

# INFORMATIVENESS AND THE INCUMBENCY ADVANTAGE

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April 22, 2017

# THE INCUMBENCY ADVANTAGE

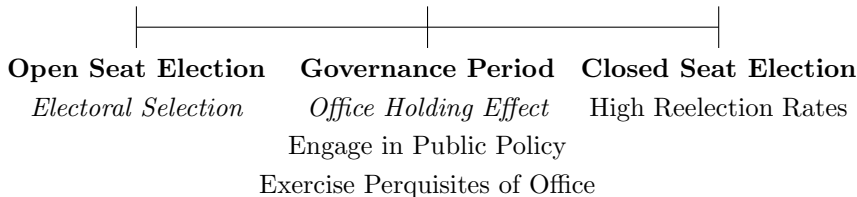
Following Erickson (1971), a large literature has studied high incumbent reelection rates

The worry is that these rates indicate normative trouble

*Whenever the resources of public office are used to insulate individual politicians from electoral risk, their accountability to their constituents is weakened.... Thus, insulation from electoral risk of the kind suspected would, at a single stroke, debilitate the two fundamental accountability relationships of a democratic system of government.*

—Cox and Katz (2002)

# A PICTURE OF THE LITERATURE



Recent empirical work tries to isolate office holding effect

- ▶ Argues this is the normatively troubling part

# OUR INTERVENTION IN THE ARGUMENT

We emphasize a new mechanism that operates during the governance period

- ▶ Governance outcomes are correlated with Incumbent's type
- ▶ Suppose incumbent and challenger are ex-ante identical
- ▶ Difference in informativeness leads to incumbency effect on reelection

Key finding is that incumbency effect and voter welfare can be positively related

## RELATED LITERATURE

Many, many papers estimate the incumbency advantage

- ▶ Recent empirical wave initiated by Lee (2008)
- ▶ Follow-ups: Linden (2004), Fowler and Hall (2014), Klasnja and Titiunik (2016), ...
- ▶ Eggers (2016) critiques the identification

Closely related theoretical papers:

- ▶ Caselli, Cunningham, Morelli, and Moreno de Barreda (2013)
- ▶ Ashworth, Bueno de Mesquita, and Friedenbergh (2017)

## AN EXAMPLE

2 candidates: Incumbent and Challenger

- ▶ Each has type  $\theta \in \{\underline{\theta}, \bar{\theta}\}$
- ▶ Same prior for each:  $\Pr(\theta = \bar{\theta}) = \pi \in (0, 1)$

In each of 2 periods, governance outcome depends on type of politician in power and mean-zero normal noise:

- ▶  $g_t = \theta_t + \epsilon_t$

Between the governance periods, Voter retains Incumbent or replaces with Challenger

- ▶ Observes  $g_1$ , but not  $\theta_1$  or  $\epsilon_1$
- ▶ Payoff is  $g_1 + g_2$

## SOLVING THE EXAMPLE

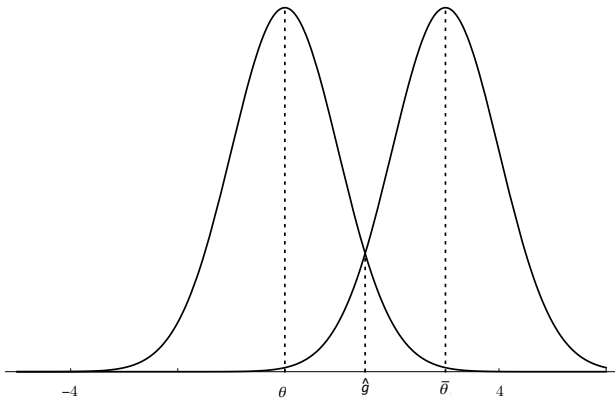
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Reelect iff  $g_1 \geq \hat{g} = \frac{(\bar{\theta} + \theta)}{2}$

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# INCUMBENT'S WIN PROBABILITY

Hypothesis testing interpretation:

- ▶  $H_0 = \{\theta_I = \bar{\theta}\}$  vs.  $H_1 = \{\theta_I = \underline{\theta}\}$
- ▶ Rejecting the null = replacing the Incumbent
- ▶ Type I error: replace high type Incumbent (prob  $\alpha$ )
- ▶ Type II error: retain low type Incumbent (prob  $\beta$ )
- ▶ Symmetry of Normal pdf  $\Rightarrow \alpha = \beta$

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Incumbent is reelected if:

- ▶  $\theta_I = \bar{\theta}$  and no Type I error
- ▶  $\theta_I = \underline{\theta}$  and Type II error

$$\Pr(\text{Reelect Incumbent}) = \pi(1 - \alpha) + (1 - \pi)\beta$$

# THE INCUMBENCY EFFECT

The **incumbency effect** is  $\Pr(\text{reelect incumbent}) - \frac{1}{2}$

Since  $\alpha = \beta$ , incumbency effect is

$$\begin{aligned}\mathcal{IE} &= \pi(1 - \alpha) + (1 - \pi)\alpha - \frac{1}{2} \\ &= \left(\pi - \frac{1}{2}\right)(1 - 2\alpha)\end{aligned}$$

- ▶ Positive iff  $\pi > \frac{1}{2}$
- ▶ Decreasing in probability of error

# A MORE GENERAL MODEL

Now suppose  $g = f(a, \theta) + \epsilon$  where

- ▶  $a \in A$ , a closed subset of  $\mathbb{R}_+$  with smallest element  $\underline{a}$
- ▶  $f$  strictly increasing in  $a$  and  $\theta$
- ▶  $\epsilon$  has symmetric density  $\phi$  whose likelihood ratio is onto  $\mathbb{R}_+$  with strictly positive derivative ( $\Rightarrow$  MLRP)

Politician in office gets payoff  $B - c(a)$

- ▶  $c$  is strictly increasing
- ▶  $B > c(\underline{a})$

Symmetric uncertainty about  $\theta$

# COMPLEMENTS VS SUBSTITUTES

Effort and type are **complements** if, for any  $a_{**} > a_*$ ,

$$f(a_{**}, \bar{\theta}) - f(a_{**}, \underline{\theta}) \geq f(a_*, \bar{\theta}) - f(a_*, \underline{\theta})$$

- ▶ eg,  $f(a, \theta) = a\theta$

Effort and type are **substitutes** if, for any  $a_{**} > a_*$ ,

$$f(a_*, \bar{\theta}) - f(a_*, \underline{\theta}) \geq f(a_{**}, \bar{\theta}) - f(a_{**}, \underline{\theta})$$

- ▶ eg,  $f(a, \theta) = \sqrt{a + \theta}$

# VOTER BEHAVIOR

Suppose Voter expects effort  $a^*$

Voter reelects Incumbent iff  $\frac{\phi(g-\bar{\theta})}{\phi(g-\underline{\theta})} \geq 1$ , or

$$g \geq \hat{g}(a^*) \equiv \frac{f(a^*, \bar{\theta}) + f(a^*, \underline{\theta})}{2}$$

# EQUILIBRIUM EFFORT

If Incumbent actually chooses effort  $a$ , reelection probability is

$$\begin{aligned}\Pr(a|a_*) &= \pi [1 - \Phi(\hat{g}(a_*) - f(a, \bar{\theta}))] \\ &\quad + (1 - \pi) [1 - \Phi(\hat{g}(a_*) - f(a, \underline{\theta}))]\end{aligned}$$

There is a pure-strategy equilibrium with effort level  $a_*$  iff

$$B \Pr(a_*|a_*) - c(a_*) \geq B \Pr(a|a_*) - c(a)$$

for all  $a \in A$ .

# A COMPARATIVE STATIC

## PROPOSITION

*Suppose that:*

- ▶  $A = \mathbb{R}_+$ ;
- ▶  $f$  is concave and differentiable in  $a$ , with  $\frac{\partial f}{\partial a} > 0$ ; and
- ▶  $c$  is strictly convex and differentiable, with  $c'(0) = 0$  and  $\lim_{a \rightarrow \infty} c'(a) = \infty$ .
- ▶ (Plus a technical condition.)

*Fix  $B > B'$ . If  $a_H(B)$  and  $a_H(B')$  are the largest equilibrium efforts at  $B$  and  $B'$ , respectively, then*

$$a_H(B) > a_H(B')$$



# HYPOTHESIS TESTING REDUX

Probability of Type I error:

$$\alpha(a_*) \equiv \Pr(f(a_*, \bar{\theta}) + \epsilon_1 < \hat{g}(a_*)) = \Phi \left( -\frac{f(a_*, \bar{\theta}) - f(a_*, \underline{\theta})}{2} \right)$$

Probability of Type II error:

$$\beta(a_*) \equiv \Pr(f(a_*, \underline{\theta}) + \epsilon_1 \geq \hat{g}(a_*)) = 1 - \Phi \left( \frac{f(a_*, \bar{\theta}) - f(a_*, \underline{\theta})}{2} \right)$$

- Symmetry of  $\phi$  implies  $\alpha(a_*) = \beta(a_*)$

# INFORMATIVENESS

Both error probabilities are decreasing in

$$\iota(a_*) \equiv \frac{f(a_*, \bar{\theta}) - f(a_*, \underline{\theta})}{2}$$

Interpret by thinking of  $g$  as outcome of an experiment informative about  $\theta$ —different actions induce different experiments

## PROPOSITION (ABF 2017)

*The experiment induced by  $a_*$  is Blackwell more informative than the experiment induced by  $a_{**}$  if and only if  $\iota(a_*) > \iota(a_{**})$*

# THE INCUMBENCY EFFECT

The **incumbency effect** is  $\Pr(\text{reelect incumbent}) - \frac{1}{2}$

$$\begin{aligned}\mathcal{IE}(a_*) &= \pi(1 - \alpha(a_*)) + (1 - \pi)\alpha(a_*) - \frac{1}{2} \\ &= \left(\pi - \frac{1}{2}\right) (2\Phi(\iota(a_*)) - 1)\end{aligned}$$

- ▶ There is an incumbency advantage if  $\pi > \frac{1}{2}$  and an incumbency disadvantage if  $\frac{1}{2} > \pi$
- ▶ The absolute value of the effect is increasing in informativeness

# INFORMATIVENESS AND THE INCUMBENCY EFFECT

	Complements	Substitutes
$\pi > \frac{1}{2}$	$\mathcal{IE}(a)$ increasing in $a$	$\mathcal{IE}(a)$ decreasing in $a$
$\pi < \frac{1}{2}$	$\mathcal{IE}(a)$ decreasing in $a$	$\mathcal{IE}(a)$ increasing in $a$

- ▶ Complements  $\Rightarrow f(a, \bar{\theta}) - f(a, \underline{\theta})$  increasing in  $a$
- ▶ Substitutes  $\Rightarrow f(a, \bar{\theta}) - f(a, \underline{\theta})$  decreasing in  $a$
- ▶  $|\mathcal{IE}|$  increasing in  $\iota(a) = \frac{f(a, \bar{\theta}) - f(a, \underline{\theta})}{2}$

# VOTER WELFARE

Fix equilibrium with first-period effort  $a_*$

Expected first-period welfare:

$$\text{VW}_1(a_*) = \pi f(a_*, \bar{\theta}) + (1 - \pi) f(a_*, \underline{\theta})$$

*Ex ante* expected second-period welfare:

$$\text{VW}_2(a_*) = \Pr(\theta_2 = \bar{\theta} | a_*) f(\underline{a}, \bar{\theta}) + (1 - \Pr(\theta_2 = \bar{\theta} | a_*)) f(\underline{a}, \underline{\theta}).$$

- $\Pr(\theta_2 = \bar{\theta} | a_*) = \textit{ex ante}$  (equilibrium) probability winner has type  $\bar{\theta}$

# COMPARATIVE STATICS OF VOTER WELFARE

## PROPOSITION (ABF17)

$VW_1$  is increasing in  $a$ .

$VW_2$  is increasing in  $a$  if effort and type are complements.

$VW_2$  is decreasing in  $a$  if effort and type are substitutes.

- ▶ Complements  $\Rightarrow$  informativeness increasing in  $a$
- ▶ Blackwell  $\Rightarrow$  Voter second-period payoff higher

# COMPARATIVE STATICS OF VOTER WELFARE, II

## PROPOSITION (ABF17)

*Fix  $a_{**} > a_*$ , and suppose effort and type are substitutes. There exist  $\underline{\pi}[a_*, a_{**}], \bar{\pi}[a_*, a_{**}] \in (0, 1)$  so that the following are equivalent:*

1.  $\pi \in (0, \underline{\pi}[a_*, a_{**}]) \cup (\bar{\pi}[a_*, a_{**}], 1)$ .
2.  $\text{VW}_1(a_{**}) + \text{VW}_2(a_{**}) \geq \text{VW}_1(a_*) + \text{VW}_2(a_*)$ .

- Benefit of increased informativeness increasing in *ex-ante* uncertainty

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No

Consider complements and  $\pi > \frac{1}{2}$

- ▶ Shift from low effort to high effort
- ▶ Increase in both components of Voter welfare
- ▶ Since  $\pi > \frac{1}{2}$ , increase incumbency advantage
- ▶ Opposite of the relationship suggested by the literature

# IS THE IE A VALID MEASURE OF VW?

No

Consider substitutes and  $\pi > \max(, 1/2, \bar{\pi}[a_*, a_{**}])$

- ▶ Shift from low effort to high effort
- ▶ Increase sum of components of Voter welfare
- ▶ Since  $\pi > \frac{1}{2}$ , decrease incumbency advantage
- ▶ Opposite of the case of complements