Stealing an Election: Violence or Fraud?[*]

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Abstract

Political actors often resort to electoral violence in order to gain an edge over their competitors even though violence is much harder to hide than fraud and more likely to delegitimize elections as a result. The existing literature tends to treat violence and fraud as equivalent strategies, explaining the former in terms of the same factors as the latter, or to treat violence as a means of last resort due to its overtness. We argue, in contrast, that violence is neither and, in fact, that political actors can use violence for the very reason that it is hard to hide. Its overtness, we argue, allows political actors to observe whether the agents they enlist to manipulate elections for them do so and reduces these agents' likelihood of shirking in turn. We develop our argument through a formal model showing that electoral monitors, by exacerbating problems of moral hazard (i.e., shirking) can induce actors to increasingly turn to violence and use process tracing to examine the implications of this model through the example of Egypt.

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"[T]he murder of democracy."[1] That is how Indian Prime Minister Modi once described electoral violence in his country. Electoral violence poses a threat to democracy that extends far beyond the world's most populous democracy. By some measures, election violence has marred elections in more than one-third of all countries in the world.[2] Where electoral violence does not prevent elections from being held, it erodes the quality and legitimacy of elections by lowering turnout, restricting the vote choice, and biasing election results (Bratton 2008; Collier and Vicente 2014; Bekoe and Burchard 2017). However significant, the pernicious effects of electoral violence are not limited to democracy. Electoral violence also weakens countries' economies, undermines peace processes, fosters distrust among communities, and provokes even more violent forms of conflict (Dercon and Gutiérrez-Romero 2012; Burchard 2015; Hafner-Burton, Hyde and Jablonski 2018).

A primary goal of electoral violence – a broad term referring to the threat or use of physical force against persons or property in relation to an election – is to alter the outcome of an election before it has occurred (Hoglund 2009; Dunning 2011, 4). This type of electoral violence has the same goal as electoral fraud and is arguably even a form of it. Electoral fraud includes any illegal action intentionally undertaken to change the outcome of an election, such as ballot stuffing, multivoting, and vote buying (Lehoucq 2003). Perhaps, not surprisingly, the existing literature that tries to explain why this particular type of electoral violence occurs often treats electoral violence and electoral fraud as equivalent strategies, explaining the former in terms of the same conditions as the latter, or as a means of last resort due to the higher risks and costs that it entails.

In contrast to the prevailing literature, we treat electoral violence and electoral fraud as distinct strategies and argue that one of the reasons that electoral violence is considered a means of last resort – its overtness – is the very reason why political actors use violence to win elections. Specifically, we argue that political actors use electoral violence to alter the outcome of elections

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[1] "West Bengal Panchayat Election Violence a Murder of Democracy: PM Modi," *The Indian Express*, 17 May 2018.

[2] This figure is derived from two V-Dem project measures of election violence (v2elintim; v2elpeace) for 173 countries between 1989 and 2017 (V-Dem 2018). A country experienced electoral violence in a national election if there was "no harassment or intimidation of opposition by the government or its agents, during the election campaign period and polling day" (v2elintim=0), or "no election-related violence between civilians occurred" (v2elpeace=0).

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because they cannot rely on the agents that they recruit to commit fraud on their behalf to do so. Fraud agents have incentives to shirk their commitments to varying degrees and the hidden nature of fraud makes it difficult for political actors to monitor their behavior. Since electoral violence is overt, however, political actors can observe whether the agents they recruit to commit violence for them actually do so, reducing these agents' incentive to shirk in turn.

To analyze this question, we develop a formal model of electoral violence demonstrating how one factor that increases incentives to shirk – electoral monitors – can induce violence. We then use process tracing to examine the causal mechanisms identified in this model through the example of multiparty elections in pre-2011 Egypt. Egypt is a case for which electoral fraud and violence were both options for candidates and where candidates had an incentive to manipulate the elections given the competitiveness of the elections and the attractiveness of winning office, and where importantly, there was exogenous variation in the incentive of fraud agents to shirk due to the judicial supervision of elections in this period. Consistent with our argument, electoral violence occurred in a period when fraud agents had greater incentives to shirk due to the judicial supervision of elections. The competitiveness of the elections, as well as the potential sanctions candidates faced for cheating, also affected the intensity of violence in this period.

We do not propose that our explanation is the only reason for why political actors use electoral violence to win elections, but that it is one possible reason that explains a number of important and puzzling phenomena: that is, why politicians use electoral violence to steal elections despite the negative consequences of it; why electoral violence commonly occurs in conjunction with electoral fraud; why governments are responsible for more electoral violence than opposition actors even though the former have a comparative advantage over the latter in terms of the ability to commit electoral fraud (Straus and Taylor 2012); and why electoral monitors do not alway have the same beneficial effect on electoral violence as on electoral fraud (Daxecker 2014; Asunka et al. 2017). Our study has significant policy implications for the prevention of electoral malfeasance, suggesting that certain tools, such as electoral monitors and sanctions, which are intended to reduce

electoral fraud, can interact in unexpected ways and inadvertently increase electoral violence in some cases.

Existing Explanations for Electoral Violence

Electoral violence can serve many different purposes and can be purely expressive or non-strategic in intent. It is used not only to alter the outcome of an election, but it is also used to influence the political platforms of parties and candidates (Schedler 2014; Lessing 2015), discredit elections and peace processes (Condra et al. 2018), and prevent elections from occurring at all. It is also used to express discontent with the way in which elections are conducted (Hyde and Marinov 2014; Sedzika and Rose 2015; Brancati 2016) and prevent the expression of such discontent (Hafner-Burton, Hyde and Jablonski 2014). The electoral violence that is the subject of our analysis is violence used in order to alter the outcome of an election. It includes violence used to force candidates to drop out of elections, disrupt campaign rallies, prevent or compel voters to go to the polls, and destroy ballots, among other things. It does not not include violence to compel governments to recount votes or hold new elections in order to rectify perceived malfeasance.

Existing explanations for this type of electoral violence focus on the competitiveness and the stakes of the elections, as well as the permissiveness of the environment in which the elections take place. Electoral competition is said to intensify the need to resort to irregular forms of competition to win elections and may make political actors more apt to believe that they can win through force (Bratton 2008; Sterck 2015). Chaturvedi (2005) and Collier and Vicente (2008) argue, in contrast, that governments are more likely to resort to violence when they are weak because weak actors rely on a small contingent of hardcore supporters whose support is not likely to be lost by deploying violence to win an election. Hafner-Burton, Hyde and Jablonski (2014) also argue that governments use violence, alongside other fraudulent strategies, when they are weak, but contend that they use it not only when they are weak, but also when they are uncertain about their popularity.

High-stake elections – where the odds and the consequences of losing are significant – are

also argued to increase the likelihood of electoral violence. The odds of losing an election are higher in majoritarian systems than in proportional representation systems (Mueller 2012; Bob-Milliar 2014; Fjelde and Höglund 2016), while the consequences of losing an election are greater when the office elected has substantial decision-making authority or control over the distribution of patronage (Bratton 2008; Kraetzschmar and Cavatorta 2010; Arriola and Johnson 2012; Klaus and Mitchell 2015; Fjelde and Höglund 2016), and when the policy preferences of the electorate are polarized as when economic inequality is high (Fjelde and Höglund 2016).

Meanwhile, the permissiveness of the environment in which elections take place affects not only the motivation, but also the capacity to conduct violence. Many factors are said to contribute to a permissive environment including: a lack of checks on executive power (Hafner-Burton, Hyde and Jablonski 2014) and international oversight (Daxecker 2014; von Borzyskowski 2014; Asunka et al. 2017); a culture of impunity and an attitude that considers violence a legitimate political tool (Collier and Vicente 2008; Höglund 2009); weak and politicized security forces; a large pool of potential recruits due to high levels of youth unemployment and/or the presence of criminal gangs (Bob-Milliar 2014; Chaturvedi 2005; Colombo, d'Aoust and Sterck 2018; Sterck 2015); as well as a large supply of easily-obtainable weapons (EC-UNDP 2011).

Many of these explanations for why political actors use electoral violence to win elections do not distinguish between electoral fraud and violence in that they explain violence in terms of the same factors that explain fraud (e.g., electoral competitiveness, stakes, and permissiveness). Meanwhile, others explanations that distinguish between the two tend to see violence implicitly or explicitly as a means of last resort. Kraetzschmar and Cavatorta (2010), for example, see electoral violence as "a measure of last resort" because it sends an observable signal that governments are weak and lack other effective tools to remain in power (p. 335). Collier and Vicente (2008) concur, seeing violence as "a strategy of desperation by the weak" because it alienates non-base supporters morally opposed to violence. Similarly, Taylor, Pevehouse and Straus (2017) claim that incumbents only resort to violence when "nonviolent tools at their disposal cannot guarantee

victory" because violence is not necessarily effective and can result in major sanctions because it observable to domestic and international audiences (p. 399).

Other studies that do not necessarily see violence as a means of last resort either do not have the same objective as we do here, namely to explain why political actors use violence as opposed to fraud in order to win elections, or do not see the observability of violence as the reason why political actors resort to electoral violence. For example, Robinson and Torvik (2009) look to explain which voters—undecided or ideological—political actors target with violence, not whether political actors use violence per se, while Harish and Little (2017) seek to explain the timing of all sorts of political violence in relation to elections. In their analysis, Harish and Little allow for the intra-temporal substitution of violent and non-violent tactics, but focus, in contrast, on opposition actors and do not consider the role of electoral monitors or sanctioning bodies in this tradeoff. While Daxecker (2014) and Asunka et al. (2017) analyze the effect of monitors on electoral manipulation, and also conclude that monitors can increase violence, they argue that monitors increase violence relative to fraud because it is easier to relocate than fraud to other districts or the period prior to election day.

Violence as a Solution to a Moral Hazard Problem

Electoral violence is easier to observe than electoral fraud and, consequently, reduces the incentive of the agents that candidates enlist to steal elections for them to shirk – that is, to agree to commit electoral malfeasance but not carry it out. Electoral violence is relatively easy to observe because it typically occurs in public, is known to at least its victims, and has visible effects in terms of injuries and deaths. Since violence is overt, candidates are able to observe whether the agents they enlist to commit violence for them actually do so, and can pay violent agents conditional on their having committed the violence, thereby, eliminating the problem of moral hazard or shirking.

Electoral fraud is much more difficult to observe than electoral violence. While violence is typically carried out in public, fraud is generally carried out within the confines of polling booths or

in the back rooms of polling stations and counting centers. In many cases, fraud is not observable to anyone other than the person who committed it. Indications of fraud after the fact are also often ambiguous. The lack of consensus regarding the best method to measure electoral fraud attests to the difficulty of observing fraud (Alvarez, Hall and Hyde 2009; Brancati 2014; Venice Commission 2018). Since fraud is less observable, candidates are unable to effectively condition payments to fraud agents based on whether or not they committed fraud, and are forced instead to pay agents based on the outcome of the fraud – that is, whether the candidate won the election or not.[3] Payments of this nature include patronage or other forms of political favors extended to districts or individuals where candidates win.

This arrangement presents a problem of moral hazard because fraud agents have private information about whether they committed the fraud or not. Fraud agents have various reasons to shirk. Fraud agents have an incentive to shirk because committing fraud requires effort and agents prefer to engage in other activities, especially if the fraud that they commit is unlikely to be pivotal, and if agents fear being punished for violating laws prohibiting fraud. They may also have an incentive to shirk if they anticipate being on the losing side of an election (Mares 2015; Rundlett and Svolik 2016), do not have the same ideological preferences as those for whom they commit the fraud (Stokes 2005), and have economic independence (Mares 2015).

As a result, we argue, that where conditions are permissive – that is, where political actors have access to agents willing and able to commit violence on their behalf, political actors have a strong incentive to resort to violence.[4] Permissiveness does not mean that actors or their agents are exempt

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[3]Our argument does not apply to cases where candidates buy individual votes and require votes to show proof of having cast their ballots for particular candidates, such as a photo of the ballot. Even in these cases, though, shirking can occur, as voters can subsequently invalidate their ballots or fail to cast them

[4]Although all candidates do not have access to both violence and fraud, the high co-morbidity of fraud and violence across states suggests that actors, particularly incumbents, commonly have access to both fraud and violence in weakly democratic and competitive authoritarian states. In the World Values Survey (2010-14), 78.12% of respondents who said voters are "threatened with violence at the polls" either "very often" or "fairly often" also said that voters are "bribed" or that votes were not "counted fairly" either "very often" or "fairly often."See: http://www.worldvaluessurvey.org. According to V-Dem, vote-buying and irregularities were either "systematic" or "common" in 59.31% of national elections (1989-2017) in which "opposition candidates/parties/campaign workers were subjected to repression, intimidation, violence, or harassment by the government, the ruling party, or their agents"

from punishment if caught committing violence and, in fact, the probability of being sanctioned and the size of the punishment for committing malfeasance, we expect, has an important influence on the likelihood of candidates using violence. Since violence is overt and more easily detected than fraud, a high sanction will deter candidates from resorting to electoral violence instead of fraud. Electoral violence is not a means of last resort in our view because it is not committed only by those who have no other means to win elections, but by those for whom electoral fraud alone is not the optimal strategy.

In the section to follow, we develop a formal model of electoral manipulation in order to explain why and under what conditions political actors are likely to use violence to alter the outcome of an election when both fraud and violence are possible. The formal model looks at two levers by which misconduct can be suppressed—electoral monitoring, which reduces the success of a covert act, and sanctioning, the levying of penalties on observed or likely misconduct. We look at electoral monitors in the model because monitors increase the likelihood of shirking by making fraud less effective and, thus, allow us to observe how an increase in the incentive to shirk affects electoral violence. In contrast to others who argue that political actors resort to violence when monitors are present because violence is easier to hide (Daxecker 2014; Asunka et al. 2017), we argue that political actors resort to violence when monitors are present because violence is easier to *observe* and, thus, easier for political actors to monitor.

Much of the formal theoretic literature on electoral manipulation argues that uncompetitive elections provide a credible signal of support for regimes, and that this signal is conditioned on the possibility, or occurrence, of electoral manipulation (Little 2012; Egorov and Sonin 2014; Gehlbach and Simpser 2015*a*), and the presence of electoral monitors (Chernykh and Svolik 2015; Luo and Rozenas 2018). Our model complements this literature. We consider a candidate who is focused on minimizing the perception of manipulation (and potential sanction) while also engaging in various tactics of electoral manipulation. In our model, both the incumbent and the sanctioning

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(V-Dem 2018).

body are faced with a moral hazard problem, being concerned with whether electoral manipulation did or will occur. Conversely, Little (2012) and Luo and Rozenas (2018b) focus on problems of adverse selection, showing that monitoring and various forms of electoral manipulation can change voter beliefs about incumbent types. A key distinction between the informational basis of our approach and those of Little and Luo and Rozenas is that our argument does not rely on adverse selection between the incumbent and the audience.[5]

A Model of Electoral Violence and Fraud

We begin with a simple market for fraud where there is an electoral district that a candidate seeks to win and a population of potential fraud agents that the candidate hires from. The candidate sets a wage for fraud, $c_f \geq 0$, that is essentially a bribe to the fraud agent to commit electoral fraud. This payment could take the form of patronage to a fraud agent's district or other political favors in the event the district is won. We assume that the candidate can commit to pay an agent whose district the candidate wins. Any agent—whether choosing to commit fraud or to shirk—wants to be paid, and will receive c_f if the candidate wins their district. If the candidate loses the district, the agent receives a wage of 0. The candidate receives $w - c_f$ for winning a district and 0 for losing. The agent must invest a privately observed cost $\kappa > 0$ to engage in fraud; thus, the agent makes a decision about whether to shirk or not, which we denote $a \in \{0, 1\}$. The cost to engaging in fraud is distributed according to a $U[0, 1]$ distribution.[6]

The fraud agent's strategy is denoted by $\sigma_f : \mathbf{R}_+ \times [0, 1] \to [0, 1]$, where

$$\sigma_f(c_f, \kappa) = \Pr(a = 1 | c_f, \kappa).$$

[5]In our model, the audience is referred to as the sanctioning body, but the core of our theoretical argument would apply far more broadly. The only asymmetric, privately held information in our model is held by the fraud agent regarding whether the agent committed fraud.

[6]As fraud agents are identically distributed across districts, our analysis focuses on the candidate's decision at the district level. Therefore, we implicitly assume that the candidate seeks to maximize district wins subject to the costs incurred for doing so.

In equilibrium, the agent will use a cutoff strategy of the form

$$\sigma_f(c_f, \kappa) = \begin{cases} 1 & \text{if } \kappa \leq \tau(c_f), \\ 0 & \text{if } \kappa > \tau(c_f), \end{cases}$$

where $\tau(c_f) \geq 0$ is the maximal cost that the agent will incur to engage in fraud, conditional on wage c_f. Thus, by our assumption that $\kappa \sim U[0,1]$, the proportion of fraud agents who would choose to engage in fraud is $\tau(c_f)$.

We let $\theta \in \{0,1\}$ denote whether the candidate won the agent's district ($\theta = 1$) or not ($\theta = 0$). A district win is a noisy signal of whether the agent engaged in fraud. If $a = 1$ then $\theta = 1$ with probability p_1 and $\theta = 0$ otherwise. If $a = 0$ then $\theta = 1$ with probability p_o and $\theta = 0$ otherwise. We assume that $p_1 > p_o$, so that fraud increases the likelihood of a district win (otherwise the fraud agent would never choose to commit fraud in equilibrium). The term p_o can be conceived of as the baseline electoral strength of the candidate, or the likelihood the candidate will win the district in the absence of any manipulation.

If τ agents will commit fraud, the candidate's expected electoral payoff from this baseline exchange is:

$$EU_o(c_f | p_o, p_1, w, \tau) = p_1 \tau(w - c_f) + p_o(1 - \tau)(w - c_f). \tag{1}$$

The agent will choose to commit fraud when the cost of doing so is sufficiently low relative to the benefit of receiving a payment. The agent's expected payoff from choosing $a = 0$ is $c_f p_o$. The agent's expected payoff of choosing $a = 1$ is $c_f p_1 - \kappa$. Thus, the agent will choose to commit fraud when:

$$\kappa < c_f(p_1 - p_o). \tag{2}$$

Given a wage c_f committed to by the candidate, the fraction of agents who would find it optimal to commit fraud is

$$\tau^*(c_f) = \min\{c_f(p_1 - p_o), 1\}. \tag{3}$$

Substituting $\tau^*(c_f)$ into Equation 1, the candidate's optimal wage for a fraud agent is

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\begin{aligned}
c_f^* &= \frac{1}{2}\left(w - \frac{p_o}{(p_1 - p_o)^2}\right) \text{ if } w \in \left(\frac{p_o}{(p_1 - p_o)^2}, \frac{2p_1 - p_o}{(p_1 - p_o)^2}\right), \\
c_f^* &= \frac{1}{p_1 - p_o} \text{ if } w \geq \frac{2p_1 - p_o}{(p_1 - p_o)^2}, \text{ and} \\
c_f^* &= 0 \text{ if } w \leq \frac{p_o}{(p_1 - p_o)^2}.
\end{aligned}
\tag{4}
$$

When $w \leq \frac{p_o}{(p_1 - p_o)^2}$ (which we can reexpress as $p_1 \leq p_o + \sqrt{\frac{p_o}{w}}$), fraud is not effective enough relative to the value of winning to induce the candidate to commit to a positive wage. When $w \geq \frac{2p_1 - p_o}{(p_1 - p_o)^2}$, the value of winning the district is so high that the candidate commits to a wage that induces every agent to work. For the remainder of the analysis, we restrict our attention to cases in which $w < \frac{2 - p_o}{(1 - p_o)^2}$, so as to rule out situations in which the value of an electoral win is so high that the candidate can eliminate the problem of moral hazard.

The Possibility of Sanctioning Fraud

We now consider the existence of a "sanctioning body," or "body" with an interest in penalizing candidates who have won an election via fraud.[7] A sanctioning body of this kind includes domestic courts, foreign countries, or international organizations, such as the European Union, with an interest in promoting clean elections.[8] Later, we will also consider the body's interest in punishing violence. The sanctioning body is capable of imposing a sanction of $s > 0$ on the candidate. The term s could be conceived as many different things, including the costs of overturning

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[7]Importantly, we assume that the body only benefits from punishing candidates who *won* via fraud—if the candidate engaged in fraud but lost the election the body would prefer to take no action.

[8]While there are many sanctioning bodies of this kind, there are also sanctioning bodies that are not neutral and do not sanction fraud-ridden elections so long as their preferred candidate wins. These bodies do not have the same effect.

election results or an economic cost, such as the freezing of foreign assets or the loss of trade. The magnitude of this sanction simply captures the threat to the candidate of facing penalty. While we use the language of "certain sanction" throughout the paper, the threat could be probabilistic in nature—for example, if there is some uncertainty about the body's ability to carry through with the penalty. The relevant point is that if the body chooses to sanction the candidate, the candidate faces an expected penalty of s.

We term the sanctioning body's decision $d \in \{0,1\}$, with the decision to sanction denoted $d = 1$. The body's decision to sanction will depend on the sanctioning body's belief about the prevalence of fraud and its effect on the election. We assume that the body receives benefit of $b \geq 1$ for sanctioning a candidate that manipulated an electoral win via fraud and pays a cost of 1 to sanctioning a candidate who won without manipulation.

Conditional on a district win $(\theta = 1)$, the sanctioning body's posterior belief that the agent engaged in fraud, β_θ, is:

$$\beta_1(\tau) \equiv \Pr[a = 1 \mid \theta = 1, \tau] = \frac{\tau p_1}{\tau p_1 + (1 - \tau)(p_o)}.$$

The expected payoff of sanctioning to the body following an electoral win is:

$$b \frac{\tau p_1}{\tau p_1 + (1 - \tau)(p_o)} - (1 - \frac{\tau p_1}{\tau p_1 + (1 - \tau)(p_o)}). \tag{5}$$

Conditional on a win, the body will choose $d = 1$ if this expected payoff is positive.[9] It follows that the body will sanction if the equilibrium fraction of fraud agents, $\tau^*(c_f)$ (defined in Equation 3), satisfies $\tau^*(c_f) > \frac{p_o}{p_o + b p_1}$. Thus, the body will sanction if

$$c_f > \frac{p_o}{(p_1 - p_o)(p_o + b p_1)} \equiv c_S. \tag{6}$$

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[9]We assume that if indifferent, the sanctioning body does not sanction.

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The term c_S is the maximum wage the candidate could set in order to prevent sanction in the event of a win. Thus, the candidate receives one of the following two payoffs for committing fraud, depending on whether his choice of fraud wage, c_f, triggers sanction:

$$EU_c(c_f \leq c_S | p_o, p_1, w, \tau, s, c_v) = \tau^*(c_f)p_1(w - c_f) + (1 - \tau^*(c_f))p_o(w - c_f) \quad (7)$$

$$EU_c(c_f > c_S | p_o, p_1, w, \tau, s, c_v) = \tau^*(c_f)p_1(w - c_f - s) + (1 - \tau^*(c_f))p_o(w - c_f - s). \quad (8)$$

In the event that the candidate explicitly sets $c_f = c_S$, this expected payoff is the following:

$$\begin{aligned} EU_c(c_S | p_o, p_1, w, \tau, s, c_v) &= \tau^*(c_S)p_1(w - c_S) + (1 - \tau^*(c_S))p_o(w - C_S) \\ &= \frac{(w(p_1 - p_o)(bp_1 + p_o) - p_o)(b + 1)p_o p_1}{(p_1 - p_o)(bp_1 + p_o)^2}. \end{aligned} \quad (9)$$

The candidate's optimal wage that will not trigger sanction is:

$$c^*_{f, d=0} = \min\{c^*_f, c^S\},$$

where c^*_f is the candidate's baseline optimal wage defined in Equation 4. If triggering sanction, the candidate's optimal wage is:

$$c^*_{f, d=1} = \frac{1}{2}\left(w - s - \frac{p_o}{(p_1 - p_o)^2}\right) \text{ if } p_1 > p_o + \frac{p_o}{\sqrt{p_o(w - s)}}, \text{ and } c^*_{f, d=1} = 0 \text{ otherwise.} \quad (10)$$

Electoral Violence

Finally, we consider the role of violence as an alternative or complimentary strategy for electoral manipulation by allowing the candidate to hire a violence agent at (exogenous) cost $c_v > 0$. The key difference between fraud and violence is that violence is observable. Thus, the decision to engage in violence incurs a sanction of s with certainty, irrespective of whether the candidate wins

or loses. Conversely, fraud is only sanctioned in the event that the candidate wins the election and only in the event that the win was sufficiently likely to have been due to manipulation.

Electoral violence is beneficial to the candidate in that it serves as an insurance policy by increasing the likelihood that the candidate will win the district. In the event that other means would not have yielded a district win, violence yields an expected payoff to the candidate of w_v. We let w_v be a catchall term capturing the probability that violence successfully results in a district win (i.e $w_v = p_v w$). We presume that $w_v > s$, so that in the absence of any cost to violence, it is worthwhile relative to sanction. This is without loss of generality, as otherwise violence would be dominated. It follows that the candidate's expected payoff for engaging in violence ($v = 1$) is:

$$EU_c(c_f, v = 1 | p_o, p_1, w, \tau, s, c_v) = EU_o(c_f | \cdot) + w_v (\tau(1 - p_1) + (1 - \tau)(1 - p_o)) - s - c_v. \quad (11)$$

Again, plugging $\tau^*(c_f)$ into Equation 11 and solving for the optimal wage for fraud we get that, if $v = 1$, the candidate optimally commits to:

$$c_{f,v=1}^* = \frac{1}{2} \left(w - w_v - \frac{p_o}{(p_1 - p_o)^2} \right) \text{ if } p_1 > p_o + \frac{p_o}{\sqrt{p_o(w - w_v)}}, \text{ and } c_{f,v=1}^* = 0 \text{ otherwise.} \quad (12)$$

It is useful to note that as violence becomes increasingly effective (w_v approaches w), the equilibrium fraud wage with violence, $c_{f,v=1}^*$, approaches zero. When $w_v \geq w - \frac{p_o}{(p_1 - p_o)^2}$, this wage equals zero and no agents will engage in fraud.

The Game

With these pieces of our story in place, the path of play is as follows, and illustrated in the following game tree.

- Stage 0. The fraud agent draws cost κ, which is private information to the agent.

- Stage 1. The candidate simultaneously decides whether to hire a violence agent or not, and
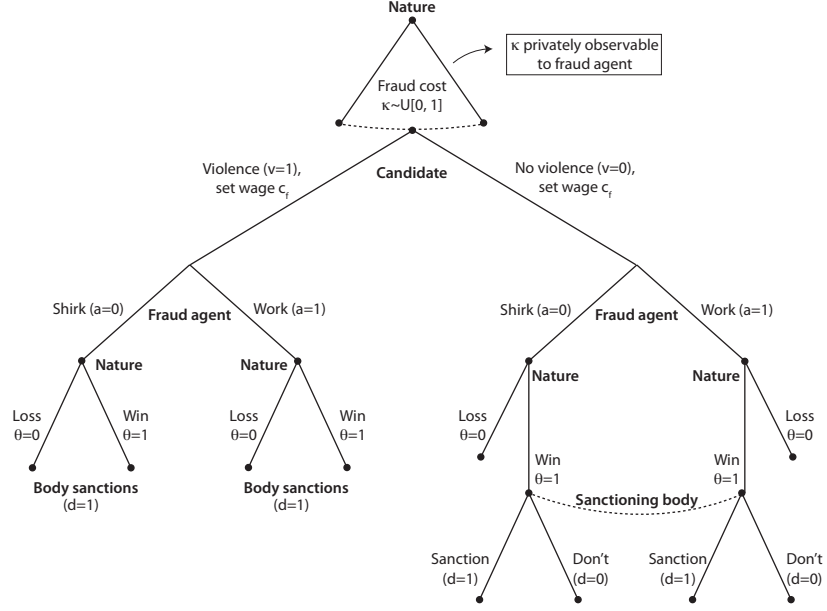
commits to a fraud wage, $c_f \geq 0$.

- Stage 2. The fraud agent decides whether to shirk depending on the offered wage; the candidate wins the agent's district with probability p_o if the agent shirks, and with $p_1 > p_o$ if the agent works.

- Stage 3. The sanctioning body decides whether or not to impose sanction s on the candidate. The game ends and payoffs are then realized.

The candidate plays strategy $\sigma_c : [0,1] \times [0,1] \times \mathbf{R}_+ \times \mathbf{R}_+ \to \mathbf{R}_+ \times \{0,1\}$, where $\sigma_c(p_o, p_1, w, b)$ maps into a wage commitment $c_f \geq 0$ and violence decision $v \in \{0,1\}$. As described earlier, the fraud agent plays strategy $\sigma_f : \mathbf{R}_+ \times [0,1] \to [0,1]$, where $\sigma_f(c_f, \kappa) = \Pr(a = 1 | c_f, \kappa)$. Letting $d \in \{0,1\}$ denote the decision to sanction or not, the sanctioning body plays strategy $\sigma_s : \mathbf{R}_+ \to [0,1]$, where $\sigma_s(c_f) = \Pr(d = 1 | c_f)$.[10] Our solution concept is perfect Bayesian equilibrium: a triple of strategies $(\sigma_c^*, \sigma_f^*, \sigma_s^*) = ((c_f^*, v^*), a^*, d^*)$ and belief τ^* (about the likelihood a fraud agent will work) satisfying:

1. τ^* is consistent with the fraud agent's action a being sequentially rational given c_f^* and the distribution of κ.

2. The sanctioning agent's decision d^* is sequentially rational given the agent's beliefs τ^* and given c_f^*.

3. The candidate's decision c_f^*, v^* is sequentially rational given d^* and a^*.

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[10]Throughout, simply to make the analysis clearer, we suppose that, if payoff indifferent, the candidate prefers no manipulation to electoral fraud to violence, and prefers constrained fraud to fraud with sanction.

Payoffs are as follows:

- If $\theta = 0$ (the district is lost):

  The fraud agent receives the following payoffs for shirking and working, respectively:

  $$U_f(a = 0|c_f, \theta = 0) = 0,$$

  $$U_f(a = 1|c_f, \theta = 0) = -\kappa.$$

  The candidate receives the following payoffs for no violence and violence, respectively:

  $$U_c(c_f, v = 0|\theta = 0) = 0,$$

  $$U_c(c_f, v = 1|\theta = 0) = -c_v - s.$$

The sanctioning body receives the following payoffs to sanction and no sanction:

$$U_s(d = 1|v = 1, \theta = 0) = b,$$

$$U_s(d = 1|v = 0, \theta = 0) = 0,$$

$$U_s(d = 0|\cdot, \theta = 0) = 0.$$

- If $\theta = 1$ (the district is won):

  The fraud agent receives the following payoffs for shirking and working, respectively:

$$U_f(a = 0|c_f, \theta = 1) = c_f,$$

$$U_f(a = 1|c_f, \theta = 1) = c_f - \kappa.$$

  The candidate receives the following payoffs for no violence and violence, respectively:

$$U_c(c_f, v = 0|d = 0, \theta = 1) = w - c_f,$$

$$U_c(c_f, v = 0|d = 1, \theta = 1) = w - c_f - s,$$

$$U_c(c_f, v = 1|d = 1, \theta = 1) = w - c_f - s - c_v.$$

  The sanctioning body receives the following payoffs to sanction and no sanction:

$$U_s(d = 1|v = 1 \text{ or } a = 1, \theta = 1) = b,$$

$$U_s(d = 1|v = 0 \text{ and } a = 0, \theta = 1) = -1,$$

$$U_s(d = 0|\cdot, \theta = 1) = 0.$$

Baseline Analysis

The candidate will do one of six qualitatively different things in equilibrium, which we characterize in terms of the parameters p_1 (the efficacy of fraud in generating an electoral win) and s (the cost to

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the candidate of being sanctioned). Figure 1 depicts all six regions.[11] We characterize the regions formally via their dividing lines in the Appendix.

No manipulation: The candidate may choose to not manipulate the election, setting $c_f = 0$ and $v = 0$.

Violence: The candidate may manipulate solely through violence, setting $c_f = 0$ and $v = 1$.

Low fraud: The candidate may offer a low fraud wage and incur no sanction, setting $c_f < c_S$ and $v = 0$.

Constrained fraud: The candidate may offer a moderate fraud wage that is potentially lower than his optimal wage in order to not trigger sanction, setting $c_f = c_S$ and $v = 0$.
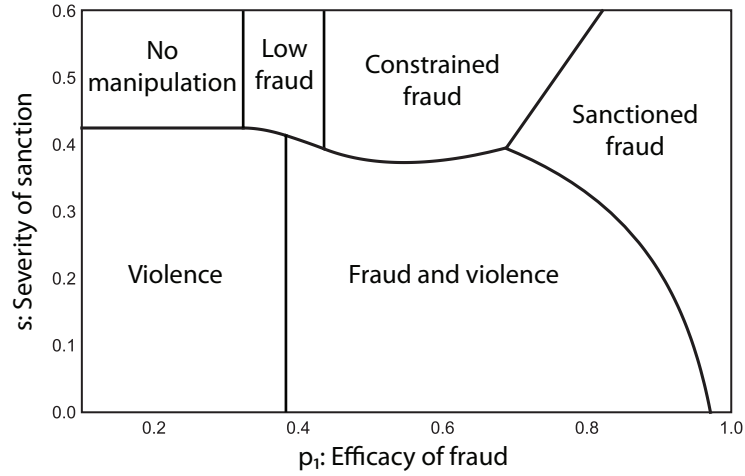
Violence and fraud: The candidate may engage in both fraud and manipulation and incur sanction, setting $c_f > 0$ and $v = 1$.

Sanctioned fraud: The candidate may engage in a high level of fraud that triggers sanction while not engaging in violence, setting $c_f > c_S$ and $v = 0$.

Figure 1 plots the efficacy of fraud, p_1 (the likelihood that fraud results in a district win) along the x-axis for $p_1 \in [p_o, 1]$. The y-axis plots the severity of the sanction, s: the magnitude of the penalty that the candidate faces if sanctioned. Since the expected payoff to violence is not directly affected by p_1, it is useful to note that there is a maximum level of "severity of sanction," s, above which violence will never be engaged in. Violence is most enticing to the candidate when fraud is least effective ($p_1 = p_o$), and therefore for any s above which no manipulation is preferred to violence, increasing the effectiveness of fraud can only make violence less desirable. This maximum s is shown in the horizontal line dividing violence from no manipulation.

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[11]The parameter values used to generate the figure are $w = 2, p_o = .1, b = 1, c_v = .25$, and $w_v = .75$.

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Figure 1: Six equilibrium regions

Moving left to right along the bottom of the figure, as fraud becomes more effective the candidate prefers to engage in a mixture of both violence and fraud, even though this incurs a fixed cost of c_v (the violence wage), a cost of c_f if the district is won (the fraud wage or bribe), and sanction with certainty. However, engaging in both forms of manipulation increases the likelihood of a district win, and when s is sufficiently low this is worthwhile. As fraud becomes increasingly effective, the candidate ultimately shifts entirely to fraud in order to avoid paying the violence agent. When s is low, the candidate willingly incurs sanction in order to offer a high wage, thereby reducing the chance of shirking by the fraud agent.

When s is high, the candidate will never engage in violence because it is certain to trigger sanction. As we move from left to right in the efficacy of fraud the candidate first engages in no manipulation, then in a low level of fraud that will not trigger sanction. For moderate levels of p_1 the candidate will engage in a constrained level of fraud so as to avoid sanction; as p_1 gets high the candidate willingly incurs sanction in the event of a win in order to induce work by the fraud agent.

It is interesting to note that for moderate regions of s, the occurrence of violence is not monotonic in fraud's effectiveness. When $s \approx .38$ we see violence for low levels of p_1, then constrained

fraud for moderate levels, and then a mixture of violence and fraud for higher levels. This occurs in part because there are complementarities to the use of both fraud and violence. If the candidate chooses to incur the fixed cost of sanction, the candidate can simultaneously both raise the fraud wage to induce more fraud and also engage in violence as insurance against a district loss.
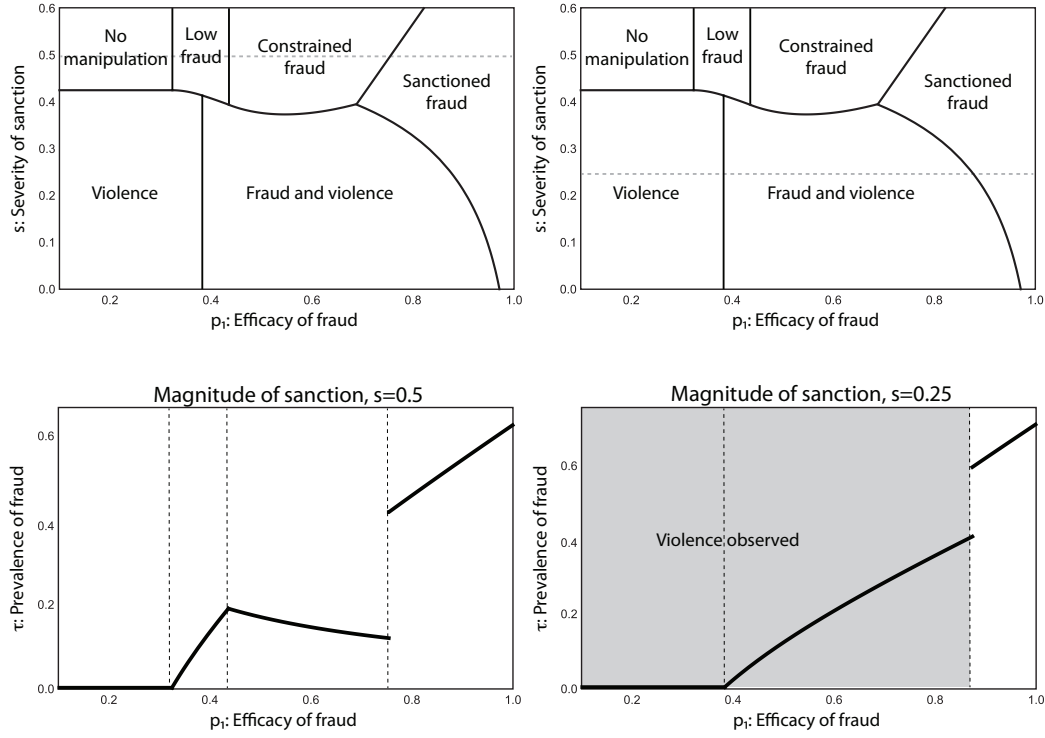
Direct and Indirect Effects of Election Monitoring

Monitoring—a reduction in the efficacy of fraud, p_1—has an effect not only on the equilibrium strategy of the candidate, but also on the behavior of the agents of electoral manipulation. Equation 2 shows that p_1 has a direct and positive effect on the fraud agent's payoff to working because p_1 affects the likelihood the district is won and, therefore, the likelihood that the agent is ultimately paid. However, p_1 also has an indirect effect on the agent's incentive to work through the candidate's optimal choice of wage, c_f. The total effect of monitoring on fraud must take into account both monitoring's direct effect and wage effect, which for certain regions of the parameter space, may work in opposite directions.

To see that p_1 can have conflicting effects on the incentives of the fraud agent, note that when the candidate is seeking to avoid sanction (the case of constrained fraud), p_1 has a negative effect on the wage the candidate will offer the agent (Equation 6). This is because, *ceteris paribus*, higher values of p_1 increase the sanctioning body's belief that an electoral win was due to fraud. In order to avoid triggering sanction due to the higher effectiveness of fraud, the candidate must correspondingly increase the fraud agent's incentive to shirk by lowering the fraud wage.

Figure 2 depicts the effect of p_1 on the equilibrium fraction of agents engaging in fraud, τ^*, for slices of the parameter space in which sanctions are strong or weak ($s = .5$ and $s = .25$). The figure shows that when s is low, reducing p_1 always serves to reduce the fraction of agents engaging in fraud. However, this reduction is not universally beneficial, because it ultimately induces the candidate to resort to violence as a means of electoral manipulation. This shift to violence occurs when the efficacy of fraud drops below $p_1 \approx .875$. When p_1 drops very low (below $p_1 \approx .38$) the

Figure 2: The effect of monitoring

candidate entirely shifts to violence as a means of electoral manipulation.

When s is high, this shift to violence never occurs. However, in this case monitoring may also be ineffective in reducing the prevalence of electoral manipulation. In particular, as p_1 drops below $p_1 \approx .75$, the candidate shifts from "unconstrained" fraud to constrained fraud in order to circumvent sanction. At this point, reducing fraud's efficacy leads to an *increase* in the prevalence of fraud. This is because a lower effectiveness of fraud reduces the incentive of the sanctioning body to punish an electoral win. The candidate can capitalize on the body's increased unwillingness to sanction by committing to a higher fraud wage. We summarize these observations in the following proposition, proved in the Appendix.

Proposition 1 *The effect of increased electoral monitoring (a reduction in p_1) on violence and the prevalence of fraud is conditional on the magnitude of sanction, s.*

- *When s is low, increased monitoring always weakly reduces the prevalence of fraud. How-*

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ever, as monitoring becomes increasingly effective, the candidate substitutes violence for fraud.

- *When s is high, violence is not observed and monitoring has an ambiguous effect on the prevalence of fraud. Increased monitoring reduces fraud when fraud is either highly effective or highly ineffective. For moderate levels of effectiveness, increased monitoring may increase the prevalence of fraud.*

- *For moderate s, the effect of increased monitoring can be ambiguous on both the candidate's use of violence and the prevalence of fraud.*

Our characterization of the dividing lines governing candidate behavior also generates the following straightforward corollary.

Corollary 1 *When baseline electoral strength is sufficiently high, the candidate will never engage in electoral manipulation.*

In this model, we have laid out the conditions that affect a candidate's decision to manipulate an election using either violence or fraud. Due to the overt nature of violence relative to fraud, engaging in violence is more certain to incur sanction, but is not subject to the agency problem of moral hazard. We used the dual interventions of sanctioning and monitoring to examine how changing the incentives of fraud agents via monitoring affects a candidate's choice of manipulation strategies. The model demonstrates that the effect of increased monitoring depends critically on the threat posed by sanction, as well as the baseline effectiveness of fraud. In the model, we look at sanctions that are imposed as a function of the amount paid to the fraud agent and, thus, consider situations in which the sanctioning body faces the same moral hazard problem as the candidate in assessing whether fraud has occurred. In reality, these bodies may draw upon other sources of information, including monitoring reports. Extending our model to allow the sanctioning agency to directly observe fraud would increase the regions of the parameter space on which violence is

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observed. Our assumption that violence is sanctioned with certainty is a conservative assumption. The fact that violence occurs in the model without assuming that the sanctioning body may utilize additional sources of information makes our results about violence stronger.

Electoral Violence in Egypt

Herein, we use process tracing to examine the causal mechanisms identified in our theoretical model through the example of multiparty parliamentary elections in pre-2011 Egypt. Egypt is a case for which electoral fraud and violence were both options in this period. Most of the fraud and violence in this period was contracted by individual candidates running under the banner of the ruling party – the National Democratic Party (NDP) – not the government or higher echelons of the party (Blaydes 2010).[12] These candidates, which are the focus of our analysis, had an incentive to manipulate the elections because they faced competition from other parties and independents within certain districts and were not necessarily popular enough to win without manipulating the elections. The parliament, although it had no decision-making authority and, thus, could not be described as high-stakes, offered candidates an opportunity for rent-seeking and immunity from prosecution (Blaydes 2010).[13] There were also no competing dynamics in Egypt in this period because non-state actors were not present then as they are today, and the only direct presidential election in this period did not occur at the same time as the parliamentary elections. After the Arab Spring in 2011, many factors with the potential to affect electoral violence changed simultaneously, making it impossible to separate out their effects.

In this period, there was also exogenous variation in the incentive of fraud agents to shirk due

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[12]The NDP was formed in 1978 after Egypt's first multiparty elections and, thus, did not control the first government in this period. Since the fraud and violence were contracted by individual candidates, neither can be interpreted as an attempt by the national government to signal state strength or ensure bureaucratic compliance as they might in other contexts (Magaloni 2008; Simpser 2013; Gehlbach and Simpser 2015*b*).

[13]Under the constitution, the parliament did not propose, but only approved policies, including the budget, drafted by the government. The president could veto its decisions, including votes of confidence. Further, between 1976 and 2010, NDP candidates (including independents that joined the NDP after the elections) won between approximately 73-94 percent of the seats in the People's Assembly. See: Inter-parliamentary Union http://archive.ipu.org/parline-e/parlinesearch.asp. Accessed 9 September 2018.

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to the judicial supervision of the 2000 and 2005 elections. The judges, which carried out responsibilities similar to electoral monitors, were present in all stations regardless of their propensity to experience electoral fraud and/or violence. Prior to 2000, members of judiciary bodies, but not necessarily judges, supervised the polling stations where votes were counted, while civil servants supervised the polling stations where votes were cast. These actors, dependent on the government for their jobs unlike judges, permitted the fraud to occur and were often complicit in it.[14] This change in supervision was not indicative of an otherwise diminished capacity of NDP candidates to conduct fraud in comparison to violence. It occurred as a result of a Supreme Court ruling.[15] While the government had significant discretion in how it implemented this decision, the government allowed judges to supervise the elections due to pressure from the judges (Said 2008), a desire to uphold the rule of law in order to attract foreign investment (Moustafa 2008*a*), and pressure from the US for democratic reform following 9/11 (Weisman 2005; Youmans 2016; Sharp 2006). After the 2005 elections, the Egyptian government revised the constitution and eliminated the judges' supervisory role.

The Egypt case also provides variation in the potential for sanctions. In the pre-2011 period, there were two sets of sanctioners: the Egyptian courts and the United States. The courts had the authority throughout this period to sanction candidates for electoral malfeasance by invalidating the electoral results. The United States only acted as a sanctioner around the 2005 elections – one of the two elections supervised by the judges. After 9/11, the US government pressured Egypt to hold free and fair elections due to its belief that democracy was an important defense against terrorism (Weisman 2005; Youmans 2016; Sharp 2006). The US did not threaten to sanction individual candidates, but rather the Egyptian government. However, the threat of sanction led the government to intervene in the election process in ways that it otherwise would not have. Thus,

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[14]Although the law required judges to supervise all polling stations, there were some shortages in judges. These shortages were alleviated, but not eliminated, in 2005 by conducting the elections in phases (IRI 2005a, 12). Importantly, the judiciary, not the government, determined which stations to assign judges.

[15]The ruling invalidated Article 24 of Law 73 (1956), which allowed public sector employees to supervise elections instead of members of judiciary bodies as Article 88 of the Constitution required.

the threat of US sanction had downstream effects on the incentives of the candidates themselves. A US sanction had a high potential to hurt the Egyptian government because the US provided a substantial amount of foreign aid to Egypt.

The presence of monitors and sanctions in pre-2011 Egypt intersect, allowing us to observe the absence of electoral monitors (i.e., judges) in the presence of a low threat of sanction, and the presence of electoral monitors in the presence of both a low and high threat of sanction, as Table 1 depicts. Judges fully supervised both the 2000 and 2005 parliamentary elections. In these elections, the threat of sanction was low, except for the first phase of the 2005 parliamentary elections. It was low because neither the courts, nor the United States, were likely to impose sanctions. In the first phase of the 2005 parliamentary elections, the threat of sanction was high due to the higher likelihood of the US to impose sanctions. The model, thus, predicts that we should observe an increase in violence around the 2000 and 2005 parliamentary elections, except for the first round of the 2005 elections. The level of violence does vary in Egypt according to our expectations, but before proceeding to examine the effect of monitors on electoral violence under different sanctioning regimes, we describe in detail the level of electoral violence in Egypt in this period.

Table 1: Variation in Electoral Monitors/Judges and Sanctions in pre-2011 Egypt

	High threat of sanction	Low threat of sanction
Low effectiveness of fraud (Electoral monitoring)	2005 elections, phase 1 (low fraud, low violence)	2000 elections 2005 elections, phase 2 and 3 (low fraud, high violence)
High effectiveness of fraud (No electoral monitoring)		all other elections (high fraud, low violence)

The Timing and Intensity of Electoral Violence in Egypt

Prior to the Arab Spring, Egypt experienced electoral violence in every election since at least its

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first multiparty parliamentary elections in 1976 (Markaz al-Mahrousa 2008). Figure 3 depicts the level of violence committed on behalf of NDP-affiliated candidates in parliamentary elections held between 1976 to 2011.[16] This violence was committed primarily by police and baltageya (thugs) who threatened and intimidated candidates and voters to vote and to vote for particular candidates around the elections, and who tried to block opposition supporters from entering polling stations on election day. The bar plot depicts the level of either "violence, repression, intimidation, or harassment" that the government, the ruling party, and its agents subjected opposition parties, candidates, and campaign workers to in elections to the People's Assembly, according to the V-Dem Project (V-Dem 2018). The solid red line represents the number of people that the police killed on the day of the polls when most police killings occurred. These are original data collected from domestic and international newspapers and non-governmental organization (NGO) reports.[17] The dashed red line represents the number of known police killings and the number of election-day killings for which the perpetrator is not known. Most of these police killings occurred as a result of clashes between the police and supporters of opposition candidates outside polling stations.
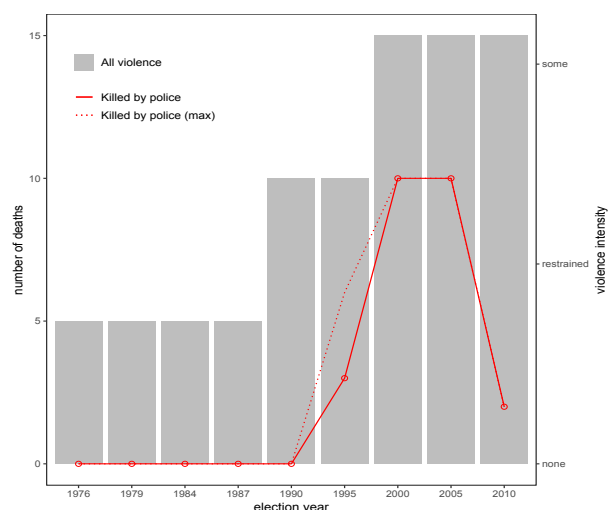
As is evident from this graph, the level of violence peaked around the 2000 and 2005 elections, which were supervised by the judges. The quantitative data agree with reports by Egyptian NGOs, which described the government-perpetrated violence in the 2000 and 2005 elections as much greater than in previous elections (Markaz al-Mahrousa 2008; NAHR 2005; EOHR 2005), as well as expert accounts of these polls as "the bloodiest and most violent in Egypt's history" (Brown and Nasr 2005; Moustafa 2013; Abdulbaki 2008, 454).[18] The 2005 elections, unlike earlier elections, occurred in phases, with districts throughout the country holding elections at different times. The first phase of these elections were peaceful while the subsequent phases were very violent (NAHR

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[16]Our analysis focuses on the parliamentary elections since all but the 2005 presidential elections were indirect.

[17]The 2000 and 2005 killings were a result of multiple distinct incidents. These figures are not likely to reflect changes in media freedom as it did not change substantially in this period. From 1976-2010, V-Dem categorizes government attempts to censor print or broadcast media as "indirect but nevertheless routine" (v2mecenefm_ord).

[18]More deaths occurred in 1995 than in 2005, but these deaths were a result of fights between tribes, not government actions (Ahram 1995; Ebeid 1996).

Figure 3: Government-related Electoral Violence

Note: Violence Intensity is coded based on the following question: "In this national election, were opposition candidates/parties/campaign workers subjected to repression, intimidation, violence, or harassment by the government, the ruling party, or their agents?" The response categories are: "Frequent: There was systematic, frequent and violent harassment and intimidation of the opposition by the government or its agents during the election period; Some. There was periodic, not systematic, but possibly centrally coordinated harassment and intimidation of the opposition by the government or its agents; Restrained: There were sporadic instances of violent harassment and intimidation by the government or its agents, in at least one part of the country, and directed at only one or two local branches of opposition groups" (V-Dem 2018).

2005; EOHR 2005). The total level of physical and non-physical (and less overt) forms of abuse remained high in Egypt in 2010, according to V-Dem. However, the number of persons killed on election day declined, as did other forms of physical violence, such as assaults and beatings (HRW 2010; Amnesty International 2010).[19]

Incentives for Electoral Violence with No Judicial Supervision and Low Sanction Threat

Outside the period of judicial supervision when the threat of sanction was weak, the level of electoral violence was relatively low while the level of electoral fraud was high. The fraud was committed primarily by poll workers who stuffed ballots, allowed multiple voting, and doctored the

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[19]V-Dem does not separate out physical and non-physical forms of violence so it is unclear if the discrepancy between police killings and V-Dem in 2010 is due V-Dem's inclusion of non-physical violence or different assessments of the level of physical violence. Violence could have been higher in 2010 due to the higher stakes of these elections given the impending succession of Hosni Mubarak (Zahid 2010; Collombier 2012), changes in the People's Assembly's authority on the budget and votes of confidence (Wittes 2005; Kassem 2006; Brown, Dunne and Hamzawy 2007), and the adoption of Presidential Election Law 174 (2005) requiring parties to have 5% of seats in the legislature (or 250 elected officials' signatures) to nominate candidates for the next presidential election.

vote count, among other things, and secondarily by voters, who sold their votes and voted illegally in exchange for patronage to their districts, as well as personal benefits, such as cash, clothes, and food. In the absence of the judges, poll workers and voters had only a modest incentive to shirk. Without the judges present in the polling stations to observe, document, and attest to the fraud, fraud was effective, and both the poll workers and voters benefitted from NDP candidates winning in the districts where they committed fraud. The poll workers benefited because they were assigned to stations in which they lived and the government typically distributed patronage to districts in which NDP candidates performed well (Blaydes 2010; al-Ississ and Atallah 2015). Poll workers further benefitted from the NDP maintaining control of the government because they were public sector employees, typically teachers, reliant on the government for their jobs.[20] Voters similarly benefitted from the patronage that an NDP win in a district would bring as they typically committed fraud in the districts in which they resided.[21]

Poll workers and voters still had some incentive to shirk, though, because committing fraud required effort and because how much effort they exerted individually in committing fraud was not observable from the final vote tally. There was also no real chance of the NDP losing control of the parliament, so that the poll workers' public sector jobs would not have been lost even if the NDP lost in a particular district. Voters had more incentive than poll workers to shirk because they lacked strong ideological ties to the NDP (Masoud 2014), and because the odds of one fraudulent voter making a difference to the outcome of an election in a district was extremely small, unlike in the case of a single poll worker who could affect a large number of votes.[22]

Even though the potential for fraud agents to shirk was modest in this period, NDP candidates

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[20]The public sector comprised about one-third of employment so that the loss of a public sector job was consequential (Bank of Egypt 2002; CAPMAS 2008; CAPMAS 2010). Public sector employment was associated with electoral support for the government according to regression analyses (al-Ississ and Atallah 2015).

[21]Voters were required to vote in the district in which they were born, not were they resided, but were legally allowed to request permission to vote at another polling station. Geographic mobility was not very high in this period, especially in rural areas, so it was commonplace for voters to reside in the district in which they were born in adulthood.

[22]In Egypt, only 3.34% and 1.38% of respondents to the 2005-09 and 2010-14 waves of the World Values Survey said that they were either active or inactive members of a political party. See: http://www.worldvaluessurvey.org. Accessed 26 July 2018.

appeared concerned about the possibility of their shirking, undertaking measures to preclude this, such as placing party members inside polling stations to pressure agents to commit fraud (al-Sawy, Ali, Moussa and Ibrahim 2005). These measures are unlikely to have completely alleviated the candidates' concerns over shirking because they could be subverted and did not apply to all types of fraud. The candidates' concerns were well-founded as shirking did occur, as evidenced by poll workers often arriving late or not at all to polling stations, by voters invalidating their ballots at higher rates in wealthy districts where a high payoff is needed to buy votes (Blaydes 2010), and by Egypt's exceptionally low level of voter turnout (Brownlee 2011).

Not only was the incentive to shirk modest in this period, but the potential for sanction was also low. In this period, only the Egyptian courts threatened to sanction the elections for malfeasance by invalidating the results of the elections in individual districts.[23] The courts had this authority because they were largely independent of the executive branch – a legacy of the French and English colonial rule (Lendrevie-Tournam 2008; Aziz 2016), and could not be removed from office without serious cause.[24] Invalidating the results was a consequential sanction for an individual candidate, but the courts only invalidated a small proportion of the districts where fraud occurred, and did not, therefore, pose much of a threat.[25] The fact that electoral fraud was conducted out in the open in this period is indicative of the candidates' lack of concern regarding this threat. In this period, poll workers openly stuffed ballot boxes, invalidated and discarded ballots for opposition candidates, allowed voters to vote where they were not permitted, and altered the final vote tallies. Voters, for their part, openly voted without prior identification papers, voted in the place of others (even persons of a different sex), accepted money to vote for certain candidates, and voted multiple times.

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[23]There were also laws punishing individuals for committing fraud or violence, but these laws were never enforced. See: Law Number 73 of 1956 on the Exercise of Political Rights (Chapter 4, Articles 39-51).

[24]Judges were not fully independent of the executive branch as the executive branch had authority over judges' appointments, transfers, and promotions (al-Khudayri 2008).

[25]For example, the *Mideast Mirror* (1995) report that 10 seats were invalidated in the 1995 elections. We do not know the basis on which the courts decided to invalidate the results due to the non-transparency of the regime.

Incentives for Electoral Violence with Judicial Supervision and Low or High Sanction Threat

Under the period of judicial supervision, the level of electoral violence surrounding the parliamentary elections was much higher and the level of fraud was reportedly lower. Judicial supervision, as Louay Abduleki writes, "merely led the regime to switch its manipulation techniques from direct interference in ballot counting and processing inside polling stations to blatant obstruction outside the stations" (Abdulbaki 2008, 456). Nathan J. Brown and Hesham Nasr concur, arguing that judicial supervision "simply moved electoral manipulation outside of the polling station, sometimes by just a few feet" (Brown and Nasr 2005, 3). Similarly, Tamir Moustafa writes that "the 2000 and 2005 elections were the cleanest on record inside polling stations, but the regime notoriously contained this development with increased repression outside of polling stations" (Moustafa 2011, para. 9). The level of violence was only high, though, in the 2000 elections and in the latter phases of the 2005 parliamentary elections when the threat of sanction was low. In the first phase phase of the 2005 elections, when the threat of sanction was high, the level of violence was low.

The judges made it much more difficult to commit electoral fraud, giving fraud agents more incentive to shirk, because they instructed poll workers to follow procedures designed to deter fraud, and also documented and reported publicly the abuses they observed (Bernard-Maugiron 2008).[26] The judges helped ensure the secrecy of the ballot, for example, by directing voters not to vote outside booths, arranging the polling booths to ensure voters' privacy, and instructing party agents not to enter polling booths with voters. In previous elections, the secrecy of the ballot was compromised because polling stations lacked adequate numbers of voting booths, because booths were missing privacy curtains and turned around so that voters could be observed casting their ballots, and because party members were allowed to follow voters into booths to observe their vote choices (Hendriks:1985; AlSawy 2005; HWMI 2005). Prior to the elections, candidates running for office would have expected the judges to make it more difficult to commit fraud because

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[26]The judges had more authority than most electoral monitors, which typically only document and report abuses.

the Judges' Club, a social club comprising 90% of all judges, had issued statements insisting on transparent elections and reforms to facilitate electoral competition, such as the removal of Egypt's state of emergency.(al-Khudayri 2008; Moustafa 2008*b*; Said 2008; Bernard-Maugiron 2008).[27]

Judges are also believed to have deterred fraud and induced shirking because of the high regard that they were held at the time. This regard was due to the fact that they were perceived as politically neutral, were largely independent of the executive branch at that time, and had used their judicial authority in the previous two decades to protect civil rights (al-Sayyed 2009; Aziz 2016).[28] The judges' own accounts of the elections suggest that they were aware of the esteem they were held in at the time and that this esteem provided incentives to shirk. In interviews, the judges related that poll workers expressed embarrassment and shame when asked why they committed fraud – evading the judges questions, hanging their heads down, averting the judges' eyes, crying, and running away (Nadi al-Qudah 2005). Judge Yussef Auf, who supervised the elections, believes that people who otherwise would have committed fraud did not even try because of "the trust and confidence that the public had in the judges, the desire that the public had for free and fair elections, and the belief that this was possible under the judges"[29]

While the judges made it more difficult to commit fraud, they did not make it impossible to commit fraud. Every polling station had only one judge (while some lacked judges completely due to shortages), and the judges were not trained or experienced in managing the polling stations and lacked enforcement power.[30] To circumvent the judges, the NDP's agents waited until the judges were not present or not paying attention to commit fraud. They instigated fights to distract the judges, cut the electricity to polling stations to obscure their activities, locked the judges out of

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[27]The government reportedly tried to ensure the judges' complicity by selecting judges that they believed would be more loyal to the regime (2000 only) and paying them a higher than normal salary to supervise the polls (Moustafa 2013, p. 169, Al-Khudayri 2008, p. 51). However, most judges were not (Bernard-Maugiron 2008; Aziz 2016, 148).

[28]Judges were prohibited by law from being members of political parties (Law 46 of 1972, Articles 72-77) and generally perceived as unbiased although some were thought to sympathize with the Muslim Brotherhood (Pioppi 2013, 3). They also did not benefit from any patronage that a NDP victory in their polling station would yield because they were not assigned to polling stations where they resided. Interview, Ossama Kamel, 17 September 2018.

[29]Judge Yussef Auf, Interview, 23 January 2019.

[30]On the training of judges, see: Interview, Ossama Kamel, 17 September 2018.

the polling stations, and put sleeping pills in the judges' drinks to incapacitate them (al-Sawy, Ali, Moussa and Ibrahim 2005). In order to vote more than once, voters scrubbed the indelible ink off their fingers and changed their clothes to look like a different person (al-Sawy, Ali, Moussa and Ibrahim 2005).

While judicial supervision increased the incentives of poll workers and voters to shirk, it did not increase the incentives of the police and baltageya to shirk since violence is overt. The violence around the 2000 and 2005 elections was witnessed not only by its victims, but also by others (e.g., voters, opposing candidates, judges, the media, and NGOs), and was widely reported on in the press and in NGO reports (Markaz al-Mahrousa 2008; NAHR 2005; EOHR 2005).[31] The police and baltageya did not appear to make any effort to hide their activities.[32] The police openly cordoned off polling stations and physically blocked opposition supporters from voting at polling stations, forcibly confiscated identification and registration cards to prevent people from voting, and assaulted people (e.g., candidates, voters, journalists, NGOs, and judges) in front of witnesses inside and outside the polling stations (Markaz al-Mahrousa 2008; NAHR 2005; EOHR 2005). With judges present at every polling station, the police did not try to evade the judges by changing the location of their activities either. Although the police did not generally try to hide the violence, they did try to deny responsibility for it, but without much success, claiming that the police were simply trying to maintain order (*Al Ahram* 2005).

Unlike in the case of fraud agents, there were no reports in this period of the police or baltageya shirking by not committing violence, accepting money from an opposition candidate to commit violence on their behalf, or demanding cash or other payments from candidates and their supporters in order not to assault them (Markaz al-Mahrousa 2008; NAHR 2005; EOHR 2005). When asked why political candidates used violence, not just fraud, to win elections under the Mubarak regime,

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[31]While the judges' jurisdiction did not apply to activities outside the polling stations, the judges were aware of the intimidation, harassment, and violence outside the polling stations and reported on it widely (Bernard-Maugiron 2008).

[32]One isolated report of the police trying to hide their activities describes the police as enacting a charade, by dressing up and threatening people, in order to appear to intervene to protect voters (*Agence France-Presse* 2005).

Mona Makram-Ebeid, a two-term member of parliament said, it is "because you can never be sure that your people did what they said."[33] While some police or baltageya may have shirked, the fact that there were no reports of these actors shirking suggests that any shirking was minimal.

In both the 2000 and 2005 elections, the courts had the authority to sanction candidates by overturning the results in particular districts, but as in the period outside judicial supervision, the courts posed little threat to the candidates because their likelihood of doing so was low. In the 2005 elections, the US also threatened to sanction the Egyptian government if the elections were not free and fair. Given Egypt's reliance on US foreign aid, this sanction posed a significant threat to the Egyptian government. As a result of this potential sanction, in an unusual move, the Egyptian government reportedly intervened in the elections, ordering the police not to use physical force at the polling stations, but only in the first phase of the 2005 elections. (ICEM 2005; Markaz al-Mahrousa 2008).[34] After the strong showing of the Muslim Brotherhood in the first phase of these elections, the Egyptian government reportedly rescinded its orders, and the subsequent phases of these elections were very violent.

The threat of a US sanction declined in the latter phases of the 2005 elections due to the Muslim Brotherhood's electoral success in the first round and the US's fear of a Muslim Brotherhood victory. The Egyptian government is said to have intentionally allowed the Muslim Brotherhood to compete more openly in the 2005 elections, and and not the secular opposition, in order to scare the US into reducing pressure on it to democratize (Gause III 2006, 64; Youmans 2016, 1225). Ultimately, the US government did not sanction Egypt due to the violence. The US government considered rescinding aid to Egypt, and passed a House resolution explicitly condemning the violence and overall quality of the elections, but did not in the end. The US even subsequently decreased its pressure on Egypt, reportedly fearing that open and competitive elections would empower Islamists (Youmans 2016).

[33]Interview, Mona Makram-Ebeid, 2 May 2019.
[34]The 2005 parliamentary elections took place in three phases, with different part of the country voting at different times.

Unlike the parliamentary elections, the 2005 presidential elections, which took place earlier, were not violent at all despite the fact that the judges also supervised these elections, and despite the fact that the stakes of the presidential elections were much higher than those of the parliamentary elections. However, there was little need to resort to violence in order to win this election because incumbent President Hosni Mubarak faced very weak competition. Mubarak faced little competition because the elections were announced only three weeks prior to the polling day and after voter registration had ended, and because independents were not able to run, preventing the Muslim Brotherhood from forwarding a candidate, among other things (IRI 2005b).[35] The lack of violence in these elections is also consistent with the predictions of our model that electoral monitoring will only increase the level of violence in situations in which candidates have a strong need to use either fraud or violence to win an election.

Alternative Explanations

We can rule out a number of potential alternative explanations for the increase in violence around the 2000 and 2005 elections. There were no other changes in the environment in which these elections took place that would have significantly altered the effectiveness of electoral fraud relative to violence. The government introduced no-so indelible ink and transparent boxes in these elections, but these materials only made it more difficult to commit fraud due to the judges' checking that the procedures around them were implemented properly. In 2005, international NGOs were permitted for the first and only time to observe activities outside the polling stations, but their numbers were too few to be consequential, and would not have affected activities inside the polling stations anyway.[36] There also was not clearly more young people willing to commit violence in

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[35]This is not the only difference between these elections. Fewer polling stations were supervised by judges in the presidential election than in the parliamentary elections since voting took place on a single day, making it easier to commit fraud in the presidential elections. The government was also able to bar 1,500 judges who were outwardly critical of the regime from supervising the presidential elections (CSCE 2006).

[36]The International Republican Institute delegation, for example, included 14 people across three cities (IRI 2005a). In the 2005 elections, Egyptian NGOs were also permitted to observe activities inside of polling stations, but they observed no more than 10% of all polling stations due to their small numbers and the lack of information about their

this period. Youth unemployment did not increase sharply prior to the 2000 and 2005 elections, and in fact was approximately 5 percentage points lower than in the previous elections in 1995.[37]

Although we can rule out these alternative explanations for the violence, we cannot fully rule out the possibility that the violent agents' lower likelihood to shirk was due, at least in part, to certain characteristics that they possessed. Violent agents did not have less incentive than fraud agents to shirk due to their relationship with the government. The police were part of the government apparatus and as public employees they benefitted from an overall NDP victory, but so did poll workers. Moreover, unlike poll workers and voters, the police did not benefit from any patronage that an NDP victory in the district that they worked on election day would yield because they were not permitted to work polling places where they lived or had family.[38] The baltageya were not part of the government apparatus and did not necessarily support the candidates on whose behalf they committed the violence (Boutaleb:2000; Markaz al-Mahrousa 2008; Dagher 2011).

The police and baltageya's training and discipline are unlikely to have contributed to their lower likelihood to shirk either. The Egyptian police were well-trained but they lacked discipline, as demonstrated by the high level of corruption among the police's lower ranks (Siegelbaum 2015). The baltageya lacked any training at all. However, the police and the baltageya did not engage in electoral violence in response to top-down orders from the Ministry of Interior, but rather in response to bribes by local candidates or government officials supporting them. Still, the police and baltageya's penchant for violence might have contributed to their lower likelihood to shirk. The police were known for their excessive use of force but the baltageya were responsible for the real brutality (*Guardian* 2011). Some baltageya were former prisoners, who committed violence in exchange for their release from prison and/or the expungement of their criminal records, although most baltageya are believed to have been unemployed and impoverished youth who committed

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authorities, among other reasons (ICEM 2005; IRI 2005a, 9-10).

[37] Youth unemployment pertains to persons aged 15-24 (% of total labor force). Source: World Development Indicators Online (World Bank 2014).

[38] Interview, Tewfick Aclimandos, 3 May 2019.

violence due to financial need (Boutaleb:2000; Markaz al-Mahrousa 2008; Dagher 2011).

Conclusion

Why political actors use violence to alter the outcome of an election when violence is much harder to hide than fraud and more likely to delegitimize elections as a result is puzzling. In this paper, we have offered one explanation for this phenomenon that takes into account the distinctions between fraud and violence and also accounts for other surprising aspects of electoral violence, such as its comorbidity with fraud, prevalence among incumbent governments, and occurrence in the presence of electoral monitors. Our analysis of pre-2011 Egypt lends strong support to our argument since the level of electoral violence in this period varied across elections according to the extent to which fraud agents had an incentive to shirk given the presence of judges in the polling stations and the potential sanctions candidates faced for manipulating elections.

Our findings are not unique to Egypt. In many authoritarian regimes and weakly democratic states, candidates are able to use both electoral violence and fraud in order to steal elections, and face little threat of being sanctioned for stealing them. The motivation of candidates to use violence due to the incentive of fraud agents to shirk given the more hidden nature of fraud is universal. In the Egypt case, the incentive to shirk increased as a result of judges who made it more difficult to commit fraud in ways very similar to monitors. Electoral monitors are commonplace today although the degree to which monitors are effective in reducing fraud varies across contexts (Hyde 2011). Still, electoral monitors are but one factor that increases the incentive of fraud agents to shirk and that can alter the incentive of political actors to use violence. Weak partisan ties, which are common in transitional elections, and intra-ethnic competition are others.

Our findings also have significant policy implications. Often it is assumed that strategies used to reduce fraud, such as electoral monitors, also reduce electoral violence. However, as our research demonstrates, this is not necessarily the case. While others have made this point regarding electoral monitors (Daxecker 2014; Asunka et al. 2017), we offer a different explanation for why

monitors have this effect, and we identify the conditions under which we expect this effect to oc-cur. Our results suggest that monitors increase violence relative to fraud when candidates face low to medium costs of sanction and are moderately or highly vulnerable electorally. Increased mon-itoring reduces fraud without increasing violence when the potential costs of sanction are high, and when fraud is either very effective or very ineffective. When the costs of sanction are high, increased monitoring may actually increase the prevalence of fraud when fraud is moderately effec-tive. Our findings, thus, underscore the importance of thinking through the incentives that different strategies designed to reduce electoral manipulation have on all types of malfeasance since strate-gies intended to discourage certain harmful activities may not necessarily produce more desirable changes in behavior.

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Appendix

Derivation of equilibrium regions. Figure 4 depicts the six possible equilibrium regions that were previously characterized and discussed in Section .[39] Much of our analysis was done in the text of the paper. Backwards inducting, the sanctioning body will always sanction when violence is observed, and will sanction when $c_f > c_S$ otherwise (derived in Equation 6). The fraud agent will work when $c_f \geq \frac{\kappa}{p_1 - p_o}$ (derived in Equation 2). The candidate may choose either no manipulation ($c_f = 0$ and $v = 0$), only violence ($c_f = 0$ and $v = 1$), a mixture of fraud and violence ($c_f > 0$ and $v = 1$), or only fraud ($c_f > 0$ and $v = 0$). In this final case fraud may incur sanction, it may be low enough to not trigger sanction, or it may be constrained (in the event that the candidate sets $c_f = c_S$). The optimal fraud wage in each of these three cases was derived in Equations 4, 6, and 12. Calculating the candidate's equilibrium strategy simply involves calculating his expected payoff in each of these six scenarios.

In what follows the following three values of p_1 (labeled p^a, p^b, and p^c) will be utilized. p^a is the point below which the candidate would prefer no manipulation to fraud, with

$$p^a = p_o + \sqrt{\frac{p_o}{w}}.$$

p^b is the point below which the candidate would prefer violence to a combination of violence and fraud, with
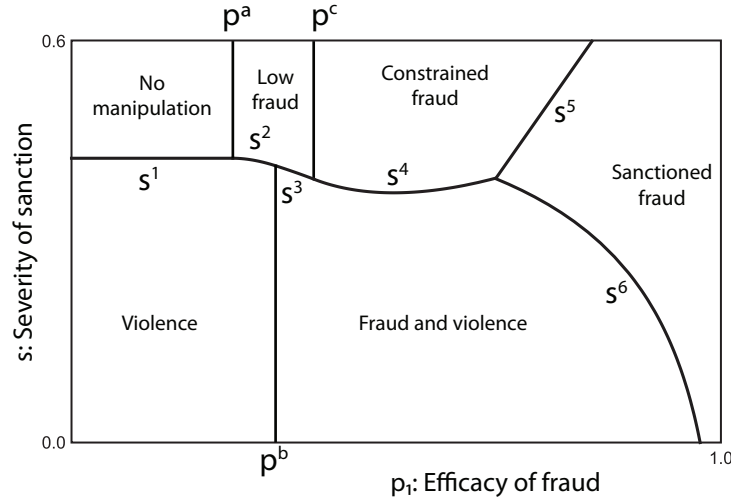
$$p^b = p_o + \frac{p_o}{\sqrt{p_o(w - w_v)}}.$$

p^a and p^b are calculated in Equations 4 and 12, respectively. p^c is the point above which the candidate's optimal fraud wage (in the absence of violence) will trigger sanction, or

$$p^c \text{ solves } c_f^*(p_1) = c_S(p_1).$$

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[39]Again, the parameter values used to generate the figure are $w = 2, p_o = .1, b = 1, c_v = .25$, and $w_v = .75$.

Figure 4: Six equilibrium regions with labeled cutpoints

c_f^* and c_S are defined in Equations 4 and 6. While we define p^c implicitly, it exists and is unique. To see this, note that $c_f^*(p_1)$ is increasing in p_1 for $p_1 > p_o$, and $c_S(p_1)$ is always decreasing in p_1. Thus, the equation has at most one solution. At $p_1 = p^a$, $c_f^* = 0$ and $c_S > 0$. As $p_1 \to \infty$, c_f^* approaches $\frac{w}{2}$ while c_S approaches zero. Thus, these functions cross once, at $p^c > p^a$. It should be noted that it may be the case that for certain combinations of parameter values $p^c > 1$; if so, there is no point at which sanction would be triggered.

We now characterize our equilibrium regions using these three cutpoints and Equations 7, 8, 9, and 11 (these equations respectively define the candidate's expected payoff for fraud without sanction, fraud with sanction, constrained fraud, and violence). All cutpoints and dividing lines are pictured in Figure 4.

No manipulation: When $p_1 \leq p^a$ fraud is never engaged in, as it is simply not effective enough to warrant a positive fraud wage. In this case, we can solve for

$$EU(c_f = 0, v = 0|\cdot) \geq EU(c_f = 0, v = 1|\cdot)$$

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to see that no manipulation is weakly preferred to violence when $s \geq w_v(1 - p_o) - c_v$. In Figure 4 we label

$$s^1 = w_v(1 - p_o) - c_v.$$

Violence: By the above logic, when $p_1 \leq p^a$ and $s < w_v(1 - p_o) - c_v$, the candidate engages in violence.

When $p_1 \in (p^a, p^b]$ the candidate will never engage in both fraud and violence, but may engage in fraud without violence or violence without fraud. If $p^b \leq p^c$ (as in Figure 4), the candidate's choice will depend on the s^2 that solves $EU(c_f^*, v = 0|\cdot) = EU(0, v = 1|\cdot)$, or

$$s^2 = w_v(1 - p_o) - c_v - \frac{\left(p_o - w(p_1 - p_o)^2\right)^2}{4(p_1 - p_o)^2},$$

a decreasing and concave function of p_1. When $s < s^2$, the candidate engages only in violence.

If $p^b \geq p^c$ the candidate's choice for $p_1 \in [p^c, p^b]$ will depend on the $s^{2\prime}$ that solves $EU(c^S, v = 0|\cdot) = EU(0, v = 1|\cdot)$, or

$$s^{2\prime} = w_v(1 - p_o) - c_v + \frac{p_o \left(w(p_1 - p_o)^2(bp_1 + p_o) - (b + 1)p_o p_1\right)}{(p_1 - p_o)(bp_1 + p_o)^2}.$$

When $s < s^{2\prime}$ the candidate engages only in violence.

Low fraud: By the above, when $p_1 \in (p^a, p^b]$, $p^b < p^c$ and s is above s^1, the candidate engages only in unconstrained fraud. If $p_1 \in (p^b, p^c]$, the candidate will also engage in low, unconstrained fraud when

$$EU(c_f^*, v = 0|\cdot) > EU(c_f^* > 0, v = 1|\cdot).$$

This holds when $s \geq s^3$, with

$$s^3 = \frac{1}{4}w_v \left(-2w(p_1 - p_o)^2 + w_v(p_1 - p_o)^2 - 2p_o + 4\right) - c_v.$$

Constrained fraud / Violence and fraud / Sanctioned fraud: Finally, when $p_1 > \max\{p^b, p^c\}$ the candidate chooses between constrained fraud, sanctioned fraud, and a mixture of violence and fraud. The candidate weakly prefers constrained fraud to a mixture of violence and fraud when $s \geq s^4$, where s^4 solves:

$$EU_c(c_S, v = 0|\cdot) = EU_c(c^*_{f,v=1}, v = 1|\cdot).$$

The candidate weakly prefers constrained fraud to fraud with sanction when $s \geq s^5$, where s^5 solves:

$$EU_c(c_S, v = 0|\cdot) = EU_c(c^*_{f,v=0,s>0}, v = 0|\cdot).$$

And the candidate prefers fraud with sanction to violence when $s \geq s^6$, where s^6 solves:

$$EU_c(c^*_{f,v=0,s>0}, v = 0|\cdot) = EU_c(c^*_{f,v=1}, v = 1|\cdot).$$

While the equations characterizing these cutpoints aren't particularly illuminating (to us), we include them for completeness:

$$s^4 = \frac{1}{4(p_o - p_1)^2}\Bigg(-\frac{4(b+1)p_o p_1(p_o - p_1)(w(p_o - p_1)(bp_1 + p_o) + p_o)}{(bp_1 + p_o)^2}$$

$$-4c_v p_o^2 + 8c_v p_o p_1 - 4c_v p_1^2 + p_o^4(w - w_v)^2 - 2p_o^3(w - w_v)(2p_1(w - w_v) - 1)$$

$$+2p_o^2 p_1(w - w_v)(3p_1(w - w_v) - 2) + 4p_o^2 w_v + p_o^2$$

$$-2p_o p_1^2(w - w_v)(2p_1(w - w_v) - 1)$$

$$-8p_o p_1 w_v + p_1^4(w - w_v)^2 + 4p_1^2 w_v\Bigg).$$

$$s^5 = w - \frac{2\sqrt{\frac{(b+1)p_o p_1(p_1 - p_o)^3(w(p_1 - p_o)(bp_1 + p_o) - p_o)}{(bp_1 + p_o)^2}} + p_o^2 - p_o p_1}{(p_1 - p_o)^3}.$$

$$s^6 = \frac{1}{(p_o - p_1)^4}\Bigg((p_o - p_1)^2(w(p_o - p_1)^2 + p_o - 2)$$

$$+\Big((p_o - p_1)^4(p_o^2(-4c_v + 6p_1^2 w^2 - 4w(3p_1^2 w_v + p_1 + 1)$$

$$+2w_v(p_1(3p_1 w_v + 2) + 2) + 1) + 8c_v p_o p_1 - 4c_v p_1^2 + p_o^4(w - w_v)^2$$

$$-2p_o^3(w - w_v)(2p_1(w - w_v) - 1)$$

$$-2p_o(2p_1(w - w_v) - 1)(p_1^2(w - w_v) - 2) + (p_1^2(w - w_v) - 2)^2)\Big)^{\frac{1}{2}}\Bigg).$$

To summarize: When $s^5 \geq s^6$ the candidate engages in **fraud with sanction** for $s \in [s^6, s^5)$, **constrained fraud** for $s \geq s^5$, and a mixture of **violence and fraud** for $s < s^6$.

When $s^5 < s^6$ the candidate engages in **constrained fraud** for $s \geq s^4$ and a mixture of **violence and fraud** for $s < s^4$. □

Proof of Proposition 1. *The effect of increased electoral monitoring (a reduction in p_1) on the prevalence of fraud is conditional on the magnitude of sanction, s.*

The prevalence of fraud, $\tau^*(c_f)$, is the equilibrium fraction of potential fraud agents choosing to commit fraud. By Equation 3, we know that

$$\tau^*(c_f) = c_f(p_1 - p_o).$$

In our six equilibrium regions we can use the equilibrium fraud wage c_f^* to calculate the equilibrium prevalence of fraud, $\tau^*(c_f)$:

- No manipulation: $\tau^*(c_f) = 0$ (by definition),

- Violence: $\tau^*(c_f) = 0$ (by definition),

- Low fraud: $\tau^*(c_f) = \frac{p_1 - p_o}{2}(w - \frac{p_o}{(p_1 - p_o)^2})$ (by Equation 4),

- Constrained fraud: $\tau^*(c_f) = \frac{p_o}{p_o + b p_1}$ (by Equation 6),

- Sanctioned fraud: $\tau^*(c_f) = \frac{p_1 - p_o}{2}(w - s - \frac{p_o}{(p_1 - p_o)^2})$ (by Equation 10),

- Fraud with violence: $\tau^*(c_f) = \frac{p_1 - p_o}{2}(w - w_v - \frac{p_o}{(p_1 - p_o)^2})$ (by Equation 12).

It is clear that τ^* is flat or increasing in p_1 for every equilibrium region other than constrained fraud; when fraud is constrained, τ^* is decreasing in p_1. We now prove the proposition's three claims in turn.

When s low, increased monitoring always weakly reduces the prevalence of fraud. However, as monitoring becomes increasingly effective, the candidate substitutes violence for fraud.

By our derivation above, when $s < \min\{s^1, s^4, s^5\}$ the candidate will never engage in constrained fraud, and always prefers violence to no manipulation. Thus, increased monitoring (a reduction in

p_1) will always lead to a weak reduction in the prevalence of fraud, τ^*. Solving

$$EU_c(c^*_{f,v=0,s>0}, v=0|\cdot) = EU_c(c^*_{f,v=1}, v=1|\cdot)$$

for p_1, we get that violence is preferred to fraud with sanction when

$$p_1 < p_o + \frac{\sqrt{2}((p_o-2)(s-w_v)-2c_v)}{\sqrt{(s-w_v)(s-2w+w_v)((p_o-2)(s-w_v)-2c_v)}}.$$

Thus, if monitoring reduces the efficacy of fraud below this level, the candidate will choose to engage in violence. For $p_1 < p^b$ (defined in the previous section) the candidate will engage solely in violence.

When s is high, violence is not observed and monitoring has an ambiguous effect on the prevalence of fraud. Increased monitoring reduces fraud when fraud is either highly effective or highly ineffective. For moderate levels of effectiveness, increased monitoring may increase the prevalence of fraud.

Using our derivations above, when $s \geq \max\{s^1, s^2, s^3, s^4, s^6\}$ violence is never engaged in. An increase in monitoring will reduce fraud in the event that the candidate is engaging in fraud with sanction or low fraud, by the τ^* defined above. If the candidate is engaging in constrained fraud, a reduction in p_1 to any $p'_1 \geq p^c$ will increase the equilibrium prevalence of fraud.

For moderate s, the effect of increased monitoring is ambiguous on both the candidate's use of violence and the prevalence of fraud.

This is proven by example, for the parameter values used to generate Figures 1 and 4. When $w = 2, c_v = .25, p_o = .1, b = 1, w_v = .75$, and when $s = .38$, then starting at $p_1 = 1$ the candidate

engages in only fraud (with sanction) until monitoring reduces p_1 to $p_1 = .718$. Then the candidate engages in both fraud and violence for $p_1 \in (.627, .718)$. When $p_1 \leq .627$, the candidate engages in constrained fraud for $p_1 \geq .481$. For $p_1 < .481$ the candidate always engages in violence, resorting to the sole use of violence when $p_1 \leq .382$. As monitoring reduces p_1 from 1 to zero, fraud decreases ($p_1 \in (.627, 1)$), then increases ($p_1 \in (.481, .627)$), then decreases ($p_1 \in (.382, .481)$), and finally goes to zero ($p_1 \leq .382$). $\square$

Corollary 1. *When baseline electoral strength is sufficiently high, the candidate will never engage in electoral manipulation.*

Using the previous characterization of our equilibrium regions, when $s \geq s^1$ and when $p_1 \leq p^a$ the candidate chooses no manipulation. Therefore, the candidate will not manipulate when $p^a \geq 1$ and $s^1 \leq 0$. We can rewrite these conditions as $p_o + \sqrt{\frac{p_o}{w}} \geq 1$ and $w_v(1 - p_o) - c_v \leq 0$. Thus, when $p_o \geq \max\left(1 - \frac{c_v}{w}, 1 + \frac{1 - \sqrt{1+4w^2}}{2w^2}\right)$ the candidate will choose no manipulation. It is straightforward to show that $\max\left(1 - \frac{c_v}{w}, 1 + \frac{1 - \sqrt{1+4w^2}}{2w^2}\right)$ is strictly less than 1. $\square$