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**« Why are Reforms incomplete?
Reputation versus the “need for enemies” »**

**Maxime MENUET
Patrick VILLIEU**

Pourquoi les réformes sont-elles incomplètes ?

Réputation versus « besoin d'ennemis »

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Résumé :

Pourquoi les politiciens ne résolvent-ils pas les problèmes sociaux? L'une des raisons pourrait être que ces problèmes sont très difficiles à résoudre. Une autre peut être que les politiciens n'ont pas la capacité de résoudre des problèmes difficiles, c'est-à-dire qu'ils sont « incompetents ». Mais il peut exister une troisième explication : les politiciens manquent parfois d'incitation à résoudre des problèmes en raison des inefficacités générées par le processus électoral dans les démocraties représentatives. Tel est le cas lorsque les politiciens ont une incitation pour « garder leurs ennemis en vie », précisément parce qu'ils sont compétents pour résoudre un problème : une fois le problème éliminé, des politiciens compétents perdent leur avantage électoral. Dans cet article, nous montrons que les forces réputationnelles peuvent, dans une certaine mesure, contourner l'incitation des politiciens à ne pas résoudre les problèmes. Si la réputation du politicien au pouvoir dépend de la quantité de réformes qu'il met en œuvre, et affecte positivement sa probabilité d'être réélu, l'arbitrage entre la réputation et le « besoin d'ennemis » aboutit à un ensemble incomplet de réformes, permettant de résoudre seulement une partie des problèmes. Ce mécanisme pourrait contribuer à l'explication du haut degré de persistance de certains problèmes économiques ou sociaux, tels que, en l'occurrence, l'endettement public.

Mots Clef : Dette publique, Public Choice, Jeux non coopératifs, Réputation

Keywords: Public Debt, Public Choice, Non-cooperative games, Reputation

Code JEL : D7 D8 E61 E62 C72

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Why are Reforms incomplete? Reputation versus the “need for enemies”

By MAXIME MENUET AND PATRICK VILLIEU*

Why do Politicians not solve social problems? One reason may be that such problems are very difficult to solve. Another one may be that Politicians have not the ability to solve difficult problems, i.e. they are “incompetent”. But there is another reason: Politicians sometimes lack the incentive to solve problems because of inefficiencies generated by electoral process in representative democracies. It is the case when Politicians have the incentive “to keep their enemies alive”, precisely because they are competent in solving the problem: once the problem removed, competent Politicians lose their electoral advantage. In this paper, we show that reputational strengths can, to some extent, circumvent Politicians’ incentives not to address the problems. If the reputation of an incumbent Politician depends on the amount of reforms he implements, and positively affects his probability of being reelected, the trade-off between reputation and the “need for enemies” leads to an incomplete set of reforms, which can handle only a part of the problems. This mechanism might contribute to the explanation of the high degree of persistence of some social or economic diseases such as, specifically, public indebtedness.

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The fact that a society can create social cohesion through identifying a common enemy is a leitmotiv of political science and has been described by a number of works in psychology, sociology, history or social anthropology (see e.g. Bailey (1998)). The idea that enemies serve a function for societies and for individuals comes from psychological fundamentals such that children or adolescents construct their identity through a need for opposition and that everybody needs “to identify some people as allies and others as enemies” (Volkan, 1985). In his “beloved enemies”, Barash (1994) even affirms that it is in human nature to need to create opponents. Such arguments have been applied to sociology and politics notably in the context of the cold war (Wolfe, 1983). More generally, following Finlay, Holsti and Fagen (1967), “it seems that we have always needed enemies and scapegoats; if they have not been readily available, we have created them”. Murray and Meyers (1999) distinguish two typical explanations for why people need enemies. The first one is that people “psychologically need enemies

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as suitable targets for the displacement of their personal fears and hostilities”; the second one is that political leaders can create enemies “to mobilize the nation around common aims”.

In this paper, we consider the possibility that this second motivation to the “need for enemies” might not only be a matter of war (hot or cold) or fear of an external threat, but might be extended to the fight against macroeconomic diseases whose liquidation is a goal shared by the community and which can be manipulated by Politicians in power. There are numerous examples showing that macroeconomic variables may have been diverted from their stated objectives. The objective of “fighting inflation” during the 1980s might have been an instrument for imposing reforms in the job market (for ending wage indexation), and the persistence of an inflation threat might have helped Governments to maintain a pressure on wages. In some European countries, the persistence of high levels of unemployment might have exerted a threat to workers for them to accept low working conditions or might have been used as a signal that the Government was tough and determined to fight inflation (Drazen and Masson, 1994), while the declared goal of “fighting unemployment” ensured a sufficient level of social cohesion. More recently, the crisis of sovereign debts in European Monetary Union gave rise to a novel enemy, namely the public debt, whose persistence exerts pressures leading populations to accept austerity measures.

In all of these examples, the macroeconomic “enemy” can be used to create a “unifying myth” (according to Bailey (1998)) for other purposes, possibly welfare enhancing.¹ But such myths can also be used by Politicians interested in their reelection, in the same way than our fear of foreign enemies. The “need for enemies” has often been mentioned to describe Politicians’ attempts to justify continuing failed policies, or to create some scapegoats in order to escape from internal reforms.² But not implementing internal reforms may also be the consequence of our need for keeping the enemy alive. Indeed, the “need for enemies” will be looked on in quite a different light if, instead of being regarded as a factor which comes from the incapacity of Politicians to undertake reforms, it is seen as a factor which leads Politicians not to undertake reforms.

Fergusson et al. (2012) develops an interesting application of this mechanism to the fight against guerilla groups like the FARC in Columbia, suggesting that president Uribe incentive to eliminate the guerilleros would have been mitigated by the fact his electoral advantage would have been removed if he had eliminated

¹Notice that mythmaking is not necessarily counterproductive from a social welfare perspective. A society can take advantage to tying its minds on a unifying myth, if such a myth facilitates overcoming some particular interests, for example.

²One of the most influential examples of this point of view is given in the Report entitled The First Global Revolution by the Council of the Club of Rome (1991): “*The need for enemies seems to be a common historical factor. Some states have striven to overcome domestic failure and internal contradictions by blaming external enemies. ... In searching for a common enemy against whom we can unite, we came up with the idea that pollution, the threat of global warming, water shortages, famine and the like, would fit the bill. But ... all these dangers are caused by human intervention in natural processes, and it is only through changed attitudes and behavior that they can be overcome. The real enemy then is humanity itself.*”

them too quickly. As Fergusson et al. (2012) states the problem arises when Politicians are elected because they are “the person for the job”: once the job is over, the Politicians may be replaced even if (and because) they have successfully completed the job for which they were elected. A classic example in history (also cited by Fergusson et al. (2012)) is Winston Churchill who led Britain to victory in the Second World War as prime minister, but was immediately removed by electors as soon as the war was won in 1945. Another example, more recent and more closely linked to economics, might be related to the episode of Claudio Monti in Italy, where the initial massive popular support for the centrist coalition has collapsed once the reforms implemented.³ For sure, austerity and unpopular reforms may have led to a desire to sanction the coalition, but the fact that reforms were already launched probably may have removed the electoral advantage of Monti because the threat of the enemy was pushed aside.

These examples also show that the “need for enemies” story is only one part of the piece. Generally, one can find mechanisms that ensure that reforms are undertaken, at least partially. In some extreme circumstances, “the person for the job” is designated, by an election or not, and she does the job, because she is the “right” person (she has a great sense of community that goes beyond his electoral interest) or because this is the “right” time (she takes advantage of favorable conditions). In other circumstances, the society may delegate some objectives to an independent agent - such that a “conservative” central banker *à la* Rogoff (1985) to fight inflation, for example. However, such a delegation of decisions to an “independent” agent or to a “providential” person, even if she does not become a dictator (benevolent or not), might raise a problem of democratic control.⁴

The other possibility, more usual in democracies where the “rules of the game” are based on elections, is to resort to reputational strengths to circumvent Politicians incentives not to reform. Effectively, in general, electors do not perfectly perceive the “competence”⁵ of Politicians, either incumbent Politicians or their

³In November 2011, Monti accepted to form a Government that would remain in office until the next scheduled general elections in 2013. He became Prime Minister of Italy and formed a “technocratic” cabinet entirely composed of unelected professionals. On this occasion, he received the largest support ever acquired in a confidence vote in the Italian Parliament. However, after having introduced emergency austerity measures, restored financial stability and implemented structural reforms in the labor market, Montis centrist coalition was only able to come fourth at the election of 24 February 2013, obtaining 10.5% of the vote.

⁴In modern history, a salient example of issues raised by such a problem of democratic control following a radical change in the “rules of the game” has been the questioning about the implementation of the Constitution of 1958 in France, following the failure of the Fourth Republic to reform the country. Thus, on May 19, 1958, General de Gaulle asserted at a press conference that he was “*at the disposition of the country*”. In response to a journalist who feared that he would violate civil liberties, as his opponent François Mitterrand later denounced in his famous book *Le coup d'état permanent* (1964), De Gaulle retorted vehemently: “*Have I ever done that? Does anyone believe that, at age 67, I am going to launch a career as a dictator?*” For an interesting anthropological analysis of the “rules of the political game” in France during the period, see Bailey (1969), chapter 9.

⁵In our paper, “competence” may describe either the Politician’s ability or his concern for reforms. Electors do not know if the Politicians are very committed to the reforms (for example, they do not know at the time of the election, the exact composition of the future team in power). Thus, “competence” describes the expected comparative advantage of the Politicians in the problem to be solved.

opponents. However, by launching reforms, the incumbent Politician can attempt to signal his competence and to improve his reputation in order to maximize his chances of reelection, while his opponent cannot, since he is not at the helm of power. Such a signaling mechanism goes against the strengths underlying the “need for enemies” and gives rise to a trade-off between “not to reform” in order to keep the enemy alive and “to reform” in order to maximize reputation.

More precisely, we are interested in reforms that Politicians may deal directly and which are acceptable by the great majority of people, like, especially, reforms that improve public finances, by reducing “wasteful” expenditures or by generating exceptional receipts.⁶ For this reason, we consider that the Government in office does not attempt to maximize some partisan objective (such that his electors’ welfare), but simply tries to maximize his chances to be reelected (net from the cost of reform effort).

The basic mechanism driving our analysis can be described by the following example of an electoral competition in a municipality. Suppose that there are two candidates. The incumbent defends the construction of a tennis hall and his challenger a library. Suppose also that the incumbent candidate has an advantage in public finance management, possibly because she is in office and has access to more information. If she leaves a healthy financial position at the end of his term, the election will be played on the relative “popularity” of the opponents and on the “ideological” preferences of electors (“sportsmen” against “intellectuals”). However, the incumbent candidate can attempt to take advantage of his competence in public finance by leaving a deteriorated financial situation in order to induce some “intellectuals” not to support his challenger, who is less competent to solve this problem. The same argument can be applied to national elections: a Government in office, who is “skilled” in solving a problem, can be induced not to provide much effort to fight this problem in order to keeping alive an electoral advantage, beyond voters ideological preferences or popularity shocks hitting his campaign. But not to solve the problem can damage his reputation to be competent, thus the Politician in office can use the choice of reform effort as a strategic variable in the voting process: for strategic Politicians, electoral choices are too serious a matter to be entrusted to the ideological preferences of voters or to random shocks on popularity.

In this paper we consider an incumbent Government who is simply seeking reelection. Before the election, he tries to manipulate the vote by introducing “reforms” in the public finance stance, which result in “liquidating” a part of public debt. However, the success of reforms depends not only on his reform

⁶Of course, a number of reforms involve conflicts between social groups to defend specific interests or jeopardize some acquired positions. In such conditions, reforms can be abandoned because they are too politically costly or because they do not correspond to the preferences of voters supporting the incumbent party. Although these ingredients can be easily introduced in our model (see Appendix D) we want to develop another argument for why Governments do not reform even if electors recognize that what is costly is the fact not to reforming. Thus, our goal is not to describe precisely all the reasons that can explain that reforms are incomplete or postponed, but to isolate a new mechanism based on the trade-off between the “need for enemies” and “reputation”.

effort, and on his competence, but also on the “macroeconomic or political context”, which symbolizes the difficulty to reform and that we define as a random shock hitting the efficiency of reforms. For reputational strengths to emerge, we also suppose that the incumbent Government is, on average, more “competent” than his opponent, i.e. he has a comparative advantage in reforming. However, Electors do not know his exact competence (nor that of his opponent) and they do not perceive the random shocks that affect the efficiency of reforms, nor the effort of Government, but only the global outcome of the reforms, namely the amount of public debt “liquidation”. Knowing this outcome, they attempt to infer the degree of competence of the incumbent Government by using a Bayesian procedure. It follows that a higher amount of reforms will increase the reputation of the incumbent Politician, i.e. the probability that he is competent. Finally, the chance of reelection of the incumbent Government depends both on his “reputation”, and on the “need to keep the enemy alive”. This results in a trade-off which, generally, gives rise to incomplete reforms because it is the interest of the incumbent Government to reform, but only partially.

The amount of reforms that will be implemented is the outcome of a political equilibrium resulting from the confrontation between the temptation of the Government to take advantage of his competence and the control of his reputation by the voters. In equilibrium, this amount will positively depend on the probability that the incumbent Government is competent (which enhances the benefits of “reputation”) and will negatively depend on the competence gap between the incumbent Government and his challenger (which strengthens the “need for keeping public debt alive”). In addition, our model exhibits a “Goldilocks theorem” for the probability of reelection of an incumbent Government: to maximize his chances of success, the macroeconomic context must be neither “too bad” nor “too good”. Effectively, if a “too bad” economic context generates a low amount of reforms which reduces the incumbent Politician’s reputation, a “too good” economic context, *ceteris paribus*, may give rise to an amount of reforms that weakens the electoral advantage of a competent Politician.

Therefore, our model offers three types of explanations for why reforms are incomplete: because macroeconomic conditions are difficult, because the incumbent Government is incompetent or because he is competent but he acts strategically.

This paper is connected with a large number of analyses in political economy literature focusing on “positive” approaches of reforms and that Besley and Coate (1998) qualifies as “sources of inefficiency” in representative democracies. With a closely concern to ours, but using a very different specification, Alesina and Drazen (1991) and Drazen and Grilli (1993) are interested in the optimal delay in reforms following a “war of attrition” and the benefits of crisis to implement reforms more rapidly. In our framework, reforms are not only delayed but remain optimally incomplete. In a model with asymmetric information like ours, Cukierman and Tommasi (1998) also presents a framework where the Politician who cares most about doing something is the least likely to do it (like President

Nixon, who opened the door to the international legitimization of the People’s Republic of China in the early 1970s, in spite of his strong anti-Communist convictions). But the argument of Cukierman and Tommasi (1998) rests on the fact that voters are imperfectly informed about the ideology of policymakers, while in our model they are imperfectly informed about their competencies. More specifically, two cases of strategic behavior of a Politician facing rational forward-looking voters have been extensively studied in the literature. The first case focuses on uncertainty about Governments preferences (as in, e.g., Alesina and Cukierman (1990)), or about Governments abilities (Cukierman and Meltzer (1986), Rogoff and Sibert (1988) and Rogoff (1990), among others). In these frameworks, the incumbent Politician acts strategically in order to “signal” his preferences or abilities to voters. In the second case, studied in particular by Persson and Svensson (1989), Alesina and Cukierman (1990) and Milesi-Ferretti and Spolaore (1994) among others, the incumbent Politician uses a state variable (typically public debt) to manipulate the choices of voters or of future policymakers.⁷ Our model can be viewed as joining these two strands of literature. Effectively, by choosing his reform effort, an incumbent Government can affect election outcomes both through signaling and through the residual burden which he will bequeath to his possible, incompetent, successors.

The rest of the paper is organized as follows. Section 1 presents the baselines of the model, Section 2 describes the way Households compute the reputation of the incumbent Government, following a Bayesian approach, and Section 3 presents the resulting political equilibrium. Finally, Section 4 produces some numerical results and Section 5 concludes.

I. The model

We are interested in a very general set of problems which focuses on an Agent who is hired by a Principal to carry out a specific task, namely to “liquidate” a “problem”. There are two periods, and the Agent can remove a part of the “problem” at each period. At the end of the first period, the Principal has to decide whether to renew or not the Agent in office. In this game, the Agent can act strategically: even if he is “competent”, i.e. he can solve the problem in the first period, he has no interest to do so, because he would not be renewed once the problem solved. Thus, he is induced not to liquidate in the first period, in order to maximize his chances to be renewed. But of course, the fact that the Agent does not liquidate in the first period may affect the probability to be renewed, because it’s a bad signaling (zero liquidation might signal that the Agent is incompetent or is a shirker and affect his reputation).

⁷Aghion and Bolton (1990) present an interesting model in which public debt can be used as a political instrument to ensure reelection. In the incumbent Politician (typically a conservative one) can more credibly commit not to default than his opponent, he has an incentive to excessive accumulation of public debt in order to increase the number of bond-holders (which will vote for the most “competent” candidate, i.e. the one which is less likely to default).

In this paper, we attempt to solve the trade-off between these two conflicting forces: the need to keep enemies alive and the need to preserve reputation. We model this trade-off in a public finance set-up, with the Principal the Electors, the Agent a Politician or a (local or central) Government, but our framework can be applied to any problem involving a job contract.

A. Agents' preferences

We consider one economy with N districts indexed by $n \in \{1, \dots, N\}$, each populated by a continuum of Households (or Citizens) with measure normalized to unity. In addition, there are two Politicians (or parties) denoted by D and R respectively, where $i \in \{D, R\}$ represents the ideological bias.

There are two periods. In period 1, a Politician $i \in \{D, R\}$ holds power, and at the end of period 1 there is an election for deciding who will be in power in period 2. In the first period, the Politician initially in power distributes to Households the public good $g_1 = \sum_{n=1}^N g_{1n}$. To finance this public good, he can resort to public debt or distorsive taxation. In addition, at each period $t \in \{1, 2\}$, he can launch reforms that lead to “liquidate” a part l_t , $0 \leq l_t \leq 1$, of his financial needs. The part l_t corresponds to the share of public expenditure that can be financed without detrimental effect on Household’s welfare, namely cuts in wasteful spending (such as unnecessary “operating” expenditures arising from bureaucracy, corruption or X-inefficiencies), flat taxes, or extraordinary resources (donations, ability to withdraw funds from international institutions), all elements that we do not model explicitly, but which depend on the “ability” of the Politician in office to generate “painless” resources. At the end of the first period, the residual amount of public spending is financed by issuing public debt (d_1), so that the budget constraint is simply: $d_1 = (1 - l_1)g_1$. Then, the election takes place and the Government i , $i \in \{D, R\}$, is renewed or his challenger takes office.

In the second (and last) period, the Government newly elected can once again launch reforms and he has to repay public debt and interests (namely: $(1 + r)d_1$, where r is the constant real interest rate) and there is no other spending. To finance the debt burden, the Government must levies taxes from Households $\tau_2 = \sum_{n=1}^N \tau_{2n}$, since he cannot borrow in the last period ($d_2 = 0$). Taking into account reforms launched in the second period (l_2), the Government intertemporal budget constraint is simply given by:

$$(1) \quad \tau_2 = (1 + r)d_1 - l_2(1 - l_1)g_1 = (1 - l_1)(1 + r - l_2)g_1.$$

Household n (thereafter we identify district n to Household n) derives utility from consumption in the two periods: c_{1n} and c_{2n} , and from the public good g_{1n} , namely, assuming a log-linear utility function for simplicity:

$$(2) \quad U_n := u(c_{1n}, c_{2n}, g_{1n}) = \log(c_{1n}) + \frac{1}{1 + \rho} \log(c_{2n}) + \lambda \log(g_{1n}),$$

where ρ is the rate of discount and λ is a positive parameter reflecting the preference for the public good. Household n receives a constant level of income y_n in the first period and saves for consumption and tax payments during second period, hence, defining by s_n Household n ' saving, the following budget constraints hold: $s_n = y_n - c_{1n}$ and, $c_{2n} = (1+r)s_n - \tau_{2n}$. Thus, the intertemporal budget constraint is given by: $c_{1n} + c_{2n}/(1+r) = y_n - \tau_{2n}/(1+r)$. Consequently, first order conditions conduct to the following usual relationships:

$$c_{1n}^* = \frac{1+\rho}{2+\rho} \left(y_n - \frac{1}{1+r} \tau_{2n} \right), \text{ and } c_{2n}^* = \frac{1+r}{1+\rho} c_{1n}^*.$$

And the Household n 's utility becomes:⁸

$$(3) \quad U_n = u_{0n} - \frac{\tau_{2n}(2+\rho)}{y_n(1+\rho)(1+r)},$$

where $u_{0n} := \frac{1}{1+\rho} \left\{ (2+\rho) \log \left(y_n \frac{1+\rho}{2+\rho} \right) + \log \left(\frac{1+r}{2+\rho} \right) \right\} + \lambda \log(g_{1n})$.

Finally, anticipating on resolution, in symmetric equilibrium we have: $\tau_{2n} = \tau_2/N$, and $g_{1n} = g_1/N$. Therefore, by introducing (1) in (3) and defining $\gamma_n := (2+\rho)/y_n(1+\rho)(1+r)N$, we obtain a reduced form for Household n 's utility:

$$(4) \quad U_n = u_{0n} - \gamma_n g_1 (1-l_1)(1+r-l_2).$$

Consequently, Households' utility positively depends on the amount of "liquidation" in each period (which is the part of public spending which will not lead to an increase in public debt or in taxes). Furthermore, from (4), since $l_2 \leq 1$, Citizen n 's welfare is maximum when $l_1 = 1$.

B. Households as voters

The key assumption in our model is that the amount of liquidation is not totally a control variable for the Government, but depends on his effort in implementing reforms (his control variable e), on his degree of competence (g), but also on the economic or social context, which may be more or less favorable to the success of reforms, and that we model as a random shock (ε). This shock symbolizes either, social resistance to reforms (strikes, demonstrations, lobbying, ...) or economic climate, which may be more or less conducive to reforms (good times allow providing compensation to the losers). Thus, ε represents the state of the power relationship between pro and con-reforms in the society.

Each Politician can be competent (g -type), or incompetent (b -type). Thus, we define the success probability of the Government i , $i \in \{D, R\}$, of competence j , $j \in \{b, g\}$, in attempting to reform in the first period by: $l_{1i}^j = \varepsilon_1 q_i^j e_{1i}^j$, where $q_i^j \geq$

⁸We use $\log \left(1 - \frac{\tau_{2n}}{y_n(1+r)} \right) \approx -\frac{\tau_{2n}}{y_n(1+r)}$ for "small" taxes' rate τ_{2n}/y_n .

0 and $e_{1i}^j \geq 0$. The random variable $\varepsilon_t \geq 0$, $t \in \{1, 2\}$, with mean $\mathbb{E}(\varepsilon_t) =: \alpha \leq 1$, represents exogenous shocks, outside the control of Politician, on the possibility to reduce public spending.

We assume that in each period the Government in office produces some “normal” effort in reforming (say \bar{e}), which we take as exogenous. However, in the period preceding the election ($t = 1$) the incumbent Politician is induced to act strategically by choosing an amount of reform effort (possibly) different from \bar{e} , namely: $e_{1i}^j = \bar{e} + z_i^j \geq 0$, where $z_i^j \geq -\bar{e}$ denotes the extra reform effort (positive or negative) that a “Machiavellian” Politician of type i and competence j will undertake to manipulate Electors. In the second period, the newly elected Government has no short-run electoral concern, thus: $e_{2i}^j = \bar{e}$, so that the amount of reforms is simply: $l_{2i}^j = \varepsilon_2 q_i^j \bar{e}$. In the rest of the paper, in order to save notations, we define: $\varepsilon_1 =: \varepsilon$, and $e_{1i}^j =: e_i^j$, which we consider to be the choice variable of Government i of competence j (since the choice of e_i^j is equivalent to the choice of z_i^j).

We consider that $q_i^b > q_i^g$, $i \in \{D, R\}$, namely a competent Government i has a higher probability of success in reforming than an incompetent one. In addition, for a same competence j , two Politicians may differ in their preferences or in their abilities. We suppose that Politician R has a greater competence in reforming than Politician D , i.e. $q_R^j \geq q_D^j$, $j \in \{b, g\}$. An alternative interpretation is that the abilities of Politicians are the same, but Politician R has a bias in favor of reforms.⁹

Households know the ideological bias of the Government in place $i \in \{D, R\}$ in the first period (in what follows, we will consider, unless otherwise and without loss of generality, that the Government initially in office is of type R). They also know the amount of “liquidation” that arises in the first period l_{1R} . However, they cannot observe the reform effort of the Politician in office (e_R^j), because they don’t know his competence q_R^j nor the random shock ε that hits the success probability of liquidation, which are private information for the incumbent Government. We will show below how Households can infer the competence of Government in office from the signal l_{1R} . After the election, Government R is reelected or a new Government of type D takes place. From equation (4) in the case of a Government $i \in \{D, R\}$ and competence $j \in \{b, g\}$ is elected, Household n ’s expected utility is given by:

$$(5) \quad \mathbb{E}_i^j[U_n] = \begin{cases} u_{0n} - \gamma_n g_1 (1 - l_{1R}) (1 + r - l_{2D}^j) & \text{if } i = D, \\ u_{0n} - \gamma_n g_1 (1 - l_{1R}) (1 + r - l_{2R}^j) + \theta_n + \xi & \text{if } i = R. \end{cases}$$

⁹In our model “competence” may also reflect the degree of Government involvement in pursuing reforms. The type R -Government is strongly committed to this goal, while the type- D Government may have interest in (or may be more “competent” for) other objectives. Considering a multi-objective framework would not fundamentally change the model, the main point being that the Government of type R has an incentive to keep alive his comparative advantage.

In addition to utility derived from consumption, Households have preferences over ideology and other characteristics of Politicians which we call “popularity”. Thus, we suppose that Household n feels an additional expected utility ($\theta_n + \xi$) if the Politician R is in power. This term includes two components: θ_n is idiosyncratic and ξ is common to all voters. Following the probabilistic voting models of Lindbeck and Weibull (1987), and Persson and Tabellini (2000), we suppose, on the one hand, that each Household n has an ideological preference θ_n in favor of Politician R . Therefore, $\theta_1, \dots, \theta_N$ are independent random variables, constant over time, and uniformly distributed on $[-\frac{1}{2s}, \frac{1}{2s}]$, with density $s > 0$.¹⁰ On the other hand, the random variable ξ reflects the general popularity of Politician R , and is uniformly distributed on $[-\frac{1}{2k}, \frac{1}{2k}]$, with density $k > 0$.¹¹

Finally, even if Households don’t know the precise degree of Politicians’ competence in reforming, they may have some prior information on this competence, possibly based on past behavior of Politicians. In what follows, we suppose that Households assign some prior probability δ , $0 \leq \delta \leq 1$, to the fact that a Politician is competent (i.e. g -type). Therefore, we introduce a random variable X_i which represents Politician i ’s competence, $i \in \{D, R\}$. If Politician i is skilled (respectively unskilled), then $X_i = g$ (respectively $X_i = b$), with:

$$(6) \quad \mathbb{P}\{X_i = g\} = 1 - \mathbb{P}\{X_i = b\} = \delta.$$

However, there is an asymmetry in our model, since the Government in office can send a signal to increase this prior probability by launching reforms. In other words, he can attempt to increase its reputation to be competent by liquidating a high part of public debt (high level of l_{1R}). On the contrary, his opponent, who is not in office, cannot send such a signal, so that his reputation remains at the initial level δ .

C. Timing of events

The timing of events can be depicted as follows:

1. The random shock ε on the success probability of reforms is revealed to the Government in office. The Government $i \in \{D, R\}$ of competence $j \in \{b, g\}$ decides the effort in implementing reforms e_i^j , in order to maximize his chances of reelection. Thus, the amount of effective liquidation of public spending will be: $l_{1i}^j = \varepsilon q_i^j e_i^j$. If the Government is initially of type R , as we consider, this

¹⁰ s is a measure of voters’ responsiveness to Government decisions. Indeed, as s increases, Households care more about Government policy relative to ideology, see equation (5).

¹¹ We could easily introduce the case where the popularity shock (ξ) negatively depends on the amount of reforms l_{1R} . Effectively, reforms can involve “political” costs because they face special interests (such as e.g. agents who collect taxes, who might have took benefits from corruption) and give rise to a punishment vote, even if Citizens recognize that reforms are, globally, desirable. In other words, the drug may be good for the patient but hard to swallow, like a visit to the dentist. Appendix D shows how this feature can be introduced within our framework without change in our results.

amount is $l_{1R} = \varepsilon q_R^g e_R^g$ if the Government is competent, or $l_{1R} = \varepsilon q_R^b e_R^b$ if the Government is incompetent.

2. Households observe the amount of liquidation l_{1R} . They don't know the shock ε nor Politicians' competence.
3. Households revise their prior probability that the incumbent Government is competent δ , knowing the signal l_{1R} .
4. The general popularity shock ξ is revealed and Households vote according to their expected utility.
5. The Politician $i \in \{D, R\}$ who got the most votes takes power in period 2.
6. If the initial set of reforms have been unsuccessful ($l_{1R} < 1$), a second set of reforms is launched by the newly elected Government, and the game ends.

As usual, we look for the pure subgame perfect equilibrium, and we solve the model by backwards induction. The two crucial stages in our model are steps 1 (choice of effort by the incumbent Government) and 3 (Households revise their probability that the incumbent Government is competent after having received the signal l_{1R}). Let us depict these stages in the two following Sections.

II. Government's reputation and signaling

Households don't know the incumbent Government's competence, but they observe the actual "liquidation" of public debt l_{1R} , which they use as a signal to revise their beliefs about Government reputation δ . In what follows, we suppose that Households adopt a Bayesian procedure to revise the probability that the Government is competent. According to the fact that the incumbent Government is of type R , the signal l_{1R} can be obtained only in two cases:

$$l_{1R} = \begin{cases} l_{1R}^g = \varepsilon q_R^g e_R^g & \text{if the Government is competent (g-type),} \\ l_{1R}^b = \varepsilon q_R^b e_R^b & \text{if the Government is incompetent (b-type).} \end{cases}$$

Households guess that the amount of liquidation l_{1R}^j is an increasing function of εq_R^j , denoted by $h(\cdot)$, and which is given by the following definition.

DEFINITION 1: *(Households guess) Households guess is given by the function $h(\cdot)$ continuous, increasing, positive, such that:*

$$(7) \quad l_{1R}^j = h(\varepsilon q_R^j).$$

This means that the elasticity of effort in implementing reforms with respect to εq_R^j must be less than unity (in absolute value), which will be the case in equilibrium (see equation (31) in the following Section). Using the method of

undetermined coefficients, this guess will be verified as a rational expectation equilibrium, as shown in Section 4.

Now we define the probability that the incumbent Government is competent knowing the signal l_{1R} , that we note p_R and whose value is established in the following Theorem.

THEOREM 1: (*Bayesian revision of probability*) *Given the signal l_{1R} , the probability that the incumbent Government is competent is:*

$$(8) \quad p_R = \delta + \frac{\delta(1-\delta)\Lambda}{1+\delta\Lambda}, \quad \text{where } \Lambda := \frac{\mathbb{P}\{\varepsilon = \varepsilon^g(l_{1R})\}}{\mathbb{P}\{\varepsilon = \varepsilon^b(l_{1R})\}} - 1, \quad \forall l_{1R} \in [0; 1].$$

PROOF:

The bayesian revision of probability takes place in two stages.

Step 1. The signal received by Households can take any particular value l_{1R} only in two cases: if the random shock ε takes the value ε^b or ε^g respectively, where ε^b and ε^g are given by:

$$(9) \quad l_{1R}^j = h(\varepsilon q_R^j) = l_{1R} \Rightarrow \varepsilon = \frac{1}{q_R^j} h^{-1}(l_{1R}) =: \varepsilon^j(l_{1R}), \quad \forall j \in \{b, g\}.$$

To reduce the notations, we note $\varepsilon^j(l_{1R}) =: \varepsilon^j, j \in \{b, g\}$. Of course ε^b and ε^g depend on the signal l_{1R} , more precisely: $d\varepsilon^j/dl_{1R} \geq 0, j \in \{b, g\}$. In addition, $\varepsilon^g < \varepsilon^b$. Indeed, if the observed amount of liquidation is high, it's likely that the shock that caused this amount is also high. But, since a competent Government has more chances to success in reforms, the required shock associated to a skilled Government to verify the observed level of liquidation (ε^g) is less than the one required if the Government is unskilled (ε^b).

Step 2. Let $l \in L^2([0; 1])$ be the signal received by Households in period 1. The probability that the incumbent Government is competent knowing the signal $l = l_{1R}$ is, according to Bayes rule:

$$(10) \quad p_R = \mathbb{P}\{X_R = g | l = l_{1R}\} = \frac{\mathbb{P}\{l = l_{1R} | X_R = g\} \mathbb{P}\{X_R = g\}}{\mathbb{P}\{l = l_{1R}\}}.$$

Yet the unconditional probability that the Government is competent is the initial value of his "reputation" δ , thus, $\mathbb{P}\{X_R = g\} = \delta$. Besides, in accordance with the law of total probability, $\mathbb{P}\{l = l_{1R}\} = \mathbb{P}\{l = l_{1R} | X_R = g\} \mathbb{P}\{X_R = g\} + \mathbb{P}\{l = l_{1R} | X_R = b\} \mathbb{P}\{X_R = b\}$. Furthermore, according to Step 1, $\mathbb{P}\{l = l_{1R} | X_R = b\} = \mathbb{P}\{\varepsilon = \varepsilon^b(l_{1R})\}$ and, $\mathbb{P}\{l = l_{1R} | X_R = g\} = \mathbb{P}\{\varepsilon = \varepsilon^g(l_{1R})\}$. Therefore, (10) becomes:

$$(11) \quad p_R = \frac{\delta \mathbb{P}\{\varepsilon = \varepsilon^g(l_{1R})\}}{\delta \mathbb{P}\{\varepsilon = \varepsilon^g(l_{1R})\} + (1-\delta) \mathbb{P}\{\varepsilon = \varepsilon^b(l_{1R})\}}.$$

Finally, after rewriting, we obtain the above expression (8). \square

COROLLARY 1: *The probability p_R is increasing with Λ .*

PROOF: By (8), $\partial p_R / \partial \Lambda = \delta(1 - \delta) / (1 + \delta \Lambda)^2 \geq 0$. \square

Theorem 1 shows that the reputation of the incumbent Government p_R depends on the signal received by Households. Effectively, since $\varepsilon^g(\cdot)$ and $\varepsilon^b(\cdot)$ positively depends on the amount of observed liquidation l_{1R} , Λ is also a function of the signal l_{1R} in equation (8). The next step is to precise the probability distribution of the shock ε in order to explicit the linkage between l_{1R} and p_R . For this purpose, we introduce f the probability density function of the shock ε , defined on the support $[\beta, +\infty[$, $\beta \geq 0$. In addition, we suppose f is a Normal density $N(\alpha, \sigma^2)$, as in Figure 1, and is given by:

$$(12) \quad f : s \mapsto \frac{1}{\kappa \sqrt{2\pi} \sigma^2} \exp\left\{-\frac{(s - \alpha)^2}{2\sigma^2}\right\} \mathbf{1}_{[\beta, +\infty[}(s),$$

where $\mathbf{1}$ is the indicator function, κ is the density parameter given by: $\kappa := [1 - G(\beta)]$, and $G(\cdot)$ is the cumulative distribution function of the Normal distribution $N(\alpha, \sigma^2)$.

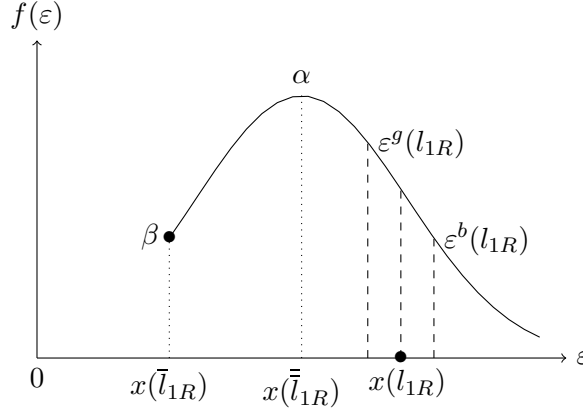


FIGURE 1. THE DENSITY FUNCTION OF ε

With such a density function we assume that intermediate shocks are more probable than “high” or “low” ones. Therefore, the opportunities to reduce public debt are distributed in such a manner that “moderate” liquidations are more probable. Another interpretation might be that ε is a shock on Politician competences, and that there is higher occurrence of moderately competent Politicians.

In what follows, we define $q_i := q_i^b + q_i^g$ and, $\tilde{q}_i := q_i^g - q_i^b$, hence $q_i^b = (q_i - \tilde{q}_i)/2$, and $q_i^g = (q_i + \tilde{q}_i)/2$, $i \in \{D, R\}$. Furthermore, in our simulations below, we will

suppose that the differential \tilde{q}_i is small.

The following Proposition establishes the link between the signal l_{1R} and the “reputation” of the incumbent Politician.

THEOREM 2: *(The Government’s reputation) The probability that the incumbent Politician is competent according to the signal l_{1R} is given by:*

$$(13) \quad p_R = \delta + \Pi(l_{1R}), \quad \forall l_{1R} \in [0; 1],$$

where the signal function $\Pi(\cdot) \in C^1(\mathbb{R})$.

COROLLARY 2: *For the Gaussian distribution (12), there is $\beta > 0$ such that $\Pi'(\cdot) \geq 0$.*

PROOF:

We prove the Theorem 2 in two Steps. The first Step consists in replacing the probability p_R with a density relation, which is given by the following Lemma, and in the second Step we compute the signal function $\Pi(\cdot)$ and we prove Corollary 2.

LEMMA 1: *Given the density of probability $f(\cdot)$, the probability p_R in equation (8) can be written as:*

$$(14) \quad p_R = \frac{\delta f(\varepsilon^g(l_{1R}))}{\delta f(\varepsilon^g(l_{1R})) + (1 - \delta)f(\varepsilon^b(l_{1R}))}.$$

PROOF: See Appendix A.

Equation (14) can be rewritten as: $p_R = \delta + \Pi(l_{1R})$, where:

$$(15) \quad \Pi(l_{1R}) = \frac{\delta(1 - \delta)\check{\Lambda}(l_{1R})}{1 + \delta\check{\Lambda}(l_{1R})}, \quad \text{and } \check{\Lambda}(l_{1R}) := \frac{f(\varepsilon^g(l_{1R}))}{f(\varepsilon^b(l_{1R}))} - 1.$$

Step 2. By (9), and our previous definition of q_R and \tilde{q}_R , we can write:

$$(16) \quad \varepsilon^b(\cdot) = \frac{2h^{-1}(\cdot)}{q_R - \tilde{q}_R}, \quad \text{and } \varepsilon^g(\cdot) = \frac{2h^{-1}(\cdot)}{q_R + \tilde{q}_R}.$$

Hence, with the Gaussian distribution (12):

$$\check{\Lambda}(\cdot) = \exp\left\{\frac{1}{2\sigma^2}[\varepsilon^b(\cdot) - \varepsilon^g(\cdot)][\varepsilon^b(\cdot) + \varepsilon^g(\cdot) - 2\alpha]\right\} - 1.$$

Now, let us define the function $x(\cdot)$ by: $x(\cdot) = 2q_R h^{-1}(\cdot)/(q_R - \tilde{q}_R)(q_R + \tilde{q}_R)$, so that $\varepsilon^b(\cdot) + \varepsilon^g(\cdot) = 2x(\cdot)$, and $\varepsilon^b(\cdot) - \varepsilon^g(\cdot) = 2\tilde{q}_R x(\cdot)/q_R$. Thus, we obtain:

$$(17) \quad \check{\Lambda}(\cdot) = \exp\left\{\frac{2\tilde{q}_R x(\cdot)}{q_R \sigma^2}[x(\cdot) - \alpha]\right\} - 1.$$

We can remark that $\Pi(l_{1R}) \geq 0$ if $\check{\Lambda}(l_{1R}) \geq 0$, namely if $x(l_{1R}) \geq \alpha$, or equivalently if $l_{1R} \geq \bar{l}_{1R} := h(\alpha[q_R - \tilde{q}_R][q_R + \tilde{q}_R]/2q_R)$. In addition, we can easily compute:

$$\Pi'(l_{1R}) = \frac{\delta(1-\delta)}{[1+\delta\check{\Lambda}(l_{1R})]^2} \check{\Lambda}'(l_{1R}) = \frac{\delta(1-\delta)[1+\check{\Lambda}(l_{1R})]}{[1+\delta\check{\Lambda}(l_{1R})]^2} \frac{2\tilde{q}_R x'(l_{1R})}{q_R \sigma^2} [2x(l_{1R}) - \alpha].$$

Notice that: $x'(\cdot) \geq 0$, since $h'(\cdot) \geq 0$; hence $\Pi'(l_{1R}) \geq 0$ if $2x(l_{1R}) \geq \alpha$, namely if $l_{1R} \geq \bar{l}_{1R}$, where: $\bar{l}_{1R} := h(\alpha[q_R - \tilde{q}_R][q_R + \tilde{q}_R]/4q_R)$. Finally, we define $\beta = x(\bar{l}_{1R}) = \alpha/2$. \square

From equations (15) and (17) it is clear that the reputation of the incumbent Government p_R can be positively or negatively affected by the “signal” of liquidation. Effectively, if the liquidation l_{1R} is “small”, $\Pi(l_{1R})$ is negative and the incumbent Politician suffers from a loss of reputation ($p_R < \delta$). If the amount of liquidation is “high”, on the contrary, $\Pi(l_{1R})$ becomes positive and the reputation of the incumbent Politician improves ($p_R > \delta$). With the Gaussian distribution (12), $\Pi(l_{1R}) \geq 0$ if $l_{1R} \geq \bar{l}_{1R}$, and $\Pi(l_{1R}) \leq 0$ if $\bar{l}_{1R} \leq l_{1R} \leq \bar{\bar{l}}_{1R}$. However, in both cases, the reputation of the incumbent Government is increasing with l_{1R} , as Corollary 2 ensures. Thus, the Politician on power has an incentive to reform in order to strengthen its reputation as soon as $l_{1R} \geq \bar{l}_{1R}$, which corresponds to $\varepsilon \geq \beta = \alpha/2$. Nevertheless, the actual amount of liquidation is not directly chosen by the Government in power, who can only choose his level of effort in reforming. Therefore, in bad economic or political contexts (low values of ε) it is not an advantage to hold power, because the absence of reform will lead voters to degrade the reputation of the incumbent Politician.

III. The political equilibrium

To describe the political equilibrium, we first characterize the electoral process, before studying the trade-off between reputation and the need for enemies, and determining the optimal reform effort of the incumbent Government.

A. The determination of Citizens' vote

At the end of period 1 the election takes place and Citizens vote for the candidate which gives them the highest expected utility according to the signal l_{1R} . There are two candidates: the incumbent Politician, of type- R and his challenger of type- D .

On the one hand, if the incumbent Government R is reelected, Citizen n 's welfare is:

$$(18) \quad \mathbb{E}_R[U_n] = p_R \mathbb{E}_R^g[U_n] + (1 - p_R) \mathbb{E}_R^b[U_n],$$

with $p_R = \delta + \Pi(l_{1R})$ the probability that the incumbent Politician is competent. According to the definition (5), Citizen n 's expected utility if R reelected is given by:

$$(19) \quad \mathbb{E}_R^j[U_n] = u_{0n} - \gamma_n g_1 (1 - l_{1R}) (1 + r - l_{2R}^j) + \theta_n + \xi, \quad j \in \{b, g\}.$$

By (18) and (19) we obtain:¹²

$$(20) \quad \mathbb{E}_R[U_n] = u_{0n} - \gamma_n g_1 (1 - l_{1R}) \{1 + r - \alpha \bar{e} [p_R q_R^g + (1 - p_R) q_R^b]\} + \theta_n + \xi.$$

On the other hand, if the opponent D is elected, Citizen n 's welfare is:

$$(21) \quad \mathbb{E}_D[U_n] = p_D \mathbb{E}_D^g[U_n] + (1 - p_D) \mathbb{E}_D^b[U_n],$$

where, according to definition (6), the probability that the Politician D is competent is simply: $p_D = \delta$, since the challenger cannot enhance his reputation by signaling. Therefore, Household n 's expected utility becomes:

$$(22) \quad \mathbb{E}_D[U_n] = u_{0n} - \gamma_n g_1 (1 - l_{1R}) \{1 + r - \alpha \bar{e} [\delta q_D^g + (1 - \delta) q_D^b]\}.$$

Household n will support the incumbent Government R if the expected differential of welfare $W_{n,R}$ is positive, i.e.:

$$(23) \quad W_{n,R} := \mathbb{E}_R[U_n] - \mathbb{E}_D[U_n] \geq 0.$$

By (20) and (22), it follows:

$$(24) \quad W_{n,R} = \alpha \bar{e} \gamma_n g_1 (1 - l_{1R}) [\Delta_R + \tilde{q}_R \Pi(l_{1R})] + \theta_n + \xi,$$

where, $\Delta_R := \delta(q_R^g - q_D^g) + (1 - \delta)(q_R^b - q_D^b) \geq 0$ represents the initial (namely, before signaling) average gap of reputation between type- R and type- D Politicians. In what follows, we will consider that this gap remains positive after signaling, namely that: $\Delta_R \geq -\tilde{q}_R \Pi(l_{1R}), \forall l_{1R} \geq 0$.

The term $(1 - l_{1R})$ in the RHS of (24) reflects the incentive to “keep the enemies alive”. Effectively, since $\Delta_R + \tilde{q}_R \Pi(l_{1R}) \geq 0$, the incumbent Government (of type R) is reputed to be more competent than his challenger. If he liquidates all public expenditure before the election ($l_{1R} = 1$), electoral choices will be subject to ideological preferences or random shocks on popularity only ($\theta_n + \xi$). But the incumbent Politician can take advantage of his competence gap by keeping the problem alive, thus he has an incentive not to liquidate public debt in the first period.¹³ In the absence of any reputational concern (namely, if $\Pi(\cdot) = 0$), the

¹²We use $\alpha := \mathbb{E}\varepsilon_2$.

¹³Households' welfare is maximized for $l_{1R} = 1$, but if $l_{1R} < 1$, the electors will suffer more damages if the Politician D is elected, than if R is reelected. Thus, even if the incumbent Government was able to finance the public good g_1 entirely by painless resources (namely if he was able to fix $l_{1R} = 1$), he is induced not to do so in order to preserve his electoral advantage.

Government in office would not reform ($l_{1R}^* = 0$). But this incentive can be offset by the term $\tilde{q}_R \Pi(l_{1R})$ in the RHS of (24), which reflects the gain of reputation obtained by signaling: the more the incumbent Government liquidates, the more he increases the probability to be competent on the eyes of the voters.

Finally, we define $S_{n,R}$, that is, Household n 's vote for party R . Given our assumptions about the distribution of ideological preferences, $S_{n,R}$ can be expressed as:

$$S_{n,R} := \mathbb{P}_\theta\{W_{n,R} \geq 0\} = \mathbb{P}_\theta\{\theta_n \geq -\bar{\theta}\} = \int_{-\bar{\theta}}^{1/2s} s \, dx = \frac{1}{2} + s\bar{\theta},$$

where $\bar{\theta} := \alpha \bar{e} \gamma_n g_1(1 - l_{1R})[\Delta_R + \tilde{q}_R \Pi(l_{1R})] + \xi$.

Clearly, Household n 's vote for party D is given by $1 - S_{n,R}$. From both candidates' point of view, $S_{n,i}$, $i \in \{D, R\}$, is a random variable, since it is a transformation of the random variable ξ capturing the party R 's average popularity.

Let us consider a majoritarian rule in which the party having obtained at less 50% of votes wins the election. Under this electoral rule, μ_R , which denotes the reelection probability of Politician R , is given by:

$$(25) \quad \mu_R := \mathbb{P}_\xi\left\{\sum_{n=1}^N S_{n,R} \geq \frac{1}{2}N\right\},$$

where the probability refers to the random variable ξ . By simplification, we suppose that Households have the same income y and thus $\gamma_n =: \gamma$ for all $n \in \{1, \dots, N\}$. Therefore, by the definition of $S_{n,R}$ and our previous assumption that ξ is uniformly distributed on $[-\frac{1}{2k}; \frac{1}{2k}]$, we have:

$$(26) \quad \mu_R = \mathbb{P}_\xi\{\xi \geq -\bar{\xi}\} = \int_{-\bar{\xi}}^{1/2k} k \, dx = \frac{1}{2} + k\bar{\xi} =: \mu_R(l_{1R}),$$

where $\bar{\xi} := \alpha \bar{e} \gamma g_1(1 - l_{1R})[\Delta_R + \tilde{q}_R \Pi(l_{1R})]$.

The expression of the probability of reelection μ_R in equation (26) points out the cross-relation between “reputation” and the “need for enemies”.

B. The trade-off between reputation and the “need for enemies”

From relation (26), Households' vote depends on the amount of liquidation that the incumbent Government implements before the election l_{1R} . This gives the incumbent Politician of competence $j \in \{b, g\}$ the possibility to manipulate the probability of reelection by setting an adequate amount of liquidation l_{1R}^j . In this Subsection, we first describe how the “economic or political context” ε influences the probability of reelection of the incumbent Government, and then what would be the optimal choice of liquidation to maximize this probability.

PROPOSITION 1: (“Goldilocks Theorem”) *Ceteris paribus*, to maximize the reelection probability of the incumbent Government, the “economic or political context” must be neither “too bad” nor “too good”.

PROOF:

From equation (26), the reelection probability of a Politician of competence q_R^j who provides an effort e_R^j is:

$$(27) \quad \mu_R^j - \frac{1}{2} = \mu_0(1 - \varepsilon q_R^j e_R^j)[\Delta_R + \tilde{q}_R \Pi(\varepsilon q_R^j e_R^j)],$$

where $\mu_0 := k\alpha\bar{e}\gamma g_1$.

The first term in the RHS of (27) is decreasing in ε , while the second term is increasing in ε . Thus, there is, in general, a critical value of the shock ε that maximizes μ_R^j . This value ($\bar{\varepsilon}$) is such that $d\mu_R^j/d\varepsilon = 0$ and $d^2\mu_R^j/d\varepsilon^2 \leq 0$ and is implicitly determined by the following relation: $(1 - \bar{\varepsilon}q_R^j e_R^j)\Pi'(\bar{\varepsilon}q_R^j e_R^j) = \frac{\Delta_R}{\tilde{q}_R} + \Pi(\bar{\varepsilon}q_R^j e_R^j)$, where, in accordance with our previous assumptions: $\Pi'(\cdot) \geq 0$ and $\frac{\Delta_R}{\tilde{q}_R} + \Pi(\cdot) \geq 0$. \square

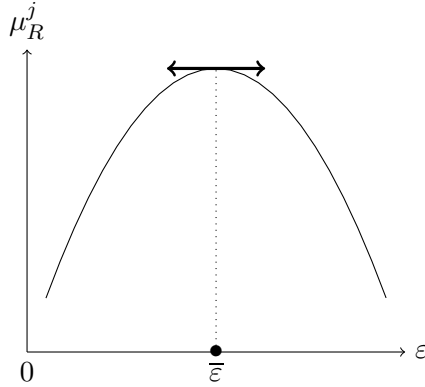


FIGURE 2. A GOLDILOCKS THEOREM

A “good” economic or political context (namely, $\varepsilon \gg \bar{\varepsilon}$) gives rise to a “involuntary” high amount of reform that weakens the electoral advantage of the incumbent Politician (for an unchanged level of reform effort e_R^j). Conversely, a “bad” context ($\varepsilon \ll \bar{\varepsilon}$) generates a low amount of reforms which reduces the “reputation” of the incumbent Politician. In both cases, the probability of reelection will be low. Thus the chances of success of the Government in office are maximized when the shock on the possibility to reform is neither “too bad” nor “too good”.

The same type of argument can be found for Government’s incentive to reform. Let’s suppose that the Government can directly choose the amount of liquidation

l_{1R}^j (this is not true, because it can only choose his effort e_{1R}^j , but the mechanisms giving rise to the trade-off between reputation and the need for enemies will be similar, as we will show below). The impact of reforms (which result in an effective amount of liquidation l_{1R}^j) on the probability of reelection of the incumbent Government can be obtained by the following derivative of relation (27):

$$(28) \quad \frac{1}{\mu_0} \frac{d\mu_R^j}{dl_{1R}^j} = \tilde{q}_R(1 - l_{1R}^j)\Pi'(l_{1R}^j) - [\Delta_R + \tilde{q}_R\Pi(l_{1R}^j)].$$

The first term in the RHS of relation (28) represents the marginal gain of “reputation” on the probability to be renewed: $\mathcal{R}(l_{1R}^j) := \tilde{q}_R(1 - l_{1R}^j)\Pi'(l_{1R}^j) \geq 0$. This gain positively depends on the marginal effect of reforms on the probability that agents assign to the fact that the Government is competent ($\Pi'(l_{1R}^j)$) and to the skill gap of the incumbent Politician \tilde{q}_R .¹⁴ In addition, this gain is the higher the lower liquidation has been in the first period. Effectively, if the amount of reforms before the election has been important, public debt will be low, and the interest burden that can be alleviated by reforms in the second period will be relatively small. In this case, “reputation” to be very competent in reforming will not significantly improve the chances of success in the election.

The second term in the RHS of relation (28) represents the marginal gain of “keeping the enemy alive”: $\mathcal{N}(l_{1R}^j) := [\Delta_R + \tilde{q}_R\Pi(l_{1R}^j)] \geq 0$. By not reforming in the first period, the incumbent Government takes advantage of his initial reputation to be, in average, more competent than his challenger (Δ_R). But this gain also positively depends on the amount of liquidation undertaken before the election, since the signal of liquidation improves the reputation of the incumbent Government: the more the Government is perceived as competent, the higher the benefits of “keeping the public debt alive” will be. This “need for public debt” is positively related to the competence gap between a skilled and a unskilled incumbent Government (\tilde{q}_R). Figure 3 illustrates the trade-off between the “need for enemies” and “reputation”.

To maximize the probability of reelection, the Politician in office should choose the amount of reform \hat{l}_R^j which cancels relation (28), at the intersection of relations $\mathcal{R}(l_{1R}^j)$ and $\mathcal{N}(l_{1R}^j)$. Since $\mathcal{N}(l_{1R}^j)$ is increasing in l_{1R}^j while $\mathcal{R}(l_{1R}^j)$ is decreasing¹⁵ in l_{1R}^j , there is, in general one interior solution $\hat{l}_R^j \in [0, 1]$.

So far, we have assumed that the incumbent Government is of type R . If the Government in office is of type D , with a challenger of type R , the analysis is unchanged, with the subscript D replacing the subscript R . The only change in is that the initial gap of reputation becomes: $\Delta_D = -\Delta_R \leq 0$. Thus, for a given gap of competence of the incumbent Government (namely: $\tilde{q}_D = \tilde{q}_R$), the marginal benefit of “keeping the enemy alive” is lesser for a type- D incumbent Govern-

¹⁴In this Subsection, we consider that the functional form $\Pi(\cdot)$ is invariant to changes in parameters. This hypothesis will be relaxed in the following Section.

¹⁵Under the sufficient condition that $\tilde{q}_R \rightarrow 0$, see Appendix B.

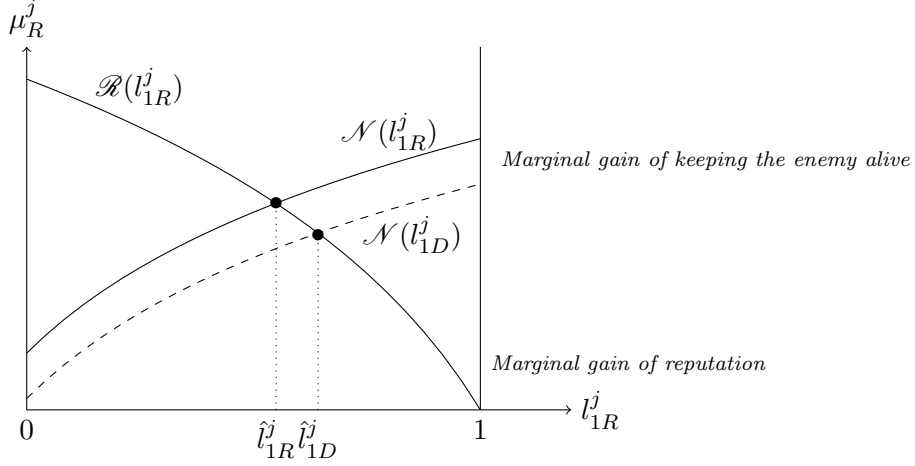


FIGURE 3. THE TRADE-OFF BETWEEN “REPUTATION” AND “THE NEED FOR ENEMIES”

ment than for a type- R one ($\mathcal{N}(l_{1D}^j) \leq \mathcal{N}(l_{1R}^j)$), while the marginal benefit of reputation is unchanged ($\mathcal{R}(l_{1D}^j) = \mathcal{R}(l_{1R}^j)$). Therefore, the amount of reforms that maximizes the probability of reelection of a type- D Government is higher than those of a type- R Government: if the Politician in office is less competent than his challenger, he will implement more reform ($\hat{l}_D^j \geq \hat{l}_R^j$) to maximize the probability of reelection (see Figure 3).¹⁶

However, the incumbent Government cannot choose the actual amount of liquidation l_{1i}^j , which depends on the random shock that hits the probability of success of reforms. He can only choose the reform effort e_i^j . Let us now turn our attention to the optimal choice of effort.

C. The optimal choice of reform effort

In what follows, we suppose that the reform effort is costly for the incumbent Government. Indeed, reforms require embarking on a negotiation process that generates costs, whether the increased workload of the Government, or psychological or political costs. Thus, for a liquidation effort e_i^j , we define the cost function $c(e_i^j)$, where $c(\cdot)$ is an increasing and strictly convex function, and we suppose that the incumbent Politician (of type R) seeks to maximize his probability of reelection net of the cost of effort. As a consequence, the optimal effort of liquidation should satisfy in equilibrium:

$$(29) \quad e_R^{j*} = \operatorname{argmax}_{e_R^j} \{\mu_R^j - c(e_R^j)\}.$$

¹⁶This property can be likened to the argument of Cukierman and Tommasi (1998), that Governments do not always do what is expected of them.

The solution of this program is characterized in the following Proposition and Corollary.

PROPOSITION 2: (*Optimal reform effort*) *The optimal amount of reform l_R^{j*} corresponding to the optimal choice of effort e_R^{j*} of the incumbent Government R of competence j , $j \in \{b, g\}$, satisfies the following relation:*

$$(30) \quad \mathcal{R}(l_{1R}^{j*}) = \mathcal{N}(l_{1R}^{j*}) + \frac{1}{\mu_0 \varepsilon q_R^j} c' \left(\frac{l_{1R}^{j*}}{\varepsilon q_R^j} \right).$$

PROOF: See Appendix B.

COROLLARY 3: *For $(l_{1R}^{j*}, \varepsilon q_R^j)$ verifying the optimal condition (30), there is a function $\varphi \in C^1(\mathbb{R}_*^+)$, defined on $\mathbb{R}_*^+ \rightarrow \mathbb{R}_*^+$, such that the optimal amount of reforms can be written:*

$$(31) \quad l_{1R}^{j*} = \varphi(\varepsilon q_R^j), \text{ where } \varphi'(\cdot) \geq 0.$$

PROOF: See Appendix B.

In relation (30), the optimal decision on liquidation comes from the trade-off between “reputation” and the “need for enemies” on the reelection probability that we have analyzed in Subsection 3.B, but also on the cost of reforming. Relation (30) shows that the result of the optimal liquidation positively depends on the “economic or political context” (ε) and on the competence of the incumbent Government (q_R^j). It is also positively associated to the skill-gap of type- R Politicians (\tilde{q}_R) and negatively associated to the average initial reputation gap between type- R and type- D Politicians (Δ_R).¹⁷

When the competence gap between a skilled and an unskilled incumbent Government \tilde{q}_R increases, the marginal gain of reputation $\mathcal{R}(l_{1R}^j)$ increases while the marginal gain of the “need for enemies” $\mathcal{N}(l_{1R}^j)$ may increase or decrease, depending on the sign of $\Pi(l_{1R}^j)$. In any case, as we can verify in relation (28), $\mathcal{R}(l_{1R}^j)$ increases more than proportionally with respect to $\mathcal{N}(l_{1R}^j)$, thus inducing the incumbent Government to further liquidate public spending. This effect is independent of the incumbent Politician’s intrinsic competence, $j \in \{b, g\}$. Effectively, even an unskilled Politician can take advantage of the fact that if he launched more reforms, his reputation to be competent will increase.

Conversely, the higher the initial reputation-gap between type- R and type- D Politicians (Δ_R), the higher the success probability of the incumbent Government, independently of his actions to enhance his reputation. Therefore, when Δ_R

¹⁷Effectively, from the implicit function theorem, it is straightforward to show from equation (30) that: $l_{1R}^{j*} = \varphi(\varepsilon q_R^j, \Delta_R, \tilde{q}_R)$, where: $\partial_1 \varphi \geq 0$, $\partial_2 \varphi \leq 0$, and $\partial_3 \varphi \geq 0$. See Appendix B.

increases, it is in the interest of the Government in office to liquidate less in order to take advantage of the “need for enemies” mechanism.

Finally, to establish the existence of a rational expectation equilibrium, we have to identify the function $\varphi(\varepsilon q_R^j)$ in (31) and the function $h(\varepsilon q_R^j)$ in (7).

IV. Identification and some numerical results

In order to establish formal results, we consider from now that Household’s guess ($h(\cdot)$) is a linear increasing function of the facility to reform εq_R^j , namely:

$$(32) \quad h(\varepsilon q_R^j) = a + b\varepsilon q_R^j,$$

where a and $b \geq 0$ are parameters that have to be identified in equilibrium.

To proceed to identification, we suppose a simple quadratic function of effort, such that: $c(e_R^j) = c_0(e_R^j)^2$, and we consider linear approximations of equations (13) and (30). The strategy of linearization is established in the following Lemma.

LEMMA 2: *(Linearization) For $\varepsilon \geq \beta$, if the variance of ε (σ^2) is sufficiently small:*

i. The signal function $\Pi(\cdot)$ can be approximate by:

$$(33) \quad \Pi(l_{1R}) \approx \phi_0 + \phi_1 l_{1R},$$

where $\phi_0 := \phi_0(a, b)$, and $\phi_1 := \phi_1(b) > 0$.

ii. The optimal value of liquidation is, for small value of \tilde{q}_R :

$$(34) \quad l_{1R}^{j*} = A(a, b) + B(a, b)\varepsilon q_R^j,$$

where $A(\cdot)$ and $B(\cdot) > 0$ are parameters depending on a and b .

PROOF: See Appendix C.

The final step of the resolution is to identify parameters of relations (32) and (34) to prove the existence of a rational expectation equilibrium verifying the initial guess of Households on the form of Government signal.

PROPOSITION 3: *(Identification) The rational expectation equilibrium is established for the couple (a^*, b^*) that identifies relations (32) and (34). Thus, the two following relations ensure identification:*

$$(35) \quad A(a^*, b^*) = a^*,$$

$$(36) \quad B(a^*, b^*) = b^*.$$

In general one can find one couple (a^, b^*) that verifies these two relations.*

PROOF: See Appendix C.

Let us now present some numerical results. Simulations are operated from the following benchmark calibration: $\alpha = \delta = 0.5$, $q_R = \mu_0 = 1$, $\tilde{q}_R = \Delta_R = 0.1$, $\sigma^2 = 0.05$ and $c_0 = 0.01$. For this calibration, $a^* = 0.0068$ and $b^* = 0.5771$. Results are robust to changes in parameters, as we will show.

Figure 4 presents the equilibrium amount of reform effort implemented by a skilled (continuous line) or an unskilled (dashed line) Government, and the associated levels of liquidation and probabilities of reelection, as functions of shocks on the “macroeconomic or political context” (ε). To this end, we conduct 10 random draws of the shock ε around values of 0.5, 1 and 1.5 respectively (first plot of Figure 4). The optimal liquidation process closely follows the stochastic behavior of ε , but, of course, for the same shock ε the liquidation implemented by a skilled Government is always higher than the one implemented by an unskilled Politician (third plot of Figure 4).

The fourth plot in Figure 4 illustrates the “Goldilocks Theorem” of Section 3.B, but generalizes this Theorem to the endogenous choice of reform effort, while the latter was considered as exogenous in Section 3.B. Effectively, the optimal probability of reelection is maximum for a range of shocks close to $\varepsilon \approx 1$, and decreases for worse or better macroeconomic or political contexts. Thus it is not an advantage to beneficiate to “exceptionally favorable” conditions.

Does it pay to be relatively¹⁸ incompetent? Figure 4 shows that, beyond some threshold for exogenous shocks (close to unity in our simulation), the chances of success of an incompetent type-R Government are higher than the chances of a competent one. Effectively, for very high shocks, the optimal liquidation (the one that maximizes the probability of reelection minus the cost of effort) implemented by a competent Government is so strong that the enemy (the unliquidated part of public debt) becomes very low. Hence, a less competent Politician would be able to keep the enemy more alive, thus having bigger chances of success in the election.

Nevertheless, the incompetent Politician needs to deliver a higher effort than the competent Politician (see the second chart of Figure 4), thus his gain (the probability of reelection minus the cost of effort) is always lower the one of a competent Politician. Furthermore, with the Gaussian distribution (12) most of the shocks are close to $\alpha = 1/2$, as we have shown. Therefore, cases in which the probability of reelection is higher for an incompetent Government than for a competent one are very unusual.

To implement some robustness checks, we depict the effect of changes in \tilde{q}_R and Δ_R on the equilibrium amount of liquidation, respectively in Figure 5 and Figure 6, for a given shock ε .¹⁹

If the competence-gap between the type-R Politicians (\tilde{q}_R) increases, coefficient

¹⁸Remember that the type-R Government is more competent, on average, than his type-D challenger.

¹⁹In Figures 5 and 6, $\varepsilon = 0.5$.

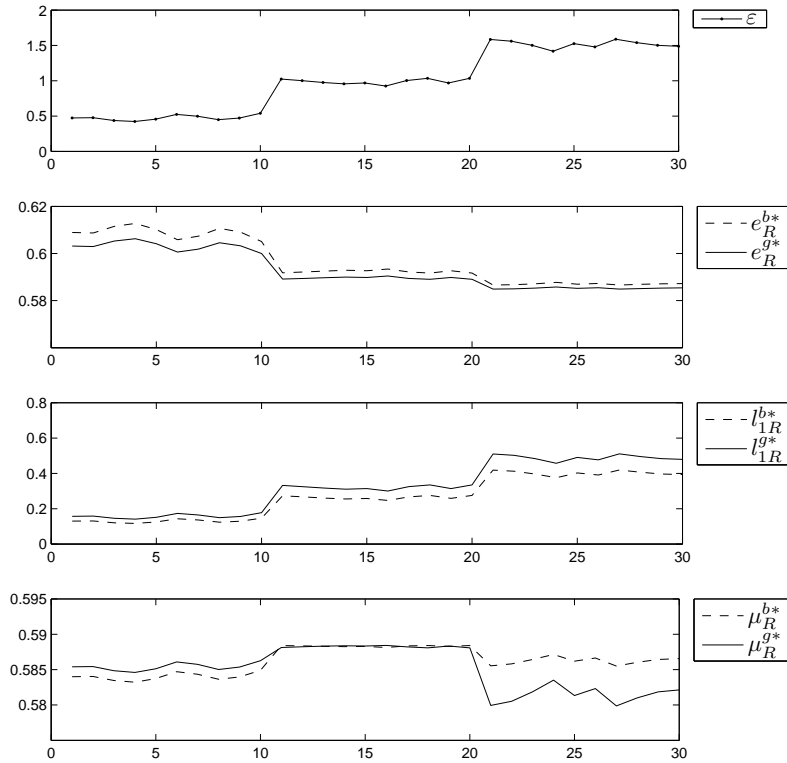


FIGURE 4. OPTIMAL REFORM EFFORT, LIQUIDATION AND PROBABILITY OF REELECTION AS FUNCTIONS OF SHOCKS ON THE “ECONOMIC OR POLITICAL CONTEXT”.

a^* increases while coefficient b^* increases and then decreases, as Figure 5 shows. The optimal amount of liquidation increases with \tilde{q}_R both for a skilled and for an unskilled Government, but in a much more significant extent if the Government is skilled. As a result, the reputation of the skilled Government rises quite rapidly, while the reputation of the unskilled Government declines since the observed liquidation is lower than it should be, given the competence-gap \tilde{q}_R .

Essentially, these results can be explained in the same manner as in the previous Section. When the skill gap increases, the incumbent Government, if he is the skilled one, must take advantage of this gap, by undertaking many reforms for enhancing his reputation. The same is true for the unskilled Government, but he will reform only to a lesser extent, precisely because of its incompetence, so he cannot benefit from reputational gains.

On the contrary, if the competence-gap between type-R and type-D Govern-

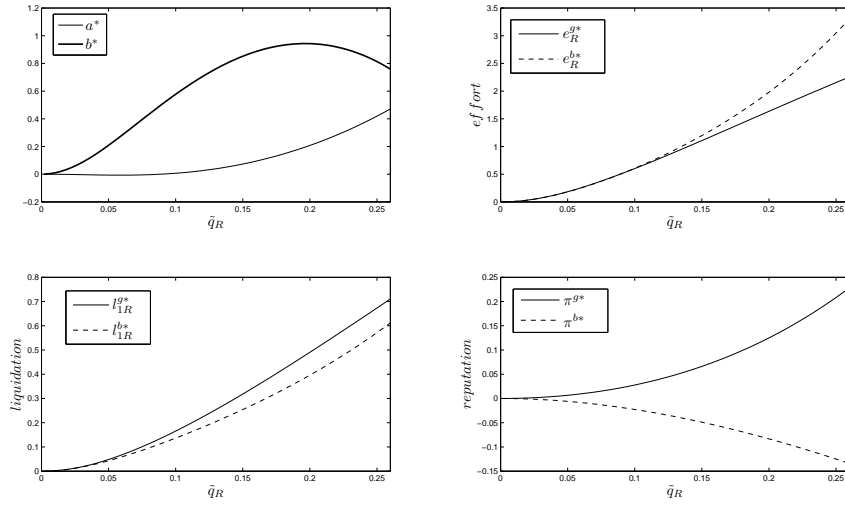


FIGURE 5. EFFECT OF CHANGES IN THE COMPETENCE GAP OF THE INCUMBENT GOVERNMENT.

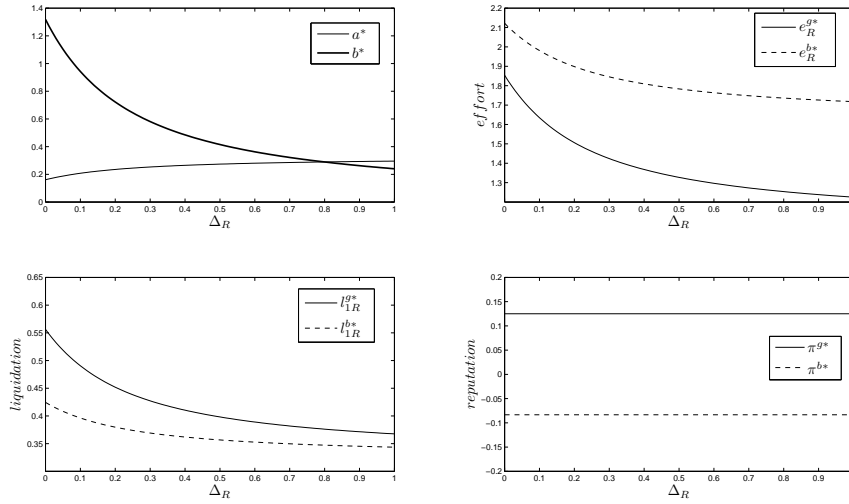


FIGURE 6. EFFECT OF CHANGES IN THE COMPETENCE GAP BETWEEN THE INCUMBENT GOVERNMENT AND HIS CHALLENGER.

ments (Δ_R) increases, the incumbent Government is induced to less reform efforts and the resulting liquidated share of public debt decreases (see Figure 6)

because the benefits of keeping the enemy alive are higher. This is even more true that the reputation does not change with Δ_R , as shows Figure 6. Effectively, reputation depends on the term $h^{-1}(l_{1R}^{j*})$ in relation (14). Yet, in equilibrium: $h^{-1}(l_{1R}^{j*}) = (l_{1R}^{j*} - a^*)/b^* = q_R q_R^j \varepsilon$ is independent of Δ_R . In other words, rational voters know that a change in liquidation associated to a change in the competence gap between type-R Politicians and type-D Politicians does not affect the probability that the incumbent type-R Government is competent or not.

V. Conclusion

In this paper we have shown that the trade-off between “Reputation” and the “Need for enemies” may generate an incomplete set of reforms, because, in our set up, the liquidation of the public debt is made endogenous within the political process. One important question raised by this perspective is whether Governments use reforms to manipulate voters, and especially if they are Machiavellian enough to let a problem to persist in spite of their competence to liquidate this problem. In this respect, our paper joins a number of results in political economy literature in which Governments use public debt strategically to manipulate the choices of voters or of future policymakers.²⁰ Furthermore, in our framework, the need for enemies is only part of the story. Beyond the need for keeping the enemy alive which leads competent Governments to undertake only few reform effort, reforms may also be incomplete because Governments are incompetent or because of adverse shocks hitting the economy, out of the control of Politicians.

Therefore even a strategic Government who chooses the level of effort in order to maximize his chances of reelection can be removed if the economy is hit by strongly positive or negative shock (“Goldilocks Theorem”). Indeed, the exercise of power is a risky game: if the context is “too bad”, even a strategic incumbent Government will be perceived as incompetent, even if the effort of liquidation is strong.

Definitely, there are many examples showing that bad economic or political contexts are detrimental for the election of incumbent Politicians. Finding circumstances such that a good context has been prejudicial is a more complex task. This might be the case of the US mid-term election in 1994 for example, which was more devastating to the Presidents party than any midterm since 1946, despite relatively good economic performances.²¹ Besides, the “state of the economy” midterm loss indicator suggested much smaller losses, and the results of this election were very enigmatic in relation to all traditional explanatory factors (see Campbell (1997)). Another prominent example may be the failure of Prime Minister Jospin in France, who was ousted of the second round of pres-

²⁰See, e.g. Persson and Svensson (1989), Alesina and Cukierman (1990), Aghion and Bolton (1990), and Milesi-Ferretti and Spolaore (1994).

²¹The economy was healthier than in most midterms economies, as shown by the annual economic growth, which was about 2.5% in 1994, compared to an average midterm growth rate of only 1.4% from 1946 to 1994, for example.

idential election in 2002, while the economic situation had improved during his term (rather strong economic growth, decline in unemployment and in public debt): everything happened as though the improvement of the economic climate had made him lose its comparative advantage in the election, to the benefit of his challengers. The United Kingdom general election of 1997 may also symbolize the enemy-loss syndrome. In this occasion in effect, despite falling unemployment and a strong economic recovery following the early 1990s recession, Prime Minister John Major suffered from the Conservatives' worst defeat since 1906, with their lowest percentage share of the vote since 1832.

Our setup may lead to interesting prospects for future research. First, the trade-off between "Reputation" and the "Need for enemies" might be studied in other contexts, specifically microeconomic ones, in order to examine how to implement optimally incentives in a job contract, for example. Second, our model, like much of existent literature, describes a non-repeated game. Besides, introducing the trade-off between "Reputation" and the "Need for enemies" in a repeated-game framework might be interesting. Effectively, in an intertemporal framework, an incumbent Government who has a good chance of losing the election can seek to worsen the situation of his successor, to increase its chances in a subsequent election. By bequeathing a high debt burden to his possible successor, the incumbent Government can force its newly elected challenger to "*pay the bill*" (Alesina and Cukierman, 1990). Thus, a bad electoral context would be an additional inducement to not to reform, if the incumbent Politician has a chance to return to power in the future. It would be particularly interesting to study the interplay between the electoral process and Citizens welfare in such intertemporel frameworks, in the context of Dynamic Stochastic General Equilibrium Models augmented with electoral cycles, in the lines of Battaglini and Coate (2008), for example.

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APPENDIX A: PROOF OF LEMMA 1

Step 1. We prove the following result:

$$(A.1) \quad \lim_{n \rightarrow +\infty} \frac{n}{2} \mathbb{P}\left\{\varepsilon^j - \frac{1}{n} \leq \varepsilon \leq \varepsilon^j + \frac{1}{n}\right\} = f(\varepsilon^j), \forall j \in \{b, g\}, \forall l_{1R} \geq 0,$$

where for simplicity $\varepsilon^j := \varepsilon^j(l_{1R})$, $\forall l_{1R} \geq 0$.

To this end, we define the functions’ sequence $(\psi_n^j)_{n \geq 1}$ by:

$$(A.2) \quad \psi_n^j : s \mapsto \begin{cases} n/2 & \text{if } \varepsilon^j - 1/n \leq s \leq \varepsilon^j + 1/n, \\ 0 & \text{else.} \end{cases}$$

Therefore, $\frac{n}{2} \mathbb{P}\left\{\varepsilon^j - \frac{1}{n} \leq \varepsilon \leq \varepsilon^j + \frac{1}{n}\right\} = \mathbb{P}\{\psi_n^j(\varepsilon)\} = \int_{\mathbb{R}} \psi_n^j(s) f(s) ds$.²² By (A.2), we can write:

$$\int_{\mathbb{R}} \psi_n^j(s) f(s) ds = \int_{\varepsilon^j - 1/n}^{\varepsilon^j + 1/n} \frac{n}{2} f(s) ds.$$

Yet, f is continuous. Thus, there is $\zeta \in [\varepsilon^j - 1/n; \varepsilon^j + 1/n]$, such that:

$$\int_{\varepsilon^j - 1/n}^{\varepsilon^j + 1/n} \frac{n}{2} f(s) ds = f(\zeta) \int_{\varepsilon^j - 1/n}^{\varepsilon^j + 1/n} \frac{n}{2} ds = f(\zeta).$$

Furthermore, $\varepsilon^j - 1/n \leq \zeta \leq \varepsilon^j + 1/n$. So, by taking the limit:

$$\varepsilon^j - \lim_{n \rightarrow +\infty} \frac{1}{n} \leq \zeta \leq \varepsilon^j + \lim_{n \rightarrow +\infty} \frac{1}{n} \Rightarrow \varepsilon^j \leq \zeta \leq \varepsilon^j.$$

²² $\int_{\mathbb{R}} \psi_n^j(s) f(s) ds < +\infty$. Indeed, $\psi_n^j \in L^1$, $\forall n \geq 1$, since $\|\psi_n^j\|_{L^1} = 1 < +\infty$. And, $f \in L^1$, since f is a probability density function. Finally, $x \mapsto \psi_n^j(x) f(x) \in L^1$, $\forall n \geq 1$.

Consequently $\zeta = \varepsilon^j$ and since f is continuous, $f(\zeta) = f(\varepsilon^j)$. Finally we obtain equation (A.1):

$$\lim_{n \rightarrow +\infty} \frac{n}{2} \mathbb{P}\{\varepsilon^g - \frac{1}{n} \leq \varepsilon \leq \varepsilon^g + \frac{1}{n}\} = f(\zeta) = f(\varepsilon^j).$$

Step 2. We can write:

$$(A.3) \quad \mathbb{P}\{\varepsilon = \varepsilon^j\} = \lim_{n \rightarrow +\infty} \mathbb{P}\{\varepsilon^j - \frac{1}{n} \leq \varepsilon \leq \varepsilon^j + \frac{1}{n}\} = \lim_{n \rightarrow +\infty} \frac{2}{n} \mathbb{P}\{\psi_n^j(\varepsilon)\}.$$

Therefore, by (A.3) and (11), we can write:

$$(A.4) \quad p_R = \frac{\delta \mathbb{P}\{\varepsilon = \varepsilon^g\}}{\delta \mathbb{P}\{\varepsilon = \varepsilon^g\} + (1 - \delta) \mathbb{P}\{\varepsilon = \varepsilon^b\}} \\ = \frac{\delta \lim_{n \rightarrow +\infty} \frac{2}{n} \mathbb{P}\{\psi_n^g(\varepsilon)\}}{\delta \lim_{n \rightarrow +\infty} \frac{2}{n} \mathbb{P}\{\psi_n^g(\varepsilon)\} + (1 - \delta) \lim_{n \rightarrow +\infty} \frac{2}{n} \mathbb{P}\{\psi_n^b(\varepsilon)\}}.$$

Finally, by (A.1), $\lim_{n \rightarrow +\infty} (n/2) \mathbb{P}\{\psi_n^b(\varepsilon)\} = f(\varepsilon^j)$, and multiplying (A.4) by $n/2$, we obtain:

$$p_R = \frac{\delta f(\varepsilon^g)}{\delta f(\varepsilon^g) + (1 - \delta) f(\varepsilon^b)}.$$

□

APPENDIX B

PROOF of PROPOSITION 2

The first order condition for the maximization of Government's program (29) implies, from (27):

$$\frac{d\{\mu_R^j - c(e_R^j)\}}{de_R^j} = \varepsilon q_R^j \mu_0 \{(\tilde{q}_R [(1 - l_{1R}^j) \Pi'(l_{1R}^j) - \Pi(l_{1R}^j)] - \Delta_R) - c'(e_R^j)\} = 0.$$

Since $\varepsilon q_R^j e_R^j = l_{1R}^j$, this equation immediately results in (30).

The second order condition implies:

$$\frac{d^2\{\mu_R^j - c(e_R^j)\}}{de_R^j{}^2} = \mu_0 (\varepsilon q_R^j)^2 \tilde{q}_R [(1 - l_{1R}^j) \Pi''(l_{1R}^j) - 2\Pi'(l_{1R}^j)] - c''(e_R^j) < 0.$$

Effectively, by hypothesis: $c'(\cdot) \geq 0$, $c''(\cdot) > 0$, and $\Pi'(\cdot) \geq 0$ according to Corollary 2. Thus a sufficient but unnecessary condition for the SOC to be verified is that: $\tilde{q}_R \Pi''(l_{1R}^j) \rightarrow 0$, which is the case either if $\Pi''(l_{1R}^j) = 0$ (as in our simulations in Section 5), or if the differential of competence is small ($\tilde{q}_R \rightarrow 0$), which we have supposed.

Consequently, the amount of liquidation l_{1R}^j verifying the first order condition (30) is a maximum and solution of the problem (29), which we will note $l_{1R}^j = l_{1R}^{j*}$. \square

PROOF of COROLLARY 3

The optimal amount of liquidation l_{1R}^{j*} is defined by the relation $\Psi(l_{1R}^{j*}, \varepsilon q_R^j) = 0$, where, by (30):

$$\Psi(l_{1R}^{j*}, \varepsilon q_R^j) = \tilde{q}_R[(1 - l_{1R}^{j*})\Pi'(l_{1R}^{j*}) - \Pi(l_{1R}^{j*})] - \Delta_R - \frac{1}{\mu_0 \varepsilon q_R^j} c'(\frac{l_{1R}^{j*}}{\varepsilon q_R^j}).$$

Hence,

$$\partial_1 \Psi(l_{1R}^{j*}, \varepsilon q_R^j) = \tilde{q}_R[(1 - l_{1R}^{j*})\Pi''(l_{1R}^{j*}) - 2\Pi'(l_{1R}^{j*})] - (\frac{1}{\mu_0 \varepsilon q_R^j})^2 c''(\frac{l_{1R}^{j*}}{\varepsilon q_R^j}),$$

$$\partial_2 \Psi(l_{1R}^{j*}, \varepsilon q_R^j) = \frac{1}{\mu_0} (\frac{1}{\varepsilon q_R^j})^2 [c'(\frac{l_{1R}^{j*}}{\varepsilon q_R^j}) + \frac{l_{1R}^{j*}}{\varepsilon q_R^j} c''(\frac{l_{1R}^{j*}}{\varepsilon q_R^j})].$$

Consequently, since $c'(\cdot) \geq 0$ and, $c''(\cdot) > 0$, we have either if $\Pi''(l_{1R}^{j*}) = 0$, or $\tilde{q}_R \rightarrow 0$: $\partial_1 \Psi < 0$, and $\partial_2 \Psi \geq 0$. Therefore:

$$\frac{dl_{1R}^{j*}}{d\varepsilon q_R^j} = -\frac{\partial_2 \Psi(l_{1R}^{j*}, \varepsilon q_R^j)}{\partial_1 \Psi(l_{1R}^{j*}, \varepsilon q_R^j)} \geq 0.$$

In addition, according to the implicit function theorem, there is an application $\varphi \in C^1$, defined on \mathbb{R}_*^+ in values in \mathbb{R}_*^+ such that: $l_{1R}^{j*} = \varphi(\varepsilon q_R^j)$, $\varphi'(\cdot) \geq 0$, $\forall (l_{1R}^{j*}, \varepsilon q_R^j) \in \mathbb{R}_*^+ \times \mathbb{R}_*^+$. \square

APPENDIX C

PROOF of LEMMA 2.

Proof of i. By (15) and (16), when $\tilde{q}_R \rightarrow 0$: $\epsilon^b(l_{1R}) \rightarrow \epsilon^b(l_{1R}) \Rightarrow \check{\Lambda}(l_{1R}) \rightarrow 0$, $\forall l_{1R} \geq 0$. Therefore, the signal function can be approximate by: $\Pi(l_{1R}) = \delta(1 - \delta)\check{\Lambda}(l_{1R})$. In addition, by (17), when $\tilde{q}_R \rightarrow 0$: $\check{\lambda}(l_{1R}) \approx 2\tilde{q}_R x(l_{1R})[x(l_{1R}) - \alpha]/q_R \sigma^2$. Thus: $\Pi(l_{1R}) = \omega x(l_{1R})[x(l_{1R}) - \alpha]$, where

$$\omega := \frac{2\delta(1 - \delta)\tilde{q}_R}{q_R \sigma^2} \text{ and, } x(l_{1R}) = \frac{2q_R h^{-1}(l_{1R})}{(q_R - \tilde{q}_R)(q_R + \tilde{q}_R)}.$$

By choosing a sufficiently small value for the variance of shocks (σ^2), most of random shocks ε will be very “close” to their mean α .²³ Therefore, we consider the following linear approximation of $\Pi(l_{1R})$ in the neighborhood of $l_{1R} = \bar{l}_{1R}$

²³Indeed, if $\sigma^2 \rightarrow 0$, ε is degenerate random variable, thus: $\varepsilon \rightarrow E\varepsilon = \alpha$.

(namely, $x(l_{1R}) = x(\bar{l}_{1R})$), where $x(\bar{l}_{1R}) = \alpha$:

$$\Pi(l_{1R}) = \Pi(\bar{l}_{1R}) + \Pi'(\bar{l}_{1R})(x(l_{1R}) - \alpha) + o(|x(l_{1R}) - \alpha|^2).^{24}$$

By substituting $x(l_{1R})$ with its value, and as $\Pi(\bar{l}_{1R}) = 0$, and $\Pi'(\bar{l}_{1R}) = \alpha\omega$, we obtain:

$$\Pi(l_{1R}) \approx \frac{2\alpha\omega q_R h^{-1}(l_{1R})}{(q_R - \tilde{q}_R)(q_R + \tilde{q}_R)} - \alpha^2\omega.$$

Since $h^{-1}(l_{1R})$ linearly depends on l_{1R} in the guess function (32), we can write:

$$\Pi(l_{1R}) \approx \phi_0 + \phi_1 l_{1R}.$$

Notice that ϕ_0 and ϕ_1 depends on the parameters a and b of the guess function in relation (32), namely:

$$\begin{cases} \phi_1 = \frac{\alpha\omega q}{b(q - \tilde{q})(q + \tilde{q})} =: \phi_1(b), \\ \phi_0 = -(a\phi_1 + \alpha^2\omega) =: \phi_0(a, b), \end{cases}$$

where $q := q_R/2$ is the Government R 's average competence, and $\tilde{q} := \tilde{q}_R/2$.

Proof of ii. By (30), and according to the linearization of $\Pi(\cdot)$, the optimal amount of reform l_{1R}^{j*} becomes:

$$l_{1R}^{j*} = \frac{1}{2} \left[\frac{\tilde{q}_R(\phi_1 - \phi_0) - \Delta_R}{\tilde{q}_R\phi_1 + \frac{c_0}{\mu_0(\varepsilon q_R^j)^2}} \right] =: W(\varepsilon q_R^j).$$

By linearizing equation (32) in the neighborhood of $\varepsilon q_R^j = \alpha q$, we obtain: $l_{1R}^{j*} \approx A(a, b) + B(a, b) \varepsilon q_R^j$, where $A(a, b) = W(\alpha q) - \alpha q W'(\alpha q)$, and $B(a, b) = W'(\alpha q)$. Hence,

$$A(a, b) := \frac{[2\tilde{q}(\phi_1 - \phi_0) - \Delta_R](\tilde{q}\phi_1 - c_1)}{4(\tilde{q}\phi_1 + c_1)^2},$$

$$B(a, b) := \frac{c_1 [2\tilde{q}(\phi_1 - \phi_0) - \Delta_R]}{\alpha q 2(\tilde{q}\phi_1 + c_1)^2},$$

where $c_1 := c_0/2\mu_0(\alpha q)^2$. □

PROOF of PROPOSITION 3.

Replacing ϕ_0 and ϕ_1 with their values in Lemma 2, identification restrictions

²⁴Where $o(\cdot)$ is a function such as: $o(|x(l_{1R}) - \alpha|^2) \rightarrow 0$ when $l_{1R} \rightarrow \bar{l}_{1R}$.

(35)-(36) become:

$$(C.1) \quad \frac{\{2\tilde{q}[(1+a)\phi_1 + \alpha^2\omega] - \Delta_R\}(\tilde{q}\phi_1 - c_1)}{4(\tilde{q}\phi_1 + c_1)^2} = a,$$

$$(C.2) \quad \frac{\phi_1 c_1 \{2\tilde{q}[(1+a)\phi_1 + \alpha^2\omega] - \Delta_R\}}{\alpha q (2\tilde{q}\phi_1 + c_1)^2} = \frac{\alpha\omega q}{(q - \tilde{q})(q + \tilde{q})}.$$

By introducing (C.2) in (C.1), we get:

$$a = \frac{\alpha q \nu}{2\phi_1 c_1} (\tilde{q}\phi_1 - c_1), \text{ where } \nu := \frac{\omega\alpha q}{(q - \tilde{q})(q + \tilde{q})}.$$

By introducing this value in (C.2), we obtain:

$$(C.3) \quad \phi_1^2 - \frac{[\alpha\tilde{q}(5q\nu - 2\alpha\omega) + \Delta_R]}{[2 - \alpha q \nu \tilde{q}/c_1]\tilde{q}}\phi_1 - \frac{2\alpha q \nu c_1}{[2 - \alpha q \nu \tilde{q}/c_1]\tilde{q}} = 0.$$

Relation (C.3) is a second degree polynomial, on the form: $\phi_1^2 - w_1\phi_1 - w_2 = 0$, where $w_2 > 0$, and $w_1 > 0$, since:

$$5q\nu - 2\alpha\omega = \frac{3\omega\alpha q^2 + 2\alpha\omega\tilde{q}^2}{(q - \tilde{q})(q + \tilde{q})} > 0.$$

Therefore, this polynomial has only one positive root, namely:

$$\phi_1^* = \frac{1}{2} \left[w_1 + \sqrt{w_1^2 + 4w_2} \right].$$

Finally, we obtain: $a^* = \alpha q \nu (\tilde{q}\phi_1^* - c_1)/2\phi_1^* c_1$, and $b^* = \nu/\phi_1^*$. \square

APPENDIX D: THE POPULARITY SHOCK DEPENDING ON REFORMS.

One possible extension of our model is to introduce the case where the popularity shock (ξ) negatively depends on the amount of reforms l_{1R} , with sensitivity η , $\eta \geq 0$. Therefore, ξ is uniformly distributed on $[-\frac{1}{2k} - \eta l_{1R}; \frac{1}{2k} - \eta l_{1R}]$ with density $k > 0$, as Figure *D1* shows.²⁵ Effectively, the liquidation of public debt, even if it is considered by Citizens as an acceptable goal for the reform of Government finance, can involve “political” cost because it faces special interests. In such a way, electors will not base their votes uniquely on the future policies of candidates but also on the current behavior of the incumbent Politician: too much reform

²⁵This analysis in the main text corresponds to the particular case where $\eta = 0$.

currently can give rise to a punishment vote, even if voters recognize that reform are, globally, desirable.

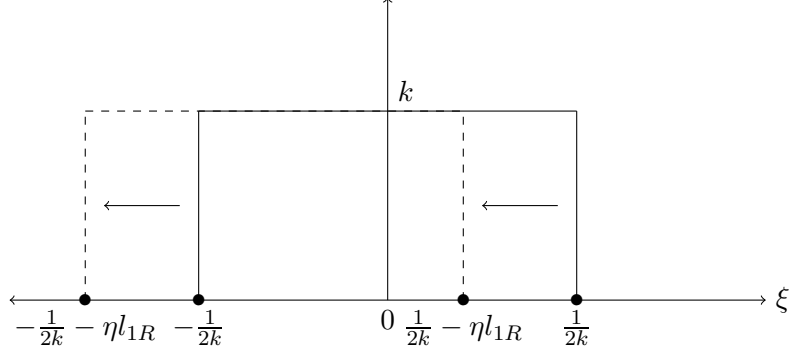


FIGURE D1. THE DENSITY OF POPULARITY SHOCK (ξ)

With such an extension, our results are unchanged to within a constant. Regarding Equation (28), the marginal gain of “reputation” ($\mathcal{R}(l_{1R}^j)$) is identical, and the marginal gain of “keeping the enemy alive” ($\mathcal{N}(l_{1R}^j)$) becomes: $\tilde{\mathcal{N}}(l_{1R}^j) = \Delta_R + \tilde{q}_R \Pi(l_{1R}^j) + \eta_0$, where $\eta_0 = \eta / \gamma \bar{\epsilon} \alpha x_0$, which represents the marginal loss of popularity when the amount of liquidation increases. Therefore, by (30), the optimal amount of reform l_{1R}^{j*} satisfies the new following relation:

$$\mathcal{R}(l_{1R}^{j*}) = \mathcal{N}(l_{1R}^{j*}) + \eta_0 + \frac{1}{\mu_0 \epsilon q_R^j} c' \left(\frac{l_{1R}^{j*}}{\epsilon q_R^j} \right).$$

Since $\eta_0 \geq 0$, the optimal reform effort e_R^{j*} is lower. Indeed, if $\eta > 0$, an adverse shock of popularity is more likely to happen, and the Government will choose a lower effort to weaken the loss of popularity. Finally, linearization and identification procedures are unchanged except for a constant η_0 .