

## Yardstick competition and political agency problems

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**Abstract.** We examine how yardstick competition between jurisdictions affects the agency problem resulting from uncertainty about politicians (adverse selection) and their policies (moral hazard). We find that yardstick comparison can contribute both to disciplining and to selecting politicians.

### 1 Introduction

Elections may be seen as a way for sorting ‘good’ from ‘bad’ incumbents (by ‘good’ incumbent, we mean someone who is honest, competent and not easily bought off by special interests). However elections do not work well in controlling and sorting politicians. There are severe problems in monitoring and evaluating the incumbent’s behavior in order to make informed decisions about whether to reelect or not. Voters face a formidable agency problem because they are inevitably poorly informed about politicians’ behavior and type. Moreover, the electoral sanction (pass or fail) is such a crude incentive scheme that it can hardly induce the politicians to do what the public wants. A theoretical model that captures this political agency

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problem simply but usefully must combine the elements of adverse selection and moral hazard.<sup>1</sup>

Given the difficulty of the agency problem voters face, it might be reasonable to try and organize *yardstick competition* among politicians for controlling problems of moral hazard and adverse selection. In this respect, the Brennan and Buchanan (1980) view is that competition among different decentralized governments can exercise a disciplinary force and break the monopoly power of a large central government. Comparing performances in office among different incumbents would help in sorting good types from bad types as well as controlling moral hazard.

We analyze the nature and effectiveness of yardstick competition on one particular aspect of the political agency problem: the possibility that incumbent politicians might use inefficient mechanisms to transfer resources to special interests.<sup>2</sup> To this end, we consider a multi-jurisdiction version of a political agency model due to Coate and Morris (1995). In this model, the incumbent in each jurisdiction chooses a policy. Then, the respective electorate, uninformed about the quality of both the incumbents and their policy, but informed about their relative performance, choose whether to retain their representative. In the second (and last) period, if reelected, and depending on his type, the incumbent chooses a transfer and the electorate receive utility. With a single agency, Coate and Morris (1995) show that an incumbent seeking reelection may behave inefficiently in equilibrium either by undertaking non-valuable policies or by not undertaking valuable ones. The aim of this paper is to examine how yardstick competition influences the incentives to behave efficiently in a multi-agency framework. Our main result is that for any correlation short of perfect correlation between agencies, it is less likely that bad politicians behave inefficiently under yardstick competition (Proposition 1).

This paper is related to the emerging literature on yardstick competition in political agency.<sup>3</sup> The common feature of this literature as well as most of the literature on electoral accountability is that the desire for reelection can motivate politicians to behave in the interest of citizens (see Wittman 1995).

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<sup>1</sup> Banks and Sundaram (1993) present an infinite horizon model that incorporates both elements. Politicians are constrained to serve at most two terms and, as in Ferejohn (1986), politicians' choice variable is effort not policy. In Barro (1973), the political agency problem is overprovision of public good. See Laffont (2000) for a nice review of political agency theory whereas Shleifer and Vishny (1998) provide more focus on transition economics. See also Przeworsky et al. (1999) for a broader historical perspective of political agency problems.

<sup>2</sup> For instance, public employment is often argued to be used as an indirect and possibly inefficient method of redistribution (see, Alesina et al. 2000).

<sup>3</sup> A very nice survey of this literature can be found in Persson and Tabellini (2000, Chaps. 4 and 9). See more specifically the papers by Besley and Case (1995) and Besley and Smart (2001). See also some recent papers like Wrede (2001) and Bodenstein and Ursprung (2001).

Besley and Case (1995) provide empirical support to the idea that voters use relative performance criterion in deciding whether to retain or not their incumbent. Besley and Smart (2001) is more theoretical and shows that the effect of yardstick competition can go either way depending on the initial reputation of the incumbent. The ambiguity arises essentially from the fact that yardstick comparison facilitates the detection of bad incumbent but has the adverse effect of inducing more rent diversion by bad incumbents who are less likely to be re-elected (last period effect). The distinctive feature of our analysis is that the electoral incentive and the desire for reelection are themselves the source of inefficiency and we assess the role of yardstick comparison in this context.<sup>4</sup> One consequence of this different approach is that yardstick competition cannot go the wrong way because in facilitating the detection of bad incumbents (sorting effect) it also makes it less likely that they will distort inefficiently their policy choice (discipline effect) in order to preserve their chance of reelection. Therefore the extra information that yardstick comparisons bring about cannot hurt the principal in our model: discipline and sorting effects work in the same direction.<sup>5</sup>

The model used to assess the effect of yardstick competition is set out in the next section. Our main result on the disciplining effect of yardstick comparison is presented in Sect. 3. Some concluding remarks are presented in Sect. 4.

## 2 A multi-jurisdiction political agency model

We use a two-period political agency model due to Coate and Morris (1995) (hereafter CM) that we extend to two agencies (jurisdictions) so that in a correlated environment, voters can use a relative performance criterion (i.e., yardstick competition) to decide whether or not to reelect their incumbent. In the first period, both incumbents choose independently and simultaneously

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<sup>4</sup> For evidence that politicians are strongly motivated by the desire for reelection, see Cain et al. (1987).

<sup>5</sup> This finding that more information can not hurt the principal should be contrasted with career concerns literature. For instance, Dewatripont et al. (1999) provide two examples in which a more precise signal about the agent's performance reduces discipline. Morris (2001) shows that observing more informative signals can worsen discipline because the good type may be induced to take more extreme action to separate from the bad type ("political correctness" effect). There is also a literature on the trade-off between transparency and efficiency. Bordignon and Minelli (2001) present a political agency model where it is optimal to have low powered incentives but more transparent rules (with negative discipline effect) to facilitate detection of bad politician (positive sorting effect). Prat (2001) presents a model in which better information on the agent's action (more transparency over actions) can unambiguously hurt the principal by producing conformism. Conformism is detrimental because the agent is taking less appropriate action and his performance is less informative of his type.

whether or not to implement a public policy, and whether or not to make cash transfers to some ‘special interest’.<sup>6</sup> Each incumbent may be of two types: the “good” type always behaves in the interest of his electorate, and the “bad” type may do rent-seeking at the expense of his electorate. The problem for voters is to distinguish a good from a bad incumbent on the basis of their performance relative to the other incumbent. In the second period, the incumbent, if reelected, simply selects a cash transfer to the special interest.

At the beginning of the game, nature selects an incumbent type in each jurisdiction. Incumbent is good with probability  $\lambda_I \in (0, 1)$  and bad with probability  $1 - \lambda_I$  in the domestic jurisdiction (the corresponding probabilities in the other jurisdiction are  $\tilde{\lambda}_I$  and  $1 - \tilde{\lambda}_I$ , respectively). Then nature selects a policy quality in each jurisdiction according to some joint distribution  $\pi$ . There is uncertainty about the benefit of any policy. The valuable policy produces a high net benefit  $B_H$  with probability  $\theta_1 \in (0, 1)$  and a low net benefit  $B_L$  with probability  $1 - \theta_1$  (with  $B_L < 0 < B_H$ ). The non-valuable policy produces the same high net benefit  $B_H$  but with a lower probability  $\theta_0$  (with  $0 < \theta_0 < \theta_1 < 1$ ). To simplify the analysis (and without any loss of generality), we assume that the joint probability distribution of policy types,  $\pi(\theta, \theta)$ , is symmetric:  $\pi(\theta_0, \theta_0) = \pi(\theta_1, \theta_1) = \rho/2$  and  $\pi(\theta_0, \theta_1) = \pi(\theta_1, \theta_0) = (1 - \rho)/2$ . We focus here on the case where  $1/2 \leq \rho \leq 1$ , so that there is *positive (or no) correlation* between the two jurisdictions.

There is asymmetric information between the incumbents and voters insofar as incumbents know more about their type and the desirability of a public policy: incumbents, but not voters, observe  $\theta \in \{\theta_0, \theta_1\}$  before deciding whether to implement the policy or not. For simplicity we shall also assume that there is symmetric information between politicians. In each jurisdiction the expected benefit from a policy  $\theta$  is  $\bar{B}(\theta) = \theta B_H + (1 - \theta)B_L$ . Moreover, both types of policy produce a rent  $R > 0$  for a special interest group. We make the same assumption as CM.

**Assumption 1.** (i)  $\bar{B}(\theta_1) > 0$ , (ii)  $\bar{B}(\theta_0) < -R < 0$ .

Part (i) says that a valuable policy ( $\theta = \theta_1$ ) produces positive expected benefit to the voters. Part (ii) says that a non-valuable policy ( $\theta = \theta_0$ ) yields expected cost to the voters in excess of the rent to the interest group; as a result, the voters would prefer to pay directly cash transfer of  $R$  to the special interest instead of having the policy implemented (if they could credibly commit doing so).

In addition to the implementation of a policy, each incumbent can make a cash transfer  $T \geq 0$  from the voters to the interest group. A good politician ( $i = g$ ) cares only about the expected welfare of the voters and about being in office. Thus, his first-period utility is  $v_g(\bar{B}(\theta) - T)$  or  $v_g(-T)$ , depending on

<sup>6</sup> The *policy choice* may refer to some government procurement of goods and services or regulatory activities; and the *cash transfers* refer to subsidies programs.

his decision to implement or not a policy of type  $\theta \in \{\theta_0, \theta_1\}$  and to make a cash transfer  $T \geq 0$ . Preference for being in office is reflected by  $v_g(0) > 0$ . A bad politician ( $i = b$ ), on the other hand, also cares about the interest group and his utility is  $v_b(\bar{B}(\theta) - T, R + T)$  or  $v_b(-T, +T)$ , depending on his decision to implement or not the policy  $\theta \in \{\theta_0, \theta_1\}$  and to make a cash transfer  $T \geq 0$ . We assume that  $v_b(\cdot, \cdot)$  is smooth and increasing in both arguments and that  $v_b(0, 0) > 0$  is the value of holding office for the bad incumbent. Let  $v_b^*(\bar{B}(\theta_1), R) \equiv \max_T v_b(\bar{B}(\theta_1) - T, R + T)$  with optimal cash transfer  $T = T_1$  and similarly,  $v_b^*(0, 0) \equiv \max_T v_b(-T, +T)$  with optimal cash transfer  $T = T_0$ . As in CM we make the following assumptions on the preference of a bad politician in the two jurisdictions (with  $\delta \in [0, 1]$  representing the incumbents' discount factor).

**Assumption 2.**  $v_b(\bar{B}(\theta_0), R) > v_b(0, 0)$ .

**Assumption 3.** (i)  $v_b^*(\bar{B}(\theta_1), R) - v_b(\bar{B}(\theta_1), R) < \delta v_b^*(0, 0)$ , (ii)  $v_b^*(0, 0) - v_b(0, 0) < \delta v_b^*(0, 0)$ .

Assumption 2 says that ignoring the reelection constraint, a bad incumbent wants to implement a non-valuable policy, at the expense of the voters, if it gives a rent  $R$  to the interest group. Assumption 3 says that the bad incumbent has a sufficiently strong desire for reelection that he would prefer to give up the optimal cash transfer if he could be reelected for sure.

Upon observing the policy type  $\theta$ , an incumbent of type  $i \in \{g, b\}$  makes a policy and cash transfer decision. A first-period strategy for the incumbent in any jurisdiction specifies a policy and transfer decision for each type of incumbent ( $i \in \{g, b\}$ ) and each realization of policy type in that jurisdiction ( $\theta \in \{\theta_0, \theta_1\}$ ) based on his (perfect) information  $\Theta$  about the politician and policy type in the other jurisdiction:  $s_i(\theta; \Theta) \in D \times R_+$ , where  $D = P$  ( $D = N$ ) denotes (no) policy implementation. Voters observe their incumbent's record  $\mathcal{R} = (D, T, B)$ , as well as the other incumbent's record  $\tilde{\mathcal{R}} = (\tilde{D}, \tilde{T}, \tilde{B})$  (with  $B \in \{B_L, B_H\}$  for  $D = P$  and  $B = \phi$  for  $D = N$ ). On the basis of these observations, voters update their initial belief ( $\lambda_i$ ) that their incumbent is good as  $\alpha(\mathcal{R}, \tilde{\mathcal{R}}) \in [0, 1]$ , which also denotes the probability that they will reelect their incumbent.<sup>7</sup> If reelected, and depending on his type, the incumbent makes a cash transfer decision and the game ends. There is no policy decision to be made in the second period.

We solve the game for its perfect Bayesian equilibria. Like CM, we refine the equilibrium concept by requiring out-of-equilibrium beliefs to be consistent with a monotonicity criterion (*monotone beliefs*). The logic of this

<sup>7</sup> This simplifying assumption can be justified as follows. An incumbent is reelected when his posterior reputation exceeds the reputation of some challenger, whose reputation is drawn from a uniform distribution on  $[0, 1]$ .

criterion is that posterior belief should reflect the fact that a bad type is more likely to deviate from the equilibrium play to make higher cash transfers.<sup>8</sup>

We now examine how yardstick competition affects the possibility that incumbent politicians use non-valuable policies as disguised transfers to the special interest. Due to the complexity of the model, we make no attempt at fully characterizing the set of PBE, but we focus instead on the equilibria studied in CM.

### 3 Disciplining effect of yardstick competition

The main insight of CM is that a bad politician may prefer to implement a non-valuable policy rather than to make a direct cash transfer. Implementing the policy indeed allows the politician to make a disguised transfer to the interest group without compromising his chance of reelection. In this section, we investigate how, in an imperfectly correlated environment, yardstick competition could affect the occurrence of this form of inefficiency. We consider the following strategy:

**Definition 1.** *Strategy S is such that in each jurisdiction, for any configurations of politician and policy in the other jurisdiction, (i) both types of incumbent make no cash transfers, (ii) a good incumbent implements valuable policies only, (iii) a bad incumbent implements both valuable and non-valuable policies.*

We now demonstrate that *strategy S constitutes an equilibrium behavior if the incumbent's initial reputation is sufficiently high, but that yardstick competition makes this kind of equilibrium less likely to arise* (and in fact impossible in a perfectly correlated environment). We proceed in three steps. First, we compute the posterior beliefs induced by strategy S. Second, we derive the reelection probabilities. Third, we prove that given the induced probability of reelection, it is optimal for both types of incumbent to play strategy S when the incumbent in the other jurisdiction does the same.

#### 3.1 Posterior beliefs

From strategy S, incumbents do not make cash transfers and the possible records in each jurisdiction are  $H \equiv (P, 0, B_H)$ ,  $L \equiv (P, 0, B_L)$ , and  $N \equiv (N, 0, 0)$ , yielding  $3 \times 3$  different record profiles. The posterior belief that

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<sup>8</sup> This monotonicity requirement implies that a good politician will never make cash transfers since this would only hurt his reputation without bringing any benefit. It follows that by making cash transfers the bad politician will reveal himself and thus he would rather choose optimal cash transfers if any (i.e.,  $T_0$  when the policy is non-valuable and  $T_1$  when the policy is valuable).

the domestic incumbent is good for any record profile  $(R, \tilde{R}) \in \{H, L, N\} \times \{H, L, N\}$  is

$$\alpha_{ij} = \frac{\lambda_I}{\lambda_I + (1 - \lambda_I)(1 + \phi_{ij})} \quad \forall i, j \in \{H, L, N\}$$

where  $\phi_{ij}$  is a measure of the *reputational cost* (i.e.,  $\alpha_{ij} \leq \lambda_I \iff \phi_{ij} \geq 0$ ). Straightforward but tedious calculations establish the following (with  $\tilde{\lambda}_I$  denoting the incumbent's initial reputation in the other jurisdiction):

$$\begin{aligned} 0 < \phi_{HH} &= \frac{\theta_0}{\theta_1} \left( \frac{(1 - \rho)\theta_1 + \rho\theta_0(1 - \tilde{\lambda}_I)}{\rho\theta_1 + (1 - \rho)\theta_0(1 - \tilde{\lambda}_I)} \right) < \phi_{LH} = \frac{\theta_1}{\theta_0} \left( \frac{1 - \theta_0}{1 - \theta_1} \right) \phi_{HH}, \\ 0 < \phi_{HL} &= \frac{\theta_0}{\theta_1} \left( \frac{(1 - \rho)(1 - \theta_1) + \rho(1 - \theta_0)(1 - \tilde{\lambda}_I)}{\rho(1 - \theta_1) + (1 - \rho)(1 - \theta_0)(1 - \tilde{\lambda}_I)} \right) \\ &< \phi_{LL} = \frac{\theta_1}{\theta_0} \left( \frac{1 - \theta_0}{1 - \theta_1} \right) \phi_{HL}, \\ 0 < \phi_{HN} &= \frac{\theta_0}{\theta_1} \frac{\rho}{1 - \rho} < \phi_{LN} = \frac{\theta_1}{\theta_0} \left( \frac{1 - \theta_0}{1 - \theta_1} \right) \phi_{HN}. \end{aligned}$$

Thus, there is always a reputational cost to implement any policy because, with strategy S, bad politicians are more likely to implement than good politicians. Since a bad politician always implements, a good politician can reveal himself by not undertaking the policy, and thus

$$\phi_{NH} = \phi_{NL} = \phi_{NN} = -1,$$

so that  $\alpha_{NH} = \alpha_{NL} = \alpha_{NN} = 1$  (the non-implementation decision guarantees reelection). When there is no correlation (i.e.,  $\rho = 1/2$ ) the model is similar to CM and the reputation costs from undertaking the policy does not depend on the outcome of the policy in the other jurisdiction:

$$0 < \phi_{HH} = \phi_{HL} = \phi_{HN} = \frac{\theta_0}{\theta_1} < 1 < \phi_{LH} = \phi_{LL} = \phi_{LN} = \frac{1 - \theta_0}{1 - \theta_1}.$$

Straightforward comparisons of posterior beliefs highlight a number of instructive results. First, there is a *direct* reputational effect: regardless of the outcome in the other jurisdiction, (i) a good performance  $B_H$  improves reputation relative to bad performance  $B_L$  (because bad politicians undertake non-valuable policies, which are more likely to fail) and (ii) undertaking the policy reduces reputation relative to no implementation (because bad politicians are more likely to implement); that is,

$$\alpha_{LK} < \alpha_{HK} < \lambda_I < \alpha_{NK} = 1 \quad \forall K = H, L, N.$$

This direct reputational effect is already present in CM's analysis. However, in a correlated environment, voters observe a relative performance that is not directly controlled by their incumbent. As a result, a second, *indirect*, reputational effect (or informational externality) appears in our model. It says that for any given domestic record, the reputation of the politician also depends

on the record of the politician in the other jurisdiction. More precisely, we have the following rankings ( $\forall K = H, L$ ):

$$\begin{cases} \alpha_{KN} < \alpha_{KL} < \alpha_{KH} & \text{if } \rho > 1/2, \\ \alpha_{KN} = \alpha_{KL} = \alpha_{KH} \equiv \alpha_K & \text{if } \rho = 1/2, \end{cases} \quad (1)$$

(where  $\alpha_H$  and  $\alpha_L$  denote the posterior beliefs in an uncorrelated environment when respectively high and low benefits are observed). In words, when there is positive correlation, the reputation of the domestic incumbent undertaking the policy is the lowest when the policy is not undertaken in the other jurisdiction and the highest when the policy is undertaken and is a success in the other jurisdiction. This is because not undertaking the policy in the other jurisdiction reveals that it was a non-valuable policy which, by positive correlation, makes it more likely that the domestic policy is also non-valuable. Since only a bad incumbent implements non-valuable policies, undertaking the policy leads voters to believe that their incumbent is bad. On the other hand, observing a successful policy in the other jurisdiction increases the chance that it was a valuable policy (since it is more likely to succeed) which, by positive correlation, increases the chance that the domestic policy is also valuable and therefore, that it could have been implemented by a good or bad politician alike. In this case the reputation cost for undertaking the policy is less than when the policy is not undertaken in the other jurisdiction.

Lastly, for  $K = H, L$ , positive correlation improves the incumbent's reputation when the policy is successful in the other region, but hurts it in the case of no implementation:<sup>9</sup>

$$\alpha_{KN} < \alpha_K < \alpha_{KH} \quad \text{if } \rho > 1/2. \quad (2)$$

### 3.2 Reelection probability

We can now derive the (*ex ante*) probability of reelection of each type of incumbent as a function of the type of the other incumbent and the policy profile. First, when  $(\theta, \tilde{\theta}) = (\theta_1, \theta_0)$ , the domestic policy is valuable and from strategy S, both types of incumbent act in the same way while in the other jurisdiction, the policy is non-valuable leading both types of incumbents to act differently. Therefore, the probability of reelection of the domestic incumbent is independent of his type due to pooling but depends on the type of the other politician:  $\forall i \in \{g, b\}$ ,

<sup>9</sup> How posterior beliefs respond to a *low* benefit in the other jurisdiction is ambiguous. Indeed, upon observing a low benefit in the other jurisdiction, posterior beliefs when undertaking the policy (regardless of its outcome) are higher in a positively correlated environment (i.e.,  $\alpha_{HL} > \alpha_H$  and  $\alpha_{LL} > \alpha_L$ ) if and only if  $1 - \theta_1 > (1 - \theta_0)(1 - \lambda_I)$ . This condition means that a low benefit is more likely to arise from the failure of a valuable policy (always undertaken) rather than from the failure of a non-valuable policy (only undertaken if the incumbent is bad).



$$\begin{aligned}
p_i(\theta_1; \theta_0, g) &= \theta_1 \alpha_{HN} + (1 - \theta_1) \alpha_{LN} \\
p_i(\theta_1; \theta_0, b) &= \theta_1 [\theta_0 \alpha_{HH} + (1 - \theta_0) \alpha_{HL}] \\
&\quad + (1 - \theta_1) [\theta_0 \alpha_{LH} + (1 - \theta_0) \alpha_{LL}].
\end{aligned}$$

Second, when  $(\theta, \tilde{\theta}) = (\theta_1, \theta_1)$ , the policy is valuable in both jurisdictions and from strategy S, both types of incumbents pool on the same action in both jurisdictions. Therefore, the probability of reelection of the domestic incumbent is independent of his own type and of the other politician's type:  $\forall j \in \{g, b\}$ ,

$$\begin{aligned}
p_i(\theta_1; \theta_1, j) &= \theta_1 [\theta_0 \alpha_{HH} + (1 - \theta_0) \alpha_{HL}] \\
&\quad + (1 - \theta_1) [\theta_0 \alpha_{LH} + (1 - \theta_0) \alpha_{LL}].
\end{aligned}$$

Third, when  $(\theta, \tilde{\theta}) = (\theta_0, \theta_0)$ , the policy is non-valuable in both jurisdictions and by strategy S, both types of incumbent in each jurisdiction separate on different actions. Therefore, the probability of reelection of the domestic politician depends both on his own type and on the other politician's type:

$$\begin{aligned}
p_b(\theta_0; \theta_0, g) &= \theta_0 \alpha_{HN} + (1 - \theta_0) \alpha_{LN}, \\
p_b(\theta_0; \theta_0, b) &= \theta_0 [\theta_0 \alpha_{HH} + (1 - \theta_0) \alpha_{HL}] \\
&\quad + (1 - \theta_0) [\theta_0 \alpha_{LH} + (1 - \theta_0) \alpha_{LL}], \\
p_g(\theta_0; \theta_0, g) &= p_g(\theta_0; \theta_0, b) = 1.
\end{aligned}$$

Fourth, when  $(\theta, \tilde{\theta}) = (\theta_0, \theta_1)$ , both types of incumbents act the same in the other jurisdiction and the domestic reelection probability is independent of the other politician's type (with the good incumbent revealing himself):  $\forall j \in \{g, b\}$

$$\begin{aligned}
p_b(\theta_0; \theta_1, j) &= \theta_0 [\theta_1 \alpha_{HH} + (1 - \theta_1) \alpha_{HL}] \\
&\quad + (1 - \theta_0) [\theta_1 \alpha_{LH} + (1 - \theta_1) \alpha_{LL}], \\
p_g(\theta_0; \theta_1, j) &= 1.
\end{aligned}$$

Lastly, in the absence of correlation, there is no informational externality and the reelection probabilities are

$$\begin{aligned}
p_b(\theta_0) &= \theta_0 \alpha_H + (1 - \theta_0) \alpha_L, \\
p_g(\theta_0) &= 1, \\
p_b(\theta_1) &= p_g(\theta_1) = \theta_1 \alpha_H + (1 - \theta_1) \alpha_L.
\end{aligned}$$

We can now rank the probabilities of reelection for the two types of incumbents.

**Lemma 1.** *With positive correlation ( $\rho > 1/2$ ), a bad incumbent playing strategy S in each jurisdiction faces probabilities of reelection that depend on the situation in the other jurisdiction as follows:  $\forall \theta \in \{\theta_0, \theta_1\}$ ,*

- (i)  $p_b(\theta; \theta_0, g) < p_b(\theta; \theta_0, b) < p_b(\theta; \theta_1, g) = p_b(\theta; \theta_1, b)$ ,
- (ii)  $p_b(\theta; \theta_0, g) < p_b(\theta)$ .

From part (i), a bad incumbent has the lowest chance of re-election when the other policy is non-valuable and the other politician is good. From part (ii) the bad incumbent is hurt by performance comparison.

### 3.3 Effect of yardstick competition

We are now in a position to check whether yardstick competition in a correlated environment can effectively reinforce the ability of voters to restrain bad incumbents from undertaking non-valuable policies. We proceed in two steps. First, we derive the minimum initial reputation beyond which it is optimal for both types of politicians to play strategy S. Second, we show that yardstick competition increases the minimum initial reputation required for the incumbent to play strategy S. Thus, yardstick competition effectively reduces the incentive for undertaking non-valuable policies.

To ensure that both types of incumbent behave as prescribed by strategy S, their reelection probability when playing strategy S must be high enough; since reelection probabilities increase, *ceteris paribus*, with the initial reputation, this amounts to say that the initial reputation must be high enough. Since strategy S prescribes actions for both types of incumbent that are independent of the situation in the other jurisdiction, both types of incumbent must find it optimal to play these actions for all possible configurations of policies and politician types in the other jurisdiction, and in particular for the least favorable situation. From part (i) of Lemma 1, we know that the prospect of reelection is worst when the incumbent faces a good politician with non-valuable policy. We further know, from part (ii) of that lemma, that greater correlation makes this worst reelection prospect even worse by increasing the ability of voters to detect bad incumbents. This reasoning establishes our main result about the desirable effect of yardstick comparisons to restrain (bad) incumbents undertaking non-valuable policies, which is stated formally in the following proposition.

**Proposition 1.** *Under Assumptions 1-3, there exists  $\lambda^*(\rho) < 1$  for all  $\rho \in [\frac{1}{2}, 1)$  such that a symmetric PBE involving incumbent strategy S in both jurisdictions exists if  $\lambda_I > \lambda^*(\rho)$ . Furthermore,  $\lambda^*(\rho) < \lambda^*(\rho') \forall \frac{1}{2} \leq \rho < \rho' < 1$ . However, at the limit for  $\rho = 1$ , there is no  $\lambda^*(1) < 1$  and a PBE involving incumbent strategy S in both jurisdictions cannot exist.*

*Proof.* See the appendix

The interpretation of this proposition is that yardstick competition can reduce (and even eliminate in case of perfect correlation) the risk of undertaking non-valuable policies by improving the ability of voters to detect those policy choices that are not in their interest, along with the bad incumbents who make such choices. This result fits nicely with what seems to be the most popular argument for yardstick competition and performance comparisons.

To see this more clearly, suppose first that there is no correlation between jurisdictions so that no information is revealed about the type of the incumbent from the policy outcome in the other jurisdiction. In this context, a bad incumbent seeking reelection with a good initial reputation may rely on wasteful (inefficient) policies to redistribute in favor of some special interest, instead of foregoing reelection by making explicit cash transfers. This follows from the stochastic relationships between policy types and outcomes (i.e., non-valuable policies have some chance of success while valuable policies might fail). However, in a correlated environment, voters have the additional possibility of drawing inference about the quality of their incumbent from observing the policy outcome in the other jurisdiction. Not undertaking the policy in the other jurisdiction reveals that it is a non-valuable policy and given positive correlation, voters would infer that the domestic policy is likely to be non-valuable, reducing the chance of reelection of the incumbent undertaking it. Hence, incumbents will have lower incentive to implement non-valuable policies that are more easily detected through performance comparison.

A natural question is whether the bad incumbent could, to some extent, neutralize the effect of yardstick competition by conditioning his decision to the type of politician and policy in the other jurisdiction. The idea is that a bad incumbent might choose to behave efficiently when facing a good politician or a non-valuable policy in the other jurisdiction. However, this conjecture is false for reasons that we now briefly explain.<sup>10</sup>

Consider first a modified version of strategy S in which the bad incumbent refrains from implementing a non-valuable policy if the policy in the other jurisdiction is non-valuable. This strategy cannot be an equilibrium. Suppose indeed that the policy is not undertaken in the other jurisdiction. Voters infer that it has to be a non-valuable policy and expect pooling from their own incumbent. But then, there is no reputation cost from implementing at home and the bad incumbent would deviate.

Consider next a strategy in which the bad incumbent refrains from implementing a non-valuable policy if the other incumbent is good. Again, such strategy cannot be an equilibrium. Suppose indeed that politicians in both jurisdictions adopt such strategy. If the policy is valuable in the other jurisdiction, then it will be implemented whatever the type of the politician. But since good and bad politicians pool on the same action in the other jurisdiction, the chance of reelection of the domestic incumbent cannot depend on the other politician's type, and therefore the bad politician cannot find it profitable to condition his decision on the type of the other politician.

#### **4 Concluding remarks**

CM prove the non-existence of an equilibrium in which both types of incumbent behave efficiently. The idea is the following. On efficiency grounds,

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<sup>10</sup> See Belleflamme and Hindriks (2002) for a formal treatment of this issue.

the incumbent should only implement the high quality policy. When reelection is likely *ex ante*, bad incumbents refrain from using direct transfers to avoid revealing their type. However, both types are equally likely to produce any record when playing the same no-transfer strategy. Thus if voters expect both types to behave efficiently, bad incumbents deviate to implement both policies since they are no less likely to be re-elected. It is straightforward to show that this non-existence result goes through under yardstick competition. This is because just as observing any particular record within a jurisdiction carries no information when both types are expected to behave efficiently, so observing an extra record in another jurisdiction is uninformative. Consequently, the incentive for bad incumbents to deviate from efficiency to dishonesty persists irrespective of performance comparison.<sup>11</sup> The same could be said for the under-implementation result of CM in which both types refrain from implementing both policies. This result is driven by two assumptions: (i) both incumbents have an overwhelming desire for re-election and (ii) voters believe that a deviation to policy implementation is certain to come from a bad incumbent. Again since voters expect both types to act the same, observing the record in another jurisdiction is uninformative and so this existence result also goes through under yardstick competition. It is also possible to show that there is no other underprovision equilibrium involving both types of incumbents choosing different actions. For instance, there is no equilibrium in which the good incumbent refrains from undertaking any policy (either valuable or not) and the bad incumbent chooses to implement at least one type of policy.<sup>12</sup>

Obviously these results rest on the assumption that politicians are equally competent and so they are equally likely to produce the same record when playing the same strategy. One interesting extension would be to explore the impact of politicians that differ not only in their honesty but also in their competency. While this would be a new research, it might improve the model's realism and deepen the contribution to the literature.

We now summarize our main result about the effect of yardstick competition. The usual presumption is that decentralized decision makers are more accountable. One possible reason is that decentralization allows per-

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<sup>11</sup> However there is a discontinuity at perfect correlation ( $\rho = 1$ ). To see this, consider that voters observe that no cash transfers are made and no policy is undertaken in the other jurisdiction. Expecting politicians to behave efficiently, voters infer that the policy is wasteful in that jurisdiction and thus (by perfect correlation), that the policy is also wasteful in their own jurisdiction. Therefore, a bad incumbent deviating from the efficient equilibrium play by undertaking a wasteful policy would reveal himself, and forego any chance of reelection.

<sup>12</sup> The reason is that if the good incumbent never implements, the bad incumbent would reveal himself by implementing. Facing no chance of reelection, the bad incumbent makes cash transfers. But then, since voters do not expect good incumbents making cash transfers, there is no reputational penalty for a good incumbent from deviating by implementing but without cash transfers.

formance comparison. In this paper we examine the role of yardstick competition for improving political decisions. Can yardstick competition make politicians more accountable? It is well known that in a general principal-agent relationships within a correlated environment, incentive schemes based on relative performance can enhance (Holmstrom 1982) and even restore (Shleifer 1985) efficiency. However, in political agency, voters are restricted to a very crude incentive scheme which is to re-elect or to vote their politicians out. In this context, Besley and Smart (2001) have shown that the effect of yardstick competition can go either way, depending on the residual degree of confidence about politicians.

In this paper, we use a different political agency framework and show that yardstick competition cannot go the wrong way, although in several cases it has no effect at all. Our political agency model is similar to Coate and Morris (1995). In this model, inefficiency arises from the fact that politicians may use non-valuable public policies as an indirect and disguised method of channeling resources to some special interest, when more transparent transfer would not find political support. Assuming symmetric information between politicians across jurisdictions, we find that yardstick competition can help discipline politicians, which is in contrast with some earlier work. In future work, it would be interesting to relax the assumption that incumbents have complete information and to give the opportunity for the good incumbent to separate from the bad one (e.g. by taxing the special interest).

### Appendix: Proof of Proposition 1

We first prove that, for all  $\rho \in (0, 1)$ , there is a  $\lambda^*(\rho) < 1$  such that there exists a PBE involving strategy S when  $\lambda_I \geq \lambda^*(\rho)$ . We start by deriving the conditions under which strategy S is an equilibrium play for both types of incumbent. The *good incumbent* never makes cash transfers and thus always chooses  $(N, 0)$  when  $\theta = \theta_0$ . When  $\theta = \theta_1$ , he prefers  $(P, 0)$  over  $(N, 0)$  for all policy and politician types in the other jurisdiction if and only if:

$$p_g(\theta_1; \theta_0, g) \geq 1 - \frac{v_g(\bar{B}(\theta_1)) - v_g(0)}{\delta v_g(0)}. \quad (3)$$

Consider now a *bad incumbent*. When  $\theta = \theta_0$ , our assumptions guarantee that he prefers  $(N, 0)$  over  $(N, T_0)$ . He also prefers  $(P, 0)$  over  $(N, 0)$  for all policy and politician types in the other jurisdiction if and only if:

$$p_b(\theta_0; \theta_0, g) \geq 1 - \frac{v_b(\bar{B}(\theta_0), R) - v_b(0, 0)}{\delta v_b^*(0, 0)}. \quad (4)$$

As the payoff from choosing  $(P, 0)$  is always larger when  $\theta = \theta_1$  than when  $\theta = \theta_0$ , condition (4) guarantees that the bad incumbent does not prefer  $(N, 0)$  when  $\theta = \theta_1$ . The condition for the bad incumbent to prefer  $(P, 0)$  over  $(P, T_1)$  for all policy and politician types in the other jurisdiction is given by:

$$p_b(\theta_1; \theta_0, g) \geq \frac{v_b^*(\bar{B}(\theta_1), R) - v_b(\bar{B}(\theta_1), R)}{\delta v_b^*(0, 0)}. \quad (5)$$

Combining conditions (3), (4), and (5) and using the facts that (i) the probabilities of reelection increase in  $\lambda_I$ , and (ii)  $p_g(\theta_1; \theta, g) = p_b(\theta_1; \theta, g)$ , we can derive the threshold  $\lambda^*(\rho)$  such that all three conditions are satisfied when  $\lambda_I > \lambda^*(\rho)$ . In particular,  $\lambda^*(\rho)$  must be the smallest value of  $\lambda_I$  such that

$$\begin{cases} p_b(\theta_0; \theta_0, g) \geq 1 - \frac{v_b(\bar{B}(\theta_0), R) - v_b(0, 0)}{\delta v_b^*(0, 0)} \\ p_b(\theta_1; \theta_0, g) \geq \max \left\{ 1 - \frac{v_g(\bar{B}(\theta_1)) - v_g(0)}{\delta v_g(0)}, \frac{v_b^*(\bar{B}(\theta_1), R) - v_b(\bar{B}(\theta_1), R)}{\delta v_b^*(0, 0)} \right\}. \end{cases}$$

Assumptions 1–3 guarantee that the two RHS are below one. We have that, for all  $\rho < 1$ , the left-hand side reelection probabilities are increasing in  $\lambda_I$  and converging to one as  $\lambda_I \rightarrow 1$ . Therefore there exists such a  $\lambda^*(\rho) < 1$ .

As the above probabilities of reelection are decreasing with  $\rho$ , it follows that  $\lambda^*(\rho) < \lambda^*(\rho')$  for all  $\frac{1}{2} \leq \rho < \rho' < 1$ . Lastly for  $\rho = 1$ , the two probabilities are equal to zero for all  $\lambda_I < 1$ . It is therefore clear that condition (6) cannot be met and that there is no  $\lambda^*(\rho) < 1$  for  $\rho = 1$ . QED

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