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# Seniority, Information and Electoral Accountability

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-Abstract-

This paper addresses the impact information has on electoral accountability in a legislative system based on seniority using laboratory experiments. A purely rational choice perspective of a simple voting environment implies that information is inconsequential when seniority is exceptionally valuable. Seniority advantage presents the opportunity to shirk at the expense of voters. I contrast the rational choice perspective to behavioral considerations of trust, betrayal and expectations. Voter information about incumbent behavior is varied across experimental treatments, and I find that information leads to accountability when voters can compare their own incumbent's behavior to the behavior of others. Moreover, information deters incumbent shirking.

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## 1. SENIORITY AND VOTER INFORMATION

Consider the principal-agent relationship between voters and elected officials. If an outcome observed by voters contains some element of randomness, thus deteriorating the incumbent's performance signal, seniority acts to insure incumbents against bad outcomes and potentially leads to moral hazard. Moreover, voters may disregard performance signals entirely if seniority is exceptionally valuable.

Seniority is a key indicator of an incumbent's experience, connections and leadership roles (Weingast and Marshall 1988). Moreover, the distributive theory of politics suggests that voters overlook shirking behavior because of the incumbent's ability to secure district specific benefits (Alvarez and Saving 1997; Arceneaux 2006; Gomez and Wilson 2001; Levitt and Snyder 1997; Stein and Bickers 1994). Sacking a senior incumbent is costly in terms of foregone experience, connections and power (Bernhardt, Dubey and Hughson 2004; Buchanan and Congleton 1994; Chari et al. 1997; Chen and Niou 2005; Dick and Lott 1993; Friedman and Wittman 1995; Knight 2002).

McKelvey and Riezman (1992) modeled the strategic implications of seniority where they showed that incumbents have the incentive to institute seniority to prevent turnover.<sup>1</sup> In theory, recurring competitive elections and promises of long-term employment would solve the principal-agent problem, but using tenure as an allocation mechanism for political power (vis. benefits) encourages the voter to lower her performance standard.

A central element upon which electoral accountability hinges is information. The amount of information gathered depends on relative costs and benefits, and its type can range from a candidate's party and platform to his experience and seniority. It is possible that shirking occurs because of the usual rational ignorance and collective action problems. Voters lack the incentive

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<sup>1</sup> See also Holcombe (1989) and Muthoo and Shepsle (2010).

to acquire and process information because of their infra-marginality and they lack incentive to act even if they are informed because personal costs are low relative to system wide costs. Most importantly, the boon of seniority may cause voters to forego information that is essential for accountability.

Any principal-agent exchange implies some amount of trust on the part of the principal, yet standard rational choice theory fails to explain trust as well as the fulfillment of unenforceable contracts (Berg, Dickhaut and McCabe 1995; Camerer 2003 and references therein; Ostrom and Walker 2002). The vast literature in experimental economics serves as evidence of economists' interest in discovering the roots of seemingly anomalous trusting and trustworthy behavior. In the context of this paper's experimental design, the agent is trusted to redistribute resources to his principals despite the uncertainty of its efficiency and the cover it might provide for any shirking. We can think of the decision to reelect the agent as a signal of further trust as well as a retrospective reward for trustworthy behavior, thus if the principal considers that this trust has been betrayed the natural retribution is to vote to replace the incumbent agent. Humans are sensitive to the betrayal of expectations and trust and are willing to incur costs to exact retribution from the offender (Abbink, Irlenbusch and Renner 2000; Koehler and Gershocoff 2003). Moreover, subjects have been shown to react positively or negatively based on being treated fairly in distributive games, which in turn affects the behavior of proposers (Charness and Rabin 2002).

There is also reason to believe that revealing information about their choices affects the behavior of elected officials. This impact has been well documented (Besley and Burgess 2002; Djankov, McLiesh, Nenova, and Shleifer 2003; Ferraz and Finan 2008; McMillan and Zoido 2004; Stromberg 2004). For instance, Besley and Prat (2006) highlight the correlation between

information, high incumbent turnover and low corruption emphasizing that information to the electorate is an essential component of accountability.<sup>2</sup>

While previous research has highlighted the consequences of seniority and information separately, this paper combines these elements to understand how they jointly affect the choices of political agents. Increasing information may lead to increasing accountability depending on voters' expectations and trust; however, an overwhelming seniority advantage may deter voters from becoming informed. Laboratory experiments are used to understand this interaction in a principal-agent experiment where subjects act as candidates and voters. Experiments are useful because they allow for control over the amount of information voters can acquire as well as the degree to which incumbents' decisions are shrouded by uncertainty.<sup>3</sup> To study such an interaction with field data is difficult because a substantial seniority advantage may be the cause of rational ignorance. Different information treatments are implemented in a game where seniority is valuable to voters. Meanwhile, this value provides senior incumbents the opportunity to use their position to enrich themselves at the expense of voters. These treatments vary the amount, type and cost of information to examine its effects on incumbents' decisions to shirk and voters' decisions to become informed and to hold politicians accountable. Results indicate that voters predictably respond to the value of seniority, yet information has an effect on accountability when voters are able to compare the behavior of all incumbents. On the other hand, incumbents do not capitalize on their seniority advantage to the extent predicted, and their decisions to shirk are affected by the information treatments.

## 2. THE ENVIRONMENT

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<sup>2</sup> For a review of the possible down side to supplying the principal full information see Prat (2005).

<sup>3</sup> Data collection might also be challenging due to incumbents' efforts to hide their shirking from constituents.

The following section will describe the environment in which we will be working. The reader will see that the rational choice perspective of the environment implies that information should not matter at all to voters when seniority is fashioned to be exceptionally valuable. This is intentional as it provides an extremely strong test of information as an impetus for accountability.

Suppose the environment lasts for  $T$  periods.<sup>4</sup> Incumbents make their decisions in the first stage. These include whether to tax voters and whether to shirk. In the second stage, voters decide the fate of incumbents. An incumbent who loses reelection is automatically replaced by a challenger, whose role is not modeled specifically but whose presence is integral to the game. Suppose there are an odd number of  $D$  districts, each with  $N_d$ ,  $d = \{1, \dots, D\}$  voters and one incumbent. Voters receive an endowment,  $E$ , each period, which is taxable. The incumbent from each district is either senior or junior based on the variable  $e_{dt}$  that measures his tenure i.e. the number of times he has been reelected. That is,

$$s_{dt} = \begin{cases} \text{senior if } e_{dt} \geq e_m \\ \text{junior otherwise} \end{cases} \quad (1)$$

where  $e_m$  is the median tenure among all incumbents. This simple rule means that  $\frac{D+1}{2}$  incumbents are senior.<sup>5</sup>

Incumbents determine whether voters are taxed by majority vote and seniority dictates how the tax revenue is distributed.<sup>6</sup> For simplicity, I assume that if voters are taxed, their entire

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<sup>4</sup> A similar equilibrium is found using an infinitely repeated game, but the experiment is a finitely repeated version, which is why it is presented here.

<sup>5</sup> This is essentially the result in Muthoo and Shepsle where seniority is instituted endogenously in a legislative bargaining framework.

<sup>6</sup> The rule used here is reminiscent of the endogenous seniority rule found in Muthoo and Shepsle (2010) in a legislative bargaining context like that of Baron and Ferejohn (1989).

endowment is collected, aggregated and then redistributed. Redistribution is determined by the following rule, where  $\sigma_{dt}$  is the district's share of the tax benefits:

$$\sigma_{dt} = \begin{cases} \frac{1}{S} & \text{if } s_{dt} = \text{senior in period } t \\ 0 & \text{if } s_{dt} = \text{junior} \end{cases}, \quad (2)$$

where  $S$  is the subset of senior incumbents. Thus, voters whose incumbent is senior gain from the redistribution whereas voters whose incumbent is junior lose. Voters in a senior district split the share equally.

The amount of the transfer a voter receives also depends on two key factors: nature and the shirking decision of the incumbent. Equation (3) below shows the voter's period payoff function. The term  $\alpha_t$  is a random efficiency variable that affects the "quality" of the net transfer delivered to voters. It is uniformly random on the range  $[\underline{\alpha}, 1]$  with mean  $\hat{\alpha} = (1 + \underline{\alpha})/2$  and variance,  $v = (1 - \underline{\alpha})^2/12$ . Each period a new  $\alpha_t$  is drawn that is unknown to incumbents; however, both voters and incumbents know the distribution from which  $\alpha_t$  is drawn. This opens the door for shirking behavior by senior incumbents.

Senior incumbents decide how much of the transfer is delivered to their voters as they have the option to take some or all of the voters' shares of the transfer. The share taken by the incumbent is represented by  $g_{dt}$  and is assumed to be equal for all voters in the district. The choice  $g_{dt}$  is bound from above by  $\frac{\sigma_{dt}\Pi_t}{N_d}$ , where  $\Pi_t = \tau_t N_d D$  i.e. is the aggregate tax revenue collected from all districts. The period payoff for a voter  $i$  in district  $d$  is:

$$U_{idt} = E - \tau_t + \alpha_t \left( \frac{\sigma_{dt}\Pi_t}{N_d} - I\{s_t\}g_{dt} \right). \quad (3)$$

The function  $I\{s_t\}$  equals 1 if the incumbent is senior. The period payoff for incumbent  $d$  is:

$$U_{dt} = W + I\{s_t\}g_{dt} * N_d. \quad (4)$$

The term  $W$  represents the incumbent wage and perquisites guaranteed while in office. It is assumed that incumbents who lose reelection join an existing pool of candidates,  $L - D$ , earning a wage  $w$  and can be elected again in the future. It is assumed that  $W > w$ . The assumption that only senior incumbents choose  $g_{dt}$  is for simplicity and highlights the power in seniority.<sup>7</sup>

In the first stage of each period, the senior incumbents choose  $g_{dt}$ . In the second stage, voters choose whether to keep the incumbent or elect a challenger. The game is played under a condition of common knowledge such that incumbents and voters understand each other's incentives. The tension in the environment is produced by the incentive for the incumbent to shirk and the uncertainty a voter experiences regarding what voters in other districts will do at the voting booth. This leads to the possible outcome where senior incumbents are shirking yet being reelected every period. The reader can find a short proof using weakly dominant, pure strategies in the appendix that explains the logic of zero turnover.

Rational choice therefore implies that the only information relevant to voters in this environment is seniority. But there is reason to believe that the revelation of incumbents' decisions will impact both voters' and incumbents' choices by attributing outcomes to the conscious decision of the agent.

Revealing information to the voter means the voter is no longer dependent on her expectation regarding nature and expectations of trust in the incumbent. If she is fully rational, the voter will behave similarly to the receiver in the oft studied ultimatum game – any payoff greater than or equal to  $\epsilon$  is acceptable, where  $\epsilon$  is the minimum amount she can receive from the

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<sup>7</sup> This is a simplification and not an argument that junior incumbents cannot provide benefits to their districts. The same arguments apply when junior incumbents have some influence in the legislature, yet remain subordinate to senior members and leadership.

incumbent. However, this is not the regular result in ultimatum game experiments. If trust drives the principal's decision calculus, we can infer that intentions matter as has been shown in other contexts involving trust and fairness (Falk, Fehr and Fischbacher 2008; McCabe, Rigdon and Smith 2003; Rigdon, McCabe and Smith 2007). A trusting voter will care whether her payoff was determined by nature or by the incumbent's action.

Consider how trust would affect the voter's calculus. Suppose the voter is informed of  $g_{dt}$  leaving no doubt whether the outcome was a product of nature or the decision of the incumbent. Common knowledge of incentives leads fully rational voters to form expectations about what their payoffs will be. As shown above, the rational expectation would be an amount  $X = \epsilon$  based on the seniority advantage in the legislature; thus, receiving an amount  $X' > X = \epsilon$  would give reason to reelect the incumbent. On the other hand, if a trusting voter forms some expectation,  $X > \epsilon$ , then receiving  $X' < X$  causes her to react negatively and she votes to elect the challenger. Rather than being satisfied with  $X' > \epsilon$ , the betrayal of trust is a sufficiently strong motivator in her decision calculus.

Consider further the possibility that the voter is informed about  $g_{dt}$  as well as  $g_{dt}$ ,  $d' \neq d$ . In this environment, voters' expectations may be affected not only by the voter's own incumbent but by the behavior of other incumbents as well. In this case, voters have a common measuring stick by which to judge the incumbents (Besley and Case 1995). Once again, a fully rational voter's expectation will be low ( $X = \epsilon$ ) given the rules of the game, but she only compares her expected return to what the incumbent delivers. Knowing what other incumbents did is irrelevant.

On the other hand, suppose a trusting voter has an expectation of  $X > \epsilon$ . If *all* incumbents leave voters with an amount less than  $X$ , yet this particular voter's incumbent shirked the least

(or was not guilty of shirking the most), the voter likely adjusts her expectation downward but rewards the incumbent with a vote for reelection. Otherwise, if the incumbent is guilty of shirking the most, the voter adjusts her expectation downward and votes to elect a challenger.

### 3. EXPERIMENTAL DESIGN

I refer to subjects as either voters or candidates but context was not used in the experiment, which is verified by the instructions found in the appendix. The parameters such as pay rates were chosen to be consistent with a similar principal-agent experiment used in previous work (Author 2012). The number of groups and group sizes were chosen for various reasons including constrained lab size and research budget. The general set up was ten candidates and five districts with three voters each ( $L = 10$ ,  $D = 5$ , and  $N_d = 3$ ). Only five candidates were in office at one time and are referred to as *incumbents*, whereas the other five are referred to as *challengers*. Of the five incumbents in any period, the top three in terms of tenure were considered senior. It is important to note that the tenure rank of the incumbents was randomly determined to begin the experiment, but it was subsequently determined by the number of consecutive reelections. In total twenty-five subjects were needed per session.

Incumbents received a salary of  $W = \$0.60$  each period, while challengers decoded text strings for 2.5 cents for every correct code. The decoding activity provided a way to keep subjects involved as well as a means to earning some money if the prediction of zero incumbent-turnover held up.<sup>8</sup> Voters received an endowment of  $E = \$0.45$  each period, which was subject to taxation. Voters were taxed an amount equal to their endowment if the active incumbents passed the tax by a majority vote. Only voters in senior districts stood to receive a positive share

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<sup>8</sup> There was not a limit on how many codes a subject could be paid for; however, their time in each period was limited by how much time it took incumbents and voters to reach their decisions.

of the tax revenue and could receive as much as \$0.75 in a single period. This means voters in junior districts were left with nothing if the tax passed.<sup>9</sup>

Recall that the efficiency aspect of the transfer. This feature captures the uncertainty of legislative promises as well as creates the opportunity for moral hazard. The efficiency variable  $\alpha_t$  varied between  $[1/3, 1]$  each period. The lower bound of  $1/3$  was chosen so that the ex-ante expected value of the transfer to senior district voters was \$0.50 such that senior district voters would prefer that the tax passed but would still allow senior incumbents to disguise their actions in the no-information treatment. The random draws of  $\alpha_t$  were the same for each treatment and session. The incumbents did not know the value of  $\alpha_t$  when making their decisions, but all subjects knew the distribution from which it was drawn.

Each session featured 20 paying periods. The first 5 functioned as practice where incumbents set taxes by simple majority rule. Groups were then randomized and the next 15 periods allowed for shirking. Subjects were thoroughly instructed on the payoff structures and were told that the maximum amount an incumbent could take per voter was 75 cents whereas the minimum was zero. They were also made aware of the respective information rule. It is important to note that subjects had access to an on-screen calculator at the beginning of each period that allowed them to test different levels of efficiency as well as incumbent shirking before making their choices. The experimenter also walked them through arbitrary examples so they could gain proficiency using the calculator and understand its output.

### *3.1 Treatments*

Each period of the experiment had two stages. In the first stage the incumbents made their choices and in the second stage voters decided whether to keep the incumbent based on the

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<sup>9</sup> Although these parameters appear to depart from reality at first blush, these were chosen to make the focal incentives salient to subjects. This is a benefit of experimental research.

information they were given. Stage 1 did not vary across treatments, but Stage 2 varied by the information voters received. While the strict rational choice prediction rules out information influencing voter decisions, behavioral considerations as to whether voters respond differently to outcomes of chance and outcomes of strategy are important. The information treatments are motivated by the model described in section 3.

*No Information Treatment (NI):* Incumbents in Stage 1 voted on the tax and each senior incumbent indicated how much of the voters' transfers they would keep if the tax passed.<sup>10</sup> In Stage 2 of this treatment voters only saw their payoffs. Incumbents saw their own payoffs, the value of  $\alpha_t$  and their voters' payoffs. An election in each district determined whether the incumbent stayed in office or not. Results were announced and voters were informed of what the candidate's seniority rank would be in the upcoming period, whether he or she was a returning incumbent or a newly elected challenger.

*Full Information Treatment (FI):* Voters in this treatment condition saw their incumbent's tax vote, the value of  $\alpha_t$  and their payoffs. If the incumbent was senior, the voter also saw how much the transfer he or she awarded himself or herself. A vote then determined the fate of the incumbent.

*Costly Information Treatment (CI):* Here voters only saw their payoffs, but they had the option of paying \$0.05 to reveal information to the group about the incumbent's decisions and the efficiency variable.<sup>11</sup>

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<sup>10</sup> Readers have questioned the necessity for this stage because it is possible to arrive at Stage 2 by automatically distributing endowments according to the seniority rule. However, doing so would omit important elements of the investigation. First, Stage 1 makes economic outcomes dependent on the seniority of incumbents as well as their actions. Second, starting subjects with an endowment that is possibly taxed creates the effect of junior voters giving up what is theirs for the benefit of voters in other districts.

<sup>11</sup> All voters had the option of paying the fee to reveal information, even those with a period payoff of zero. The bankruptcy rule instituted guaranteed that subjects leave with at least their participation payment of \$10.

*Relative Information Treatment (RI):* This treatment condition differed from the Full Information case because voters in senior districts not only observed their own incumbent's shirking but the shirking of all senior incumbents. Incumbents remained unaware of the shirking of others.

### 3.2 Hypotheses

We arrive at the predicted incumbent and voter behavior based on the strict rational choice characterization of the environment described above.

*Hypothesis 1:* Senior incumbents will take the largest amount possible from voters' transfers (75 cents per voter).

*Hypothesis 2:* Incumbents will always be reelected. The marginal voter cannot do any better by electing the challenger based on seniority rule.

*Hypothesis 3:* No voter will pay to reveal information in the Costly Information Treatment.

The FI treatment provides a direct comparison to the NI treatment where any variation in behavior can be linked to the ability to directly attribute outcomes to incumbents' choices. The CI treatment provides a measure of the willingness of voters to use information in the context of seniority advantage when it is not gratis. This treatment makes sense from a public choice perspective because informing voters may undermine the ill effects of the seniority trap, but if the cost of information is prohibitive then the situation is hardly improved. The final hypothesis constitutes a true display of rational ignorance elucidated by Downs (1957) where voters free ride on others' willingness to supply information. As he put it, "when benefits are indivisible, each individual is always motivated to evade his share of the cost of producing them."

The RI treatment adds another wrinkle to the FI treatment that may affect a voter's behavioral response by allowing them to compare their own incumbent's behavior to that of others. The behavior of other incumbents will serve as a reference point for constructing expectations and guide the voters' calculus in exacting retribution for betrayed trust (Koehler and Gershocoff 2003).

It is also likely that any difference in voter behavior will cause a reaction in incumbent behavior because this is a repeated game. Furthermore, the information treatments could impact the incumbents' behavior despite it being irrational. First, incumbents may expect retribution from offended voters and the monetary cost of losing reelection. Second, humans exhibit a desire for the good opinion of others as well as a good opinion of themselves. This explains why we observe trustworthy behavior even in situations where the trustor's reaction is unknown and retribution is not possible (Dana, Weber and Kuang 2007; Pelligra 2010).

#### 4. RESULTS

This section describes the results from eight sessions conducted at a large American public university. Subjects were recruited using the ORSEE online recruiting software (Greiner 2004). Two sessions of each treatment were conducted using 25 subjects each, for 200 subjects in all. The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007). The average payment was around \$18 including a \$10 participation payment for an hour in the lab. Instructions were read aloud and subjects went through five periods of practice before the treatment began. The aggregate results will follow the order of the hypotheses, followed by analysis of individual voter choice. The amount taken from the voters' transfers by the incumbents will be referred to as their "take." First, note that voters were taxed virtually every

period of each treatment. The incumbents in the no-information (NI), full-information (FI), costly-information (CI) and relative information (RI) treatments passed the tax 100%, 97%, 100% and 97% of the time respectively.

#### *4.1 Shirking*

*Result 1: Senior incumbents do not maximize their take on average in any treatment. The treatments had no effect on the magnitude of incumbents' take, but information did affect the frequency at which incumbents shirked.*

Table 1 displays the mean incumbent take conditional on redistribution occurring for each treatment where the last period is excluded from the analysis. The averages of each subject incumbent from each treatment are treated as independent observations. Right away, it is apparent that senior incumbents took well below the maximum of 75 cents per subject. There are no significant differences between treatments as is indicated by the p-values from Mann-Whitney tests. Note that one-sided tests were conducted when comparing treatment conditions to the baseline NI treatment because we wanted to see if increased information would lead to less shirking. When there is not a clear directional comparison between treatments, such as when comparing the FI and RI treatments, a two-sided test was conducted.

Analysis of the frequency of taking a positive amount (out of a possible fourteen rounds) indicates significant differences between treatments. Specifically, incumbents shirked significantly less often in the FI treatment compared to the CI treatment. Likewise, the frequency is lower in the RI treatment compared to the NI and CI treatments. Therefore, although the magnitude of shirking is not affected by information, the rate at which incumbents took from voters is lower when voters are more informed.

## 4.2 Reelection

*Result 2: Senior incumbents who do not shirk are reelected nearly 100% of the time in all treatments and shirking senior incumbents are reelected at extremely high rates; however, shirking senior incumbents were reelected at a significantly lower rate than non-shirking incumbents in the RI treatment. Likewise, incumbents in the RI treatment are significantly less likely to be reelected as shirking increases based on predicted probabilities. There is no difference between treatments in the average reelection rates of shirking incumbents.*

*Result 4: Voters who were informed of the conduct of their own incumbent as well as the other senior incumbents (RI treatment) were significantly more likely to reward a non-shirking incumbent with a vote for reelection. More importantly, they were significantly less likely to vote for a shirking incumbent, especially as the magnitude of shirking increased. Thus, information regarding the relative conduct of the legislature as a whole was primary to encouraging electoral accountability.*

Table 2 shows the mean reelection rates of incumbent by treatment using the district averages as independent observations. Once again, I exclude the last period from analysis. Results are separated by seniority and whether a senior incumbent shirked or not. In general, there was some turnover in each treatment, but the reelection rates were high (NI: 84%, FI: 89%, CI: 96%, RI: 87% when the incumbent shirked). Looking at the reelection rates of shirking senior incumbents tells us that voters recognized the value of seniority. Based on the behavioral arguments presented we expected that reelection rates would be relatively higher in the NI treatment where voters could only guess whether it was nature or the incumbent who reduced

their payoffs. In fact, the reelection rate falls below 100% in only two periods of the NI treatment; however, in aggregate the differences between treatments are not significant at the 5% level when the senior incumbent shirked. (Between treatment Mann-Whitney p-values for Take>0: (one-sided) NI-FI: 0.78; NI-CI: 0.10; NI-RI: 0.45; FI-CI: 0.73; CI-RI: 0.06; (two sided) FI-RI: 0.43)

Within-treatment differences are not significant for the NI, FI and CI treatments (Within treatment Mann-Whitney p-values: (one-sided) NI: 0.06; FI: 0.11; CI: 0.21). However, the difference is significant for the RI treatment (p-value: 0.01) implying that relative information is critical for electoral accountability.

Figure 1 displays the kernel density estimation of the probability of reelection as a function of shirking measured as cents taken per voter. The data include all sessions and treatments to allow for more variation in the amount taken. The probability maximizing amount was \$0.41, but for all practical purposes incumbents were almost guaranteed reelection if they took \$0.45 per voter or less. Expected utility estimates suggest that the expected utility maximizing level of taking was in fact \$0.75 per voter.<sup>12</sup> The average amount taken in every treatment was well below this, meaning that incumbents could have shirked to a much greater degree. Combining this with the reelection results indicate that it was the threat of losing reelection that restrained incumbents and not the voters' actual reactions to shirking. This is consistent with the classic result in Barro (1973) where the magnitude of the opportunity cost of losing reelection incentivizes politicians to not shirk.

Let us turn to two sets of predicted probabilities based on regression analyses. The first set is based on district level election outcomes. The standard errors are clustered at the district

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<sup>12</sup> Let  $x$  be the amount taken per voter. The expected utility was estimated as  $3x + p_x(0.60)$  where  $p_x$  is the probability of reelection when taking  $x$ . There are three voters per district and the salary for incumbents was \$0.60.

level and controls include period, session and group indicators. The second set is based on individual voter choices regarding the reelection of a senior incumbent. The respective standard errors are clustered at the individual level and the controls variables are similar. The estimated logit model of reelection is found in (5). The voter choice model is similar, with the addition of the independent variable capturing a voter's payoff, so it is withheld. A fuller description of the estimated models as well as a table including marginal effects and robust standard errors can be found in the appendix.

$$r_{idt} = \beta_1 + \beta_2 take_{dt} + \beta_3 take_{dt-1} + \beta_4 efficiency_{dt} + \beta_5 tenure + \gamma T + u_{dt} \quad (5)$$

The model features the election outcome as the dependent variable at the district level and controls for the incumbent's shirking this period and last period, the efficiency of the transfer this period, and the incumbent's tenure. The vector  $T$  captures the binary treatment variables and their interaction with the incumbents shirking.

Figure 2 features the predicted reelection probabilities for senior incumbents as a function of their shirking. The FI, CI and RI treatments are each compared to the NI treatment in each of the respective panels. The solid line in each panel is the regression line fitted to the predicted probabilities whereas the dashed line is the NI treatment baseline. The grey area surrounding each regression line indicates the 95% confidence interval. Results indicate that as shirking increases, incumbents in the RI treatment are significantly less likely to be rewarded with reelection. There is no difference when comparing the FI and NI treatments. The predicted probability of reelection in the CI treatment is significantly greater than the baseline even as the amount taken from voters increases. Despite having access to costly information, voters in this treatment were marginally more informed about incumbents' choices because very few voters purchased information, therefore explaining this difference is a challenge.

Figure 3 features the predicted probability of voting to reelect the incumbent as a function of his or her shirking. The results at the individual level reflect those at the district level. There is little to say about the comparison of the FI treatment to the baseline. There is only a small and significant difference at small amounts of taking in the FI treatment (the natural log of the median amount of \$0.05 is 1.61).

The bottom panel of Figure 3 confirms the key result from the RI treatment where we can see a clear difference in voting for the incumbent who takes increasingly large amounts from voters. At the maximum possible value of \$0.75 per voter ( $\log(75) = 4.32$ ), there was a 75% chance on average that a subject in the NI treatment would vote for the incumbent. This number is barely 50% in the RI treatment.

#### *4.3 Costly Information*

*Result 3: Voters use full and relative information when it is given to them (RI treatment), but they seldom pay to reveal information (CI treatment).*

Subjects infrequently paid to reveal information as was predicted. The mode occurs at zero whereas the average is 1.4 times per subject in the CI treatment. Eleven of the 18 subjects that did pay to reveal information did so only once. A voter was significantly more likely to pay for information following a negative change in payoff. A decrease of \$0.10 from one period to the next increased the likelihood a voter purchased information by 3% (p-value 0.00) when controlling for period and incumbent rank. This is consistent with experimental work by Collier et al. (1989) investigating rational ignorance, but it is not economically significant. The take away is that seniority can have an overpowering effect on voters' decisions to become informed. If information is a necessary impetus for accountability, we see that discouraging voters from

becoming informed is another way in which seniority buffers incumbents' behavior from scrutiny.

## 5. CONCLUSION

This paper addresses electoral accountability and the impact information when seniority is valuable. This research combines these elements using experimental treatments to vary voter information about incumbent choices to determine the impact on accountability.

Results indicate that information helped overcome the principal-agent problem by discouraging incumbent shirking. Incumbents were less likely to shirk when full information about the incumbent's choice was given to voters (FI and RI treatments). Making information available at a cost did nothing to discourage incumbent shirking.

Voters responded to seniority advantage. Senior incumbents who shirked were almost always reelected; however, providing voters with relative information about incumbent behavior significantly lowered the tolerance for a shirking incumbent. Incumbents were significantly less likely to be reelected as shirking increased based on predicted reelection probabilities. Analysis at the individual level revealed that the average voter in the RI treatment was significantly less likely to vote for a shirking incumbent. Furthermore, results indicate that seniority advantage entrenches voters in rational ignorance by discouraging them from acquiring costly information.

Thus, revealing just an incumbent's behavior to voters is not sufficient to provoke voters in this context. Instead, when the behavior of all incumbents is revealed, the elements of trust and expectations of fair treatment encourage accountability *even when it is costly*. The average wait for seniority (i.e. a recently elected junior challenger moving up to senior status) after kicking a shirking senior incumbent out of office was 4.56 periods (n=18; st.dev. 3.55) with the

maximum being eleven and the minimum being one period. This means that the voters gave up approximately \$1.87 on average when electing a challenger over a senior incumbent.<sup>13</sup> If we take nine cents per period as the average loss per voter in a senior district, where the ex-ante expected payoff is fifty-cents per period ( $75 \times 2/3$ ) and the ex-post expected payoff is forty-one cents period ( $(75-13.56) \times 2/3$ ), voters lost only \$0.41 on average over those 4.56 periods by keeping the incumbent.

From a policy perspective, improving information access to voters is more important for affecting incumbent behavior than for motivating voters. The dearth of shirking is perhaps striking considering the environment as well as the concerns of political scientists and public choice scholars. The behavior of incumbents in this experiment is possibly explained by trust-responsiveness where trusting behavior engenders a trustworthy response on the part of the agent even in the face of large opportunity costs (Guerra and Zizzo 2004; Pelligra 2010). Future research could link this concept to actual behavior of elected officials. For instance, an actual legislator who participates in patronage may not feel he is violating his constituents' trust if he is providing sufficiently large benefits along other policy or spending dimensions. Likewise, he can psychologically and publicly defend his decisions as being good for the group, as is often done when elected officials are on fact finding trips to Italy or improving roads near their property in their hometown (see Fallis, Higham, and Kindy 2012; Higham, Kindy and Fallis 2012).

What then would mitigate the power of seniority in the legislature? Information is an important influence on senior incumbents in this context. Term limits have been proposed as a

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<sup>13</sup> These totals were calculated using the average amount taken by incumbents across all treatments (13.56 cents) and the expected transfer efficiency ( $2/3$ ) and the average number of periods of seniority given up. So voters that achieved seniority a second time lost on average  $(75-13.56) \times (2/3) \times (4.56) = \$1.87$ . The voters who kicked a senior incumbent out of office and never achieved seniority status again averaged 6.5 periods ( $n=8$ ; st.dev. 3.66) between the election of a junior challenger and the end of the game. These voters gave up  $(75-13.56) \times (2/3) \times (6.5) = \$2.66$  on average.

way to mitigate the incentives created by seniority; however, a related paper experimentally tests such an institution and the collective nature of the decision mitigates its effectiveness. On average, voters seemed to perceive that term limits reduced the cost of replacing an incumbent with seniority power, but re-election rates were not affected (Author 2012). Therefore, the mollification of seniority's influence ought to be a topic of further research.

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Table 1: Average Take

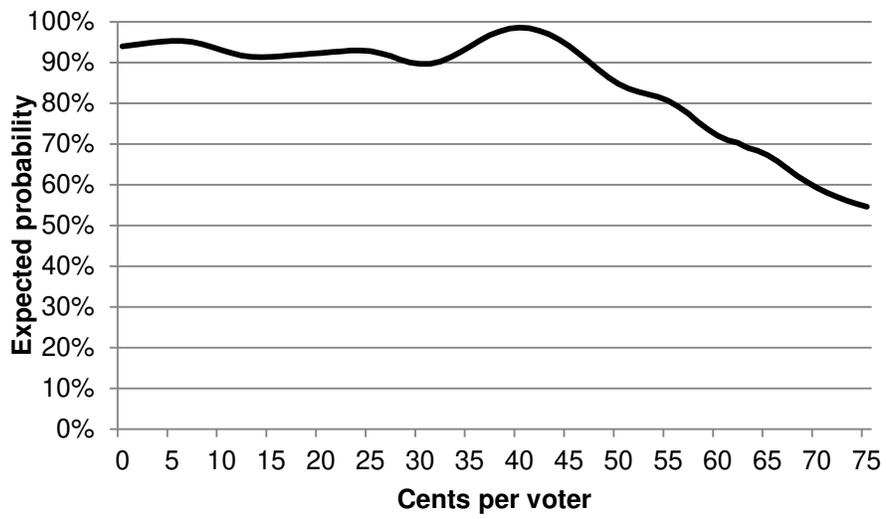
Treatment	Average Take	Mann-Whitney P-value	Freq. Take > 0	Mann-Whitney P-Value
NI	14.59	NI – FI: 0.40 <sup>a</sup>	8.56	NI – FI: 0.14 <sup>a</sup>
	(6.08)	NI – CI: 0.57 <sup>a</sup>	(2.12)	NI – CI: 0.30 <sup>a</sup>
	N=9	NI – RI: 0.56 <sup>a</sup>	N=9	NI – RI: 0.04 <sup>a</sup>
FI	11.77	FI – CI: 0.31 <sup>a</sup>	5.4	FI – CI: 0.04 <sup>a</sup>
	(5.41)	FI – RI: 0.56 <sup>b</sup>	(1.71)	FI – RI: 0.63 <sup>b</sup>
	N=10		N=10	
CI	15.05		10.57	
	(6.93)	CI – RI: 0.52 <sup>a</sup>	(2.11)	CI – RI: 0.01 <sup>a</sup>
	N=7		N=7	
RI	15.64		4.53	
	(5.19)		(1.16)	
	N=15		N=15	

Subject incumbent averages used as independent observations. a: One-sided test b: Two-sided test

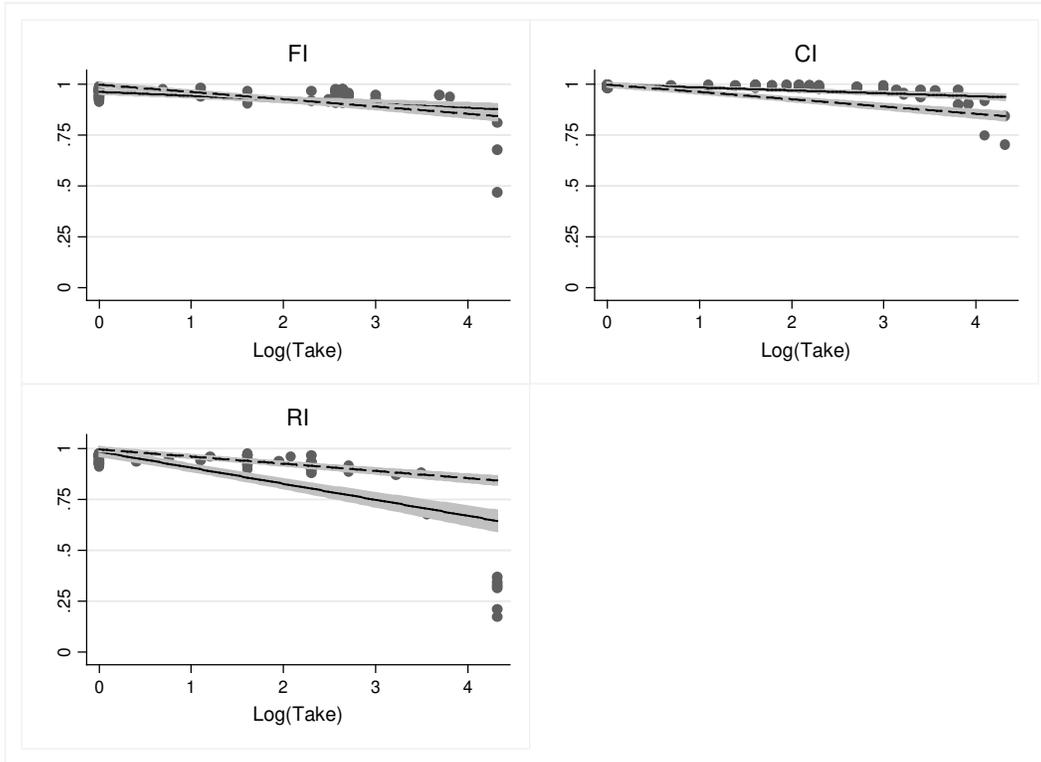
Table 2: Reelection rates at the district level

Treatment	Senior, Take > 0	Senior, Take = 0	Junior
NI	0.84	1.00	0.51
	(0.07)	.	(0.16)
	N=7	N=2	N=6
FI	0.89	0.98	0.55
	(0.06)	(0.02)	(0.14)
	N=9	N=7	N=8
CI	0.96	1.00	0.64
	(0.03)	.	(0.11)
	N=7	N=2	N=5
RI	0.87	1.00	0.63
	(0.04)	.	(0.12)
	N=9	N=6	N=9

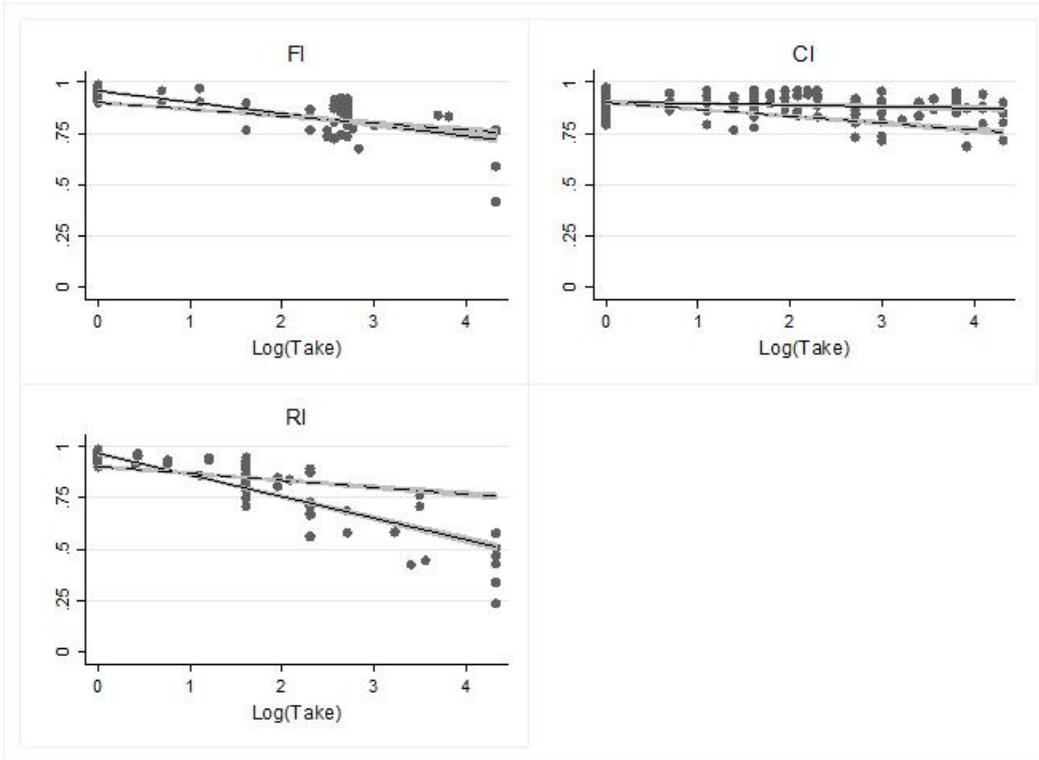
District averages used as independent observations. Between treatment Mann-Whitney p-values for Take>0 : (one-sided) NI-FI: 0.78; NI-CI: 0.10; NI-RI: 0.45; FI-CI: 0.73; CI-RI: 0.06; (two sided) FI-RI: 0.43. Within treatment Mann-Whitney p-values: (one-sided) NI: 0.06; FI: 0.11; CI: 0.21; RI: 0.01.



**Fig. 1** Expected probability of reelection as a function of shirking



**Fig. 2** Predicted probabilities of winning reelection by treatment. The solid lines are the regression lines from the respective treatments. The dashed line is the regression line from the predicted probabilities in the baseline NI treatment. The gray area around the regression lines indicates the 95% confidence intervals.



**Fig. 3** Predicted probabilities of voting for the incumbent by treatment. The solid lines are the regression lines from the respective treatments. The dashed line is the regression line from the predicted probabilities in the baseline NI treatment. The gray area around the regression lines indicates the 95% confidence intervals.

## **Vitae**

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