Appendix B (for publication online): A Model with Candidate Skill

In this appendix we extend the baseline model to consider how variation in politician skill affects the results. Let a politician's skill level $\xi \in \{0, 1\}$ be the politician's private information, with $\Pr[\xi = 1] = \kappa \in [0, 1]$ denoting the common knowledge prior belief that a randomly selected candidate is high skilled. Thus, the incumbent is now privately informed of the triple (t, ω, ξ): his or her type t (honest or corrupt), the state of the world ω (affecting likelihood of disaster), and his or her skill ξ. The incumbent's strategy space is modified accordingly. As in the baseline model, the voter observes (x, y, z): the level of prevention spending, the occurrence (or not) of a disaster, and the level of relief spending. Let β_t and β_ξ denote the voter's posterior beliefs on corruption and skill respectively.

We consider two alternatives for the influence of skill: on prevention spending, and on relief spending. Though there are interesting wrinkles in both cases, the key result of the baseline model continues to hold: prevention is prevented by the incumbent's incentive for reelection.

Skill Affects Effectiveness of Relief Spending. Suppose that for a given choice of relief spending z, the *effective relief* delivered to voters is $\zeta = \xi z$. That is, high skilled politicians implement their chosen level of relief perfectly, and low skilled politicians do not implement it at all. Voter utility (equation 1) is modified accordingly to include ζ, not simply z itself.

Suppose also that the voter's period 2 utility is $(1-t)\xi$: skill is beneficial, provided the incumbent is honest. If the incumbent is corrupt, their skill will not be used for the voter's benefit, so does not receive positive weight in utility. Conversely, honesty is only beneficial provided the incumbent is skilled: a well meaning but incompetent representative is not much good. This means, in particular, that if V retains the prior belief about t, then

period 2 utility is increasing in ξ.

Lemma 1 requires slight modification, since I's type space is now (t, ξ). For brevity we consider only the key change in the lemma.

Lemma 6 *If $\beta_t = \pi$, then V reelects if and only if $\beta_\xi \geq \kappa$. If $\beta_\xi = \kappa$, then V reelects if and only if $\beta_t \leq \pi$.*

That is, if V obtains no information about corruption, then reelection is driven entirely by beliefs about skill. This holds because the expected utility of reelecting the incumbent is $(1 - \beta_t)\beta_\xi$, and the expected utility of electing the challenger is $(1 - \pi)\kappa$.

The central point of the baseline model continues to hold with this extension, which we show in two steps.

Step (i). First, the "preventing prevention" equilibrium continues to exist. Specifically, there is a PBE such that:

- All incumbents choose $x = 0$.
- High skilled incumbents choose $z > 0$; low skilled incumbents choose $z = 0$.
- V believes $\beta_t = 1$ after $x = 1$, $\beta_t = \pi$ after $x = 0$.
- V believes $\beta_\xi = 0$ after $y = 1, z = 0$; $\beta_\xi = 1$ after $y = 1, z = 1$; and $\beta_\xi = \kappa$ after $y = 0$.
- V reelects I for $(x, y, z) = (0, 0, 0)$ or $(0, 1, 1)$, and elects the challenger otherwise.

In this PBE, incumbents never pursue prevention, and incumbents enact relief conditional on disaster if and only if they are high skilled. As in the baseline model, voters assume that enacting prevention is bad news about corruption, while foregoing it is neutral. Further, voters assume that enacting relief is good news about skill, while foregoing it is bad news.

Given these strategies, if no disaster occurs ($y = 0$), there is no opportunity for V to gauge the incumbent's skill in post-disaster relief, and all incumbents are reelected. If $y = 1$, voters will observe relief $\zeta = z$ if $\xi = 1$, and $\zeta = 0$ if $\xi = 0$. The delivery of relief spending serves as a perfect signal of the incumbent's skill level, that is, $\beta_\xi = \xi$. Unskilled incumbents have no incentive to choose $z > 0$ instead of $z = 0$: their lack of skill is revealed, and they lose reelection, in either case. However, given $(y, z) = (1, 1)$, the voter has no information about the incumbent's honesty in equilibrium—and no basis to update the prior on t. Thus, by lemma 6, conditional on $y = 1$, the incumbent is reelected if and only if $\zeta > 0$.

With respect to prevention spending, the fundamental dilemma from the baseline model continues to hold: corrupt incumbents (high or low skilled) have an incentive to claim $\omega = 1$ when it is really 0, and the voter cannot identify this misrepresentation. Low skilled types (both honest and corrupt) may seem to have an incentive to enact prevention programs. These types realize that if a disaster occurs, they will be revealed as low skilled by their failure to deliver effective relief. Therefore, it may seem that they prefer disaster prevention because it helps to conceal their ineptitude in disaster relief. But voter pessimism off the equilibrium path implies that, as in the baseline model, prevention spending leads to sure electoral defeat. Given strong career concerns, this neutralizes the low skilled incumbent's incentive to enact prevention programs. In equilibrium, these types are better off taking their chances that a disaster does not materialize even without a prevention program.

Overall, this PBE does allow V to select politicians on the basis of skill in delivering relief. But it does not eliminate pathological incentives of corrupt incumbents to misrepresent the need for prevention.

Step (ii). Second, there is no equilibrium in which prevention is enacted if and only if $\omega = 1$, which is the efficient prevention policy for voters. The logic from the baseline model is unchanged: if there were such an equilibrium,

then $x = 1$ would not be bad news about the incumbent's corruption, and would meet with reelection. But then corrupt incumbents would deviate and enact $x = 1$ when $\omega = 0$.

In short, with this version of candidate skill, there is no PBE in which prevention policy is efficient, and preventing prevention is still a PBE. In the preventing prevention equilibrium, relief spending continues to be efficient, though now it is only enacted by skilled types. This allows the voter to select on candidate skill, but not to eliminate the corrupt type's deleterious incentive to overstate the need for prevention. We conclude that extending the model to include incumbent skill in disaster relief does not eliminate the strategic problem of preventing prevention.

Skill Affects Effectiveness of Prevention Spending. Suppose (as above) that the voter's period 2 utility is $(1 - t)\xi$. Suppose also that prevention spending costs c_x no matter which type implements it, but it is effective in preventing disaster only if implemented by a high skill incumbent. Specifically, extend the model presented in the body of the article by conditioning the probability of the disaster occurring on the prevention policy x, the state of nature ω, and the incumbent's skill, ξ, as follows:

$$p(x, \omega|\xi) \quad = \quad p(\xi \cdot x, \omega).$$

Thus, for a low-skill incumbent ($\xi = 0$), prevention spending is ineffective. Accordingly, the voter's first best policy is $x = 1$ if and only if (i) $\omega = 1$ (disaster sufficiently likely), *and* (ii) $\xi = 1$ (high skill incumbent).

As in the baseline model, corrupt incumbents ($t = 1$), of any skill level, wish to enact prevention programs even when $\omega = 0$. Now, however, the sincere preference of honest but low skill incumbents is to avoid prevention even when $\omega = 1$: it imposes a cost on the voter, which the incumbent partially internalizes (through the parameter α), but confers no benefit. Moreover, the inefficacy of prevention spending by the unskilled honest type implies

that $x = 1$ only runs the risk of revealing this type's low skill level. Thus, there is even less incentive for honest types (on average) to enact prevention programs than in the baseline model.

We proceed by the same two steps as in the case where skill affects relief.

Step (i). First, the "preventing prevention" equilibrium continues to hold: all types (t, ξ) choose $x = 0$ and lose reelection after deviating to $x = 1$.

- If V interprets $x = 0$ as uninformative and $x = 1$ as a signal of $t = 1$, then given w, even a skilled, honest politician is better off choosing $x = 0$. As noted, an unskilled, honest type obtains strictly lower utility from $x = 1$, and so also prefers $x = 0$.

- If V observes a signal implying $\beta_t = 1$, then the expected utility of reelecting the incumbent is 0. The expected utility of electing the challenger is $(1 - \pi)\kappa$. Thus, if the incumbent is surely corrupt, then electing the challenger is clearly optimal.

- Since all types pool on $x = 0$, V's beliefs that $\beta_t = \pi$ and $\beta_\xi = \kappa$ in this case are validated.

Step (ii). The principal remaining question is whether there is a partially separating equilibrium such that $x = \omega$ for some subset of the $\xi = 1$ types, and $x = 0$ for the remaining types. Such an equilibrium entails prevention only if it is beneficial to voters—the incumbent is skilled, and a disaster is likely. There are two possibilities.

1. $x = \omega$ for $(t, \xi) = (0, 1)$, and $x = 0$ otherwise (i.e., only skilled, honest types ever enact prevention). If this were an equilibrium, then $\beta_t = 0$ and $\beta_\xi = 1$ after $x = 1$, and $\beta_t > \pi$ after $x = 0$. Then V would reelect after $x = 1$, and corrupt types would deviate to $x = 1$.

2. $x = \omega$ for $\xi = 1$ and $x = 0$ for $\xi = 0$ (i.e., only skilled types ever enact prevention). If this were an equilibrium, then x is uninformative about

honesty. Thus, by lemma 6, V would reelect for both $x = 1$ and $x = 0$. Then types $t = 1$ would deviate to $x = 1$ for all ω.

In short, when skill affects the efficacy of prevention in this way, there is no equilibrium in which only skilled types enact prevention only when the state of nature prescribes it. But the "preventing prevention" equilibrium continues to exist. Considering prevention as an opportunity to demonstrate skill and allowing voters to select on it does not eliminate the pathological incentives for prevention policy, or generate an equilibrium in which voters obtain efficient prevention. We conclude that extending the model to include incumbent skill in disaster prevention does not eliminate the strategic problem of preventing prevention.

Appendix C (for publication online): Politician's Value of Office Correlated with Type

In this appendix we extend the baseline model to allow for correlation between a politician's value of holding office w and his or her type t. This is to explore the possibility that corrupt politicians obtain greater value from holding office in general, due to opportunities for graft. Suppose in particular that the value of holding office is w_t for type $t \in \{0, 1\}$, and $w_1 > w_0$. It is convenient to denote $w^* \equiv 1 + \alpha(1 - c_z - c_x)$. This is the threshold on career concerns for incumbents required for propositions 2 - 4, the key results of the paper. Qualitatively, there are three cases to consider.

Case *i*: $w_1 > w_0 > w^*$. In this case, although the honest and corrupt incumbents have different reelection motives, they are relatively strong for both—in particular, strong enough to effect current-period policy decisions to secure reelection. Then although the reelection benefits are correlated with type, the proofs of all preceding propositions hold without modification.

Case *ii*: $w_1 > w^* > w_0$. In this case, the honest politician no longer values reelection enough to alter first period policy choices. This has a significant effect on the equilibrium. "Preventing prevention" no longer occurs: the honest type would deviate from such a strategy profile, enacting prevention in period 1 if and only if it is efficient. That is, the honest type sets $x = \omega$ in this case. The reason is that the relatively small w_0 is outweighed by the benefits to the honest type of getting policy "right."

There is a semi-separating equilibrium in this case in which prevention is pursued with positive probability, but leads to (probabilistic) electoral punishment.

Proposition 7 *Suppose that $w_1 > 1 + \alpha(1 - c_z - c_x) > w_0$ and $\phi > 0$. The following strategy-belief profile, $(\sigma_I^*, \sigma_V^*, \beta^*)$, is a perfect Bayesian equilibrium*

with beliefs satisfying the D1 refinement:

$$\begin{aligned}
\sigma_I^{x*}(t,\omega) &= \omega \\
\sigma_I^{z*}(t,\omega,x,y) &= y \text{ for all } (t,\omega,x) \in T \times \Omega \times X, \\
\sigma_V^*(x,y,z) &= \begin{cases} 1 & \text{if } x=0 \text{ and } y=z, \\ \rho^* & \text{if } x=1 \text{ and } y=z, \\ 0 & \text{otherwise,} \end{cases} \\
\beta^*(x,y,z) &= \pi.
\end{aligned}$$

Proof: Given the incumbents' strategy, the voter's beliefs (which we denote by $\beta(x,y) \equiv \Pr[t=1|x,y]$) along the equilibrium path of play are exactly defined and satisfy $\beta^*(x,y,z) = \pi$, as claimed. Thus, the voter's strategy is sequentially rational. The distinction between this and the baseline case considered in the body of the article is that the voter must reelect any incumbent who engages in prevention-spending with a probability less than one: otherwise, the incumbent with type $t=1$ would strictly prefer to engage in prevention spending after $\omega = 0$.

Given the voter's strategy, σ_V^*, the incumbent's expected payoffs from $x=1$ and $x=0$, given $t=1$ and $\omega=0$, are

$$\begin{aligned}
u_I(x=0|t=1,\omega=0) &= -\alpha(p(0,0)(1-c_z)) + w_1, \\
u_I(x=1|t=1,\omega=0) &= 1 - \alpha(p(1,0)(1-c_z)+c_x) + w_1\rho^*,
\end{aligned}$$

so choosing $x=0$ is a best response, given σ_V^*, so long as

$$\begin{aligned}
-\alpha(p(0,0)(1-c_z)) + w_1 &\geq 1 - \alpha(p(1,0)(1-c_z)+c_x) + w_1\rho^*, \\
\alpha(p(1,0)(1-c_z)+c_x) - \alpha(p(0,0)(1-c_z)) + w_1 &\geq 1 + w\rho^*, \\
\alpha((p(1,0)-p(0,0))(1-c_z)+c_x) + w_1 &\geq 1 + w\rho^*, \\
\alpha(c_x - (p(0,0)-p(1,0))(1-c_z)) + w_1 - 1 &\geq \rho^*.
\end{aligned}$$

Letting $\eta_\omega \equiv p(0,\omega) - p(1,\omega)$ denote the effectiveness of prevention spending conditional on ω,[15] and letting $B \equiv w_1 - 1 > 0$ denote the net benefit of reelection over the direct benefit from prevention spending as enjoyed by a corrupt ($t = 1$) incumbent, this can be rewritten as

$$\rho^* \leq \alpha(c_x - \eta_0(1 - c_z)) + B. \tag{4}$$

Checking the incentive compatibility condition for the corrupt ($t = 1$) incumbent when $\omega = 1$ yields

$$\rho^* = \alpha(c_x - \eta_1(1 - c_z)) + B. \tag{5}$$

The supposition that prevention spending is more effective when risk is high ($\omega = 1$) than when it is not ($\omega = 0$), as presented in (2) in the body of the article, implies that any ρ^* satisfying Equation (5) must satisfy Inequality (4). Accordingly, the unique value of ρ^* satisfying Equation (5) yields a perfect Bayesian equilibrium. The beliefs, β^* satisfy the D1 refinement because all paths of play (other than $y \neq z$) are assigned positive probability given the strategies of the players. ∎

Note that, while the equilibrium presented in Proposition 7 does involve prevention spending occurring, it also involves prevention spending resulting in a lower reelection probability for the incumbent. The honest types pursue prevention spending because they do not care enough about reelection, even facing certain electoral defeat, to incur the "social costs" of inefficient policy. This induces the corrupt types, when prevention spending is efficient, to also pursue the efficient policy. However, if the voter were to countenance this spending behavior with deference (*i.e.*, "trust the incumbent"), then corrupt types would also pursue prevention spending when it is inefficient. Accordingly, the voter must appear to "punish" policies *that he or she knows are efficient* because to do otherwise would lead to adverse selection.

[15] Recall that $p(x,\omega)$ denotes the probability of $y = 1$, conditional on x and ω.

While this equilibrium offers a further "rationalization" of empirical evidence that voters might punish efficient policies, it does not have the same match with empirical evidence from the behavior literature as the baseline model in the paper. There are two reasons for this. First, prevention is pursued with positive probability in equilibrium; qualitatively, this is a poor match for the empirical evidence (e.g. Healy and Malhotra 2009). Second, this equilibrium relies on relatively low values of office holding for politicians. If there is one central finding in the empirical literature on elections, it is that reelection motives are extremely strong for all politicians. And, since winning reelection is generally easier than winning office the first time, it is not easy to see why the reelection motive would be so low for a politician that took the trouble to run for office in the first place.

Case *iii*: $w^* > w_1 > w_0$. In this case, reelection motives are relatively low for all politicians. While empirically suspect, we include this case for completeness. The key point is that proposition 2 no longer holds, and there is a semi-separating PBE. In particular, both honest and corrupt types simply follow their short-term interest. Corrupt types enact prevention for all states of nature, i.e. $x = 1$ for all ω, while honest types enact the efficient policy, $x = \omega$. Given these strategies, observing $x = 1$ is bad news about corruption, while $x = 0$ is good news. Accordingly, incumbents are reelected if and only if they do not enact prevention; they are defeated if they do. Thus, only honest types are ever reelected, and even then only if $\omega = 0$ in period 1. As with Case *ii*, while this equilibrium involves positive prevention spending, it also involves voters punishing prevention spending and rewarding a lack of prevention spending followed by relief spending.