at time t of using obstruction strategy, $\{k_\tau\}_{\tau\in[0,\infty)}$, when the investigation has stopping time T, is:

$$W_t^O(T|G) = \underbrace{Bq(p_T)}_{Payoff:No\ shock} * \underbrace{e^{-\int_t^T \frac{\lambda}{k_\tau} d\tau}}_{Prob\ no\ shock} + \underbrace{(Bq(0) - \ell)}_{Payoff:With\ shock} * \underbrace{\left[1 - e^{-\int_t^T \frac{\lambda}{k_\tau} d\tau}\right]}_{Prob\ shock} - \underbrace{\beta \int_t^T k_\tau e^{-\int_t^\tau \frac{\lambda}{k_u} du} d\tau}_{Expected\ costs} \tag{3}$$

Equation 3 reflects the tradeoff the candidate faces from obstructing. As obstruction increases, it becomes increasingly likely that no bad news shock will arrive, however obstruction is costly. Moreover in equilibrium it will be the case that more obstruction decreases the median voter's belief, p_T, in the absence of a shock.[9] To think about the benefit to the candidate of avoiding detection, consider the difference in payoffs between no shock arriving and the shock arriving which we refer to as the candidate's prize:

Definition 3.2. *The candidate's* ***prize*** *for avoiding detection when the median voter has belief p following no shock is*

$$\psi(p) \equiv B[q(p) - q(0)] + \ell. \tag{4}$$

As the prize, $\psi(p)$ increases, the candidate has greater incentives to obstruct. With this in mind we consider the candidate's best response to the investigator whose strategy is stopping time T. First we consider the candidate's best reply to a given investigation length using only strictly positive levels of obstruction:

Lemma 3.1. *Suppose the investigator uses stopping strategy, T. The candidate's best reply for $t \in [0, T]$ where $k_t > 0$ for all t is:*

$$k_t = \sqrt{\frac{\lambda \psi(p_T)}{\beta}} - \lambda(T - t) > 0 \tag{5}$$

Notice that this expression is linearly increasing in time at rate λ. The first term, collects the relevant payoff considerations for the candidate. The intensity of obstruction can be understood as the first term, as this shifts the obstruction function up or down. The intensity of obstruction is increasing in the precision of information, λ, and the candidate's prize for not getting caught, $\psi(p)$. It is decreasing in the cost of obstruction, β. Now that we have the obstruction strategy for the candidate, we plug it in to rewrite the posterior for the investigator and median voter as $\bar{p}(p_0, T)$ when the prior is p_0 and the investigation has a duration of T. Let $\bar{p}(p_0, T)$ solve the following equation for $\bar{p}$:

$$\bar{p} = \frac{p_0}{p_0 + (1 - p_0)\left(1 - T\sqrt{\frac{\lambda\beta}{\psi(\bar{p})}}\right)} \tag{6}$$

Equation 6 is a rational expectations condition because when the voter/investigator holds belief $\bar{p}(p_0, T)$ after an investigation of length T, the candidate uses the strategy from Equation 5 plugging in $\bar{p}(p_0, T)$ for p_T. And when the candidate uses such a strategy, the investigator and median voter to hold belief $\bar{p}(p_0, T)$ in the absence of a shock.

[9] Obstruction is unobservable so the candidate fails to internalize this effect.

Lemma 3.1 described the candidate's best response to an investigation if we constrain him to strictly positive obstruction. Next, we determine when the candidate obstructs at a positive rate and when setting obstruction to zero is better for the candidate than the obstruction strategy in Lemma 3.1. First note that if the candidate sets $k_t = 0$ then the arrival rate of the bad news shock is infinite, meaning the shock arrives at time t with probability one. In practice this means that if the candidate wants to set obstruction to zero at any time, they want to set it equal to zero at time $t = 0$, when the prize for not getting caught is the costliest to reach. However, the candidate's strategy cannot be to set $k_t = 0$ with probability one because the investigator could stop the investigation instantaneously after time t. This would give the candidate a profitable deviation where he obstructed at some positive level for that instant and received the prize $\psi(p)$ with probability one.

The following condition determines when the candidate chooses to obstruct some of the time. The candidate always sets $k_0 > 0$ whenever:

$$\underbrace{\psi(\bar{p}(p_0, T))}_{Prize} * \underbrace{\frac{p_0}{1-p_0}\frac{1-\bar{p}(p_0,T)}{\bar{p}(p_0,T)}}_{Prob\ no\ shock} \geq \underbrace{Tk_0(\bar{p}(p_0,T))}_{Expected\ costs} \tag{7}$$

Where the left hand side of the inequality is the continuation value of using the obstruction strategy from Lemma 3.1 at time $t = 0$, while the right hand side is the value of setting $k_0 = 0$. When p_0 is too low to satisfy the above inequality, the candidate mixes between obstructing positively and setting obstruction to zero in the first instant.

Let p^* be the prior, p_0 that solves Expression 7 with equality. Then p^* is the threshold prior, above which the candidate always positively obstructs and below which he mixes.

When the candidate mixes, he must be indifferent between obstructing optimally and choosing $k = 0$, meaning immediately losing his prize. This occurs when the investigator and median voter's updated belief given the bad news shock doesn't immediately arise from the investigation equals p^*. This uniquely pins down the probability that guilty candidates obstruct at level zero, m, as

$$m(p_0) = max\left\{0,\ \frac{p^* - p_0}{(1-p_0)p^*}\right\} \tag{8}$$

The investigator and the median voter have belief p^* provided that the bad news shock does not arrive immediately. When candidate obstructs positively, he follows the obstruction strategy from Lemma 3.1, using prior p^*.

Investigator's Strategy: In equilibrium, the investigator correctly conjectures the candidate's obstruction strategy and chooses optimal stopping time T^* accordingly. The investigator is willing to learn provided that

$$\chi \ \times \ (1 - p_t) \ \times \ \frac{\lambda}{k_t} dt \geq c dt \tag{9}$$

the LHS of Equation 9 is the marginal benefit to the investigator of choosing to learn at time t. It is decreasing in time because k_t and p_t are increasing in t. Plugging in the candidate's optimal obstruction strategy, we find that the investigator wants to stop at unconstranined stopping time $T^U(p_0)$ which is the unique solution to:

$$(1 - \bar{p}(p_0, T^U)) \frac{\chi}{c} = \sqrt{\frac{\psi(\bar{p}(p_0, T^U))}{\lambda \beta}} \tag{10}$$

Notice that $T^U(p_0)$ and p_0 only enter Equation 10 through $\bar{p}(p_0, T^U(p_0))$. Moreover, there is a unique $\bar{p}$ that solves Equation 10. So any prior p_0 must have a corresponding unconstrained stopping time $T^U(p_0)$ such that $\bar{p}(p_0, T^U(p_0) = \bar{p}$. This leads to our next result:

Lemma 3.2. *If the investigation is unconstrained by the election, the investigator learns until she reaches a unique $\bar{p}$ for all priors $p_0 < \bar{p}$. If the prior $p_0 \geq \bar{p}$, the investigator stops immediately, only investigating at $t = 0$.*

This means the investigator would like to acquire information until she reaches belief threshold $\bar{p}$, however under the constraint that the investigation must end by election day. Hence the investigator stops learning at time $T^* \equiv \min\{T^E, T^U(p_0)\}$. Now we have all the components necessary to fully characterize the unique Perfect Bayes Equilibrium with sequential rationality on and off the path of play.

Theorem 3.1. *Let p^* be the unique solution to Equation 7. The game permits a unique PBE described as follows:*

1. *The investigator continues the investigation at all time $t < T^* = \min\{T^E, T^U(p_0)\}$ and stops at all $t \geq T^*$ in the absence of the bad news shock.*

2. *The investigator and voters have posterior $p_T = max\{\bar{p}(p_0, T^*), p^*\}$ in the candidate's innocence if no shock arrives and posterior $p_T = 0$ if the shock arrives during the investigation. Belief p_t for intermediate values of t following no shock is defined by Equation 1 plugging in the following obstruction strategy:*

3. *With probability $(1 - m(p_0))$, the candidate uses the following obstruction strategy:*

$$k_t = \begin{cases} \sqrt{\frac{\lambda\psi(p_T)}{\beta}} - \lambda(T^* - t) & t \leq T^*, \\ \sqrt{\frac{\lambda\psi(p_t)}{\beta}} & t > T^*. \end{cases}$$[10]

and obstructs at level 0 with probability $m(p_0) = \max\{0, \frac{p^* - p_0}{p^*(1-p_0)}\}$.

4. *The median voter selects the candidate if $\varepsilon \leq \Delta(p_{T^E})$ and otherwise selects the alternative.*

3.2 Comparative Statics

We now turn our interest to comparative statics and how changes in primitives affect the equilibrium level of obstruction which will serve as the basis for our voter welfare results. First, we consider what constitutes an increase in the equilibrium level of obstruction. Since obstruction is an increasing function over an investigation whose length can change with primitives, in what sense are the obstruction levels between any two equilibria comparable? We attack this question from the perspective of information transmission in equilibrium.

One experiment is Blackwell more informative than the other if the posteriors generated from the first experiment are a mean preserving spread of the posteriors generated in the other experiment. Each investigation is like an experiment for the voter with two outcomes, a guilty finding that gives voters belief $p = 0$ in the candidate's innocence, or no bad news shock which gives the voter belief p_T in the candidate's innocence. Consider two investigations starting with the same prior p_0, the first yielding posterior p_T in the absence of the bad news shock and the second yielding p'_T. If $p'_T > p_T$, the distribution of beliefs generated from second investigation is a mean preserving of the distribution of beliefs generated from the first experiment. Hence the second experiment is Blackwell more informative than the first experiment. The following lemma relates Blackwell informativeness to obstruction:

Lemma 3.3. *Fixing p_0 and α, k_T is a sufficient statistic for the informativeness of an investigation: if two investigations yield terminal obstruction levels k_T, k'_T then if $k'_T > k_T$, the first investigation is Blackwell more informative than the second.*

We describe an increase in the terminal level of obstruction, k_T as an increase in the equilibrium level of obstruction because the sum effect of the obstruction in equilibrium has made the investigation less informative and has also decreased the chances that a guilty candidate is caught.[11] Also recall that k_T is what we described as the 'intensity of obstruction.'

The final detail we consider before our next result is that mixing by the candidate can lead to complications in comparative statics that we reserve for Section 5.1 which considers plea-bargaining. For now we maintain $p_0 \geq p^*$ to ensure that the candidate always obstructs. Recall that p^* was the threshold prior below which the candidate would begin mixing.

Now we consider the effects of changing primitives on the equilibrium level of obstruction:

Proposition 3.1. *Assume $p_0 \geq p^*$:*

1. *An* ***increase*** *in the penalty for wrongdoing, ℓ, causes an* ***increase*** *in the equilibrium level of obstruction.*

2. *The equilibrium level of obstruction is inverse U-shaped in voter distaste for wrongdoing α: there exists a $\hat{\alpha} \in (0, \infty)$ such that for $\alpha < \hat{\alpha}$, it is increasing and for $\alpha > \hat{\alpha}$, it is decreasing.*

3. *A* ***decrease*** *in the cost of obstruction, β, causes an* ***increase*** *in the equilibrium level of obstruction.*

Items 1 and 3 are intuitive; increasing the penalty for wrongdoing makes not getting caught more attractive, incentivizing obstruction, whereas increasing the cost of obstruction should reduce the amount present in equilibrium.

Item 2 is more nuanced. Consider the term $\psi(p_T)$, the candidate's prize for not getting caught. When this prize is larger, the candidate has greater incentive to obstruct. The prize

[11] Reference the lemma in appendix

is comprised of two components. First is the legal penalty, ℓ which the candidate hopes to avoid by being cleared. Second the difference in the probability the candidate is elected to office if they are cleared versus if they are caught, $q(p_T) - q(0)$, scaled by the benefits of office, B. When the median voter does not care much about the potential wrongdoing (small α), getting caught has little effect on the candidate's election probability. Increasing α increases the probability gap, $q(p_T) - q(0)$, which makes the prize for not getting caught larger. Hence obstruction increases. Eventually, as α gets sufficiently large, the lingering probability that the candidate might still be guilty, even if the investigation clears them, hurts the candidate's chances quite a bit. This means $q(p_T)$ gets sufficiently small that the gap in election probabilities, $q(p_T) - q(0)$, starts decreasing. Once $q(p_T) - q(0)$ starts decreasing in α, increases in α shrink the prize, $\psi(p_T)$, so obstruction becomes less attractive.

3.3 Voter Welfare

We next focus on the median voter's welfare, which we take as a measure of 'for the good of the voters.' We use this measure because a choice that maximizes the median voter's welfare also maximizes the welfare of the majority of voters in an election with two candidates. Moreover, if α is constant for all voters and voters are symmetrically distributed around the median, then maximizing median voter welfare is a truly utilitarian concept for the electorate.

We call the median voters type, ε which corresponds to their idiosyncratic preference for the opposition. Using median voter type we define policies that are voter welfare improving. We do not comment on the welfare effects of a changing voter distaste for wrongdoing, α, because α is part of the voter's welfare function and changes their total utility conditioned on the candidate getting elected.

Definition 3.3. *A policy is* ***Voter Welfare Improving*** *if for all median voter types, ε, the median voter of type ε is weakly better off under the new policy and there is at least one type who is strictly better off. If instead for all median voter types, the median voter is weakly worse of and for at least one type they are strictly worse off, the policy is* ***Voter Welfare Damaging****.*

Our next result demonstrates that obstruction is damaging to voter welfare.

Proposition 3.2. *An* ***increase*** *in the equilibrium level of obstruction is voter welfare damaging. Therefore, an increase in ℓ or a decrease in β is voter welfare damaging.*

The intuition for this result is that obstruction leads to worse information for voters which follows from Lemma 3.3. From there it suffices to show that voters are in fact worse off when the investigation is less informative. Hence changes in primitives that lead to higher levels of obstruction, like lowering the cost of obstruction or increasing the legal penalty the candidate faces if caught, are bad for voters.

Notice that this means that large criminal or civil penalties levied specifically against political candidates will negatively impact voter's welfare. However, as a note of caution, our voter welfare concept only considers whether the median voter selected the candidate who gave them the most utility under full information. It is agnostic with respect to notions of justice or future deterrence.

4 Strategically Timing Information Release

In this section we augment the model in order to consider an opposition party with damaging information regarding the candidate. The opposition also wishes to win the election and can choose *when* to publicize a damaging accusation.

4.1 Set-Up

Nature draws $\omega \in \{G(uilty),\ N(otGuilty)\}$ with associated probability $Pr(\omega = N) = \gamma$ for the candidate and reveals the information to the candidate at time $t = 0$. At time $t = 0$, the opposition may observe a piece of suggestive evidence. They observe the evidence with probability $s > \frac{1}{2}$ if $\omega = G$ and probability $1 - s$ if $\omega = N$. Otherwise the opposition observes nothing. The posterior belief that the candidate is innocent after observing suggestive evidence, s, is:

$$p_s = \frac{\gamma(1-s)}{\gamma(1-s) + (1-\gamma)s}. \tag{11}$$

High values of s signal guilt, whereas low values signal innocence. We assume the suggestive evidence is perfectly transmittable to the investigator, as well as the voter; meaning that if the opposition reveals the evidence to the public, the investigator and median voter immediately update their beliefs to p_s. The opposition has no additional asymmetric information.

If the opposition observes the suggestive evidence, they choose an evidence release strategy $T^A \in [0, T^E] \cup \emptyset$ (that we will call the time of the accusation), where $T^A = \emptyset$ denotes the strategy where the opposition never releases the evidence.

If the opposition releases the evidence, the candidate, the investigator, and the voter all observe the evidence and the game proceeds in precisely the same manner as the baseline game with where the median voter and investigator hold prior belief p_s and the investigator can only investigate for length of time $T \in [0, T^E - T^A]$. Importantly, we assume the investigator cannot begin the investigation until time T^A. The opposition's payoff is the probability they are elected, meaning $1 - \Phi(\Delta(p))$, the complement of the probability the candidate is elected.

It is reasonable to wonder why the opposition needs to begin this process at all, since the voters and investigator know at time $t = 0$ that the candidate is guilty with probability γ. Why can't we allow the investigator to begin an investigation independently of the opposition's release strategy?

We offer several justifications. First, if γ is sufficiently large then the investigator is unwilling to start such an investigation in the first place because she believes the probability she will actually uncover evidence of guilt is too low.[12] Second, in many cases before an investigation can begin there must be probable cause to issue warrants or subpoenas, and oftentimes it is unclear who will become the investigator on a case until someone is officially appointed, which also requires the initial evidence to be put forward. Additionally, even when an investigator knows they will be the one with jurisdiction, and has the materials necessary for the investigation, suggestive evidence could help direct the search through those materials.

[12] If $\gamma > \bar{p}$ then the investigator would stop the investigation immediately as discussed in Section 3.1

4.2 Timing of Investigations

First, we establish that the opposition never chooses to 'sit' on a piece of suggestive evidence, failing to release it to the public.

Lemma 4.1. *If the opposition observes evidence, they always release information at some time $T^A \leq T^E$.*

The intuition behind this result is simple, since the opposition either received the evidence or they received no evidence, and can only release evidence in the case that they received it (which is positively correlated with candidate guilt), releasing evidence by time T^E must strictly decrease the median voter's posterior, meaning failing to release evidence increases the posterior. Since the opposition's utility is decreasing in the median voter's posterior, releasing evidence at time T^E will strictly dominate failing to release evidence.

Next we define an important timing concept, the October Surprise. In practice an October Surprise is an accusation made against a politician in the last few weeks before an American general election (which must take place between November 2nd and 8th). A key aspect of an October Surprise is that there isn't enough time to thoroughly vet or investigate the evidence released. In the context of this model, investigations do not have start up costs and there's no delay between evidence being released to the public and the median voter learning about the evidence and updating their beliefs. Thus we model an October Surprise as evidence released at the time of the election

Definition 4.1. *The opposition releases evidence as an* ***October Surprise*** *if they release the information at the time of the election, $T^A = T^E$.*

Our next result characterizes *when* the opposition will release evidence if they received it.

Proposition 4.1. *Suppose the opposition receives evidence, s.*

1. *If $V_C - V_A \geq \alpha$, the opposition candidate releases evidence at any time $T^A \in [0, T^E - T^*]$.*[13][14]

[13] T^* is definded as in Section 3.1, substituting p_s in place of p_0.

[14] All such choices of T^A are outcome equivalent since the investigation will last for T^* in this range.

2. *If* $V_C - V_A \leq 0$*, the opposition candidate releases evidence at the time of the election* $T^A = T^E$*.*

3. *If* $V_C - V_A \in (0, \alpha)$*, there exists a 'credibility cutoff',* $\bar{s} \in [\frac{1}{2}, 1]$ *s.t. more credible evidence* ($s > \bar{s}$) *is released at the time of the election,* $T^A = T^E$ *and less credible evidence* ($s < \bar{s}$) *is released at any time* $T^A \in [0, T^E - T^*]$*.*

To think about these results, first consider that the voter's beliefs if the accusation is leveled at the time of the election will be p_s. Moreover, p_s is the convex combination of zero (the median voter's belief if the bad news shock arrives during an investigation) and $p_T(p_s)$ (the median voter's posterior if the shock never arrives) weighted by the probability that each of those events occurs during an investigation of length T. Thus we rely on the shape of the distribution of median voter type, ε, to determine when the probability the candidate wins is minimized by releasing evidence early and when it is minimized by releasing it as an October Surprise.

Item 1 of Proposition 4.1 considers a candidate who is so far ahead that they are more likely than not to win even if they are confirmed to be guilty. This can be interpreted as the case of a popular candidate accused of something that isn't particularly damaging. This candidate can be thought of as a 'safe' front-runner. Figure 1 demonstrates the opposition's timing decision when the candidate is a strong front runner. Recall that the probability the candidate wins is the CDF of the standard normal distribution evaluated at the candidate's advantage, $\Delta(p)$. If the candidate is a strong front-runner then the candidate's advantage is confined to the upper half of the normal CDF which is concave. That means that any convex combination of two points on the CDF lies below the CDF. Figure 1 shows that an October Surprise forces the median voter to vote with their prior (the red dot) whereas an early release lets voters use information from an investigation. From the opposition's ex-ante perspective, this corresponds to the candidate getting re-elected with the probability associated with the center black dot. Since the red dot is higher than the center black dot, the candidate is more likely to win the later the investigation begins. Hence, the opponsition releases information early. Put another way, the opposition who is behind is risk loving and therefore prefers the lottery (e.g. releasing the information early and allowing voter beliefs

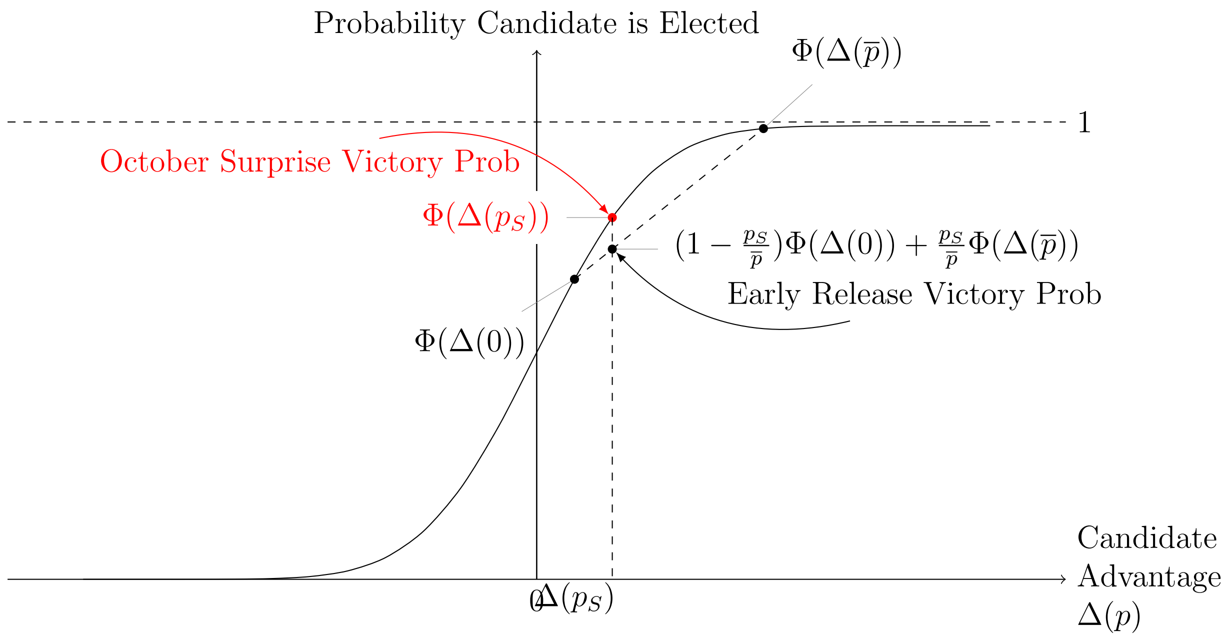

Figure 1: Evidence Release when Candidate is a Front-runner.

to spread depending on the arrival of the bad news shock) to the sure thing (e.g. an October Surprise where the opposition releases the information right at the election and the median voter has belief p_s for sure).

Conversely item 2 of Proposition 4.1 considers a underdog candidate who is disadvantaged even if they are cleared by the investigation. This confines the lottery over winning probabilities to the lower half of the normal CDF which is convex as demonstrated by Figure 2). On the convex portion of the curve, the expectation of the lottery is larger than the sure thing, meaning that the opposition prefers the October surprise where there's no chance to start an investigation. Here the candidate is disfavored enough that the 'taint' of potential wrongdoing will probably be enough to tank them. The opposition doesn't want to risk the potential upward swing associated with the underdog being partially vindicated because no bad news shock arrived during the investigation.

Item 3 of Proposition 4.1 considers a candidate who is advantaged to begin with, but who would become disadvantaged if it was confirmed they were guilty of the thing they were accused of. This means that the range we consider contains the saddle point of the CDF so it is neither concave nor convex. At this point it is up to the quality of the information itself to determine the opposition's behavior. More credible information (lower s) is more

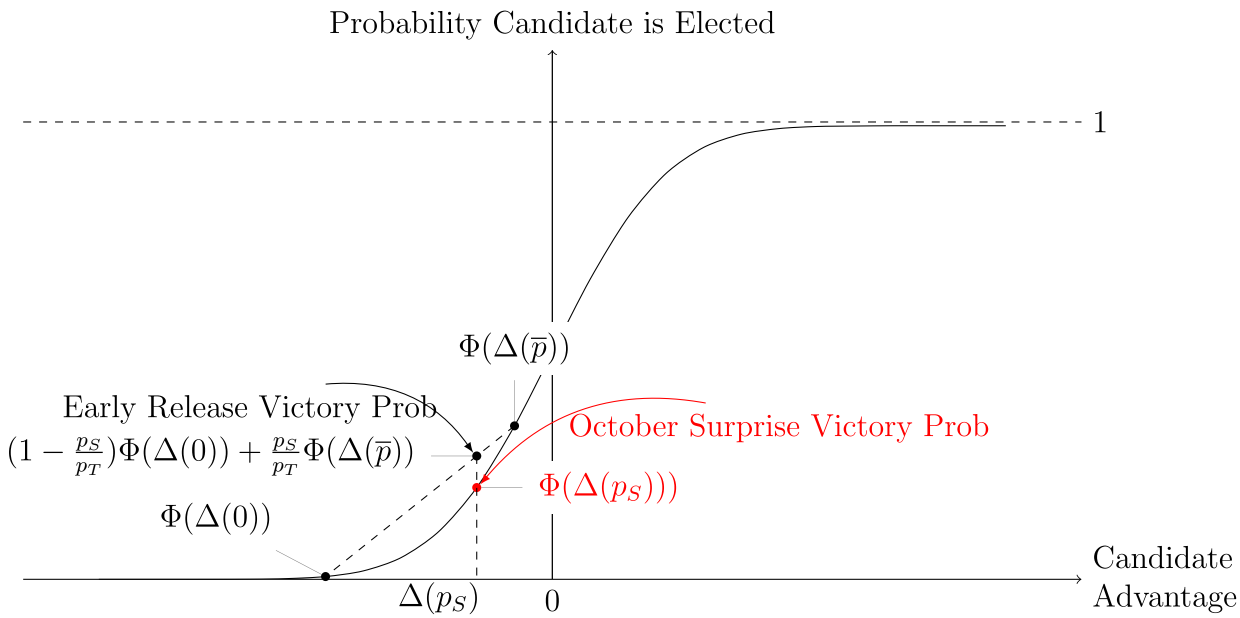

Figure 2: Evidence Release with an Underdog Candidate

likely to let the accusation taint the candidate, so the opposition is more likely to release it as an October surprise. On the other hand less credible information (higher p_s) is unlikely to taint the candidate, so the opposition releases it early hoping that the investigation finds the candidate guilty. Figure 3 demonstrates that the sum of these effects leads to a 'credibility cutoff,' $p_{s'}$ represented by the purple line and associated candidate advantage. When information is less credible it is always released early in the hopes that a guilty finding will cause a downward swing in popularity for the candidate, and when information in more credible it leads to an October surprise.

Comaparison to Gratton, Holden, Kolotilin (2018) - The question of when to release an accusation against a candidate has been analyzed formally by Gratton, Holden, and Kolotilin (2018) who assume that the opposition has private information.[15] In their model, information arises according to a Poisson process and can be released anytime after information is received. Opposition candidates with good information release information earlier as they want the information to be scrutinized, whereas opposition candidates with bad information wish to delay the release of information for fear that it would be debunked. This *credibility-*

[15] Private information also features proiminently in other models of scandals including Howell and Dziuda (2021) and Ogden and Medina (Working Paper, 2020)

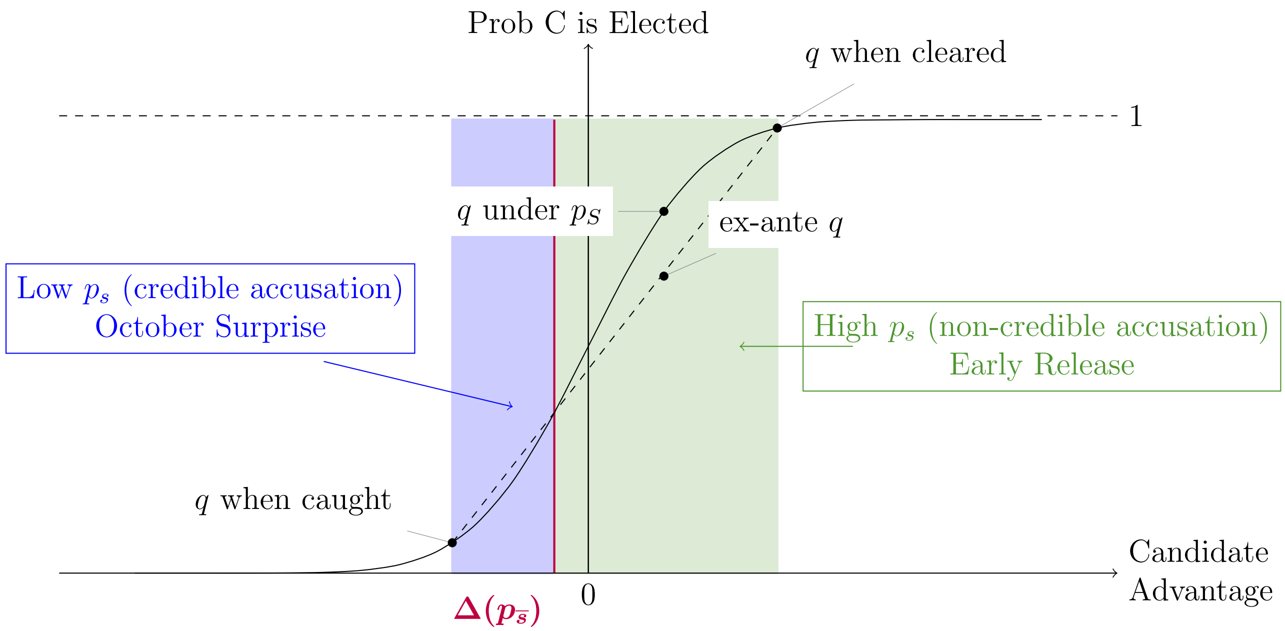

Figure 3: Timing the Evidence Release in Close Races

scrutiny effect is softened by a need for opposition candidates to release information earlier so as not to convey too much information to voters by always releasing information close to the election.

The main difference in our model is that we assume that the credibility of any information gained by the opposition can be accurately conveyed to the investigator and the voters. We believe that this is more suitable for accusations that can trigger formal investigations. With respect to such accusations often the investigator who has access to search warrants and subpeonas are much more capable of effectively vetting the accusation than the opposition is privately.

Instead of signaling concerns, the opposition's main concern when releasing information is how much information they should allow the voter access to in the form of an investigation. An investigation can be thought of like an experiment, whose length determines its informativeness. A longer investigation will be Blackwell more informative for the voter than a shorter investigation; thus by releasing information later, the opposition is restricting the voter's information. We find that the opposition's relative position vis-a-vis the candidate governs their risk preferences and as a result their preferences over how much information the voter should have. When the candidate is ahead or the race is close, but the accusation is not particularly credible, the opposition is risk loving and wants the investigation to be more informative. Hence they release information early in the election cycle. On the other hand, if the candidate is behind or the race is close, and the accusation is credible, the opposition is risk averse and wants the investigation to be *less* informative, meaning they release information late in the election cycle in the form of an October Surprise.

4.3 Voter Welfare

Now that we know the oppositions incentives for releasing accusations, we turn our attention to the effects of the opposition's timing decisions on voters and how obstruction interacts with that decision.

Our next result demonstrates that October Surprises are worse for voter welfare than any investigation of positive length. First we define T^U as the optimal length of investigation when the investigator is not constrained by an election deadline. This is characterized by the solution to Equation 3 (code ref) at $T^E = \infty$. Then we find:

Proposition 4.2. *Suppose information is released at time t. Voter welfare is constant with respect to t for $t \in [0, T^E - T^U]$ and for $t \in [T^E - T^U, T^E]$ increases in t are voter welfare damaging.*

The intuition for this result is rather simple, when the opposition releases the information later in the election cycle, the investigation must be shorter. Shorter investigations lead to worse voter information and thus worse welfare. However it is difficult to use this result to consider the welfare implications of Proposition 4.1 because the candidate's relative position versus the opposition, which determines whether or not the opposition opts for an October Surprise, is in turn determined by differing expected utility from the voters. Instead we consider what in the model might increase the opposition's incentives to release information as an October Surprise for a fixed position vis-a-vis the candidate. Our next result demonstrates that obstruction is capable of doing just that:

Proposition 4.3. *The 'credibility cutoff', $\overline{s}$, is increasing in the equilibrium level of obstruction. Moreover, higher credibility cutoffs lead to lower voter welfare.*

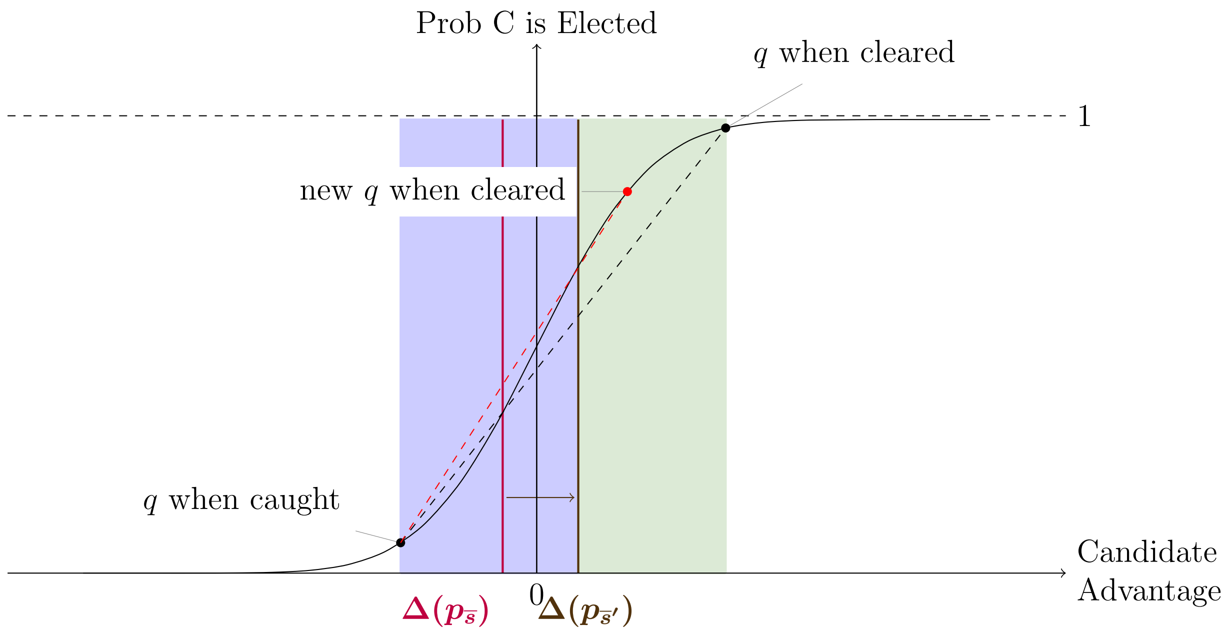

Figure 4: Obstruction causes the credibility cut-off to shift rightwards.

This result tells us that higher levels of equilibrium obstruction lead to more regular October Surprises, in the sense that there are now more signals which induce the opposition to release evidence as an October Surprise where they would have released the evidence early on when obstruction was lower. Since less information arises in equilibrium, "gambling" (i.e. hoping that the evidence is confirmed) by releasing information earlier is less appealing. Figure 4 illustrates that as obstruction increases the upper posterior drops from the upper black dot to the red dot. This means the convex combination of the upper posterior and zero shifts upwards, meaning there are more beliefs for which the convex combination lies above the CDF. The new intersection of the convex combination shifts from the purple line rightwards to the brown line. This shift leads to a new larger blue region, representing a larger set of priors under which the opposition chooses to release information as an October Surprise.

From the perspective of voter welfare, this provides another reason to be wary of strict punishments for wrongdoing. Not only does obstruction increase, the threat of obstruction causes fewer opposition types from releasing information early for fear that it won't be possible for investigators to fully investigate claims.

4.4 Comparison to Bayesian Persuasion

Since the opposition determines the median voter's information structure by deciding when to release the suggestive evidence, we compare the opposition's role to that of a sender in a Bayesian Persuasion setup like the one posited in Kamenica and Gentzkow (2011).

In this paper, the signals to voters are generated via formal investigation - hence the voter can only receive two signals; the bad news shock arrrived, or it did not. If the bad news shock arrived, the median voter's belief that the candidate is guilty equals one due to the investigation's perfect bad news structure. If there is no bad news shock, the median voter's belief is determined by the length of the investigation as well as the equilibrium level of obstruction during the investigation. The opposition's control over the length of the investigation allows them to essentially select the posterior the voter will hold following no bad news shock. This posterior is bound between the prior and the cutoff belief beyond which the investigator stops acquiring information, $\bar{p}$. The opposition's partial control leads to a solution for the opposition which is similar to concavification. Figure 4.4 compares the concavification solution to a true Bayesian Persuasion model (as in Kamenica and Gentzkow) to the opposition's strategy in this set-up. The concavification solution takes the value function for the sender (the opposition) at each possible prior, and finds the smallest possible concave function that always lies weakly above the value function. This 'concavified' value function represents the maximum attainable expected utility for the sender under a given prior for the receiver (the median voter). Figure 4.4 plots candidate advantage (a function of median voter or receiver beliefs, $p \in [0, 1]$) against the expected utility of the opposition (or sender). The black curve is the expected value function for the opposition for fixed candidate advantages, $1 - \Phi(\Delta(p))$. The green line represents the concavification of the value function. For priors below p_{TAN} the sender/opposition in Bayesian Persuasion model wants the receiver to use their prior to select actions. For priors above p_{TAN} the sender/opposition would give out two signals, one that generated belief p_{TAN}, and another that generated belief 1. In our model, the opposition cannot control the bottom posterior, and cannot choose a top posterior above $\bar{p}$. That means the opposition cannot achieve true concavification - instead their maximum ex-ante payoff is represented by the purple line in the figure. Note that the

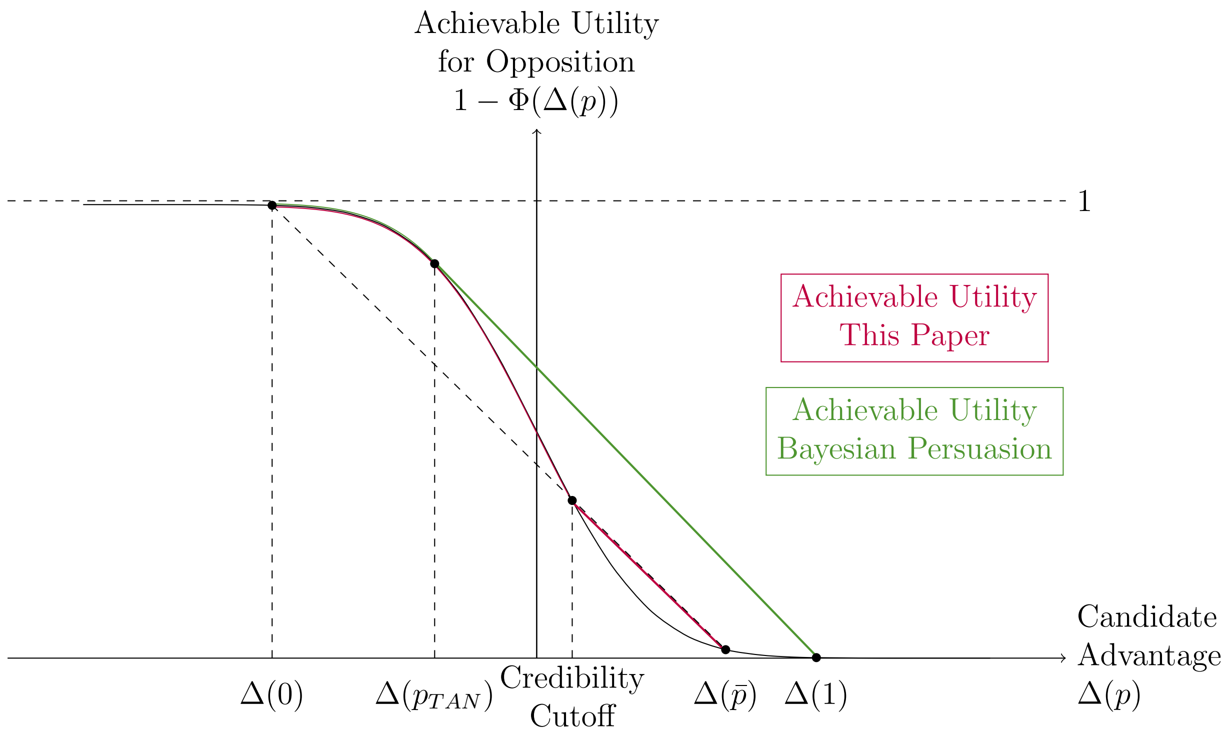

Figure 5: The opposition's expected payoffs: this paper versus bayesian persuasion

purple line always lies below the green line because the opposition's problem in this setting is a constrained version of a sender's classic Bayesian Persuasion problem.

5 Policy Questions

5.1 Plea-Bargaining

Next we allow the candidate to take a 'plea deal' where they can confess immediately to incur a smaller legal penalty. Immediate confession, or 'taking the deal' leads to penalty $\ell_1 > 0$, however if the candidate is caught at any time after $t = 0$, they pay a higher penalty $\ell_1 + \ell_2$ where $\ell_2 > 0$. The hope is that there may be ways to increase voter welfare by inducing more confession as the penalty differential ℓ_2 grows.

We are interested in how changes in policy (ℓ_1, ℓ_2) affect the obstruction strategies as well voter information. When a candidate plays a pure strategy (i.e. never takes the plea deal) there is no separate effect coming from ℓ_1 versus ℓ_2. This is because if the candidate doesn't take the deal, they incur penalty $\ell = \ell_1 + \ell_2$ if caught and the results from Proposition 3.1

still hold. The advantage of introducing the plea deal is to induce candidates to confess upfront and avoid the investigation entirely. If a candidate takes the deal then they must pay the penalty ℓ_1 for sure but they never run the risk of paying the additional penalty, ℓ_2. The decision to take the deal depends on whether the candidate prefers the lottery between the investigation coming up clean and getting caught during the investigation to confessing upfront and paying an intermediate penalty. The candidate takes the deal if the following equation holds:

$$B\Phi(V_C - V_A - \alpha(1-p_T))\left(\frac{p_0(1-p_T)}{p_T(1-p_0)}\right) + [B\Phi(V_C - V_A - \alpha) - (\ell_1 + \ell_2)]\left(\frac{p_T - p_0}{p_T(1-p_0)}\right) < B\Phi(V_C - V_A - \alpha) - \ell_1 \quad (12)$$

First we consider changes to the penalty for wrongdoing, ℓ_1. Looking at Equation 12, increasing ℓ_1 has a direct negative impact on deal taking since candidates who confess have to pay ℓ_1 all of the time as opposed to only some of it. The penalty, ℓ_1, also has an indirect effect on confession because it increases obstruction if the candidate fails to take the plea deal. The increased obstruction affects the probability of getting caught and thus the decision of whether to take the deal. Proposition 5.1 relates the effects of increasing ℓ_1 to both obstruction and voter welfare.

Proposition 5.1. *In every equilibrium, an increase in ℓ_1 leads to an increase in obstruction and a decrease in voter welfare.*

Since the first order effects of increasing ℓ_1 put downward pressure on confessions, and the increasing fines spur more obstruction, voter information deteriorates. Hence voter welfare is decreasing. The effects of an increase in ℓ_1 are similar to the findings from Proposition 3.1. The guilty candidate admits to wrongdoing less often and the investigation is less informative because obstruction increases. These effects come together to cause an unambiguous decrease in voter welfare.

Next we consider the penalty for failing to take the plea deal, ℓ_2. Unlike ℓ_1, as ℓ_2 increases, there are two opposing effects; guilty candidates take the plea deal at higher rates, however when the candidate refuses the deal, they obstruct the resulting investigation more than they did previously.

Our next result explores how these forces affect voter welfare as the penalty differential, ℓ_2, increases, making accepting a plea deal more attractive. First we define $p_0(\ell_2)$ as the prior which solves Equation 12 with equality when the penalty differential is ℓ_2. This means if the median voter and investigator have prior belief $p_0 \geq \ell_2$ when voters and the investigator have belief $p_0(\ell_2)$ the guilty candidate always refuses the plea deal. If the prior $p_0 < p_0(\ell_2)$, then the guilty candidate takes the deal with some positive probability. Thus the effect of ℓ_2 on voter welfare is different depending on the prior.

Proposition 5.2. *Consider an initial penalty for obstruction ℓ_2 and an increased penalty $\ell_2' > \ell_2$. Then:*

1. *$p_0(\ell_2') > p_0(\ell_2)$ and if $p_0 \in> p_0(\ell_2')$ then the increase in ℓ_2 induces no confessions and is voter welfare damaging.*

2. *When $p \leq p_0(\ell_2')$ and the election time constraint is binding (e.g. $T^* > T^E$), an increase in ℓ_2 increases the probability that a guilty candidate confesses. Conditional on not admitting wrongdoing, obstruction increases. Increasing ℓ_2 is voter welfare improving.*

3. *When $p \leq p_0(\ell_2)$ and the election time constraint is not binding (e.g. $T^* < T^E$), an increase in ℓ_2* ***increases*** *the probability that a guilty candidate admits to wrongdoing. Conditional on no wrongdoing being admitted, the terminal level of obstruction increases. This leads to a shorter investigation with lower levels of total learning. Thus increasing ℓ_2 is voter welfare damaging.*

When the prior is too high, the increased penalty differential is not enough to induce confessions, so increasing ℓ_2 simply intensifies obstruction, which in turn damages voter welfare. However when the prior is low, increasing ℓ_2 induces the guilty candidate to take the deal more often so the welfare effects are more difficult to parse. Although increasing ℓ_2 does encourage the guilty candidate to confess more often, it also intensifies obstruction and can shorten the investigation. When the election constraint is binding, meaning $T^* > T^E$, small increases in ℓ_2 do not affect the length of the investigation. The additional confessions outweigh the additional obstruction so voter welfare improves. On the other hand, when the election constraint does not bind, increases in ℓ_2 shorten the investigation. This is because the investigator is compensating for both the increased confession and the increased obstruction from non-confessors. Thus the total amount of learning goes down because the investigator stops learning before she reaches the old belief threshold. Hence voter welfare goes down.

In summary we find that lighter punishments for wrongdoing disincentivize obstructive behavior from candidates running for office. Although we may care about justice or restitution for particular actions, we note that it has the effect of reducing voter welfare in every range of parameters. On the other hand, when a plea-bargain offer is in place, increasing the penalty should the candidate be caught after rejecting the deal can *sometimes* improve voter welfare. If candidates do sometimes admit to wrongdoing, then increasing the penalty will encourage even more people to own up to their mistakes. When this doesn't simultaneously reduce investigator effort, this is unambiguously good for voters. However, if the investigators constraint is nonbinding, then it will be harmful to voters.

5.2 The Length of the Investigation Under Weak or Strong Political Institutions

Next we consider what happens when the investigator is permitted to continue their investigation past election day. First we explore the case where political institutions are strong, meaning that the investigator is independent of the executive, so if the candidate is elected they cannot end the investigation. Then we consider weak political institutions where an executive can fire the individual tasked with investigating them, meaning that if the candidate wins the election, he can fire the investigator, however if he loses, the investigation continues.

5.2.1 Strong Political Institutions

We can model the extended investigation under strong institutions using the baseline model from Section 2 with a single modification: here the investigator can continue the investigation beyond the date of the election, T^E. The bad news shock is still publicly observable, hence the median voter forms a posterior on election day based on the shock's arrival or lack thereof. We also assume that the candidate getting caught after the date of the election does not affect the election - if the candidate won the election, being caught afterwards does not lead to impeachment and the candidate keeps their office benefits, B.

To think about what this policy does to obstruction and voter welfare, first consider what the possibility of extending the investigation does to the candidate's payoff. In the baseline model, the candidate increased obstruction over time because his continuation payoff was increasing as he approached the end of the investigation without getting caught. Now there is a discontinuity in that continuation value at the date of the election. Before the election, the candidate is worried about getting caught both because of the potential penalty and because they don't want voters to find out they're guilty. Once the election comes, the candidate gets part of the continuation payoff - the difference in probability of winning office benefits when they're caught versus when they aren't. After the election, the candidate is only concerned about avoiding the penalty, ℓ.

This leads to a piecewise linear obstruction strategy where obstruction is linearly increasing at rate λ until election day and then discontinuously drops at election day. After the election, obstruction begins linearly increasing again at rate λ until the investigator stops investigating[16]. Obstruction over the course of the election cycle is lower because the continuation value on election day is lower. In the baseline model, the 'prize' for making it to election day being the higher probability of election benefits plus the value of the penalty. Now the prize is the higher probability of election benefits plus the value of the penalty *discounted* by the probability the candidate successfully makes it through the rest of the investigation. The following result encapsulates this idea, showing that extending the investigation past the election is good for voters:

Proposition 5.3. *When T^E binds, extending the investigation beyond T^E* ***reduces*** *equilibrium obstruction between $t = 0$ and $T = T^E$,* ***improving*** *voter welfare.*

Now we turn our attention to how this policy change affects voter welfare in the strategic timing model introduced in Section 4.1. We find that extending the investigation, in addition to reducing obstruction over the election cycle, also increases the credibility cutoff, meaning

[16] See Appendix Section A.4.2 for more details. [Make linked ref]

there is more suggestive evidence that the opposition is willing to release early instead of as an October Surprise on election day.

Proposition 5.4. *In the augmented timing model, extending the investigation beyond* T^E ***increases*** *the credibility cutoff,* p^s*, and* ***improves*** *voter welfare when the election constraint binds.*

Thus extending the investigation is a unambiguously helpful policy for voters.

5.2.2 Weak Political Institutions

Here we make a single change to the model from the previous subsection: If the candidate wins the election, the investigation ends. If the candidate loses then the investigation can proceed as before. We consider this to represent the candidate firing the investigator upon winning the election.

In the previous section we described how under strong political institutions, extending the investigation past election day improved voter welfare by reducing the candidate's prize on election day and as a result, his incentives to obstruct. Next consider what the prize to the candidate for not getting caught on election day looks like under weak political institutions. If the candidate wins, then he receives office benefits, and he can fire the investigator, meaning that the candidate will avoid the penalty ℓ for certain. If the candidate loses then he does not receive office benefits and there is a lingering probability that the candidate will have to pay the penalty because the investigation continues. So the prize for not getting caught is the difference in win probabilities weighted by the office benefits, B, plus the value of not paying the penalty times the probability the candidate doesn't get caught subsequently. This probability the candidate won't get caught after the election is larger under weak institutions than under strong institutions, however it is still strictly less than one. This means that the candidate's prize under weak institutions lies strictly between the prize under strong institutions and the prize under the norm where the investigator stops investigating by election day. Our next result ranks voter welfare under the three environments. It follows from the ranking of candidate prizes described above coupled with the fact that prizes inform the intensity of obstruction which pins down voter welfare.

Proposition 5.5. *When T^E binds, then extending the investigation under strong institutions is voter welfare improving over extending the investigation under weak institutions which is voter welfare improving over ending the investigation on election day.*

This result is surprising. One might think that since the candidate has so much at stake based on whether or not he wins the election, this would actually create more obstruction than there was under the baseline. However, when the candidate decides how much to obstruct on election day, he isn't actually comparing winning to losing, because obstruction doesn't cause a candidate to win or lose. Instead it reduces the likelihood the candidate is caught in that instant which is merely correlated with winning or losing.

5.3 Policy Discussion

The goal of these policy interventions is to try and alleviate obstruction and improve voter welfare. Unfortunately, this is not always possible. When the investigation lasts up until election day then both plea-bargaining and extending the investigation can help reduce obstruction. However when the investigation comes to it's natural conclusion before election day, allowing the investigator to continue is ineffective, while offering a plea deal is actively damaging to voter welfare.

There is one potential mechanism for alleviating obstruction when the investigator stops her investigation before the election. Our results on plea-bargaining in some sense added an extra legal penalty the candidate incurred for obstructing (ℓ_2). However voter opinion was the same whether the candidate took a plea deal, confessing immediately to all wrongdoing, or if the candidate was caught during an investigation, meaning they denied wrongdoing to voters and were subsequently found to by lying. In reality, many voters resent when they believe a politician has lied to them.If voters have a sufficient distaste for being lied to by politicians, then a plea deal can be beneficial to voters even when the investigator stops well before the election. If voters aren't very disturbed by a politician lying to investigators then there's not much policy makers can do to curtail obstruction.

Our results also have implications for the necessity of strong institutions. They tell us that although truly independent investigators are good for voters, candidates can still be held to a reasonable standard of accountability when investigators can be fired after the election. Notice that these results would be quite different were an incumbent politician capable of firing an investigator immediately. This means that in order for these investigations to deliver useful information to voters, it must be the case that there is a norm that politicians wait until after the election to fire an investigator. This would be the case if voters found firing an investigator right before an election to be highly suspicious and penalized the politician harshly for doing so.

6 Conclusion

In this paper, we provide a framework for investigations into political candidates seeking office that is sensitive to dynamic constraints, obstruction, and incorporates rich preferences on the part of voters. Our results speak to two over-arching ideas.

First, we provide a novel theory of the timing of accusations by the opposition which rests on standard distributional assumptions over electoral uncertainty that elicit either risk-averse (late release) or risk-taking (early release) behavior. We predict the stark bimodal distribution of accusations in Gratton, Holden, and Kolotilin (2018) and Nyhan (2015). Our model suggests that empirical researchers should be especially sensitive to the popularity of a scandal-associated politician and how this interacts with the timing of the scandal. Furthermore, given that we make a different prediction than Gratton, Holden, and Kolotilin (2018), we suggest that empirical trends may be easier to find if there is more fine grained measures of the "type" of information that the opposition uses to generate scandals.

Second we evaluate potential policies aimed at reducing obstruction and improving voter welfare. We find that allowing politicians to take plea deals can benefit voters, but only when the election is near enough that the investigation is unlikely to run its course before election day and the accusations against the candidate are credible. As such, discouraging obstruction through plea dealings requires a very good understanding of the investigator's cost of gathering information and voter's preferences. On the other hand, encouraging the investigator to continue investigating past election day, is more clearly beneficial to voters and can be implemented with less caution.

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A Appendix

A.1 Preliminaries

Proofs about the posterior p_t

Assumption A.1 (Technical Assumption 1)**.** *Assume no discontinuous jumps in obstruction strategy k where at t, $k_t = 0$ however $\lim_{t^-} k_t \in (0,1)$ AND $\lim_{t^+} k_t \in (0,1)$. There are a finite number of discontinuities in k_t where $\lim_{\tau \to t^-} k_\tau > 0$ and $\lim_{\tau \to t^+} k_\tau > 0$.*

Assumption A.2 (Technical Assumption 2)**.** *Assume the investigator's stopping strategy is right-continuous.*

Lemma A.1. *The posterior p_t is strictly increasing in t if $k_\tau \neq 0$ for all $\tau \leq t$.*

Proof. Recall that p_t is defined by Equation 1. The numerator of Equation 1 is constant with respect to t while the denominator, $p_0 + (1-p_0)e^{-\int_0^t \frac{\lambda}{k_\tau} d\tau}$ is strictly decreasing whenever $k_t \in (0, \infty)$. Since we defined $k_t \in [0, \infty)$, and required $k_t \neq 0$, the denominator must be strictly decreasing, meaning p_t is strictly increasing in t. □

Lemma A.2. *Suppose any realized path of obstruction $\{k_t\}_{t \in [0,T]}$ is continuous at all but a finite set of points. When $k_\tau \neq 0$ for all $\tau \leq t$, the posterior p_t is continuous in t. If for some $\tau \leq t$ such that $k_\tau = 0$, then $\tau_1 = inf\{\tau | k_\tau = 0\}$ exists and p_t has at most one discontinuity at τ_1.*

Proof. We assumed that k_t is a non-negative Lebesgue measurable function. Thus $\frac{\lambda}{k_t}$ must also be non-negative Lebesgue measurable function since $f(x) = \frac{\lambda}{x}$ is continuous and $k_t \geq 0$ ensures that the function non-negative, although it can attain the value ∞. Because $\frac{\lambda}{k_t}$ non-negative Lebesgue measurable function, it is Lebesgue integrable, which means that $F(t) = \int_0^t \frac{\lambda}{k_t} dt$ exists, although it may attain the value ∞.

Case 1 - $k_t > 0$ for all t. Because $k_t > 0$, $\frac{\lambda}{k_t} \in \mathbb{R}^+$ on the interval $[0, T^E]$. Thus $\int_0^t \frac{\lambda}{k_t} dt$ is a continuous function.

Next note that the following function is continuous and well defined for all x:

$$g(x) = \frac{p_0}{p_0 + (1-p_0)e^{-x}} \tag{13}$$

Hence p_t is continuous.

Case 2 - Because $[0, T^E]$ is compact, and we know there exists some $t \in [0, T^E]$ such that $k_t = 0$, we know that $\tau_1 = inf\{\tau | k_\tau = 0\}$ exists. For all $\tau < \tau_1$, $F(t)$ is real-valued and continuous on $[0, \tau]$ because $f(t) = \frac{\lambda}{k_t}$ is a real-valued, non-negative, Lebesgue integrable function on $[0, \tau]$.

Next we argue that either $F(\tau_1) = \infty$, or for any $t > \tau_1$, $F(t) = \infty$.

Suppose $F(t) < \infty$. Then it must be that $\lim_{\tau \to t^-} k_\tau > 0$. If so, then by Technical Assumption A.1, we know that $\lim_{\tau \to t^+} k_\tau = 0$. Because there are a finite number of discontinuities, $\exists \epsilon$ such that k is continuous on $(\tau_1, \tau_1 + \epsilon)$. Hence $\int_{\tau_1}^{\tau+\epsilon} \frac{\lambda}{k_t} dt = \infty$. Because $\frac{\lambda}{k_t} \geq 0$ for all $t \in [0, T^E]$, for any $t > \tau_1 + \epsilon > \tau_1 + \epsilon$ the integral from $\tau_1 + \epsilon$ to t is greater than zero which means $F(t) = F(\tau_1) + \int_{\tau_1}^{\tau_1+\epsilon} \frac{\lambda}{k_\tau} d\tau + \int_{\tau_1+\epsilon}^{t} \frac{\lambda}{k_\tau} d\tau = \infty$.

If $F(t) = \infty$ then k did not have a discontinuity at τ_1. Because there are a finite number of discontinuities in k there must be some $\epsilon > 0$ such that k is continuous on $[\tau_1 - \epsilon, \tau_1]$. Hence $\int_{\tau_1-\epsilon}^{\tau_1} \frac{\lambda}{k_\tau} d\tau$ is continuous. Furthermore for any $t > \tau_1$, $F(t) = F(\tau_1) + \int_{\tau_1}^{t} \frac{\lambda}{k_\tau} d\tau = \infty$.

Thus in all cases, F must be continuous on $[0, \tau_1)$ and equals ∞ on the range $(\tau_1, T^E]$. Next note that we can write $p(t) = g(F(t))$ where g is defined by Equation 13. Then $p(t)$ is continuous on $[0, \tau_1)$. It equals 1 on $(\tau_1, T^E]$. Hence it has at most one discontinuity at τ_1. □

Voter Welfare -

Lemma A.3. *Fixing p_0, if the resulting posterior following no signal, p_T increases then the new policy was voter welfare improving.*

Proof. WTS for $p'_T > p_T$ all V_ε are weakly better off and some are strictly better off. We partition the possible V_ε into three types; those who always vote for the same candidate regardless of the signal, under the regime that generates p_T and the one that generates p'_T; those who only vote for the alternative in the regime that generates p_T, but will vote for the candidate if no signal arrives in the p'_T regime, and those who vote for the alternative if the guilty signal arrives and vote for the candidate otherwise in both regimes.

Those who vote for the same candidate regardless of their generated prior: are unaffected by the change in their posterior.

Those who under p_T always vote for the alternative but under p'_T will vote for the candidate if no signal arrives: get utility $V_A+\varepsilon$ under p_T. Under p'_T, when the guilty signal arrives, they still receive $V_A+\varepsilon$, but when no signal arrives, V_ε votes for the candidate which gives them weakly better than $V_A+\varepsilon$ (o.w. they would have voted for the alternative instead). Hence these types of median voter are weakly better off under p'_T.

Those who vote for the alternative under the guilty signal and for the candidate in the absence of a signal under both regimes have expected utility:

$$p_0\left[\frac{p_0(1-p_T)}{p_T(1-p_0)}(v_C-\alpha)+\frac{p_T-p_0}{p_T(1-p_0)}(v_A+\varepsilon)\right]+(1-p_0)v_C \tag{14}$$

Because the voter prefers the alternative, $v_C-\alpha > v_A+\varepsilon$ so Equation 14 is strictly increasing in p_T. Hence these types of voter are strictly better off. □

Showing that obstruction cannot be negative

Lemma A.4. *The optimal obstruction strategy as defined in Lemma 3.1 is always strictly positive.*

Proof. Note that k_t reaches it's minimum at $t=0$, so we want to show that:

$$k_0=\sqrt{\frac{\lambda\psi(p_T)}{\beta}}-\lambda T>0$$

Suppose by contradiction that:

$$\sqrt{\frac{\lambda\psi(p_T)}{\beta}}\leq\lambda T \quad\rightarrow\quad 1\leq T\sqrt{\frac{\lambda\beta}{\psi(p_T)}}$$

Rewriting Equation [Ref eq 1] we find that

$$T\sqrt{\frac{\lambda\beta}{\psi(p_T)}}=\frac{p_0(1-p_T)}{p_T(1-p_0)} \quad\rightarrow\quad 1\leq\frac{p_0(1-p_T)}{p_T(1-p_0)}$$

but since $p_T>p_0$ for $T>0$, this cannot hold. **Contradiction.** □

A.2 Section 3 Proofs

Proof of Lemma 3.1

Proof. First we normalize the payoff from getting caught to zero, meaning the payoff to the candidate of no signal arriving during the investigation is $\psi(p_T)$. The value to C at time t when the investigation stops at time T is the flow payoff from obstruction plus the value of continuing in the game times the probability that you continue. This can be expressed by the following Hamilton-Jacobi-Bellman equation:

$$V_t = \max_{k_t}\left[-\beta k_t dt + \left(1 - \frac{\lambda}{k_t}dt\right)V_{t+dt}\right]$$

To find the optimal obstruction at time t we take the derivative of the HJB equation with respect to k_t:

$$\frac{\partial}{\partial k_t} = -\beta dt + V_{t+dt} = 0\frac{\lambda}{k_t^2}dt \to k_t = \sqrt{\frac{\lambda V_{t+dt}}{\beta}}$$

Plugging the optimal choice of obstruction, k_t back into the HJB equation yields:

$$V_t = -dt\sqrt{\lambda\beta V_{t+dt}} - V_{t+dt} + dt\sqrt{\lambda\beta V_{t+dt}}$$

Rearranging and taking limits gives us the derivative of the continuation value wrt time:

$$\lim_{dt\to 0}\frac{V_{t+dt} - V_t}{dt} = \lim_{dt\to 0}\frac{2dt\sqrt{\lambda\beta V_{t+dt}}}{dt} = 2\sqrt{\lambda\beta V_t} = \frac{\partial V_t}{\partial t}$$

Next we take the derivative of k_t and send dt to zero.

$$\frac{\partial k_t}{\partial t} = \frac{1}{2}\sqrt{\frac{\lambda}{\beta}}V_t^{-1/2}\frac{\partial V_t}{\partial t} = \frac{1}{2}\sqrt{\frac{\lambda}{\beta}}V_t^{-1/2} \cdot 2\sqrt{\lambda\beta V_t} = \lambda$$

Hence the optimal obstruction strategy increases at constant rate λ over time. We know that when $t = T$, the continuation value to the candidate, $V_t = \psi(p_T)$ because the probability the candidate is caught in the final instant while obstructing at level k_T is zero. Hence $V_T = \psi(p_T)$ so the optimal obstruction strategy for arbitrary $t \in [0, T]$ must be

$$k_t = \sqrt{\frac{\lambda\psi(p_T)}{\beta}} - \lambda(T - t).$$

By Lemma A.4 we know that this strategy is feasible meaning $k_t \geq 0$ for all t. □

Proof of Lemma 3.2

Proof. Note that the point where the marginal benefit of investigating equals the marginal cost to the investigator is at time T when the investigator naturally stops learning. Formally this point is defined by:

$$\chi(1-p_T)\frac{\lambda}{k_T}=c$$

Plugging in for optimal obstruction yields

$$(1-p_T)\frac{\chi}{c}=\sqrt{\frac{\psi(p_T)}{\lambda\beta}}$$

the LHS is strictly decreasing in p_T whereas the RHS is strictly decreasing, leading to a unique intersection at $\bar{p}$. Thus there is a unique belief threshold at which the investigator will stop investigating when unconstrained by the election. □

Proof of Theorem 3.1

Proof. First we show T^* is the optimal stopping time given the obstruction strategy from Lemma 3.1:

Recall from Lemma 3.2 that there is a unique $\bar{p}$. Plugging $\bar{p}_T$ into Equation 6 solves for a unique $T(p_0)$. This is the optimal T because it sets the marginal benefit of learning equal to the marginal cost. However there is still a binding time constraint from the election. If $T^E < T(p_0)$ then it must be that the marginal benefit of learning is greater than the marginal cost, else the investigator would not have started the investigation at all. Thus at all points below T^E the investigator would like to continue the investigation, so they let it last for as long as possible, T^E. Hence $T^*(p_0, T^E)$ is optimal.

Notice that the candidate may have used a mixed strategy where they only sometimes obfuscate, leading to the investigator having prior p^*. This only occurs when $p_0 < p^*$ so we amend the optimal T to be $T^*(max\{p_0, p^*\}, T^E)$.

Here we show that if $p_0 > \bar{p}$, the investigator stops investigating immediately. Suppose not, then the investigator picks some stopping time T and the candidate will obstruct at level $k_T = \sqrt{\frac{\lambda\psi(p_T)}{\beta}} - \lambda\epsilon$ at time $T-\epsilon$. We know at time $T-\epsilon$ the investigator wants to continue investigating, so plugging this strategy into Equation 9 gives:

$$\chi(1-p_{T-\epsilon})\lambda \geq c\left(\sqrt{\frac{\lambda\psi(p_T)}{\beta}}-\lambda\epsilon\right) \tag{15}$$

We also know that by definition of $\bar{p}$ that

$$\chi(1-\bar{p})\lambda \geq c\left(\sqrt{\frac{\lambda\psi(\bar{p})}{\beta}}\right) \tag{16}$$

However, note that $p_T > p_{T-\epsilon} > p_0 > \bar{p}$, so $(1-\bar{p}) < (1-p_{T-\epsilon})$ and for a sufficiently small ϵ,

$$\left(\sqrt{\frac{\lambda\psi(p_T)}{\beta}} - \lambda\epsilon\right) > \left(\sqrt{\frac{\lambda\psi(\bar{p})}{\beta}}\right) \tag{17}$$

Thus for sufficiently small ϵ, Inequality 15 fails. **Contradiction**.

Next we show the mixing behavior of candidates:

Suppose that $p_0 < p^*$. Then equation 7 is not satisfied meaning that the cost of obfuscating outweighs the benefits of getting caught only a fraction of the time. Thus the candidate will want to set obfuscation to 0 and get caught immediately. But if the candidate always does this then the investigator will assume that anyone not immediately revealed to be guilty is innocent and thus stops investigating after some infinitesimal time dt. This leads to a profitable deviation where the candidate only has to obstruct for an instant.

This means that the candidate must mix between obstructing and not obstructing, meaning they must be indifferent. We determined that the candidate is indifferent when the investigator has posterior p^* which means that the candidate must mix in such a manner that it gives rise to posterior p^*. If a guilty candidate mixes with probability m between not obstructing and obstructing then the investigator's posterior after an instant of learning and no signal is

$$p = \frac{p_0}{p_0 + (1-p_0)(1-m)}$$

Hence the candidate must choose to not obstruct with probability

$$m = \frac{p^* - p_0}{p^*(1-p_0)}.$$

If the candidate obstructs and the investigator has belief p^* then the optimal level of obstruction is the level corresponding to prior belief p_0.

[Off-path behavior] - In the case where the investigation was supposed to terminate at time $T^* < T^E$ suppose the investigation continues to some $t \in (T^*, T^E]$. We guess then later verify that $k_t \geq k_{T^U}$. If $k_t \geq k_{T^U}$ then plugging k_t into the investigators cost-benefit analysis, Equation 9, we see that the LHS must be less than the RHS because the two sides were equal at k_{T^U}. This means that the only sequentially rational action for the investigator is to stop. If the investigator's strategy is *stop* at time t then voters will hold belief p_t at the election day, T^E. Plugging this into the voter's expected utility function and taking the derivative wrt k_t yeilds optimal strategy:

$$k_t = \sqrt{\frac{\lambda\psi(p_t)}{\beta}}.$$

Finally notice that by Bayes Rule and the structure of perfect bad news, since $t > T^U$ $p_t > p_{T^U}$ which means that $k_t \geq k_{T^U}$.

UNIQUENESS OF EQUILIBRIUM -

Above we showed that if the investigator's strategy is pure then the equilibrium described above is unique. Here we rule out mixed strategies for the investigator.

First note that if k_t is weakly increasing then the investigator cannot mix over different stopping times. This is because $1 - p_t$ is strictly decreasing since $k_t < \infty$ and k_t is weakly increasing. Thus means the LHS of Equation 9 is strictly decreasing while the RHS is constant, so there is a unique point after which the investigator always wants to stop.

Then we must show that:

Lemma A.5. *The candidate's obstruction strategy, k_t must be weakly increasing in t.*

Proof. Suppose by contradiction that k_t is strictly decreasing over some range of time. Then there exists an $\bar{\epsilon}$ such that for any $\epsilon < \bar{\epsilon}$, $\exists t_1$ such that $t_2 = t_1 + \epsilon$ and $k_{t_1} > k_{t_2}$.

Let σ be the stopping strategy of the investigator, with CDF S, and corresponding pdf s. We know that the candidate's valuation function at time t when the investigator hasn't stopped at time t is:

$$V_t^{not\ stopped} = -\beta k_t dt + (1 - \frac{\lambda}{k_t}dt)\left[\left(\frac{S(t+dt) - S(t)}{1 - S(t)}\right)V_{t+dt}^{stop} + \left(\frac{1 - S(t+dt)}{1 - S(t)}\right)V_{t+dt}^{not\ stopped}\right] \tag{18}$$

Let $\tilde{V}_{t+dt} = \left[\left(\frac{S(t+dt)-S(t)}{1-S(t)}\right)V_{t+dt}^{stop} + \left(\frac{1-S(t+dt)}{1-S(t)}\right)V_{t+dt}^{not\ stopped}\right]$. Then following a similar argument to Lemma 3.1 [code ref], we can write the candidate's obstruction strategy as $k_t^* = \sqrt{\frac{\lambda\tilde{V}_{t+dt}}{\beta}}$. Taking the limit as $dt \to 0$ yields $k_t^* = \sqrt{\frac{\lambda V_t^{not\ stopped}}{\beta}}$. This means that since $k_{t_1} > k_{t_2}$, it must be that $V_{t_1}^{not\ stopped} > V_{t_2}^{not\ stopped}$. We can rewrite $V_{t_1}^{not\ stopped}$ as

$$V_{t_1}^{not\ stopped} = \int_{t_1}^{t_2} \left[-\beta k_\tau \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) + V_\tau^{stop} s(\tau) \right] d\tau + V_{t_2}^{not\ stopped} \tag{19}$$

Since $V_{t_1}^{not\ stopped} > V_{t_2}^{not\ stopped}$, the integrated term must be strictly positive.

First we note $V_\tau^{stop} = B(q(p_\tau) - q(0)) + \ell$. By Lemma A.2, we know that p_t is continuous in t. Thus V_t^{stop} is continuous in t. We also know that $[t_1, t_2]$ is compact so we can define $\bar{V}^{stop} = \sup_{\tau \in [t_1, t_2]} V_\tau^{stop}$. Then we know that

$$0 < \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) \left[-\beta k_\tau + V_\tau^{stop} s(\tau) \right] d\tau < \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) \left[-\beta k_\tau + \bar{V}^{stop} s(\tau) \right] d\tau \tag{20}$$

We assumed that k_t was continuous at all but a finite number of points over a compact space $[t_1, t_2]$. Thus $V_t^{not\ stopped}$ is a bounded function over $[t_1, t_2]$ so we can define $\underline{V}^{not\ stopped} = \inf_{\tau \in [t_1, t_2]} V_\tau^{not\ stopped}$. Then plugging in $k_t^* = \sqrt{\frac{\lambda V_t^{not\ stopped}}{\beta}}$ we get

$$0 < \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) \left[-\beta k_\tau + \bar{V}^{stop} s(\tau) \right] d\tau > \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) \left[-\sqrt{\beta \lambda \underline{V}^{not}} + \bar{V}^{stop} s(\tau) \right] d\tau \tag{21}$$

Hence

$$\sqrt{\beta \lambda \underline{V}^{not\ stopped}} \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) d\tau < \bar{V}^{stop} \int_{t_1}^{t_2} \left(\frac{1 - S(\tau)}{1 - S(t_1)} \right) s(\tau) d\tau \tag{22}$$

However as $\epsilon \to 0$ we find that $\int_{t_1}^{t_2} \left(\frac{1-S(\tau)}{1-S(t_1)} \right) s(\tau) d\tau$ converges to zero faster than $\int_{t_1}^{t_2} \left(\frac{1-S(\tau)}{1-S(t_1)} \right) d\tau$. Thus there exists some ϵ small enough that Inequality 22 fails. **Contradiction**.

□

If weakly increasing k_t means that the investigator uses a pure strategy, then Lemma A.3 ensures the investigator uses a pure strategy. Thus the equilibrium posited by this Theorem must be unique. □

Proof of Proposition 3.1

Proof. Here, we show that an increase in ℓ increases the level of obstruction when the election is binding.

By way of contradiction, suppose that an increase in ℓ induces a new equilibrium $\{k_t\}$ such that k_t decreases for all relevant values of t.

First notice that if obstruction decreases then the investigator/voter's posterior p_T increases since

$$p_T = \frac{p_0}{p_0 + (1-p_0)e^{-\int_0^T \frac{\lambda}{k_t} dt}}$$

is decreasing in k_t. However k_t is increasing in both p_T and ℓ, so if both these components increase then k_t must also increase.

Contradiction.

By an analogous argument k_t is increasing in both p_t and $1/\beta$ so the same contradiction holds for an increase in $1/\beta$, thus decreasing β also leads to an increased level of obstruction.

Here, we show that when the election doesn't bind, an increase in ℓ increases the level of obstruction.

Since T is now endogenous recall the condition for the optimal stopping time on T is that T^* solves

$$\frac{\lambda\beta}{\psi(p_T)} = \frac{c}{\chi(1-p_T)}$$

If we plug this into the expression for p_T we find that T^* can be rewritten as:

$$T^* = \frac{\chi(1-p_T)}{c}\left[1 - \frac{p_0}{1-p_0}\frac{1-p_T(f')}{p_T(f')}\right]$$

We can plug both these values into the expression for k_t to get

$$k_t = \frac{\lambda\chi p_0(1-p_T)^2}{cp_T(1-p_0)}$$

We take the partial derivative with respect to p_T which yields:

$$\frac{\lambda\chi p_0}{c(1-p_0)}\frac{-2(1-p_T)-(1-p_T)^2}{(p_T)^2} < 0$$

Notice that $\frac{\partial k_t}{\partial \ell} = \frac{\partial k_t}{\partial p_T}\frac{\partial p_T}{\partial \ell}$.

Next we obtain $\frac{\partial p_T}{\partial \ell}$ by first rewriting the condition for the optimal stopping time, and then taking the derivative with respect to ℓ:

$$\psi(p_T) = B(\Phi(V_C - V_A - \alpha(1-p_T)) - \Phi(V_C - V_A - \alpha)) + \ell = \frac{(\chi(1-p_T))^2\lambda\beta}{c^2}$$

$$\frac{\partial\psi(p_T)}{\partial\ell} = B\alpha\phi(V_C - V_A - \alpha(1-p_T))\frac{\partial p_T}{\partial f} + 1 = \frac{-2\lambda\beta(\chi)^2(1-p_T)}{c^2}\frac{\partial p_T}{\partial\ell}$$

Solving for $\frac{\partial p_T}{\partial \ell}$ gives us that $\frac{\partial p_T}{\partial \ell} < 0$ which means that $\frac{\partial k_t}{\partial \ell} > 0$.

For β simply note that endogenous T implies

$$\beta = \frac{c\psi(p_T)}{\lambda\chi(1-p_T)}$$

So increases in beta lead to higher values of p_T since ψ is increasing in p. Note that Lemma 3.3 relied on manipulating an equality, meaning that lower p_T must have stemmed from lower k_T. Hence β is inversely related to obstruction.

Next we're going to show that an increase in α first increases but then decreases the level of obstruction at all relevant points t.

Note that $\frac{\partial k_t}{\partial \alpha} = \frac{\partial k_t}{\partial p_T}\frac{\partial p_T}{\partial \alpha}$ and the analysis to find $\frac{\partial k_t}{\partial p_T}$ still holds.

Then once again notice that

$$B(\Phi(V_C - V_A - \alpha(1-p_T)) - \Phi(V_C - V_A - \alpha)) + \ell = \frac{(\chi(1-p_T))^2\lambda\beta}{c^2}$$

This time we take the derivative of both sides with respect to α to yield:

$$B(\alpha\phi(V_C - V_A - \alpha(1-p_T))\frac{\partial p_T}{\partial\alpha} - (1-p_T)\phi(V_C - V_A - \alpha(1-p_T)) + \phi(V_C - V_A - \alpha)) = \frac{-2\lambda\beta(\chi)^2(1-p_T)}{c^2}\frac{\partial p_T}{\partial\alpha}$$

Rearranging yields

$$\frac{\partial p_T}{\partial\alpha} = \frac{Bc^2((1-p_T)\phi(V_C - V_A - \alpha(1-p_T)) - \phi(V_C - V_A - \alpha))}{Bc^2\alpha\phi(V_C - V_A - \alpha(1-p_T)) + 2\lambda\beta(\chi)^2(1-p_T)} > 0$$

1) Whenever $(1-p_T)\phi(V_C - V_A - \alpha(1-p_T)) > \phi(V_C - V_A - \alpha)$ holds, $\frac{\partial p_T}{\partial \alpha} > 0$, which means that $\frac{\partial k_t}{\partial \alpha} < 0$.

2) Whenever $(1-p_T)\phi(V_C - V_A - \alpha(1-p_T)) < \phi(V_C - V_A - \alpha)$ holds, $\frac{\partial p_T}{\partial \alpha} < 0$, which means that $\frac{\partial k_t}{\partial \alpha} > 0$.

As α increases we shift from case 2 into case 1. This means that k_t starts out increasing in α but beyond a certain threshold begins to decrease. □

Proof of Lemma 3.3

Proof. Rewriting Equation 1 yields

$$\frac{p_0}{p_T}\frac{(1-p_T)}{(1-p_0)} = 1 - T\sqrt{\frac{\lambda\beta}{\psi(p_T)}} = 1 - \frac{\lambda T}{k_T}$$

First note that increasing k_T decreases the marginal benefit of investigating, so increasing k_T cannot lead to an increase in T. Thus, when k_T increases then T the right side of the equation increases. Since p_0 is fixed, this implies that p_T must decrease so that the left side of the equation can also increase. An investigation yielding a higher level of p_T generates posteriors which form a mean preserving spread of the investigation yielding the lower value of p_T and are thus Blackwell more informative. Hence larger values of k_T lead to lower values of p_T and are less Blackwell informative.

□

Proof of Proposition 3.2

Proof. By Lemma 3.3, a higher level of equilibrium obstruction, k_T implies that the posterior generated by no guilty signal, p_T, is lower. By Lemma A.3, a lower p_T means that voter welfare is reduced, hence higher levels of equilibrium obstruction lead to lower voter welfare.

It follows directly from Proposition 3.1 that increasing the penalty ℓ or decreasing the cost of obstruction, β lead to higher equilibrium obstruction, hence reducing voter welfare. □

A.3 Section 4 Proofs

Proof of Lemma 4.1

Proof. First consider when the opposition fails to release the evidence by time T^E. Call σ^A the opposition's evidence release strategy. The probability the opposition releases evidence by T^E is $r = \int_0^{T^E} \sigma^A(t)dt \in [0,1]$. Then following no evidence the median voter's belief in the candidate's innocence at time T^E is

$$\frac{\gamma((1-s)(1-r)+s)}{\gamma((1-s)(1-r)+s)+(1-\gamma)(s(1-r)+(1-s))} \tag{23}$$

Because $s > \frac{1}{2}$, we know that $s > 1 - s$. Because $1 - r \in [0, 1]$, by the supermodularity of multiplication, $(1 - s)(1 - r) + s \geq s(1 - r) + (1 - s)$. Then the probability from Equation 23 must be weakly greater than

$$\frac{\gamma(1 - r + rs)}{(\gamma + 1 - \gamma)(1 - r + rs)} = \gamma \tag{24}$$

Hence the probability the candidate wins when the opposition doesn't reveal information is weakly greater than $\Phi(\Delta(\gamma))$ because Φ and *Delta* are strictly increasing functions.

If the opposition releases the information at time T^E, then the release of evidence causes voters to update their beliefs at T^E to $p_s = \frac{(1-\gamma)(1-s)}{(1-\gamma)(1-s)+\gamma s} < \gamma$. Since voter's use their belief at time T^E to make their voting choice, the probability the candidate is elected is $\Phi(\Delta(p_s)) < \Phi(\Delta(\gamma))$ since Φ and Δ are strictly increasing functions. Thus releasing information at T^E strictly dominates failing to release the evidence so $T^A = \emptyset$ cannot be part of an equilibrium.

□

Proof of Proposition 4.1

Proof. The opposition maximizes their utility by minimizing the probability the candidate wins the election. Thus the opposition selects early release whenever the ex-ante probability that the candidate wins under an early release is lower than the probability that the candidate wins under an October Surprise; that is when ever the following holds:

$$\Phi(V_C - V_A - \alpha(1 - p_T))\frac{p^S}{p_T} + \Phi(V_C - V_A - \alpha)\left(1 - \frac{p^S}{p_T}\right) \leq \Phi(V_C - V_A - \alpha(1 - p^S)) \tag{25}$$

When Equation 25 doesn't hold, the opposition selects an October surprise instead.

Case 1: Let $V_C - V_A - \alpha > 0$. Note that for any $x > 0$, $\Phi(x)$ is a strictly *concave* function by properties of the standard normal distribution. Then by Jensen's inequality:

$$\Phi(V_C - V_A - \alpha(1 - p_T))\frac{p^S}{p_T} + \Phi(V_C - V_A - \alpha)\left(1 - \frac{p^S}{p_T}\right) \geq$$
$$\Phi\left((V_C - V_A - \alpha(1 - p_T))\frac{p^S}{p_T} + (V_C - V_A - \alpha)\left(1 - \frac{p^S}{p_T}\right)\right) = \Phi(V_C - V_A - \alpha(1 - p^S))$$

Thus the opposition chooses an immediate release over an October Surprise.

Ruling out intermediate releases: First note that if $T^{\in}(T^E - T^*, T^E)$, the corresponding p'_T would be less than the p_T corresponding to $T^A = 0$ as the corresponding investigation is shorter (details in the proof of Proposition 4.2). Then the line segment connecting $\Phi(\Delta(0))$

and $\Phi(\Delta(p_T))$ lies below $\Phi(\Delta(p))$ for all $p \in (0, p_T)$ including $p = p'_T$. Then for all $p \in (0, p'_T)$ the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ lies below the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p'_T))$. Evaluating these line segments at $p = p_S$ yields the ex-ante probability of candidate victory under immediate release and intermediate release respectively. Hence immediate release yields a lower candidate victory probability which rules out intermediate release on this range.

Case 2: Let $V_C - V_A < 0$. Note that for any $x < 0$, $\Phi(x)$ is a strictly *convex* function by properties of the standard normal distribution. Then by Jensen's inequality:

$$\Phi(V_C - V_A - \alpha(1-p_T))\frac{p^S}{p_T} + \Phi(V_C - V_A - \alpha)\left(1 - \frac{p^S}{p_T}\right) \leq$$
$$\Phi\left((V_C - V_A - \alpha(1-p_T))\frac{p^S}{p_T} + (V_C - V_A - \alpha)\left(1 - \frac{p^S}{p_T}\right)\right) = \Phi(V_C - V_A - \alpha(1-p^S))$$

Thus the opposition chooses an October Surprise.

Ruling out intermediate releases: the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p'_T))$ must lie above Φ for all $p \in (0, p'_T)$ meaning that the ex-ante candidate victory probability under an intermediate release leads to a higher candidate victory probability that $\Phi(\Delta(p_s))$ so the opposition always picks an October Surprise over intermediate release.

Case 3:

First we're going to define the point p_{TAN} with respect to a candidate advantage function. Since the normal distribution is a unimodal distribution, all points before it's peak at $\Delta(p) = 0$ are convex, and all points above $\Delta(p) = 0$ are concave. We assumed that $\Delta(0) < 0$ meaning that $\Phi(\Delta(0))$ is contained on the convex side of the graph. Call $\tilde{p}$ the belief that induces $\Delta(\tilde{p}) = 0$. Note $\tilde{p}$ must exist since $\Delta(p_T) > 0$ and Δ and Φ are continuous. Now consider the line that connects $\Phi(\Delta(0))$ to $\Phi(\Delta(\tilde{p}))$. Since between $\Delta(0)$ and $\Delta(\tilde{p})$, Φ is convex, the line lies entirely below the curve. On the range $[\Delta(\tilde{p}), \infty)$ the line must intersect Φ since Φ is strictly concave. Moreover, between the two points of intersection, Φ will lie entirely above the line because it is concave. Also notice that the vertical line at $\Delta(0)$ only intersects Φ once, at $\Phi(\Delta(0))$. Hence rotating the line segment counterclockwise around $\Phi(\Delta(0))$ starting from the line which connects $\Phi(\Delta(0))$ to $\Phi(\Delta(\tilde{p}))$, the line will eventually meet a tangency at some value greater than $\Delta(\tilde{p})$. If the tangency occurs above the value $\Delta(p_T)$ then the line connecting $\Phi(\Delta(0))$ to $\Phi(\Delta(p_T))$ lies entirely above the curve leading to an October Surprise as in Case 2 and the credibility cutoff occurs at p_T. Otherwise, let p_{TAN} be the belief such that the tangency occurs at $\Phi(\Delta(p_{TAN}))$.

Next note that p_s can be arbitrarily close to $1-\gamma$ by setting s arbitrarily close to $\frac{1}{2}$. By definition $p_{T^E}(p_s) \geq p_s$. Because $p_{TAN} < 1-\gamma$ we have that there exists some p_s such that $p_{T^E}(p_s) > p_{TAN}$. Note that any cross point b/w a convex combination has to be below $\Delta(p_{TAN})$, by definition of tangency.

Here we show that $p_{T^E}(p_s)$ is a continuous, increasing function in p_s. Note that for priors high enough that the election doesn't bind $p_{T^E}(p_s)$ equals a constant belief threshold $\bar{p}$. Hence on that range, $p_{T^E}(p_s)$ is continuous and weakly increasing.

Therefore we must have a point where $p_s, p_{T^E}(p_s)$ solves Equation 25 with equality. Call this point p_s^*. Note that any $p_s > p_s^*$ has a corresponding $p_{T^E}(p_s) > p_{T^E}(p_s^*)$ since $p_{T^E}(p_s)$ is strictly increasing in p_s.

Lemma A.6. *As $p_{T^E}(p_s)$ increases, the intersection, p_s, decreases.*

Proof. When $p_T > p_{TAN}$ there is a unique interior crossing point between the the standard normal CDF and the convex combination connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$. This crossing point occurs at the $\Delta(p_s)$ where p_s solves Equation 25 with equality for the given p_T.

Notice that for $p_T' > p_{TAN}$, any line connecting $\Delta(p_T')$ and $\Delta(0)$ must run below $\Phi(\Delta(p_{TAN}))$ by our construction of p_{TAN}. Next notice that $\Delta(p_{TAN}) > 0$ so the CDF between $\Delta(p_{TAN})$ and $\Delta(p_T')$ is concave. Thus the segment of the convex combination connecting $\Delta(0)$ and $\Delta(p_T')$ must lie below the CDF on the range $[\Delta(p_{TAN}), \Delta(p_T')]$. Now let $CC(\Delta(p))$ be the convex combination connecting $\Delta(0)$ and $\Delta(p_T')$ evaluated at some $\Delta(p)$. Then $CC(\Delta(p_T)) < \Phi(\Delta(p_T))$ because $\Delta(p_T) \in [\Delta(p_{TAN}), \Delta(p_T')]$. Then we can rewrite $CC(\Delta(p_s))$ as

$$\frac{p_s}{p_T} CC(\Delta(p_T)) + \left(1 - \frac{p_s}{p_T}\right) \Phi(\Delta(0)) < \frac{p_s}{p_T} \Phi(\Delta(p_T)) + \left(1 - \frac{p_s}{p_T}\right) \Phi(\Delta(0))$$

. Hence $CC(\Delta(p_s)) \in (\Phi(\Delta(0)), \Phi(\Delta(p_s)))$. It is also a straight line. Since in an ϵ-neighborhood around $\Delta(0)$ the CDF is convex, this means the convex combination must intersect the CDF on the interior of $(\Delta(0), \Delta(p_s))$. □

Since $p_{T^E}(p_s)$ is increasing in p_s, for $p_s' > p_s^*$, the new intersection point lies below p_s^* which is in turn below p_s so p_s is in the range where the convex combo lies below the CDF and info is released early. Analogously for $p'_s > p^*_s$, the convex combo lies above the CDF and info is released as an October Surprise.

Taking the derivative of Equation 25 wrt p_T while treating p_s as constant yields

$$\frac{p_s}{(p_T)^2}[\alpha\phi(\Delta(p_T))p_T - \Phi(\Delta(p_T))] + \frac{p_s}{(p_T)^2}\Phi(\Delta(0))$$

This means that the convex combination lies below the CDF at p_s therefore early release.

Analogously, if $p_s < p^*_s$, then $p_{T^E}(p_s) < p_{T^E}(p^*_s)$ so the intersection point is to the right. Thus at p_s the convex combination lies above the CDF. Hence October Surprise.

Ruling out intermediate releases: Suppose by contradiction that the ex-ante win probability for the candidate is lower than the ex-ante win probability under immediate release and under an October Surprise. This would mean both that the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ lies below the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ as well as the CDF, Φ.

If the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ lies below the line segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ then we have that $p'_T < p_{TAN}$. This is because Φ is strictly concave on the region $p \in (p_{TAN}, p_T)$ so the segment runs below any $p \in (p_{TAN}, p_T)$ which means that if p'_T was in that region, the segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p'_T))$ would have a steeper slope meaning it would lie above the segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p_T))$ which would contradict our assumption.

Since $p'_T < p_{TAN}$, the segment connecting $\Phi(\Delta(0))$ and $\Phi(\Delta(p'_T))$ must lie above Φ, else there would be a second tangency from $\Phi(\Delta(0))$ connecting to a $\Phi(\Delta(p))$ where $p < p'_T < p_{TAN}$ which cannot occur because Φ that has a unique inflection point. **Contradiction**. So intermediate release can never do as well as or better than both October Surprises and immediate release. Hence the opposition never chooses an intermediate release.

□

Proof of Proposition 4.2

Proof. Define T^U as in Equation 10 and $T^* = \min\{T^U, T^E\}$. Suppose $T^U \leq T^E$. Then we know from Lemma 3.2, the investigator continues to obtain information until he reaches a belief threshold $\overline{p}$. We defined T^U as the time it takes for the investigator to reach $\bar{p}$, and since $T^U \leq T^E$, $T^* = T^U$. Thus the investigator wishes to obtain information until T^* and then stop. If $T^A \in [0, T^E - T^*]$ then the investigator will stop by time T^E. Hence whether or not the investigator is permitted to learn past T^E will not affect the duration of the investigation or the belief $\bar{p}$ reached. If the investigation yields the same posterior $\bar{p}$, voter welfare is unchanged.

If $T^U > T^E$ then $T^* = T^E$ so the range $[0, T^E - T^*]$ is a singleton point 0.

Now suppose the opposition releases information at time $T^A \in [T^E - T^*, T^E]$. Here we show that As T^A increases, p_T is dropping:

From Equation **??** 6 we can write that if T is the duration of the investigation then

$$T \equiv \sqrt{\frac{\psi(p_T)}{\lambda\beta}} \left(\frac{p_T - p_0}{p_T(1 - p_0)} \right). \tag{26}$$

Taking the derivative with respect to p_T yields

$$\frac{\partial T}{\partial p_T} \equiv \frac{\psi'(p_T)}{\sqrt{\lambda\beta\psi(p_T)}} \left(\frac{p_T - p_0}{p_T(1 - p_0)} \right) + \sqrt{\frac{\psi(p_T)}{\lambda\beta}} \frac{1}{1 - p_0} \frac{p_0}{(p_T)^2} > 0. \tag{27}$$

Hence as the investigation gets longer, p_T is strictly increasing. However as T^A increases the investigation gets shorter since $T^E - T^A < T^*$. Hence a higher T^A implies a lower p_T.

Since higher T^A implies lower p_T, we know from Lemma A.3 that voter welfare is decreasing. □

Proof of Proposition 4.3

Proof. By Lemma A.2 we know that increased obstruction leads to lower p_T. Then by Lemma A.3 we know that higher obstruction leads to an intersection between the convex combination and the CDF at a higher p_s. Hence the credibility cutoff is higher when obstruction increases.

□

A.4 Section 5 Proofs

A.4.1 Plea-Bargaining

Proof of Proposition 5.1

Proof. First note that under pure strategies, the effect of ℓ_1 is the exact effect of ℓ from Proposition 3.1. This same logic holds if ℓ_1 is such that people were confessing before. From here we show that an increase in ℓ_1 makes confessions less likely.

Take the derivative of Equation 12 wrt ℓ_1 to get:

$$B\frac{\partial p_T}{\partial \ell_1}\left[(\alpha_1+\alpha_2)\phi(V_C-V_A-(\alpha_1+\alpha_2)(1-p_T))\left(\frac{p_0(1-p_T)}{p_T(1-p_0)}\right)+\right.$$
$$\left.\left(\frac{-p_0}{(p_T)^2(1-p_0)^2}\right)\Phi(V_C-V_A-(\alpha_1+\alpha_2)(1-p_T))\right]$$
$$+\frac{\partial p_T}{\partial \ell_1}\left(\frac{-p_0}{(p_T)^2(1-p_0)^2}\right)[B\Phi(V_C-V_A-(\alpha_1+\alpha_2))-(\ell_1+\ell_2)]-\left(\frac{p_0(1-p_T)}{p_T(1-p_0)}\right)-1=0 \tag{28}$$

WTS this derivative is positive. First note increasing ℓ_1 increases obstruction so $\frac{\partial p_T}{\partial \ell_1}<0$.

Since the derivative is positive, the difference in payoff between obstruction and confession in Equation 12 grows larger as ℓ_1 increases, meaning it reduces confessions.

If ℓ_1 increases obstruction and decreases confessions, then voter information deteriorates. Our welfare notion will punish both obstruction and dishonesty.

We consider the welfare implications for two classes of voters: First we consider a realized median voter who votes for candidate C given confession, or successful defense.

$$p_0V_C+(1-p_0)m(V_C-\alpha_1)+(1-p_0)(1-m)\left[\frac{p^*}{1-p^*}\frac{1-p_t}{p_t}\right](V_C-\alpha_1-\alpha_2)+$$
$$(1-p_0)(1-m)\left[1-\frac{p^*}{1-p^*}\frac{1-p_t}{p_t}\right](V_A-\varepsilon)$$

Plugging in $p^*=\frac{p_0}{p_0+(1-p_0)(1-m)}$ and $m(p_0)=\frac{p^*-p_0}{p^*(1-p_0)}$ we get

$$p_0V_C+(1-p_0)m(V_C-\alpha_1)+(1-p_0)\left[\frac{p_0}{(1-p_0)}\frac{1-p_t}{p_t}\right](V_C-\alpha_1-\alpha_2)+$$
$$(1-p_0)\left[(1-m)-\frac{p_0}{(1-p_0)}\frac{1-p_t}{p_t}\right](V_A-\varepsilon)$$

We know that an increase in ℓ_1 decreases m and decreases p_T. Let us therefore take the derivative of the above expression with respect to both p_t and m.

$$\frac{\partial W^{2b}}{\partial m}=(1-p_0)(V_C-\alpha_1)-(1-p_0)(V_A-\epsilon)$$

which is positive whenever $V_C-\alpha_1>V_A-\epsilon$ so that welfare is increasing in m precisely for the realized voter under consideration.

$$\frac{\partial W^{2b}}{\partial p_T} = -\frac{p_0}{p_T^2}(V_C - \alpha_1 - \alpha_2) + \frac{p_0}{p_T^2}(V_A - \varepsilon)$$

which is positive whenever $V^A - \varepsilon > V_C - \alpha_1 - \alpha_2$. This inequality clearly holds for our swing voter. Therefore voter who vote for C under confessions and successful defense are worse off as ℓ_1 increases.

Next we consider voters who only want to vote for a candidate who successfully defends themselves.

$$p_0 V_C + (1-p_0)m(V_A - \varepsilon) + (1-p_0)\left[\frac{p_0}{(1-p_0)}\frac{1-p_t}{p_t}\right](V_C - \alpha_1 - \alpha_2) + (1-p_0)\left[(1-m) - \frac{p_0}{(1-p_0)}\frac{1-p_t}{p_t}\right](V_A - \varepsilon)$$

Here,

$$\frac{\partial W^{2a}}{\partial m} = (1-p_0)(V_A - \varepsilon) - (1-p_0)(V_A - \epsilon) = 0 \quad \& \quad \frac{\partial W^{2a}}{\partial p_T} = -\frac{p_0}{p_T^2}(V_C - \alpha_1 - \alpha_2) + \frac{p_0}{p_T^2}(V_A - \varepsilon)$$

$\frac{\partial W^{2a}}{\partial p_T}$ is positive whenever $V^A - \varepsilon > V_C - \alpha_1 - \alpha_2$. Therefore voters who vote for C under successful defense are worse off as ℓ_1 increases. □

Lemma A.7. *If $\ell_2' > \ell_2$ then $p_0(\ell_2) < p_0(f\ell_2')$.*

Proof. As ℓ_2 increases, only the LHS of Equation 12 changes, however Equation 12 must hold with equality. Thus we consider what the corresponding p_0 is that re-establishes the equality. Since only the LHS is changing, and it was increasing, there must be a change in p_0 that causes a decrease in the LHS.

The LHS of equation 12 is a convex combination of the terms $B\Phi(\Delta(p_T))$ and $B\Phi(\Delta(0)) - \ell_1 - \ell_2$ where the weights add up to one. As p_0 increases there is more weight on $B\Phi(\Delta(p_T))$ which is strictly larger than $B\Phi(\Delta(0)) - \ell_1 - \ell_2$. Thus increasing p_0 increases the LHS and decreasing p_0 decreases the LHS. Thus as ℓ_2 increases, the $p_0(\ell_2)$ that solves Equation 12 with equality also increases. □

Proof of Proposition 5.2

Proof. Case 1 - If $p_0 > p_0(\ell_2')$ then welfare goes down.

First note that $p_0(\ell_2)$ is increasing in ℓ_2 so $p_0(\ell_2') > p_0(\ell_2)$ by Lemma A.7. Thus in both cases there is no confession. Thus the candidate reacts to an increase in ℓ_2 precisely he would a change to ℓ_1. Formally we can redo the analysis from Proposition 5.1 considering $\ell_1 + \ell_2$ to be a single obsject since there's no mixing. From Proposition 5.1 we know this means that obstruction increases and voter welfare decreases.

Case 2 - Here we show that obstruction is increasing in ℓ_2. When the fine is ℓ_2, C prefers to obstruct following the strategy defined by $p_T(\ell_2)$ rather than the strategy defined by $p_T(\ell_2')$ (denoted p_T and p_T' hereafter). This yields the following incentive compatibility condition on the expected utility:

$$\psi(p_T,\ell_2)\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}\right]-\beta T\left[T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}-\lambda T\right]\geq$$
$$\psi(p_T,\ell_2)\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T',\ell_2')}}\right]-\beta T\left[T\sqrt{\frac{\lambda\beta}{\psi(p_T',\ell_2')}}-\lambda T\right] \quad (29)$$

Similarly when the fine is ℓ_2', C prefers using the strategy associated with p_T' to deviating to the strategy associated with p_T. This yields IC constraint:

$$\psi(p_T',\ell_2')\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T',\ell_2')}}\right]-\beta T\left[T\sqrt{\frac{\lambda\beta}{\psi(p_T',\ell_2')}}-\lambda T\right]\geq$$
$$\psi(p_T',\ell_2')\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}\right]-\beta T\left[T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}-\lambda T\right] \quad (30)$$

Combining these inequalities and eliminating terms yields $\psi(p_T',\ell_2')\geq\psi(p_T,\ell_2)$ meaning $k_T(p_T')\geq k_T(p_T)$.

Next we show that the voter's posterior following an investigation with no signal is higher under ℓ_2'. First consider that to confess under any ℓ_2, C must be indifferent between confession and obstruction. The utility of confession is independent of ℓ_2, so obstruction under ℓ_2 and under ℓ_2' must yield the same expected payoff:

$$\psi(p_T,\ell_2)\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}\right]+B\Phi(\Delta(0))-\ell_2-\beta T\left[\sqrt{\frac{\lambda\psi(p_T,\ell_2)}{\beta}}-\lambda T\right]=$$
$$\psi(p_T',\ell_2')\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T',\ell_2')}}\right]+B\Phi(\Delta(0))-\ell_2'-\beta T\left[\sqrt{\frac{\lambda\psi(p_T',\ell_2')}{\beta}}-\lambda T\right] \quad (31)$$

Recall from Equation 6 that

$$\left[1-T\sqrt{\frac{\lambda\beta}{\psi(p_T,\ell_2)}}\right]=\frac{p_0(1-p_T)}{p_T(1-p_0)}$$

Rearranging and substituting gives

$$B\left[q(p'_T)-q(p_T)\right]2\left[\psi(p'_T,\ell'_2)\frac{p'_0(1-p'_T)}{p'_T(1-p'_0)}-\psi(p_T,\ell_2)\frac{p_0(1-p_T)}{p_T(1-p_0)}\right] \tag{32}$$

Now suppose by contradiction that $p'_T \leq p_T$. Then the left side of Equation 32 is weakly negative because $q(p)$ is increasing in p. Hence:

$$\psi(p'_T,\ell'_2)\frac{p'_0(1-p'_T)}{p'_T(1-p'_0)} \leq \psi(p_T,\ell_2)\frac{p_0(1-p_T)}{p_T(1-p_0)} \quad \rightarrow \quad \frac{p'_0(1-p'_T)}{p'_T(1-p'_0)} \leq \frac{p_0(1-p_T)}{p_T(1-p_0)}$$

where the right statement is true because $\psi(p'_T) \geq \psi(p_T)$. Rearranging again yields

$$\frac{p_T(1-p'_T)}{p'_T(1-p_T)} \leq \frac{p_0(1-p'_0)}{p'_0(1-p_0)}$$

which implies that $p'_T > p_T$ because $p'_0 > p_0$ **Contradiction.** Hence we cannot have that $p'_T \leq p_T$ so $p'_T > p_T$. Finally note that since $\psi(p,\ell_2)$ is strictly increasing in both p and ℓ_2, this means that obstruction strictly increased because $\psi(p'_T,\ell'_2) > \psi(p_T,\ell_2)$.

Case 3 - Here we show first that the voter's utility is independent of m, and ultimately only relies on the prior and the belief if the investigation occurs and the signal does not arrive. If the voters identify the candidate as guilty, either by confession or the bad news signal, their beliefs jump to 0, and otherwise they will be p_T. Hence the probability a candidate is not discovered to be guilty (from the voter's perspective) is $\frac{p_0}{p_T}$, so the probability a candidate is identified to be guilty is $1-\frac{p_0}{p_T}$ which is not a function of m. Since there are no false positives the voter's utility is strictly increasing in $1-\frac{p_0}{p_T}$.

Now recall that Equation 10 gives the belief threshold under which the investigator wants to stop when unconstrained by the election deadline. Note that we assumed in this case T^E was non-binding so Equation 10 will pin down the terminal belief, p_T. Rewriting Equation 10 with ψ gives

$$(1-p_T)\frac{\chi}{c} = \sqrt{\frac{B(q(p_T)-q(0))+\ell_1+\ell_2}{\lambda\beta}} \tag{33}$$

Note that ℓ_2 enters ψ because if the investigation is occurring the candidate forwent the plea deal so if he is caught, he pays $\ell_1+\ell_2$.

For small increases in ℓ_2, suppose by contradiction that p_T weakly increases. Then the RHS of Equation 33 strictly increases because ℓ_2 strictly increases and $Bq(p_T)$ weakly increases. However the LHS is weakly decreasing in p_T. **Contradiction**. Thus p_T is strictly decreasing in ℓ_2. Therefore as ℓ_2 increases, $1-\frac{p_0}{p_T}$ decreases so voter welfare is decreasing.

□

A.4.2 Extending the Investigation

Equilibrium characterization under an extended investigation

Lemma A.8. *Suppose that $T^U > T^E$. Under the extended investigation model, C's optimal obstruction strategy is*

$$k_t = \begin{cases} \sqrt{\frac{\lambda\left(B(q(p_{T^E})-q(0))+\ell\left[1-(T^*-T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]\right)}{\beta}} - \lambda(T^E - t) & t \leq T^E \\ \sqrt{\frac{\lambda\ell}{\beta}} - \lambda(T^* - t) & T^E < t \leq T^*. \\ \sqrt{\frac{\lambda\ell}{\beta}} & t > T^*. \end{cases}$$

Proof. Start by considering time $t \in (T^E, T^U]$. The continuation value for the candidate at any such time is:

$$V_t = \max_{k_t} \left[-\beta k_t dt + \left(1 - \frac{\lambda}{k_t} dt\right) V_{t+dt}\right] \tag{34}$$

We know from the proof of Lemma 3.1 that the solution to the optimal obstruction problem over the specified range is

$$k_t = \sqrt{\frac{\lambda V_{T^*}}{\beta}} - \lambda(T^* - t)$$

On this range the value function evaluated at T^* is the value to the candidate of not being caught at time $T^* > T^E$ which equals ℓ. Hence the optimal obstruction strategy from $t \in (T^E, T^U]$ is $k_t = \sqrt{\frac{\lambda\ell}{\beta}} - \lambda(T^* - t)$.

Then we can write the investigators belief at the time they stop investigating, T^*, as:

$$p_{T^*} = \frac{p_{T^E}}{p_{T^E} + (1 - p_{T^E})e^{-\int_{T^E}^{T^*} \frac{\lambda}{k_\tau} d\tau}} = \frac{p_{T^E}}{p_{T^E} + (1 - p_{T^E})\left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]} \tag{35}$$

where p_{T^E} is the investigator's belief at the time of the election. Next consider when after the election the investigator would choose to stop (we demonstrate later that the investigator will not stop before the election if $T^U > T^E$ in the baseline). Plugging into [ref optimal stopping equation] with the new obstruction strategy, we find that the investigator will stop when

$$p_{T^*} = 1 - \frac{c}{\chi}\sqrt{\frac{\ell}{\lambda\beta}}$$

We can also write the probability that the candidate doesn't get caught between T^E and T^* as $\left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]$. Hence the candidate's valuation of not getting caught at time T^E is $B(q(p_{T^E}) - q(0)) + \ell\left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]$. So now let's consider the candidate's strategy before the election. Once again the value function evolves as in Equation 34. However, the value function evaluated at time T^E is $B(q(p_{T^E}) - q(0)) + \ell\left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]$. Hence the optimal obstruction strategy for $t \in [0, T^E]$ is

$$k_t = \sqrt{\frac{\lambda\left(B(q(p_{T^E}) - q(0)) + \ell\left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]\right)}{\beta}} - \lambda(T^E - t).$$

Now we consider the strategy should the investigator go beyond T^*. If the equilibrium obstruction level is at least k_{T^*} then the marginal benefit of obstructing is at least $(1 - p_t)\frac{\lambda}{k_{T^*}}$ while the marginal cost is c. Since for $t > T^*$, $p_t > p_{T^*}$, the marginal benefit of investigating is below the marginal cost so by sequentially rationality the investigator's strategy must be stop. Then, once again, the equilibrium level of obstruction at time t should be $\sqrt{\frac{\lambda\ell}{\beta}}$

□

Proof of Proposition 5.3

Proof. Suppose that $T^U > T^E$, i.e. T^E binds. Then in the case where the investigator must stop the 'prize' for reaching the end is $\psi(p_{T^E}) = B[q(p_{T^E}) - q(0)] + \ell$. Whereas if the investigation can continue, then from Lemma A.8 the new terminal obstruction level is $k_T = \sqrt{\frac{\lambda[B(q(p'_{T^E}) - q(0)) + \ell * prob]}{\beta}}$ with $prob = \left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}}\right]$ so we can rewrite the 'prize' for not getting caught as $B(q(p'_{T^E}) - q(0)) + \ell * prob$. This is equivalent to a scenario where the investigation has to stop at T^E but the penalty is reduced from ℓ to $\ell * prob$. We know from Proposition 3.1 that if the penalty ℓ drops then the voter is better off.

□

Proof of Proposition 5.4

Proof. First note the opposition's payoff is fully determined at time T^E. Thus the opposition only cares about the investigation and candidate obstruction through time T^E, and this is all that will inform their strategy. Thus we can apply Proposition 4.3 to determine the opposition's behavior. By lemma A.8, we know that there is lower equilibrium levels of obstruction over the period $[0, T^E]$ when T^E binds. Hence by Proposition 4.3, extending the investigation increases the credibility cutoff. We know from Proposition 4.3 that increasing the credibility cutoff improves voter welfare. □

Proof of Proposition 5.5

Proof. Suppose that $T^U > T^E$, i.e. T^E binds. Again if the investigator must stop, the 'prize' for reaching the end is $\psi(p_{T^E}) = B[q(p_{T^E}) - q(0)] + \ell$.

If the investigation can continue under weak political institutions we can write the prize for not getting caught as:

$$(q(p''_{T^E}) - q(0)) + \ell * \left(\left[1 - (T^{*\prime} - T^E)\sqrt{\frac{\lambda\beta}{\ell}} \right] * (1 - q(p''_{T^E})) + q(p''_{T^E}) \right) \tag{36}$$

which is the expected difference in office benefits for not getting caught plus the penalty times the probability the candidate avoids the penalty. The probability the candidate avoids the penalty is the probability they lose times the probability they are not caught in the subsequent investigation plus the probability that they win, $q(p''_{T^E})$. The probability that the candidate doesn't get caught conditional on an investigation occurring is the same under weak and strong institutions so it is $\left[1 - (T^{*\prime} - T^E)\sqrt{\frac{\lambda\beta}{\ell}} \right]$. We replace T^* with $T^{*\prime}$ to account for the potentially different length of a subsequent investigation.

From Proposition 5.3 the prize under strong political institutions is:

$$B(q(p'_{T^E}) - q(0)) + \ell * \left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}} \right] \tag{37}$$

We can rank these as situations where the investigation has to stop at T^E but the penalty is reduced from ℓ to $\ell * \left[1 - (T^* - T^E)\sqrt{\frac{\lambda\beta}{\ell}} \right]$ for strong institutions and for weak institutions: $\ell * \left(\left[1 - (T^{*\prime} - T^E)\sqrt{\frac{\lambda\beta}{\ell}} \right] * \left(1 - q(p''_{T^E})\right) + q(p''_{T^E}) \right)$. We know from Proposition 3.1 that if the penalty ℓ drops then the voter is better off. The penalty is highest in the case where the election terminates at T^E and ℓ is multiplied by 1. Next largest penalty is for weak institutions, and the lowest penalty is for strong institutions since:

$$\left[1-(T^{*}-T^{E})\sqrt{\frac{\lambda\beta}{\ell}}\right] < \left(\left[1-(T^{*\prime}-T^{E})\sqrt{\frac{\lambda\beta}{\ell}}\right] * (1-q(p''_{T^E})) + q(p''_{T^E})\right) \tag{38}$$

□