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Otto H. Swank
Bauke Visser

Department of Economics, Erasmus University Rotterdam, and Tinbergen Institute.

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Tinbergen Institute Amsterdam
Roetersstraat 31
1018 WB Amsterdam
The Netherlands
Tel.: +31(0)20 551 3500
Fax: +31(0)20 551 3555

Tinbergen Institute Rotterdam
Burg. Oudlaan 50
3062 PA Rotterdam
The Netherlands
Tel.: +31(0)10 408 8900
Fax: +31(0)10 408 9031

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Do Elections Lead to Informed Public Decisions?*

Otto H. Swank†
Erasmus University Rotterdam
and Tinbergen Institute

Bauke Visser‡
Erasmus University Rotterdam
and Tinbergen Institute

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Abstract

Democracies delegate substantial decision power to politicians. Using a model in which an incumbent can design, examine and implement public policies, we show that examination takes place in spite of, rather than thanks to, elections. Elections are needed as a carrot and a stick to motivate politicians, yet politicians who are overly interested in re-election shy away from policy examination. Our analysis sheds light on the distance created in mature democracies between the political process and the production of policy relevant information; on the role played by probing into candidates' past; and on the possibility of crowding out desirable political behaviour by increasing the value of holding office.

*We are grateful to seminar participants at Erasmus University Rotterdam, University of Amsterdam and University of Bologna for comments. Please send correspondence to Bauke Visser, Dep of Economics, H 7 -20, Erasmus University Rotterdam, PO Box 1738, 3000 DR Rotterdam, The Netherlands.

†swank@few.eur.nl

‡bvisser@few.eur.nl

1 Introduction

One of the functions of elections is to provide incentives to office holders to act on the preferences of citizens. The idea is that the threat of losing office discourages office holders to abuse their power and encourages them to serve the public. In this view on elections, the role of voters is simple. They should employ a voting rule that is based on past performances. Office holders with a good record should be rewarded with re-election, while those with a poor record should leave office.

Although the disciplining role of elections is widely acknowledged, few will maintain that holding elections is a perfect mechanism. An important problem is that it is hard for voters to evaluate policy. Why? Office holders usually face complicated problems, like unemployment, poverty, pollution, crime, and so forth. To address those problems properly they have to take several actions: they have to design alternative projects or programs; they must hire expertise to investigate their consequences; they have to select a project or program and implement it. Ordinary voters have only limited information about the political process. At best, voters observe outcomes. Sometimes, they know that a government program has been launched. Occasionally, the media reports that some program performs well or that it turns out to be a disaster. For many programs and public projects, however, voters will not notice the consequences, at least not before the responsible politicians can be sent home. The reason is that it often takes considerable time before their consequences become fully visible.

The combination of a multi-stage policy process and poorly informed voters raises the question whether elections encourage politicians to perform all tasks, to perform specific tasks or to perform no task at all. This is the main question our paper addresses. We consider a situation where in each electoral term voters want politicians to perform three tasks. The first task is the design of a project. The second is the examination of the consequences of the project. The final task is making the decision whether or not to undertake the project. At the end of each electoral term, voters can re-elect the incumbent or replace him by another politician. They observe whether or not a project is undertaken. If a project is undertaken, voters learn the consequences of the project only with a probability. If the status quo is maintained, voters do not know the reason for this. A dilemma results. Is the

status quo maintained because the incumbent designed a project, examined it, and found out that it would not improve upon the status quo? Or is it maintained as she did not design a project in the first place? In the first place, the incumbent should be rewarded with re-election, while in the second case she should be punished.

Our general conclusion is that policies are examined in spite of, not thanks to, elections. Elections do stimulate the design of projects because activism on the part of politicians is a prerequisite for re-election. The electorate resolves the dilemma mentioned above by punishing the incumbent if the status quo is maintained, as rewarding the status quo would amount to rewarding shirking–no project would be designed. Here we also encounter the reason why elections do not encourage politicians to examine policy consequences. Suppose a project is designed, examined and it is realised its consequences are bad. Maintaining the status quo would imply losing the elections. Why, then, would an incumbent examine a policy if basing the implementation decision on the information obtained by doing so can only hurt the chances of re-election? The only reason is that the incumbent cares sufficiently about the public good. Another implication is that electoral concerns may distort the project implementation decision. The incumbent's desire to keep office may induce him to undertake projects which are not in the public interest.

Although our results show limitations of holding elections as a means of guiding the behaviour of politicians, we want to emphasize that we do not want claim that democracy fails. In many democracies, agencies responsible for the collection and provision of information operate at some distance from the political process. This holds for agencies as the U.S. Census Bureau, the Bureau of Labor Statistics (see Stiglitz, 1998) and the CPB Netherlands Bureau for Economic Policy Analysis (CPB). Placing information providers at some distance can be interpreted as an institutional response to mitigate a problem that arises from holding elections.

We also identify the conditions under which voters can induce politicians to design projects and examine their consequences. One result is that the higher is the probability that voters observe policy consequences, the more politicians are encouraged to promote the public interest. Against the background that ordinary voters have hardly incentives to acquire information about policy consequences, this result illustrates the important role of information providers in democracies. Information providers, like the media, opposition parties, fire alarms (McCubbins

and Schwartz, 1984) or interest group endorsements (Lupia and McCubbins, 1994; Grossman and Helpman, 1998) help voters to control politicians. Again the flavour of our analysis is that democracy is much more than holding elections every four years. For example, our results suggest that independent media are a pre-condition for elections to function well.

This paper builds on the literature, started with Barro (1973) and further developed by Ferejohn (1986), that applies principal-agent theory to the analysis of the relationship between politicians and voters. Besley and Case (1995) present empirical evidence supporting the main prediction of the theoretical literature that elections encourage elected officials to act on voters' preferences. Analyzing the behaviour of U.S. governors from 1950-1986 they find that policy responds to a binding term limit of Democrats. Persson, Roland and Tabellini (1997) use a principal-agent model to analyze how well alternative constitutions help voters to control office holders. Though the focus of our model differs, an important similarity between their model and ours is that the policy process consists of various stages. Coate and Morris (1995) employ a principal-agent model to analyze whether or not lack of information on the part of voters lead to inefficient methods of redistribution. A similarity between their paper and ours is the emphasis on imperfect information about policy consequences on the part of voters. Le Borgne and Lockwood (2003) show that elections may discourage politician to act on voters' preferences. Following Rogoff (1990), they distinguish between less competent and more competent politicians. When a new politician enters office, he does not know his ability. One way of discovering ones ability is learning by doing. The reason why elections may encourage politicians to shirk is that the chance of losing office reduces the benefit of learning by doing. As in Le Borgne and Lockwood, in our paper electoral concerns may have adverse effects.

Our paper deviates from most literature on political economics in two respects. First, in our model voters want office holders to perform multiple tasks rather than one task. The problems voters face is therefore reminiscent to the one described in Holmstrom and Milgrom (1991) where a principal's objective function is dependent on various tasks an agent can perform. They compare three ways of aligning the interest of the agent with those of the principal: the introduction of output-based incentive pay, separation of tasks, and allocation of asset ownership. Because of the

binary nature of our re-election rule (one is either re-elected or not), the 'balanced' incentive schemes described in Holmstrom and Milgrom cannot be used to motivate incumbents. Nor is ownership a relevant solution. Separation of tasks is a possible solution. In fact, in section 5, we argue that one can interpret some observed institutional arrangements as evidence of task separation with a view to improving the policy process. There we also discuss what our model implies for the use of extrinsic incentives. Second, we assume that while voters observe whether or not a project has been implemented, they do not always observe outcomes. The implication of the two novel aspects is that voters cannot always use a simple cut-off rule. They also have to determine what to do if an incumbent has acted favourably in one dimension - a project has been designed - but it is unknown whether the incumbent has acted properly in another dimension - whether the consequences of the project are examined.

The remainder of this paper is organized as follows. The next section presents the model. Section 3 identifies the conditions under which voters can induce office holders to design projects and to examine their consequences. Section 4 discusses an extension of our model. We allow the incumbent to design and examine two projects rather than one. We show that this extension has important implications for our result that elections never encourage politicians to collect information about policy consequences. Section 5 discusses main findings and implications. Proofs of lemmas, propositions and the theorem can be found in the Appendix.

2 The Model

We consider an infinitely repeated game of incomplete information. In each period, the players are a politician, to whom we refer as the incumbent, and the representative voter, called the voter. The assumption of a representative voter is tantamount to the assumption that homogeneous voters coordinate on a voting strategy. We come back to this when we discuss the voting rules. The voter derives utility from implemented projects. His preferences are described by the following utility function:

$$\mathsf{E}\sum_{t=0}^{\infty}\delta^{t}X_{t}\left(p+\mu_{t}\right) \tag{1}$$

where E is the expectations operator; t stands for time; $0 < \delta < 1$ is the discount factor; $X_t \in \{0, 1\}$, with $X_t = 1$ denoting a new project is implemented in period t, and $X_t = 0$ meaning that the status quo is maintained; p is the expected net benefit of a project; μ_t is a stochastic term, uniformly distributed over $[-h, h]$. We assume that $h > |p|$. The implication is that whether or not the voter benefits from implementation depends on μ_t. By normalization, the voter does not derive utility from the status quo. Throughout this paper, we assume that (1) not only represents the representative voter's preferences, but also the public interest.

The design, examination and implementation of the project is the main responsibility of the incumbent. In each period t, the incumbent makes three related decisions. Her first decision is whether to design a project, $D_t = 1$, or not, $D_t = 0$. The cost of designing a project equals $C \geq 0$. We assume that in each period the incumbent can design at most one project. We relax this assumption in Section 4. Suppose that a project has been designed, $D_t = 1$. Then the second decision the incumbent makes is whether to examine the benefits of the project or not, $B_t \in \{0, 1\}$. The cost of examination equals $W \geq 0$. One could think of W as the time and effort the politician needs to understand the project payoff. Alternatively, W could be viewed as the wage bill of a government department charged with the analysis of the consequences of policies. This department is a passive player: by paying W in period t the incumbent, but not the voter, learns μ_t. One of the objectives of this paper is to show that elections do not necessarily induce the incumbent to examine policy consequences and make informed decisions. We therefore abstract from principal-agent problems between the department and the incumbent, as such problems may form another reason why policy is sometimes based on an insufficient amount of information. We assume that the costs C and W are entirely borne by the incumbent. We come back to this assumption when we discuss the economic environment in Section 2.1. Finally, if $D_t = 1$, the incumbent has to decide whether or not to implement the project. We assume that the incumbent's strategy is time and history independent, e.g., having been in office before does not alter the incumbent's current behaviour.

An incumbent j values office, cares to some extent about the public interest, and dislikes the effort she may put in designing or examining projects. Her preferences

are described by

$$\mathsf{E}\sum_{t=0}^{\infty}\delta^t\left(d_t^j\left(\lambda - D_tC - B_tW\right) + \theta X_t\left(p+\mu_t\right)\right) \tag{2}$$

d_t^j is a binary variable, taking the value one if j is in office in period t and zero otherwise. The weight θ ($\theta \leq 1$) represents the degree to which the incumbent internalises the effects of project implementation on the citizenry.[1] The larger θ, the stronger the incumbent's inclination to do good. The value λ of holding office may include 'ego rents'[2] and vanity. We would argue that remuneration plays less of a role in motivating a politician, given the relatively modest salary earned when compared with the remuneration packages of executives working in the private sector. In any event, we do not think of λ as something the voter manipulates to further his own interests. We come back to this issue when we discuss the results of the paper. By normalization, the incumbent derives zero utility from status quo.

To illustrate the basic idea behind the incumbent's utility function let us discuss two extreme cases. First suppose that $\lambda = 0$ and $\theta = 1$. Then, apart from the privately incurred costs, the incumbent's interest coincides with the public interest. The period t social welfare function equals

$$SW_t = X_t(p+\mu_t) - D_tC - B_tW \tag{3}$$

That is, we include the benefits and costs of a project, but not the utility the incumbent obtains by being the agent who decides. Below we will assume that the social benefits of designing a project and hiring a bureaucrat exceed the (private) costs. We will also assume that the incumbent's concern to do good is not sufficiently strong to induce the incumbent to act in accordance with the public interest. An

[1] That a politician who is thrown out of office still derives utility from project implementation equal to $\theta\left(p+\mu_t\right)$ although voters are assumed to be homogenous and the representative voter derives $p+\mu_t$ can be explained by the following example. Suppose a major bridge is constructed connecting the southern and northern part of a country with 15 million inhabitants. The utility of the usage of the bridge equals one util to everyone, whether one is or has been in office or not. The total utility of the bridge therefore equals 15 million utils. Some people, however, care about the utility the bridge has for others. If these persons happen to be in office, the degree θ to which they internalise the utility of others influences their decisions. But it is not the case that if everyone were to care about the utility the bridge represents for two-thirds of the population, the total utility of the bridge would actually be 15 million $\times$ 10 million utils.

[2] See Persson and Tabellini (2000).

extreme example of this would be $\lambda > 0$ and $\theta = 0$. Then, the incumbent is not concerned with policy outcomes *per se*. She is an effort-averse office seeker. The incumbent will only design public projects or examine them if this improves her prospects of staying in office. Arguably, λ and θ are inversely related in that people who care more about holding office tend to care less about the intrinsic value of a policy. There is no reason to assume, however, that $\lambda = 1 - \theta$. Politicians who seem to be equally eager to stay in office may still care to different degrees about the public good. In what follows we therefore use the two parameters separately. We are aware that equation (2) is a rather *ad hoc* representation of the incumbent's preferences. However, it facilitates the analysis of the question to what extent voters must rely on concerns to do good for informed public decisions to take place.

The timing of events is as follows. The voter chooses his voting rule at the beginning of each period t. This voting rule is a function of the information he has at the end of the period. Then Nature draws μ_t. Oblivious to μ_t, the incumbent then decides whether to design a project or not. If a project is designed, she can decide to examine it, in which case μ_t is revealed to her. If a project has been designed she next has to determine whether to implement the project or not. Based on what the voter observes and following the voting rule, the incumbent stays in office or not. An incumbent who loses office is never reappointed. Instead, an opponent j', identical to the incumbent, is appointed. Opponents are passive. What matters is their availability.

At the elections, the voter knows whether a policy has been implemented or not. The performance of an implemented policy is observed only with a certain likelihood. Formally, if $X_t = 1$, then the voter observes $p + \mu_t$ with probability α, and does not observe $p + \mu_t$ with probability $1 - \alpha$. Although the voter can observe that the status quo has been maintained, he does not know whether the incumbent designed a project or not. Likewise, the voter does not observe whether or not a project is examined. All in all, our assumptions imply that voters have limited insight into the political process, and become aware of the presence or absence of new policies only, and possibly of their payoff. We believe that this captures well the situation involving major policy choices like wars, infrastructural projects, and institutional reforms. The outcomes of these policies are often hard to assess, one important reason being that many have predominantly long-run consequences that show up

far beyond the election period.

We follow the literature by assuming that the voter employs a retrospective voting rule that only uses information that becomes available in the current period.[3] This rule specifies whether the incumbent is reappointed ($\rho_t = 1$) or sent home ($\rho_t = 0$) at the end of period t, given the information the voter possesses concerning this period. As noted above, the voter in our model should be seen as representing a large electorate of homogenous voters who co-ordinate on a voting strategy. As a dispersed electorate would need an overwhelming amount of information to co-ordinate on a mixed strategy – even when preferences are homogenous – in what follows we limit ourselves to equilibria in pure strategies. Assuming heterogeneity of preferences would reduce the incentives to design a project and therefore to collect information on the consequences of project implemenation: as some voters would prefer the status quo while others would value implementation, re-election becomes less dependent both on the decision to design a policy and on the decision to gather information. In other words, by assuming homogeneity we create a situation most conducive to informed policy design.

A voting rule consists of three parts. The first part determines whether or not the incumbent is re-elected if the status quo is maintained. The second part describes whether or not the incumbent is reappointed if a project is implemented and the voter does not observe its consequences. The third part determines what vote is cast when the consequences of an implemented project are observed. This part identifies a cut-off point, v. If $p + \mu_t \geq v$, the incumbent is re-elected; if $p + \mu_t < v$ the incumbent is sent home. Four qualitatively different voting rules can therefore be identified:

$$\text{Rule 1:} \quad \rho = \begin{cases} 1 & \text{if } X = 1 \text{ and } p_t + \mu_t \geq v \text{ observed} \\ 0 & \text{otherwise} \end{cases}$$

$$\text{Rule 2:} \quad \rho = \begin{cases} 1 & \text{if } X = 1 \text{ and (i) } p_t + \mu_t \geq v \text{ observed or (ii) } \mu_t \text{ unobserved} \\ 0 & \text{otherwise} \end{cases}$$

$$\text{Rule 3:} \quad \rho = \begin{cases} 1 & \text{if (i) } X = 1 \text{ and } p_t + \mu_t \geq v \text{ observed, or (ii) } X_t = 0 \\ 0 & \text{otherwise} \end{cases}$$

[3] See, e.g., Persson, Roland, and Tabellini (1997).

$$\text{Rule 4:} \quad \rho = \begin{cases} 1 & \text{if } X = 1 \text{ and (i) } p_t + \mu_t \geq v \text{ observed or (ii) } \mu_t \text{ unobserved,} \\ & \text{or if } X = 0 \\ 0 & \text{otherwise} \end{cases}$$

The existence of four types of voting rules illustrates the main problem the voter faces. He wants to reward good behaviour and to punish bad behaviour, but does not know whether $X_t = 0$ or $X_t = 1$ is the result of good or bad behaviour. What, for example, is a voter to deduce from the observation that the status quo is maintained? It could mean that the incumbent did not design any project at all, an instance of behaviour that should be punished. Voting rules 1 or 2 would then be appropriate. If instead the status quo was maintained because the incumbent listened carefully to the advice provided to him by a bureaucrat, then the outcome of such behaviour should be perceived as a sign of good behaviour. And re-election should be uncontroversial, as it is with rules 3 and 4. Observe that the rule "send home after each period" can be obtained from rule 1 by setting $v = p + h$. Likewise, if $v = p - h$ in rule 4, an incumbent remains in office no matter what. Finally, by setting $v = p + h$ in rule 3, voters can reward inactive politicians and punish active ones.

We have assumed that (i) the environment is stationary, (ii) voting rules only use current information, and (iii) the incumbent's strategy is time and history independent. As a consequence, any period t equilibrium strategy is also an equilibrium strategy in any other period. In other words, the way in which an incumbent enters office - or the reason why she stays in office - is immaterial, both for the incumbent's behaviour and for the probability of re-election. In what follows we therefore suppress any reference to time.

2.1 The Economic Environment

We assume that from a social welfare point of view it is optimal to design a project and have it investigated. In case a project has been designed and examined, it is socially optimal to implement the project if and only if μ_t is such that $p + \mu_t \geq 0$. Let $\mu^{soc} := -p$ denote the socially optimal threshold value. The expected benefits of this implementation rule for the voter equal $\frac{1}{2h}(h - \mu^{soc})\left[p + \frac{1}{2}(h + \mu^{soc})\right] = \frac{1}{4h}(h + p)^2$.

Assumption 1 *From a social welfare point of view, it is optimal to design a project and have it investigated:*

$$\begin{aligned} W + C &< \frac{1}{4h}(h+p)^2 \\ W &< \frac{1}{4h}(h+p)^2 - p \end{aligned}$$

The second part ensures that once a project has been designed it is socially beneficial to have it examined. This part is redundant if $p < 0$. In that case, once a project has been designed, it is socially beneficial to have it examined: $W < W + C < \frac{1}{4h}(h+p)^2 < \frac{1}{4h}(h+p)^2 - p$.

For elections to matter, it should not be the case that without the threat of being thrown out of office an incumbent politician would already 'do good' – men is not governed by angels, to paraphrase James Madison. Nor should the social optimum be attained if there is no possibility of being re-elected – men is not governed by masochists, to paraphrase Marquis de Sade. In particular, for elections to matter it should not be the case that without the threat of losing elections or without the possibility of winning them a politician would (i) implement projects if and only if it is socially beneficial; (ii) hire a bureaucrat to analyse the merits of a policy; and (iii) design a policy. The following assumption is sufficient to guarantee that such benevolent behaviour does not occur.

Assumption 2 *Incumbents are neither angels nor masochists:*

$$\begin{aligned} \theta\frac{1}{4h}(h+p)^2 &< W + C \\ \theta p &< C \end{aligned}$$

This assumption says that the utility the incumbent derives if expected project benefits are maximal do not outweigh the joint cost of project design and examination. The second part, relevant only if $p > 0$, excludes the possibility that without re-election concerns an incumbent would design a project and implement it without examination. It is in this sense that re-election concerns matter. Without them, no project would be designed. These conditions put an upperbound, $\widehat{\theta}$, on the degree to which politicians care about the common good.

We also assume that the per period value of being in office is larger than the cost of designing and examining a project:

Assumption 3 *The per period value of holding office exceeds the costs of designing and examining a project:*

$$\lambda - W - C > 0$$

We now come back to our assumption that the costs of designing and evaluating the project are entirely borne by the incumbent. With minor modifications we could have assumed that the costs are partly borne by the incumbent – e.g., time and effort dedicated to designing and thinking about the project – and partly by the voter, e.g. in the form of tax. Write $C = C^j + C^l$ and $W = W^j + W^l$, where j stands for the incumbent and l for the voter. The resulting changes to the utility functions of the voter and the incumbent would be straightforward, and assumption 2 would have to be expressed in terms of C^j and W^j. Of course, the social welfare function and assumption 1 would stay the same. Although utility levels are affected, splitting the costs does not change the analysis qualitatively. We therefore assume that all costs are borne by the incumbent.

3 Analysis

In this section we analyse the extent to which the voting rules stimulate an incumbent politician to design a policy, examine it, and finally implement it if doing so is socially beneficial.

As the importance the incumbent attaches to the project is not enough in itself to design a socially beneficial project, any voting rule should create re-election concerns that provide the incumbent with incentives to do so. Both voting rules 3 and 4 can therefore be safely ignored as they put a premium on maintaining the status quo, and therefore on not designing a project at all. The premium consists of assuring re-election if the status quo is maintained, while putting re-election at risk if a project is implemented.

Proposition 1 *Under assumptions 1–3 no project will be designed if the voter uses either rule 3 or 4.*

3.1 General Observations on Rules 1 and 2

We will now limit the analysis to voting rules 1 and 2. Both rules condition re-election on project implementation. They differ in the exact specification of the conditions. Whereas mere project implementation may be sufficient if the voter uses rule 2, observation of the true payoff is a necessary condition for re-election with rule 1. More specifically, a voter who uses rule 1 requires project payoff to be reportedly higher than a specified threshold value for the incumbent to be re-elected: "no news is bad news". An electorate that uses rule 2 is happy to re-elect the incumbent as long as she was active in the current period but the results are unknown: "no news is good news". If however the results are published, performance should be sufficiently good to merit re-election. Thus, the latter rule provides an incentive to implement a project in the hope that a project will go unobserved, an incentive that is absent in case of rule 1.

The re-election rules differ in the possibility of ensuring that the incumbent implements a project if and only it is socially beneficial to do so. Suppose the electorate uses rule 1, and suppose a project has been designed and examined. If the electorate has set $v = 0$, the best reply of the incumbent is to implement a project if and only if $p + \mu \geq 0$. The incumbent has no interest in being more demanding than the voters. That is, she has no interest in rejecting a project with $p + \mu \geq 0$, as she would forego a profitable project without improving her chances of being re-elected. Nor is she inclined to be more lenient than the electorate. If she were to accept a project for which $p + \mu_t < 0$, she would both feel a loss in terms of project payoff and be thrown out of office for sure.

Lemma 1 *Suppose the electorate uses rule 1 and has set $v = 0$. Furthermore suppose a project has been designed and examined. Then, a project is implemented if and only if it is socially beneficial to do so.*

As we show below, rule 2 inevitably leads to a project implementation decision that is distorted. The idea is that with re-election possible when a project is implemented and its payoff goes unnoticed, an incumbent accepts a project even though it is known to lead to a loss. She trades off the loss made on the project against the value of being re-elected. Given that the policy implementation decision is potentially optimal if rule 1 is used, we now first analyse this rule in depth.

3.2 Further Analysis of Rule 1

This section presents the conditions under which a project is designed and examined under rule 1. We first assume that the electorate sets $v = 0$, as the first best can potentially be attained for this value of v. Recall that under rule 1, $v = 0$ implies that any incumbent who designs and examines a project will choose implementation if and only if $p + \mu \geq 0$.

Suppose that a policy has been designed in period t. Consider the decision to examine this policy or not. If the policy is examined, and the socially optimal implementation rule is used, the period t payoff equals $\lambda - W - C + \theta \frac{1}{4h} (h + p)^2$. Let V_{t+1}^{EL} denote the incumbent's discounted expected value of the equilibrium continuation game if she is re-elected. Furthermore, let V_{t+1}^{NE} denote the incumbent's discounted expected value of the equilibrium continuation game if she is sent home. The expected payoff of designing a project, not having a bureaucrat, and implementing a project if and only if $p + \mu > 0$ can now be written as

$$\lambda - C - W + \theta \frac{1}{4h} (h + p)^2 + \alpha \frac{(p + h)}{2h} V_{t+1}^{EL} + \left(1 - \alpha \frac{(p + h)}{2h}\right) V_{t+1}^{NE} \qquad (4)$$

where $\alpha \frac{p+h}{2h} = \alpha \Pr (p + \mu \geq 0)$ is the probability that the incumbent wins an election.

If no examination takes place, the politician still has to decide whether to implement the project or to reject it. If the conditions are such that it is optimal to reject it if the project is not examined, then the conditions are also such that no project should have been designed in the first place: this saves on project design costs C but leaves the payoff otherwise unaffected. That is, the strategy of designing a project, examining it, and maintaining the status quo cannot be part of an equilibrium. Therefore, assume that if a project has been designed, but goes unexamined, it is implemented. The period t payoff then equals $\lambda - C + \theta p$. With rule 1, examining a project or not does not change the probability of re-election. Given that a project has been designed, re-election depends solely on two factors outside the control of the politician: the probability that the outcome is observed, α, and the value of μ relative to that of v. The expected payoff of not evaluating a policy equals

$$\lambda - C + \theta p + \alpha \frac{(p + h)}{2h} V_{t+1}^{EL} + \left(1 - \alpha \frac{(p + h)}{2h}\right) V_{t+1}^{NE} \qquad (5)$$

From equations (4) and (5) it follows that if

$$\theta \frac{1}{4h} (h+p)^2 - \theta p \geq W \tag{6}$$

the project is examined.

Now we turn to the decision to design a policy or not. Suppose that (6) holds, implying that if a project is designed, it is examined. Then, the relevant comparison is between the payoff of not designing,

$$\lambda + V_{t+1}^{NE} \tag{7}$$

and the payoff of designing, evaluating and implementing the project if and only if $p + \mu \geq 0$ (see equation (4)). A policy is therefore designed if

$$\theta \frac{1}{4h} (h+p)^2 + \alpha \frac{p+h}{2h} \left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) \geq W + C \tag{8}$$

Inequalities (6) and (8) specify the conditions under which policy design, examination, and socially optimal implementation is the incumbent's best reply to an electorate that uses rule 1 and sets $v = 0$. Given this behaviour of the incumbent, the electorate attains the first best by using rule 1 and setting $v = 0$. The next proposition summarises the above results.

Proposition 2 *If*

$$\theta \frac{1}{4h} (h+p)^2 - \theta p \geq W \tag{9}$$

$$\theta \frac{1}{4h} (h+p)^2 + \alpha \frac{p+h}{2h} \left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) \geq W + C \tag{10}$$

where

$$V_{t+1}^{EL} - V_{t+1}^{NE} = \frac{\delta \alpha (p+h)}{2h - \delta \alpha (p+h)} (\lambda - C - W) \tag{11}$$

an equilibrium exists in which the electorate uses rule 1 and sets $v^* = 0$, and the incumbent designs and examines a project, and uses the socially optimal project implementation rule.

Inequalities (9) and (10) give the conditions under which rule 1 yields the first-best solution from the voter's perspective. Conditions (10) and (11) imply that λ must

be sufficiently high to induce the incumbent to design a project. The reason why electoral concerns encourage project design is that re-election requires implementation of a project. Quite intuitively, the higher is α, the wider is the range of λ for which condition (10) is satisfied. Re-election requires that voters observe that $p + \mu \geq 0$. A higher δ also widens the range for which (10) is satisfied: discounting the future less heavily increases the value of holding office. Electoral concerns do not affect the condition for hiring a bureaucrat. In fact, condition (9) implies that examination requires θ to be sufficiently high. Proposition 2 therefore shows that although electoral concerns encourage incumbents to design projects, voters have to rely on concerns to do good for the examination of projects.

What happens if the parameter values are such that the first best cannot be attained as a project is designed, but not examined? That is, what can the voter do if condition (10) is met, but (9) is not?

Lemma 2 *Suppose the electorate uses rule 1. Furthermore suppose that a policy has been designed. If* $\theta\frac{1}{4h}(h+p)^2 - \theta p < W$*, then the policy will not be examined, irrespective of the value of* v*.*

In other words, given the use of rule 1, if the incumbent is not sufficiently intrinsically motivated by the public good, she cannot be induced to examine the project. The reason is that once a project has been designed, examination does not affect election outcomes. Suppose, for example, that μ is such that $p + \mu < v^*$. Rule 1 implies that the elections will be lost, independent of the decision to examine the project or to implement it. That is, the only reason to examine a project is to know its value so as to avoid a socially undesirable decision. Clearly, with the value of an implemented project at its maximum if $v^* = 0$, no change in v can improve the value of examining the project.

Whether it is a bad thing that an unexamined project is implemented depends on the alternative, maintaining the status quo. Evidently, from the voter's perspective it is better to maintain the status quo if $p < 0$. However, implementing a project without examining it is still preferable to maintaining the status quo if $p > 0$.

Suppose the examination condition (9) is satisfied but the design condition (10) fails to hold. Can a change in the threshold value v^* ensure that a project is designed? Note that the left-hand side of condition (10) consists of the sum of the

value the incumbent attaches to the project payoff and the net value of being re-elected. With the project payoff at its maximum for $v = 0$, any reason to change v should stem from an improvement in the net value of re-election. An increase in v can be discarded as it reduces both the probability of being re-elected in this period and in any future period. Hence, we only have to consider a reduction in v. A direct implication of $v < 0$ is that the implementation decision is distorted. The reason is that the optimal cut-off value satisfies $\mu^* = v^* - p < \mu^{soc} = -p$, and so a socially undesirable project may be implemented. Note that μ^* cannot satisfy $\mu^* < v^* - p$, since implementation of any project with $\mu \in [\mu^*, v - p)$ is undesirable and leads to a defeat of the next elections. Maintaining the status quo would have been unambiguously better. Nor can $\mu^* > v^* - p$ be the case as this would mean that v^* does not affect any decision the incumbent makes, while v was meant to induce the incumbent to design a project. Hence, in equilibrium, $\mu^* = v^* - p$.

To sum up, a reduction in v increases the probability that the incumbent is re-elected if he designs a project. This effect of v on the incumbent's willingness to design a project is in the right direction. Moreover, a smaller value of v implies a less demanding voting rule and therefore increases the future value of office. This effect is also in the right direction. On the other hand, as $v < 0$ distorts policy choice, it reduces the expected social value of implemented projects. For small absolute values of v, the cost of such a distortion is small. The larger is the absolute value of v, the more important becomes the adverse effect of v on the expected social benefit of designing a project. The total effect of a decrease in v on the willingness of an incumbent to design a project is ambiguous. Only for small absolute values of v, a decrease in v strengthens the incumbent's incentive to design a project.

Two other considerations have to be kept in mind when v is lowered with a view to increasing the likelihood of re-election. First, as argued above any reduction of v makes it less likely that a bureaucrat will be hired. Second, a reduction in v may make the project payoff negative, in which case the electorate would rather make project design unattractive by setting $v = p + h$.[4] This suggests that any deviation from $v = 0$ should be the smallest needed to guarantee project design, while

[4]That the expected project payoff should be larger than zero is a direct consequence of our assumption that the costs of designing and evaluating the project are not borne by the electorate. In general, the condition is that the payoffs are larger than the costs, $C^L + W^L$, borne by the voters.

safeguarding project evaluation. Proposition 3 summarises the above discussion.[5]

Proposition 3 *Suppose the electorate uses rule 1. Furthermore suppose condition 9 is satisfied, but condition 10 is not. Then, the first best cannot be attained. If there is a v' satisfying*

$$\theta\frac{p+h-v'}{2h}\left[p+\frac{1}{2}\left(h+v'-p\right)\right]+\alpha\frac{p+h-v'}{2h}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right)=W+C \tag{12}$$

where

$$V_{t+1}^{EL}-V_{t+1}^{NE}=\frac{\delta\alpha\frac{p+h-v'}{2h}}{1-\delta\alpha\frac{p+h-v'}{2h}}\left(\lambda-C-W\right) \tag{13}$$

and if this v' satisfies

$$\theta\frac{p+h-v'}{2h}\left[p+\frac{1}{2}\left(h+v'-p\right)\right]-\theta p\geq W \tag{14}$$

and

$$\frac{p+h-v'}{2h}\left[p+\frac{1}{2}\left(h+v'-p\right)\right]\geq 0 \tag{15}$$

then an equilibrium exists in which the electorate sets $v^*=v'$, and the incumbent designs and examines a policy, and implements it if and only if $p+\mu>v'$.

If either condition (9), (12), (14), or (15)[6] is not met, the electorate cannot use rule 1 to induce the incumbent to design a project and examine it. A reason might be that rule 1 is too demanding for it requires that voters learn that the outcomes of the project are favourable. One problem is that voters observe outcomes only with a probability. Indeed, the lower is α, the tighter are the conditions (10) and (12) for project design. As will be seen, the nature of rule 2 is very different.

3.3 Rule 2

This section presents the conditions under which rule 2 induces politicians to design and examine a project. Recall that the difference between rule 1 and 2 is that with

[5] Condition (12) in the proposition is a third degree polynomial in v'. The solution we are interested in is the one with the smallest absolute value.

[6] Condition (15) is redundant in case $p>0$, because it holds if condition (14) does (the latter can be rewritten as $\frac{p+h-v'}{2h}\left[p+\frac{1}{2}\left(h+v'-p\right)\right]\geq p+\frac{W}{\theta}$). Clearly, for $p>0$, an equilibrium can be sustained in which a project is designed but remains unexamined for larger distortions than are allowed for in the equilibrium described in Proposition 3 for $p>0$: it suffices to replace condition (14) (and (15)) by $\frac{p+h-v'}{2h}\left[p+\frac{1}{2}\left(h+v'-p\right)\right]\geq p$.

rule 2 the incumbent is re-elected if the voter does not observe project outcomes, whereas with rule 1 the incumbent is sent home in that case. We show that this feature of rule 2 causes a distortion in the project implementation decision.

We can characterize the implementation decision by identifying the value of μ, μ^*, for which the incumbent is indifferent between implementation and status quo. The next lemma establishes that $v^* \geq p + \mu^*$ holds in equilibrium. That is, in equilibrium, the electorate is more demanding than the incumbent.

Lemma 3 *If the electorate uses rule 2, $v^* \geq p + \mu^*$ holds in equilibrium.*

The intuition for this lemma is as follows. Under rule 2, the incumbent will be re-elected if the voter does not observe project outcomes. This property of rule 2 gives the incumbent a strong incentive to implement a project. Indeed, as we will show below, the incumbent may implement projects which hurt the voter. By setting $v > p + \mu^*$ the voter decreases the benefit of re-election, thereby weakening the incumbent's incentive to implement socially undesirable projects.

We can now focus on those cases in which $v \geq p+\mu^*$. For $\mu = \mu^*$, implementation yields a payoff equal to $\lambda - C - W + \theta\left(p + \mu^*\right) + (1-\alpha) V_{t+1}^{EL} + \alpha V_{t+1}^{NE}$. If instead, the status quo is maintained, the incumbent's payoff equals $\lambda - C - W + V_{t+1}^{NE}$. The value of μ^* for which the incumbent is indifferent between implementing and maintaining the status quo equals

$$\begin{aligned} \mu^* &= -p - \frac{(1-\alpha)}{\theta}\left(V_{t+1}^{EL} - V_{t+1}^{NE}\right), \qquad (16) \\ \text{where } V_{t+1}^{EL} - V_{t+1}^{NE} &= \frac{\delta}{1 - \delta\left[\alpha\frac{h-v+p}{2h} + (1-\alpha)\frac{h-\mu^*}{2h}\right]} \end{aligned}$$

From (16) it directly follows that the project implementation decision is distorted under rule 2 (as $\mu^{soc} = -p$). The incentive to implement the project is too strong. The reason is that under rule 2 implementation of a socially undesirable project may lead to re-election. By manipulating v, the electorate can influence the extent to which a distortionary decision is taken. An increase in v reduces the value of winning the elections and therefore the advantage of implementation in terms of continuation value. Hence, with a view to minimizing the distortion associated with the project implementation decision, the policy maker should set v as high as possible.

Lemma 4 *If the electorate uses rule 2, the smallest possible distortion at the policy implementation stage can potentially be assured by setting* $v = p + h$.

The next step is to check under which conditions politicians in fact design and examine a project in equilibrium given $v = p + h$.

Suppose that the incumbent has designed a project. Furthermore suppose that there is a value of $\mu^* \in (-h, h)$ that solves equation (16) for $v = p + h$. Evaluating a project then yields a payoff to the incumbent equal to

$$\lambda - C - W + \theta \frac{h - \mu^*}{2h} \left[p + \frac{1}{2} (h + \mu^*) \right] + (1 - \alpha) \frac{h - \mu^*}{2h} V_{t+1}^{EL} + \left(1 - (1 - \alpha) \frac{h - \mu^*}{2h} \right) V_{t+1}^{NE} \tag{17}$$

If the project remains unexamined it will be implemented in equilibrium (as not implementing it cannot be part of an equilibrium in which a costly project is designed). This yields a payoff equal to $\lambda - C + \theta p + (1 - \alpha) V_{t+1}^{EL} + \alpha V_{t+1}^{NE}$. It follows that a policy is examined if and only if

$$\theta \frac{h - \mu^*}{2h} \left[p + \frac{1}{2} (h + \mu^*) \right] - \theta p - (1 - \alpha) \frac{h + \mu^*}{2h} \delta \left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) \geq W \tag{18}$$

Equation (18) shows that electoral concerns weaken the incentive to examine a policy if the electorate uses rule 2 and sets $v = p + h$. That is, the more the incumbent cares about holding office, the less inclined she is to examine the project. The intuition is as follows. If a policy is examined in equilibrium, the information made available about its quality will be used. Hence, with some probability a policy will be found unworthy of pursuing, and instead the status quo will be maintained. The upcoming elections will be lost for sure. If instead the incumbent decides to remain ignorant as to the quality of her designed policy and implements it without any examination, there is a chance that its payoff goes unnoticed even if it is a bad policy and would have been rejected had examination taken place. In other words, if the electorate uses rule 2 the chances of re-election grow dimmer due to examination.

Now consider the incumbent's decision on project design. If a policy is designed, examined, and implemented using μ^*, the expected utility for the incumbent equals the expression in (17). If instead no policy is designed, the expected utility amounts

to $\lambda + V_{t+1}^{NE}$. A policy will thus be designed if and only if

$$\theta \frac{h-\mu^*}{2h}\left[p+\frac{1}{2}\left(h+\mu^*\right)\right]+\frac{h-\mu^*}{2h}\left(1-\alpha\right)\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right)\geq W+C \tag{19}$$

If conditions (18) and (19) hold, policy design, examination, and implementation if and only if $\mu_t \geq \mu^*$ is a best reply to an electorate that uses rule 2 and has set $v = p + h$. Given that a policy is designed and examined, and that rule 2 is used, the best the electorate can do is to set $v = p + h$. The next proposition summarises the above.[7,8]

Proposition 4 *Suppose the electorate uses rule 2. Let μ^* satisfy*

$$\mu^* = -p - \frac{1-\alpha}{\theta}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right) \tag{20}$$

with

$$V_{t+1}^{EL}-V_{t+1}^{NE}=\frac{\delta\left(1-\alpha\right)\frac{h-\mu^*}{2h}}{1-\delta\left[\left(1-\alpha\right)\frac{h-\mu^*}{2h}\right]}\left(\lambda-C-W\right) \tag{21}$$

and assume $\mu^* \in (-h, h)$. If

$$\theta\frac{h-\mu^*}{2h}\left[p+\frac{1}{2}\left(h+\mu^*\right)\right]-\theta p-\left(1-\alpha\right)\frac{h+\mu^*}{2h}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right)\geq W, \tag{22}$$

$$\theta\frac{h-\mu^*}{2h}\left[p+\frac{1}{2}\left(h+\mu^*\right)\right]+\left(1-\alpha\right)\frac{h-\mu^*}{2h}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right)\geq W+C \tag{23}$$

and

$$\frac{h-\mu^*}{2h}\left[p+\frac{1}{2}\left(h+\mu^*\right)\right]\geq 0 \tag{24}$$

hold, an equilibrium exists in which (i) the incumbent designs and examines a project, and implements it if and only if $\mu_t \geq \mu^*$, and (ii) the electorate sets $v^* = p + h$.

Proposition 4 gives the conditions under which under rule 2 projects are designed and examined. Let us now examine how those conditions depend on the parameters of the model. First consider α, the probability with which the payoff of the project is revealed. If α decreases, the threshold value μ^* goes down, and the distortion

[7] Equations (20) and (26) specify a third degree polynomial in μ^*. We are interested in the solution closest to $-p$.

[8] Observe that if condition (22) holds, then so does (24) when $p > 0$.

at the project implementation stage grows. As a result, the expected value of an implemented project declines. Condition (23) governing whether a project will be designed or not can be rewritten using the expression for the optimal threshold value, equation (20), as

$$\theta \frac{(h-\mu^*)^2}{4h} \geq W + C \tag{25}$$

It is not hard to see that a lower value of α enlarges the parameter set for which a project will be designed.[9] However, if it becomes less likely that the electorate observes the project outcome before the next elections, it becomes less likely that the incumbent will examine the project. As noted, the project payoff declines, making project examination less beneficial. Moreover, in any period the chances of being re-elected are strengthened, implying that the difference in value of being re-elected or not increases. The result is that a reduction in α leads to a smaller set of parameters for which a project is examined. Of course, condition (24) guarantees that too large a distortion, or uninformed implementation, cannot be part of an equilibrium. The electorate can always ensure the status quo, by using rule 1, with $v = p + h$. In this way, it can avoid a loss on implemented projects.

A comparable negative effect results from an increase in the value attached to holding office, λ, or, equivalently, a reduction in time discounting, δ. Any increase in the value attached to being in office leads to a larger distortion, see equations (20) and (21). As a consequence, the range of parameters for which a policy is examined shrinks (as the project payoff declines, and the importance of being re-elected grows, see equation (22)). At the same the inclination to design a project is stimulated, as can be deduced from equation (25).

The upshot of this discussion is that the structure of rule 2 is such that any change in the environment that makes re-election more probable or more profitable reduces the range of parameters for which a project is examined, but widens the range for which it is designed.

What happens if either condition (22) or (23) is violated? First suppose that a project is designed, but not examined, i.e., (23) holds, but (22) does not. If the incumbent is unwilling to examine a project for $v = p + h$, then, within the bounds set by the structure of rule 2, the electorate is left without any means to strengthen

[9] Observe that $\frac{\partial \theta \frac{(h-\mu^*)^2}{4h}}{\partial \alpha} = -\frac{2(h-\mu^*)}{4h}\frac{\partial \mu^*}{\partial \alpha} < 0$.

the incumbent's incentive to take an informed decision. Any reduction of v below $p+h$ leads to a larger distortion, because the incumbent becomes more tempted to implement a project in the hope its payoff is not revealed: both the probability of re-election and the discounted value of being re-elected go up. Hence, the expected value of an implemented project goes down. Moreover, as explained above, the probability of re-election is always smaller if a project is implemented with rather than without examination. The net effect is that if (22) is violated for $v = p + h$, it is violated for any other value of v as any decline in v raises the likelihood and value of being re-elected.

This brings us to one of the main results of this paper. Whether the electorate uses re-election rule 1 or rule 2, any incentives to examine a policy stem from an intrinsic interest in the public good, not from a concern with re-election. In other words, policies are examined in spite of, not thanks to elections.

Theorem 1 *If an incumbent can only design and examine one project in her term, elections do not give the incumbent any incentives to examine decisions.*

A corollary of this result is that

Corollary 2 *A politician who does not care about the public good, $\theta = 0$, can not be motivated to take informed decisions, however much she cares about holding office.*

This in turn implies that even if the cost of information about the quality of the project were to be reduced or indeed if the relevant information were offered for free, $W = 0$, an incumbent who only cares about re-appointment would not want to examine the project.

Corollary 3 *An incumbent who does not care about the public good, $\theta = 0$, cannot be motivated to examine the project by any reduction in the cost of examination W.*

Now let us assume that condition 22 is met, but that the threshold value $v = p + h$ is too large for a project to be designed, i.e., condition 23 does not hold. In this situation, the electorate may stimulate the incumbent to design a project by lowering the threshold value, making re-election more likely. This comes at the cost of reducing the expected value of implemented projects. As a consequence, the range of parameters for which the project will be examined shrinks. Moreover,

the electorate loses any interest in reducing v if and if the project payoff becomes negative. Finally, the reduction in project payoff may offset the increased value of re-election. Therefore, the electorate will set v as high as possible such that a project is designed and examined, and such that project payoff is non-negative.

Proposition 5 *Suppose the electorate uses rule 2, and suppose condition (23) is violated, but condition (22) is not. Suppose there is a* $v^* \in (-h, h)$ *and a* $\mu^*(v^*) \in (-h, h)$ *that jointly satisfy*

$$\theta \frac{h - \mu^*(v^*))}{2h} \left[p + \frac{1}{2}(h + \mu^*(v^*)) \right] + \frac{(1-\alpha)(v^* - [p + \mu^*(v^*)]) + p + h - v^*}{2h} \left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) = W + C \quad (26)$$

with

$$V_{t+1}^{EL} - V_{t+1}^{NE} = \frac{\delta[(1-\alpha)(v^* - [p + \mu^*(v^*)]) + p + h - v^*]}{2h - \delta[(1-\alpha)(v^* - [p + \mu^*(v^*)]) + p + h - v^*]} (\lambda - C - W) \quad (27)$$

and

$$\theta(p + \mu^*(v^*)) = -(1-\alpha)\left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) \quad (28)$$

If

$$\theta \frac{h - \mu^*(v^*))}{2h} \left[p + \frac{1}{2}(h + \mu^*(v^*)) \right] - \theta p - \frac{(h + \mu^*(v^*))(1-\alpha)}{2h} \left(V_{t+1}^{EL} - V_{t+1}^{NE} \right) \geq W \quad (29)$$

and

$$\theta \frac{h - \mu^*(v^*))}{2h} \left[p + \frac{1}{2}(h + \mu^*(v^*)) \right] \geq 0 \quad (30)$$

hold, an equilibrium exists in which (i) the incumbent designs and examines a project, and implements it if and only if $\mu > \mu^*(v^*)$*, and (ii) the electorate sets* $v = v^*$*.*

Clearly, if there is no value for v^* or for $\mu^*(v^*)$ in the interval $(-h, h)$, then this equilibrium does not exist. If either condition (22), (26), (29), or (30) is not met, rule 2 cannot be used to induce the incumbent to design and examine a project. One major possible reason is either too low or too high a probability that the project payoff is revealed. In the first case, although a project would be designed, it would not be examined. In the latter case, no project would be designed.

4 Extension

An important result of the previous section is that electoral concerns discourage incumbents to examine a project. We have discussed two reasons for this result. First, electoral concerns may distort project choice, and thereby reduce the value of information about the the consequences of the project. Second, examination of a project increases the probability of status quo, and status quo never leads to re-election. In this section we argue that there is a countervailing force. In a situation where the incumbent can design more than one project, examining a project could be in the interest of an incumbent because a bureaucrat can prevent the incumbent from implementing a project that leads to losing office.

To illustrate this countervailing force, we extend the model of the previous section by giving the incumbent the opportunity to design two projects. More specifically, we split up each period t into two parts, $(t,1)$ and $(t,2)$. In each part k the incumbent can design one project, $D_{t,k} \in \{0,1\}$ with $p + \mu_{t,k}$, and examine it, $B_{t,k} \in \{0,1\}$. We maintain the assumption that the incumbent can implement only one project (if $X_{t,1} = 1$, then $X_{t,2} = 0$). One could think of a policy reform. Only one reform is possible. If, as a result of examining it, a proposal for a reform is found to lead to disappointing results, the incumbent can choose to design another one. The costs of designing a project, C, and examining it, W, are the same for $(t,1)$ and $(t,2)$. To show most convincingly that it is electoral concerns that may encourage an incumbent to examine a project, we assume that incumbents do not care about the public interest. Recall that under such circumstances, an incumbent would not examine a project if he could only design one project. We focus on voting rule 1. Re-election thus requires implementation of a project and that project payoffs exceed the threshold v.

4.1 Analysis

We first analyze the second part of the incumbent's term. We identify the condition under which the incumbent designs a project in the second part of her term and argue that the incumbent never examines a project in the second part of his term. Suppose that in the first part of her term, an incumbent designed a project, hired a bureaucrat, but did not implement a project, because it would not lead to re-election.

Then, in the second part of his term, this incumbent has his last chance of designing a project that may please voters. Suppose that $D_{t,2} = 1$. Clearly, in the second part of his term, the incumbent has no incentive to hire a bureaucrat. The reason is that the incumbent is not concerned with the public interest. Moreover, examining the consequences of the project does not affect his chances of re-election. So, if the incumbent designs a project in part two of his term, $D_{t,2} = 1$, he will implement it without further ado. Now consider the incumbent's decision whether or not to design a project. If $D_{t,2} = 0$, the payoff to the incumbent equals $\lambda - C - W$.[10] If $D_{t,2} = 1$, his payoff equals $\lambda - 2C - W + \alpha\frac{p+h-v}{2h}V_{t+1}^{EL}$. The incumbent therefore chooses $D_{t,2} = 1$ if

$$\alpha\frac{p+h-v}{2h}V_{t+1}^{EL} > C \tag{31}$$

Equation (31) shows that if the discounted value of re-election is sufficiently high, the incumbent will design a project in the second part of his term.

Let us now consider the first part of the incumbent's term. Suppose that (31) holds. Furthermore suppose that in the first part of his term, the incumbent has designed a project, $D_{t,1} = 1$, and has hired a bureaucrat, $B_{t,1} = 1$. Clearly, given the voting rule, it is only in the interest of the incumbent to implement the project if $p + \mu_{t,1} \geq v$. If $p + \mu_{t,1} < v$, then implementation would lead to a certain defeat in the next election. Now consider the incumbent's decision whether or not to examine the project, $B_{t,1}$. When he does not hire a bureaucrat, $X_{t,1} = 1$ yields $\lambda - C + \alpha\frac{p+h-v}{2h}\delta V_{t+1}^{EL}$. If $B_{t,1} = 1$, the incumbent's expected payoff equals

$$\lambda - C - W + \alpha\frac{p+h-v}{2h}\delta V_{t+1}^{EL} + \frac{v-(p-h)}{2h}\left[\alpha\frac{p+h-v}{2h}\delta V_{t+1}^{EL} - C\right] \tag{32}$$

The second term of (32) gives the probability that the project designed in the first part of an electoral term leads to re-election multiplied by the equilibrium continuation value for the incumbent if he is reappointed. The third term gives the expected payoff to the incumbent if it turns out that $X_{t,1}$ does not satisfy the voter. This term represents the benefit of a bureaucrat from the incumbent's point of view. The bureaucrat shows the incumbent whether or not the first project is good enough. If not, another project should be designed. Hence, hiring a bureaucrat yields a higher

[10] Notice that $V_{t+1}^{NE} = 0$. The reason is that the incumbent only values office. Moreover, with infinite citizens, the incumbent's share in the public interest is negligible.

payoff than not hiring if

$$\frac{1}{2h}\left(v-(p-h)\right)\left[\alpha\frac{(p+h-v)\delta V_{t+1}^{EL}}{2h}-C\right]>W \tag{33}$$

Notice that if condition (33) holds, then conditions (31) holds too.

Now consider the decision whether or not to design a project. Not designing a project in the first part of her term gives the incumbent a payoff equal to $\alpha\frac{(p+h-v)\delta V_{t+1}^{EL}}{2h}+\lambda-C$. If $X_{t,1}=1$, then his payoff is equal to (32). Hence, the condition for designing a project is the same as the condition for hiring a bureaucrat. To sum up, given that the voter uses rule 1 and has set the threshold v, and assuming that condition (33) holds, the incumbent's best reply is as follows: she designs and examines a project in the first part of her term, and implements it if $\mu_{t,1}$ satisfies $p+\mu_{t,1}>v$. If instead $p+\mu_{t,1}\leq v$, then she designs a second project and implements it without consulting a bureaucrat.

Let us now determine the optimal value of v, supposing that condition (33) is satisfied. The value of v directly affects the project implementation decision. Given that an incumbent chooses $X_{t,1}=1$ iff $p+\mu_{t,1}>v$ and chooses $X_{t,2}=1$ otherwise, the expected period t payoff to the voter equals

$$\frac{(p+h-v)}{2h}\left[p+\frac{1}{2}\left(h+v-p\right)\right]+\frac{\left(v-(p-h)\right)p}{2h} \tag{34}$$

The first term of (34) is related to the first part of an incumbent's term. With probability $\frac{1}{2h}(p+h-v)$ the incumbent designs a project for which $p+\mu>v$. The term in square brackets gives the expected payoff to the agent for a project with $p+\mu>v$. The second part of (34) is related to the second part of the incumbent's term. It gives the expected payoff to the voter if $X_{t,2}=1$. Provided that (33) is satisfied, the voter chooses that value of v that maximizes (34). Simple algebra shows that (34) is maximized at $v^*=p$, implying that $\mu^*=0$. This implies that a project is implemented in the first part of the term with probability $\frac{1}{2}$, and that the expected value of a project implemented equals $p+\frac{1}{4}h$.[11] To understand the fact that $v^*=p$, first recall that if in the first part of the incumbent's term no

[11] Obviously, the expected value created is larger than the value of an implemented project that remains unexamined, p. If $p+\frac{1}{4}h<0$, the voter does not want the incumbent to implement a project. This can be assured by setting $v=p+h$.

project is implemented, then another one will be implemented in the second part. Since the latter project will not be screened by a bureaucrat, that project yields an expected payoff to the voter equal to p. By setting $v^* = p$ the voter is certain that the incumbent only implements a project in the first part of his term if that project delivers a higher payoff than the expected payoff of a project that is not screened. The following proposition summarizes the above discussion.

Proposition 6 *Suppose the incumbent only values office, $\theta = 0$, $\lambda > 0$. Suppose the electorate uses rule 1, and that the incumbent can design a project twice. Assume $p + \frac{1}{4}h > 0$, and assume $\frac{1}{2}\left[\alpha\frac{1}{2}V_{t+1}^{EL} - C\right] \geq W$. Then, an equilibrium exist in which (i) the voter sets $v^* = p$, and (ii) the incumbent designs and examines a project in the first part of her term, and implements it if $\mu_{t,1}$ satisfies $p + \mu_{t,1} \geq 0$. If instead $p + \mu_{t,1} < 0$, the project is not implemented in the first part of her term. Instead, she designs a second project and implements it without consulting a bureaucrat.*

In the light of our earlier findings, the most important result of this section is that electoral concerns may to some extent encourage an incumbent to collect information. "To some extent", as electoral concerns do not stimulate an incumbent to aquire information at the end of her term. Clearly, this result remains if we assume that she can design n projects rather than 2: electoral concerns do not induce her to collect information at the last part of her term.

Another result from the above analysis is that, as an incumbent does not collect information in the second part of her term, the implementation decision is inevitably distorted. Too many projects are undertaken. Our assumption that the incumbent is not concerned with the public interest aggravates the distortion. If the incumbent also cares about the public good, she may decide to collect information in the second part of her term. This would reduce, but not offset, the distortion.

5 Discussion

Democracies delegate substantial decision power to politicians. The electorate would like good public decisions to rely on insight rather than luck. Our analysis shows the challenge an electorate faces in assuring this is actually the case. It shows that informed political decision making requires a sufficient degree of intrinsic motivation.

Valuing office, and hence valuing re-election, may be an obstacle to policy examination. A tension results. By assumption, elections are needed as a carrot and a stick to motivate politicians. Yet politicians who are overly interested in re-election shy away from policy examination.

This tension stems from the fact that examination, and basing the implementation decision on the information obtained, improves the value of implemented policies rather than the chances of re-election. Under rule 1, examination leaves the probability of re-election unaffected. Hence, politicians who identify little with the public good will not examine a project. Under rule 2, examination reduces the likelihood of re-election as drawing a project that falls short of the standard set by the incumbent now leads to losing office, while without examination the project would have been implemented and re-election would have been possible. Thus, politicians who are hardly intrinsically motivated or care substantially about holding office do not examine projects.

Under rule 2, then, the likelihood of observing the payoff of implemented projects plays an important role when it comes to policy examination. The more likely it becomes that the project payoff is revealed (α), the larger is the set of parameters for which a project will be examined. Conditional on a project being designed and examined, any increase in α reduces the distortion at the project implementation stage. This suggests that it is in the interest of the citizenry to improve the likelihood of observation. A high general level of education is likely to stimulate a better insight into the way a specific policy measure will impact voters' lives. Similarly, closer media attention, especially of an investigative kind, ameliorates the possibilities of controlling political delegates through elections.[12] However, the inclination to design a project is *reduced* by enhanced observability of the policy implications. Hence, our model suggests that whether or not improvements in the observability of policy outcomes remedy a shortcoming in the political process depends on the circumstances that bring about the failing in the first place.

We find that policies are examined in spite of elections. Yet some of our assumptions create a world in which the inclination to examine policies thanks to elections should be strongest. In other words, alternative assumptions would further reduce

[12] This will also make project design more likely under rule 1, as observing the payoff of an implemented project with too low a frequency may hinder project design.

the tendency to examine policies. First, we assume the electorate to be both homogeneous and able to coordinate on a re-election rule. A heterogeneous electorate, or one that is unable to coordinate on a specific rule, would make re-election less dependent on the actual implementation of a policy as some voters would prefer maintaining the status quo. Policy examination would become less profitable.[13] We also assume that incumbents, opponents, and the electorate agree on what is the socially desirable implementation rule. There is therefore no problem of aggregation of preferences. Third, it is assumed that principal-agent problems do not hamper the relationship between the incumbent and bureaucrat, nor that the incumbent and the bureaucrat differ in their views as to what constitutes a socially desirable policy. Once again, a deviation from this assumption could make examination more problematic. Finally, we assume that the incumbent deals with one societal problem in her term, and that the electorate bases her verdict on how well she addresses this problem. It is not uncommon to identify a president or government with one major issue, think of Reagonomics and Thatcherism, or Roosevelt's New Deal. The overarching political strategy and the general political stance rather than specific individual decisions may then rule the likelihood of re-election. In other cases, the probability of re-election depends on the way the politician addresses a variety of issues. With more than one problem to be addressed, the possible lack of observation of the results in one area may reduce the incentive to examine policy proposals in another as re-election has become unlikely anyway. Alternatively, the electorate may decide to become less demanding. In any event, the inclination to examine any single project would shrink.

Information plays a key role in our understanding of a representative democracy. This paper highlights that delegation of decision authority in a democracy does not by itself lead to the production and use of relevant information by the delegates.

Sometimes an institutional change may suffice to improve the alignment of the incumbent with the electorate. For example, if a project is designed, but the incumbent has no incentive to examine it, one of the means open to the electorate is a lengthening of the term the incumbent stays in office. This was discussed in

[13] By assuming that the electorate is both homogeneous and able to coordinate on a voting rule we follow the literature, see Ferejohn (1986) and Persson, Roland, and Tabellini (1997). Note, however, that relaxing this assumption would reduce the beneficial effect elections have in their papers.

section 4. A project may now be examined, but it comes at the cost of an inevitably distorted implementation decision. Also, any model that allows for the possibility of rent extraction by an incumbent will show that a longer term worsens this moral hazard problem, see e.g. Ferejohn (1986).

If the electorate uses rule 1, an incumbent who cares about the public good, but too little to examine policies herself, would pay heed to an unfavourable advice of an independent institution. In this sense, the existence of organizations that both collect information and provide analysis and that operate at some distance from the political process can be seen as an institutional arrangement meant to fill the gap left uncovered by holding elections.[14] Many of such organizations exist. They view their proclaimed independence as their principal defining characteristic, especially those that receive some public funding or were set up with governmental aid.[15] The Irish Economic and Social Research Institute, ESRI, for instance, having explained that it receives a grant-in-aid from the Department of Finance writes in bold on its webpage "The ESRI is not a semi-state agency and the Government plays no legal role in appointing the Council or Executive". It is also made clear that when the Institute was founded in 1960, a decision in which the Secretary of the Department of Finance played a significant role, "it was considered desirable that this research be done outside the civil service in a setting free from government or political influence". That the government is represented in the Institute can, however, not be denied: "In practice it is usual for a senior official of the Department of Finance to be elected to serve on the Executive".[16]

Apart from being a crucial input in the public decision process, information about political decisions and outcomes is the key ingredient for elections to perform their controlling function. We have depicted this information as if it 'appears', by an act of Nature, at an exogenous rate. Clearly, in reality some information appears without the conscious intervention of a human, although the likelihood may

[14] Our model predicts that if a politician does not care about the public good, she would still ignore this information, even if it were provided for free, or equivalently if it its costs were sunk because incurred as a matter of convention rather than discretion. In reality, ignoring existing information and reports may pose a serious threat to a politician's credibility if it is found out that what was ignored was relevant to the issue at hand.

[15] See for example the homepages of the economic research and policy analysis organizations united in Euroframe (www.euro-frame.org) or in Enepri (www.enepri.org).

[16] The ESRI website is www.esri.ie.

still be influenced by human action. Think of information about the quality of some decisions taken by the ministry of Transport as signalled by rush hour traffic congestion. However, within the realm of politics, it seems that an important part of information is more likely to be both consciously produced and revealed. Does this improve the functioning of a democracy? Does it depend on the voting rule the electorate uses? These are very much open questions about which we make some tentative comments by way of conclusion.

If information is endogenous, the intentions of the politician take centre stage. She may want to diffuse true or fabricated information that is favourable to her position, and, similarly, consciously hide information that would be detrimental to her chances of re-election.[17] If information revelation is a prerequisite for re-election, as is the case under rule 1, politicians are tempted to produce information. The credibility of this information becomes a serious issue. Quality media may serve as a screening device, and the presence of opposition parties and interest groups helps. But we would also suggest that governmental auditing offices serve as 'certifying institutions' of the statements politicians make regarding the success of important policy measures. The scope of various such offices, like the United States General Accounting Office, GAO, and the Netherlands Court of Audit (*Rekenkamer*), has gradually broadened over time. Initially, these courts carried out audits. Today, they also evaluate the performance of programmes. They try to determine whether or not policies have had the intended effects. The reports they publish will only be credible if the executive branch can commit not to interfere with their analysis and publications. They should therefore operate independently of the executive. Such is in fact often the case: the GAO, for instance, is the "audit, evaluation, and investigative arm of Congress", not of the president;[18] and both the German *Bundesrechnungshof* and the Dutch *Rekenkamer* are subject only to the law.

An incumbent is even less interested in publication of information about the quality of her decisions when a 'no news is good news' re-election rule is used. Under such a rule, revealing information may reduce the incumbent's chances of re-election,

[17] One way in which individual politicians or political parties may influence the provision of information is by owning the media. Djankov et al. (2001) find empirical evidence that government ownership of the media is associated with inferior economic and social outcomes. See Besley and Prat (2002) for a model of collusion between government and media.

[18] See www.gao.gov.

making it more likely that pertinent information is ignored, obfuscated or put in the 'doofpot'[19]. With this re-election rule, freedom of press is essential, as is the freedom to investigate the performance of public policies. The Dutch *Rekenkamer*, e.g., is able to decide for itself "what to audit, how to do so, and what to publish".[20]

If an incumbent may consciously produce and hide policy relevant information, verifying her intentions forms an important goal of elections. Can a candidate be trusted, can she be relied on? It is in the electorate's interest to stimulate an interest in the public good, if it wants policies to be examined. We would tentatively suggest that it is easier to instill a sense of civic virtue and identification with the public the more united this public is. It may well be harder to find potential politicians with an interest in the public good in a society that for a long time has thought along tribal lines like Iraq than in a society that has had a strong national tradition and identity as, say, France. Also, the more a society is focused on individualism and material well being, the harder it will be to stimulate an identification with the public good.

The emphasis put by certain political candidates during their election campaigns on personal integrity rather than their views on actual policy problems can be interpreted very much along the same lines. If one can convince the electorate to be willing to abstain from personal pleasure ("I didn't inhale") to remain a reputable and trustworthy person, with values aligned with those of the majority of one's potential voters, then voters may well believe that in actual matters of policy the candidate will decide once again in accordance with their interests. Clearly, elections perform a screening function, with voters selecting candidates on the basis of any characteristics the former deem relevant. This aspect was left undiscussed in our model. Selecting the candidate who identifies most with the public good makes project examination more likely. Probing into a candidate's past by her opponents and the media is a consequence of the desire to establish a candidate's civic virtue or lack of it. Given the determining role played by the identification with the common

[19] The doofpot is an 'extinguisher', a pot that was traditionally kept next to fireplaces to put hot coals in and extinguish them. Ethel Portnoy, the author, explains this word as follows: "As for real [Dutch] scandals, I've seen them being hushed up time and again. The Dutch even have a phrase for this kind of process - putting the affair in the doofpot, the way one pushes a firebrand into a barrel of sand. They use this phrase a lot, for they seem to need it frequently" (http://www.nrc.nl/W2/Lab/Profiel/Netherlands2000/behaviour.html).

[20] See www.rekenkamer.nl.

good in the decision whether to examine a policy or not, this scrutiny, often frowned upon by the educated citizen, may well serve an important purpose.

Can raising the value of holding office, λ, with a view to attracting better candidates, replace probing for trust? Changing λ has ambiguous effects that depend on the voting rule used. Increased ego rents, bigger palaces, more media attention etc. improve the likelihood that a project is designed when the electorate uses the first voting convention. If it is the case that λ and θ are inversely related, an increase in λ may cause problems as it will reduce the weight attached to the public good. The larger price incentive will then also reduce the range of parameters for which a policy is examined. Under the second rule, an increase in λ leads to a larger distortion, puts project examination at risk, while making project design more attractive. Indeed, if the electorate uses the second convention, extrinsic motivation (price incentives) may crowd out intrinsic motivation (public spirit), even in the absence of an inverse relationship between λ and θ.[21] Suppose $p > 0$, and that the parameters are such that an equilibrium exists in which a project is designed and examined, i.e., conditions (20)-(24) are satisfied. If λ goes up as the result of say a higher salary, it may be the case that a project is no longer examined, implying that the project payoff has gone down. In other words, before the increase in λ the incumbent was sufficiently interested in the public good to induce her to examine the project. The increase in salary has eliminated these good intentions.

[21] Terminology borrowed from Frey, Oberholzer-Gee, and Eichenberger (1996).

Appendix A: Proofs

Proof of Proposition 1: Immediate.

Proof of Lemma 1: This was shown in the text above the Lemma.

Proof of Proposition 2: The proof was provided in the text leading up to the presentation of the proposition. That $V_{t+1}^{EL} - V_{t+1}^{NE} = \frac{\delta}{1-\delta\alpha\frac{h+p}{2h}}(\lambda - C - W)$ follows from the strategy followed by future incumbents and the voter. In any period, each incumbent and the voter face the same problem as in period t. Hence, strategies which are optimal in period t are also optimal in period $t+i$. Q.E.D.

Proof of Lemma 2: This is shown in the text directly following the lemma.Q.E.D.

Proof of Proposition 3: From the analysis in the text we know that if the first best cannot be obtained because no project is designed, the only solution available is to let $v^* < 0$. In the text we have shown that in equilibrium $\mu_t^* = v^* - p$.

Suppose a project has been designed and consider the incumbent's decision whether or not to examine it. If the project is examined, the payoff to the incumbent equals

$$\begin{aligned} &\lambda - W - C + \theta\frac{p+h-v^*}{2h}\left[p + \frac{1}{2}(v^* - p + h)\right] \\ &+\alpha\frac{p+h-v^*}{2h}V_{t+1}^{EL} + \left(1 - \alpha\frac{p+h-v^*}{2h}\right)V_{t+1}^{NE} \end{aligned} \tag{A.1}$$

If the project remains unexamined it will be implemented (as not implementing it cannot be part of an equilibrium in which a costly project is designed), yielding a payoff of

$$\lambda - C + \theta p + \alpha\frac{p+h-v^*}{2h}V_{t+1}^{EL} + \left(1 - \alpha\frac{p+h-v^*}{2h}\right)V_{t+1}^{NE} \tag{A.2}$$

Therefore, the project will be examined if and only if

$$\theta\frac{p+h-v^*}{2h}\left[p + \frac{1}{2}(v^* - p + h)\right] - \theta p \geq W \tag{A.3}$$

If no project is designed, the incumbent's payoff equals $\lambda + V_{t+1}^{NE}$. Now suppose

equation (A.3) holds. Then, a project will be designed if and only if

$$\theta\frac{p+h-v^*}{2h}\left[p+\frac{1}{2}\left(v^*-p+h\right)\right]+\alpha\frac{p+h-v^*}{2h}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right)\geq W+C \quad \text{(A.4)}$$

with

$$V_{t+1}^{EL}-V_{t+1}^{NE}=\frac{\delta}{1-\delta\alpha\frac{p+h-v^*}{2h}}\left(\lambda-C-W\right) \quad \text{(A.5)}$$

Finally consider the strategy of the voter. His best reply is to set v^* as close to zero as possible subject to the constraint that he just induces the incumbent to design a project, and subject to the constraints that (a) the project is examined and (b) project payoff is positive. By setting v^* in this way, he distorts project implementation as little as possible. Therefore, he sets v^* such that equation (A.4) holds with equality. Q.E.D.

Proof of Lemma 3: We first show that given that a project has been designed and examined, $p+\mu^*<0$ holds. Suppose $v>p+\mu^*$. At $\mu=\mu^*$, the incumbent is indifferent between $X_t=1$ and $X_t=0$. For $\mu=\mu^*$ and $X_t=1$, the incumbent's payoff equals

$$\lambda-C-W+\theta\left(p+\mu^*\right)+\left(1-\alpha\right)V_{t+1}^{EL}+\alpha V_{t+1}^{NE} \quad \text{(A.6)}$$

For $\mu=\mu^*$ and $X_t=0$, the incumbent's payoff equals

$$\lambda-C-W+V_{t+1}^{NE} \quad \text{(A.7)}$$

Equating (A.6) and (A.7) and solving for μ^* yields

$$\mu^*=-p-\frac{1-\alpha}{\theta}\left(V_{t+1}^{EL}-V_{t+1}^{NE}\right) \quad \text{(A.8)}$$

$$\text{with } V_{t+1}^{EL}-V_{t+1}^{NE}=\frac{\delta}{1-\delta\left[\alpha\frac{h-v+p}{2h}+\left(1-\alpha\right)\frac{h-\mu^*}{2h}\right]}\left(\lambda-C-W\right)$$

Since $V_{t+1}^{EL}-V_{t+1}^{NE}>0$, $p+\mu^*<0$. Now suppose $v\leq p+\mu^*$. Then for $\mu=\mu^*$ and $X_t=1$, the incumbent's payoff equals

$$\lambda-C-W+\theta\left(p+\mu^*\right)+V_{t+1}^{EL}$$

For $\mu = \mu^*$ and $X_t = 0$, the incumbent's payoff equals

$$\lambda - C - W + V_{t+1}^{NE}$$

so that

$$\mu^* = -p - \frac{1}{\theta}\left(V_{t+1}^{EL} - V_{t+1}^{NE}\right) \tag{A.9}$$

$$\text{with } V_{t+1}^{EL} - V_{t+1}^{NE} = \frac{\delta}{1 - \delta\frac{h-\mu^*}{2h}}\left(\lambda - C - W\right)$$

Again, since $V_{t+1}^{EL} - V_{t+1}^{NE} > 0$, $p + \mu^* < 0$. Hence, we have shown that given that a project has been designed and examined, $p + \mu^* < 0$. Now, we will argue that given project design and examination, in equilibrium we have $v^* \geq p + \mu^*$. Our finding that $p + \mu^* < 0$ implies that, from the electorate's perspective, incumbents chooses $X_t = 1$ too often. If $v = p + \mu^*$, (A.9) reduces to (A.8). For $v \geq p + \mu^*$, (A.8) implies that μ^* increases with v, while (A.9) implies that for $v < p + \mu^*$, μ^* is independent of v. Hence, in the latter case the electorate cannot reduce the distortion in the implementation decision as v has no influence neither on the value of the continuation game, nor on the value of implemented projects. As a consequence, neither the decision to examine nor to design would be altered by increasing v as long as $v < p + \mu^*$ holds. With $v \geq p + \mu^*$, an increase in v starts to influence the incumbent's decisions; in particular, the distortion at the implementation stage shrinks. Hence, in equilibrium, $v^* \geq p + \mu^*$. Q.E.D.

Proof of Lemma 4: It follows from the proof of lemma 3 that a higher value of v reduces the distortion at the implementation stage. Hence, if a project is designed and examined, the smallest distortion is attained when $v = p + h$. Q.E.D.

Proof of Proposition 4: Suppose the electorate has set $v = p + h$. Hence, from lemma 3 we know that μ^* is as reported in (A.8). Consider the incumbent's decision to examine a project or not, given that a project has been designed. As in the proof of Proposition 2, the relevant comparison is between examining a project and optimal project implementation on the one hand, and not examining and implementing the

project on the other. Examining the project yields

$$\lambda - C - W + \theta\frac{h-\mu^*}{2h}\left[p + \frac{1}{2}(h+\mu^*)\right]$$
$$+ (1-\alpha)\frac{h-\mu^*}{2h}\delta V_{t+1}^{EL} + \left(1 - (1-\alpha)\frac{h-\mu^*}{2h}\right)\delta V_{t+1}^{NE}$$

whereas not examining and always implementing yields

$$\lambda - C + \theta p + (1-\alpha)V_{t+1}^{EL} + \alpha V_{t+1}^{NE}$$

Therefore, a project will be examined if and only if

$$\theta\frac{h-\mu^*}{2h}\left[p + \frac{1}{2}(h+\mu^*)\right] - \theta p - (1-\alpha)\frac{h+\mu^*}{2h}\left(V_{t+1}^{EL} - V_{t+1}^{NE}\right) \geq W$$

Now we turn to the design decision. If no project is designed the expected payoff equals $\lambda + V_{t+1}^{NE}$, and so a project will be designed if and only if

$$\theta\frac{h-\mu^*}{2h}\left[p + \frac{1}{2}(h+\mu^*)\right] + \frac{h-\mu^*}{2h}(1-\alpha)\left(V_{t+1}^{EL} - V_{t+1}^{NE}\right) \geq W + C$$

By setting v as high as possible the electorate reduces the influence of re-election concerns on the project implementation decision as much as possible. Setting $v^* = p + h$ is therefore a best reply to the behaviour of the incumbent given that rule 2 is used. Q.E.D.

Theorem 1: This follows directly from lemma 2 and from the analysis in the text in section 3.3. Q.E.D.

Proof of Proposition 5: The proof runs along lines similar to that of proposition 3. Q.E.D.

Proof of Proposition 6: This follows from the analysis in the text. Q.E.D.

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