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The Electoral Politics of Public Sector Institutional Reforms

by

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Introduction

Public sector institutions matter for economic performance. This intuitive proposition has recently received strong empirical support. For example, Hall and Jones (1998) find that differences in institutional quality explain much of the variation in production per worker between countries, Knack and Keefer (1995) show that investment and growth is higher in countries where property and contract rights are better protected, and Knack (1996) and Keefer and Knack (1997) demonstrate that the extent to which poor countries catch up with rich ones is a function of the quality of their public institutions. footnote Why some countries adopt more efficient institutions than others and why countries with inefficient institutions do not reform them are thus important questions.

In this paper, I develop a model of institutional reform in the context of political instability and polarisation. Other researchers have found that political instability and polarisation have a negative impact on savings, investment, and growth. footnote Explanations of these results usually focus on the actions of private investors. For example, political instability in combination with polarisation implies uncertainty about future economic policies. Such uncertainty could reduce private investment in irreversible capital.

I demonstrate that political instability and polarisation might also affect aggregate economic performance through a different channel, namely, the efficiency of public sector institutions. From the point of view of a politician holding office today, creating or reorganising public sector institutions is an investment; in order to realise future gains, he must spend resources at his disposal now. These resources could have been utilised for current purposes, thus creating an opportunity cost of institutional change. footnote An important feature of public sector institutions is that there are no property rights attached to them. Often, therefore, a politician can only reap the fruits of his efforts in building institutions as long as he retains control over them. It follows that his expected tenure is an important determinant of the expected benefits from such activities.

In democracies, the expected tenure of a politician is usually closely linked to elections. footnote I show that as the probability of retaining office increases, the likelihood of reforms being undertaken increase too. The intuition is that a higher probability of reelection implies that a greater share of the benefits of reform are appropriated by the person making the investment decision. footnote For politicians who are policy-motivated, political polarisation strengthens the effect of political instability on reform incentives. When an office-holder is purely motivated by policy concerns, he is indifferent between continuing in office and being replaced by another politician with identical preferences. Thus, while political instability affects the likelihood of ”good” or ”bad” states occurring, political polarisation determines how much worse the ”bad” state is than the ”good”. The greater the differences between an incumbent and his challenger(s), the lower are the incentives to reform public sector institutions for a given probability of remaining in office.

There might also be a third effect in operation: if investing in public sector institutions affects the probability of retaining office, the calculus of the incumbent is changed. Obviously, if sacrificing current resources for future gains reduces this probability, he will be less likely to do so. But if investing in the institutions he controls today improves his chances of staying put, there are benefits from doing so over and above those relating to increases in future output or the production of new goods and services. Therefore, the effect on the desirability of reforms in the eyes on an incumbent politician can depend crucially on whether such acts affect the reelection probability and if they do, in what direction. And in sum, political polarisation combines with political instability to determine the net incentives for changing the institutional structure of the public sector.

Related literature

The model developed below belongs to the literature on the political choice of state variables such as the public debt. Because state variables affect the future, they allow incumbent politicians to influence tomorrow's policies and the outcomes generated by them. Hence the interest in studying the effects of political uncertainty and polarisation on the choice of state variables. By definition, institutions are ”durable”. footnote In other words, they are state variables. Institutions tend to be ”lumpy” as well, in the sense that they cannot be continuously adjusted. The durability and lumpiness of institutions distinguish the choice of them from the choice of policies, and combines to make it more costly to change the former than the latter. The costs of institutional change is perhaps most strongly evident in the establishment of new public organisations. footnote Designing these, screening and training employees, and aquiring the necessary structures and equipment add up to a fixed cost of getting the production of the goods or services to be produced up and running. footnote

The political economy of public debt is the issue that has received the most attention in the literature on the strategic manipulation of public sector state variables; a number of authors have studied this subject in various guises. footnote The general conclusion that follows from this line of work is that (*potential*) *political instability changes the optimal choices of politicians by changing their evaluation of expenditures over time*. That is, a government will spend differently when there is a positive probability of being replaced than it would if it had been certain to continue in office. footnote This is because changes in the stock of debt alter the constraints facing other actors, like voters (influencing election results) or future governments (influencing their spending patterns or the level of public expenditures). The incumbent government can use this link between the current and the future to its advantage.

A related result is derived by Cukierman, Edwards, and Tabellini (1992): governments fearing that they will be replaced by others with different preferences over public expenditures will keep the efficiency of the tax system low so as to constrain the revenue-generating capacity of their adversaries (or increase the dead-weight costs of collecting revenues). The tax system is a public institution as defined here. However, they assume that the efficiency of the tax system is a state variable that can be costlessly changed. As argued above, I think that there are costs associated with making these changes, and it seems reasonable to expect this to be a general feature of reforms. Therefore, in the model developed below I study costly institutional reforms.

Glazer (1989) discusses how political instability might distort the political choice between projects of different duration. He demonstrates that the commitment-power of durable (two-period) projects might lead to their adoption in situations where no project or a short-lived (one-period) one would be preferred if current policy-makers were certain to continue in office. For example, if a durable project precludes the adoption of a short-lived one in the future, it can make the preferences of today's policy-makers prevail tomorrow even if the hands of future policy-makers, who might evaluate project benefits differently, cannot be tied directly. The preferences of possible successors are not modelled by Glazer (1989), however. This precludes a discussion of how political instability and political polarisation interact. As the policies and outcomes under a sequence of identical decision-makers would be the same as those produced by having one of them in charge all of the time, it is clearly necessary to analyse explicitly differences in preferences between current and (potential) future policy-makers. The model presented below allows me to do so in a context where the choice is between adopting a ”project” or not.

Svensson (1998) has independently developed a model which is very similar in spirit to the one discussed below. He focusses on legal reforms that increases the protection of private property rights, while I study efficiency-enhancing reforms which reduce the cost of producing public goods. The main difference between the two models is that in his, like in most models of strategic policy choice, political instability is exogenous. That is, election outcomes are not influenced by the optimal policies of future governments and hence not by variations in the state variables bequathed to them. footnote In my model, voters explicitly evaluate the utility they get from having different candidates in office in the next period. Since public sector reforms will in general affect this calculus, I can study how electoral incentives affect the reform incentives of incumbents, something which turns out to be important.

The Model

Material Preferences and Resource Constraints

Voters and politicians are assumed to have preferences of the following type over three different goods provided by the government, *X*, *Y*, and *Z*:

$$(1) U(C_t, X_t, Z_t; \xi) = Y_t + \xi\sqrt{X_t} + (1-\xi)\sqrt{Z_t}, t = 1,2.$$

Politicians are assumed to be policy-motivated, i.e., desiring power in order to implement their preferred policies. As can be seen, it is assumed that political disagreement is over the amount of X_t and Z_t supplied, as indexed by ξ. There are two distinct political alternatives, *A* and *B*, whose preferences satisfy $1 \geq \xi^A > \xi^B \geq 0$.

The public sector budget constraints are

$$(2a) B_1 = Y_1 + \chi_1 X_1 + \varsigma_1 Z_1 + q_X,$$
$$(2b) B_2 = Y_2 + \chi_2 X_2 + \varsigma_2 Z_2.$$

In each period, the budget finances the supply of the public goods. For simplicity, I will assume $B_1 = B_2 = B$ from now on. The "prices" of X_t and Z_t are χ_t and ς_t in terms of Y_t, respectively, i.e., a unit of e.g. X_t is equivalent to χ_t units of the numeraire good in period *t*. In the first period, the incumbent can spend $F_X > 0$ in order to reduce the price of *X* in period 2. In other words, he can pay a fixed cost to increase the efficiency of the public sector in the production of this good in the future. If he chooses not to incur this cost ($q_X = 0$), the level of efficiency stays unchanged. While the cost is modelled as a monetary outlay here, in general the costs of reform will include both budgetary expenditures and reduced current output. For example, improving organisational procedures in a ministry and buying a new computer system for a bureau are measures that should increase the productivity of employees. Buying software and paying consultants to set up the new system necessitates spending budgetary funds that could have been used to increase supply today. For instance, more case-workers could have been hired. The ensuing period of lower productivity while employees learn their way in the new system also results in fewer cases being processed, fewer investigations being undertaken, or less of whatever the organisation is producing. Thus, there is a trade-off between current and future output. How the incumbent's willingness to pay such costs of reform varies with political instability and polarisation is the subject of this paper. footnote

Political Preferences

There is a continuum of voters which are assumed to have preferences over both economic policies and non-policy characteristics of the candidates (e.g. through party allegiance). footnote For our purposes they can be grouped by their economic policy preferences, i.e., the weight atatched to the consumption of *X*. Thus, the utility of a voter *h* belonging to group *i* (i.e., for which $\xi = \xi^i$), when party *k* is in power in period 2 is

$$(3) W^{hi}(\mathbf{p_2}; k) = V^i(\mathbf{p_2}; k) + \omega^h(k).$$

Here $V^i(\mathbf{p_2}; k)$ is the indirect material utility of voters in group *i* when *k* is in power in period 2 (which is derived below). As optimal period 2 policies are functions of the prices of the public goods, $\mathbf{p_2} = \{\chi_2, \varsigma_2\}$, voters' indirect utility depends on the efficiency of the public sector in period 2. $\omega^h(k)$ is the utility voter *h* in *i* gets from other aspects of *k*'s candidacy. The gain to *h* from having *A* form the period 2 government instead of *B* is $W^{hi}(\mathbf{p_2}; A) - W^{hi}(\mathbf{p_2}; B)$. *h* votes for

A if this difference is non-negative and for B otherwise. footnote Thus, h votes for A if

$$(4)\Delta V^i(\mathbf{p_2}) \equiv V^i(\mathbf{p_2};A) - V^i(\mathbf{p_2};B) \geq \omega^h(B) - \omega^h(A) \equiv \psi^h.$$

In words, h votes for A if the utility differential from having the economic policies of A instead of B in period 2 (common to the whole group) exceeds the non-policy utility differential from having B govern instead of A (which varies among the individuals in the group). footnote The "bias" in favour of B, ψ, is assumed to be uniformly distributed on $[-\varphi + \epsilon, \varphi + \epsilon]$ in each group, where ϵ is a stochastic variable with zero mean. footnote Thus, in expectation, no group is biased towards either party in terms of non-economic issues ($E(\psi) = 0$), but a common shock to preferences might shift all groups in favour of one of them. footnote

For a given value of ϵ, the vote share of A in group i is the share of voters in that group for which $\Delta V^i(\mathbf{p_2}) \geq \psi^h$, which by the assumptions just made is

$$(5)\sigma^{Ai}(\mathbf{p_2}) = \frac{\Delta V^i(\mathbf{p_2}) + \varphi - \epsilon}{2\varphi}.$$

Hence, the total vote share of A is

$$(6)S^A = \int \mu^i \sigma^{Ai}(\mathbf{p_2})di,$$

where μ^i is the share of the electorate with a weight on the utility of consumption of X equal to ξ^i. A wins the election if $S^A \geq \frac{1}{2}$. footnote The probability that A is in office in period 2, π, is therefore the probability that $S^A \geq \frac{1}{2}$. Inserting (5) in (6) and simplifying, we find that

$$(7)\pi(\mathbf{p_2}) = prob\Big(\int \mu^i \sigma^{Ai}(\mathbf{p_2})di \geq \epsilon\Big) = \Pi\Big(\int \mu^i \sigma^{Ai}(\mathbf{p_2})di\Big),$$

where $\Pi(\bullet)$ is the cumulative probability distribution function of ϵ. footnote Due to the form of the utility function, $\int \mu^i \sigma^{Ai}(\mathbf{p_2})di$ is simply the utility differential in terms of economic policies of the group with the average ξ. Denote this average by $\widetilde{\xi}$ and let $\widetilde{\Delta V}(\mathbf{p_2}) \equiv \int \mu^i \sigma^{Ai}(\mathbf{p_2})di$. The probability that A wins the election is the probability that $\widetilde{\Delta V}(\mathbf{p_2})$ exceeds the common shock to voters' bias in favour of B in terms of non-policy aspects of the candidates.

Economic Policies and Voter Utility

Economic Policies

The indirect period 2 utility of voters is determined by the economic policies pursued by the government in charge in that period. These policies are determined by the government through the maximisation of (1) subject to $(2b)$. It is straightforward to verify that the solution to this problem entails footnote

$$(8a)X_2^{k*} = \left(\frac{\xi^k}{2\chi_2}\right)^2;$$

$$(8b)Z_2^{k*} = \left(\frac{1-\xi^k}{2\zeta_2}\right)^2;$$

$$(8c)Y_2^{k*} = B - \frac{1}{\chi_2}\left(\frac{\xi^k}{2}\right)^2 - \frac{1}{\zeta_2}\left(\frac{1-\xi^k}{2}\right)^2.$$

Given the assumption $\xi^A > \xi^B$, A spends more on X and less on Z than B does. Note that the optimal levels of supply of X and Z depend on the "prices" of these goods only.

The optimal period 1 policies are completely analogous to $(8a-c)$, the sole exception being that the level of consumption of the numeraire good incorporates any expenditures on institutional reforms.

Voter Utility under Different Period 2 Governments

$V^i(\mathbf{p_2};k)$ is found by inserting $(8a-c)$ in (1). The indirect utility of every voter group is a function of the efficiency of the public sector in period 2 with respect to producing X, i.e., the level of χ_2.

As $\Delta V^B(\mathbf{p_2}) < 0$, $\Delta V^A(\mathbf{p_2}) > 0$, and $\frac{\partial \Delta V^i(\mathbf{p_2})}{\partial \xi} = \sqrt{X_2^{A*}} - \sqrt{X_2^{B*}} + \sqrt{Z_2^{B*}} - \sqrt{Z_2^{A*}} > 0$, there is a group of voters for which $\Delta V^i(\mathbf{p_2}) = 0$. That is, voters in this group, labelled I, are indifferent between A and B when it comes to their economic policies. The preferences of these voters in terms of public goods are given by

$$(9)\xi^I = \frac{1}{2}(\xi^A + \xi^B).$$

Thus, the weight attached to the utility of consumption of X by the group of indifferent voters is just the average of the weights of A and B. Voters in groups for which $\xi^i > \xi^I$ would thus support A if their choice was based on economic policy preferences alone, while groups of voters with $\xi^i < \xi^I$ find the economic policies of B more attractive than those of A. Note that ξ^I is independent of χ_2 and ζ_2.

From (7), we know that $\frac{\partial \pi}{\partial \chi_2} = \Pi'\left(\widetilde{\Delta V}(\mathbf{p_2})\right)\frac{\partial \widetilde{\Delta V}(\mathbf{p_2})}{\partial \chi_2}$. Given the assumption $\Pi'(\bullet) > 0$, an increase in χ_2 increases the probability that A is elected if a higher level of χ_2 increases $\widetilde{\Delta V}(\mathbf{p_2})$. In other words, if the public sector becomes less efficient in terms of producing the X-good, π increases if the indirect material utility of the group of voters with the average ξ increases more or falls less when an A-government is in power in period 2 than when a B-government is in charge of economic policies.

In the appendix, I demonstrate that $\frac{\partial \widetilde{\Delta V}(\mathbf{p_2})}{\partial \chi_2} \gtreqless 0 \Leftrightarrow \tilde{\xi} \lesseqgtr \xi^I$. It follows that π increases with χ_2 if the average group of voters consists of "B-supporters". Therefore, increasing the efficiency of the public sector in the production of X reduces A's probability of re-election if the average group of voters supports the economic policies of B and increases it if these voters prefer his policies.

What drives this result is best seen by analysing the effect of χ_2 on $V^i(\mathbf{p_2};k)$. Using the public sector budget constraint and the first-order condition of k's maximisation problem with respect to χ_2, one finds that

$$(10)\frac{\partial V^i(\mathbf{p_2};k)}{\partial \chi_2} = -X_2^{k*} + \left(\frac{\xi^i}{\xi^k} - 1\right)\chi_2\frac{\partial X_2^{k*}}{\partial \chi_2}.$$

This derivative has two terms. The first is just minus the marginal utility of income times the level of X supplied by k. It is the direct effect of higher public expenditure on X (and thus lower consumption of the numeraire) when the price of this good increases.

The second term vanishes for $\xi^i = \xi^k$. This follows from the envelope theorem: a small change in the level of a variable cannot change utility at the optimum. However, for $\xi^i \neq \xi^k$, this term is different from zero due to the fact that k supplies an inoptimal level of X from the perspective of voters in group i. Since $\frac{\partial X_2^{k*}}{\partial \chi_2} < 0$, it can be seen that the last term in (10) is positive for $\xi^i < \xi^k$ and negative for $\xi^i > \xi^k$. This is due to the fact that voters for which $\xi^i < \xi^k$ ($\xi^i > \xi^k$) ideally wants a lower (higher) level of X than X_2^{k*}. Since X_2^{k*} is a negative function of χ_2, a higher level of χ_2 increases (decreases) the indirect utility of voters in such groups when k is in power by moving k's supply of X closer to (further away from) their optimal level. This implies that only (some) B-supporters might actually gain from an increase in χ_2.

$\frac{\partial \Delta V^i(\mathbf{p_2})}{\partial \chi_2}$ is the net of these direct and indirect effects of reforms across the regimes of A and

B. A is at a disadvantage relative to B with respect to the direct effect of a price increase. Since A produces more X than B, the loss in terms of higher public expenditure on X is higher under the former than the latter for *all* voters. On the other hand, an increase in χ_2 works to make A more attractive relative to B in the eyes of all voters for which $\xi^i < \xi^A$, and less attractive to those with $\xi^i > \xi^A$. As stated above, the net *total* effect is that if the public sector becomes less efficient at producing X, A becomes relatively more popular among supporters of B and loses popularity among his own supporters (for B, it is the other way around). The reason is that X_2^{A*} and X_2^{B*} converge when χ_2 goes up. This makes A less attractive relative to B for voters with $\xi^i > \xi^I$, and less unattractive relative to B for those with $\xi^i < \xi^I$. Ideology matters less when the public sector is less efficient; in the limit, when χ_2 goes to infinity, both A and B would choose not to supply any X, and no group of voters will have higher utility from the production of and expenditure on this good under one or the other type of government.

Since an efficiency-enhancing reform in the production of X reduces the price of this good, it causes policy divergence. ”Accentuating” ideological differences benefits the incumbent if the group of average voters supports his policies. Hence, A (B) has an electoral gain from reform if and only if $\widetilde{\xi} > \xi^I$ ($\widetilde{\xi} < \xi^I$).

Finally, note that $\frac{\partial \Delta V^i(\mathbf{p_2})}{\partial(\xi^A - \xi^B)} \gtreqless 0 \Leftrightarrow \xi^i \gtreqless \xi^I$. As long as $\xi^A \neq \xi^B$ the period 2 policies of the candidates differ. Then all voters for which $\xi^i \neq \xi^I$ prefer one or the other candidate, and the gain from having one’s preferred candidate in office in period 2 is increasing in the degree to which he differs from the other candidate. Accordingly, an increase in polarisation enhances the incumbent’s chances of being re-elected if the group of average voters prefer his policies to those of the opponent.

Instability, Polarisation, and Reform

The Base-Case of No Political Instability

As a point of reference, it is useful to analyse the reform incentives of the period 1 government when there is no political instability. With no loss of generality, assume that A is the incumbent. Hence, first I will look at the case where $\pi = 1$.

In line with the argument in section 2, i.e., that institutions are ”lumpy”, I assume that the efficiency of the public sector in producing good X can only be increased in discrete steps. Moreover, I concentrate on efficiency-enhancing reforms. That is, if A pays F_X in period 1, the period 2 price of X in terms of Y is reduced. footnote Specifically, the reform technology is assumed to be

$$(11)\chi_2(q_X) = \left\{ \begin{array}{l} \chi_1 = \overline{\chi}, q_X = 0; \\ \underline{\chi} < \overline{\chi}, q_X = F_X. \end{array} \right\}$$

Let $\Omega^A(q_X)$ be the value of the expected two-period objective function of A as a function of his reform choice, taking into account that he has optimally chosen period 1 policies, but might be replaced by B in period 2. The specification of the technology implies that the decision on whether to undertake the reform or not involves comparing two different values of $\Omega^A(q_X)$, $\Omega^A(F_X)$ and $\Omega^A(0)$. If $\Omega^A(F_X) > \Omega^A(0)$, investing in higher productivity in the production of X in period 2 is the optimal thing to do, whereas $\Omega^A(F_X) < \Omega^A(0)$ implies that A should abstain from implementing the reform. A critical value of the fixed cost, $\overline{F}_X$, is identified by $\Omega^A(\overline{F}_X) \equiv \Omega^A(0)$. The question of whether undertaking the reform is worthwhile thus might be rephrased as the question of whether $F_X \lesseqgtr \overline{F}_X$. The effect of political instability and polarisation on reform incentives can then be studied by investigating whether these phenomena increase or lower the critical value of the fixed cost. If the cut-off level increases (decreases), political instability and polarisation increases (decreases) the likelihood of the reform being implemented, since there are more (fewer) levels of the fixed cost for which it is optimal to do so. Solving

$\Omega^A(\overline{F}_X) \equiv \Omega^A(0)$ yields footnote

$$(12)\overline{F}_X = V^A\left(\underline{\chi};A\right) - V^A(\overline{\chi};A).$$

That the critical value is positive follows from the fact that it is equal to the difference in the value of *A*'s second-period objective function with and without reform given that it is in power in period 2 too. footnote As the reform lowers the price of *X* in period 2, the value of the second-period objective function increases if it is undertaken. Hence, in the absence of political instability there are positive levels of the fixed cost for which it is optimal to implement the reform.

Political Reform Incentives for a Given Probability of Re-election

I will now analyse the effects of political uncertainty - $0 < \pi < 1$ - and conflict on reform incentives. I start by looking at the special case $\widetilde{\xi} = \xi^I$. We know that ξ^I is independent of χ_2 (c.f. (9)). That is, $\Delta V^I(\chi_2) = 0$ for all values of χ_2. Since in this special case $\widetilde{\Delta V}(\chi_2) = \Delta V^I(\chi_2)$, π does not depend on χ_2. This allows me to focus on the "pure" effects of political instability and polarisation. The incentive effects of instability and polarisation when the reform decision affects the probability of re-election is considered below.

The value of the objective function of a type *A* incumbent when a type *k* government is in power in period 2 is defined in the same as voters' indirect utility under *k*. The utility differential $\Delta V^A(\chi_2)$ has the specific interpretation of the gain from being in power, which is positive as long as there is political polarisation (due to policies being set according to one's preferences instead of the opponent's). It is a function of χ_2 and hence of the reform choice of the incumbent.

The following lemma will prove useful in this and the next sub-section:

Lemma

If $\xi^B \neq \xi^A$, then

a) $\left[V^A\left(\underline{\chi};A\right) - V^A(\overline{\chi};A)\right] - \left[V^A\left(\underline{\chi};B\right) - V^A(\overline{\chi};B)\right] > 0$;

b) $\frac{\partial\left[V^A\left(\underline{\chi};A\right)-V^A(\overline{\chi};A)\right]-\left[V^A\left(\underline{\chi};B\right)-V^A(\overline{\chi};B)\right]}{\partial\left(\xi^A-\xi^B\right)} > 0$.

In words, the lemma states that when there is political polarisation, *A*'s gain from reform is higher when he continues in power than when he is replaced by *B*. Moreover, the difference in the gain from reform is increasing in the degree of political polarisation. This is due to the gain from reform as measured by *A*'s preferences being smaller under a *B*-government the greater the disagreement over policies.

Also note that the lemma might be rewritten as $\left[V^A\left(\underline{\chi};A\right) - V^A\left(\underline{\chi};B\right)\right] > [V^A(\overline{\chi};A) - V^A(\overline{\chi};B)]$, i.e., $\Delta V^A\left(\underline{\chi}\right) > \Delta V^A(\overline{\chi})$. That the gain from reform measured in terms of the incumbent's preferences is greater when he is re-elected is thus equivalent to the gain from being in power being greater when a reform has been undertaken. Like the differential in the gain from reform, it is increasing in the degree of political conflict. Another interpretation of this result is thus that the differential in the gain from being in power with and without reform is increasing in polarisation because ideology becomes more important when the public sector is more efficient.

The new critical value of the reform cost is defined in the same way as $\overline{F}_X$ was: $\Omega^A\left(\overline{\overline{F}}_X\right) \equiv \Omega^A(0)$. It is

$$(13)\overline{\overline{F}}_X = \pi\left[V^A\left(\underline{\chi};A\right) - V^A(\overline{\chi};A)\right] + (1-\pi)\left[V^A\left(\underline{\chi};B\right) - V^A(\overline{\chi};B)\right].$$

That is, $\overline{\overline{F}}_X$ equals the expected gain from reform. $\overline{\overline{F}}_X > 0$ since the value of *A*'s objective function in period 2 increases when χ_2 goes down regardless of which party forms the government in that period. footnote Comparing (12) and (13), we have Proposition 1:

Proposition 1:

When $\tilde{\xi} = \xi^I$, the probability of re-election is independent of $\mathbf{p_2}$. Then

a) In the absence of political polarisation, political instability has no effect on reform incentives; $\forall\pi$: $\xi^B = \xi^A \Leftrightarrow \bar{\bar{F}}_X = \bar{F}_X$.

b) If there is political conflict, political instability reduces reform incentives; $\forall\pi < 1$: $\xi^B \neq \xi^A \Leftrightarrow \bar{\bar{F}}_X < \bar{F}_X$.

c) When there is political uncertainty, reform incentives are a decreasing function of the degree of political polarisation; $\forall\pi < 1$: $\frac{\partial\bar{\bar{F}}_X}{\partial(\xi^A - \xi^B)} < 0$.

d) When there is political polarisation, reform incentives are a decreasing function of the probability of losing office; $\xi^B \neq \xi^A \Leftrightarrow \frac{\partial\bar{\bar{F}}_X}{\partial\pi} > 0$.

These results all follow from the fact that as long as $\xi^B \neq \xi^A$ the gain from reform as perceived by *A* is higher when he is in power in both periods than when *B* replaces him in period 2. Subtracting (13) from (12) we have $\bar{F}_X - \bar{\bar{F}}_X = (1-\pi)\left\{\left[V^A\left(\underline{\chi};A\right) - V^A(\bar{\chi};A)\right] - \left[V^A\left(\underline{\chi};B\right) - V^A(\bar{\chi};B)\right]\right\}$. When $\xi^B = \xi^A$, the two terms in square brackets are equal, i.e., when the two candidates are identical in terms of economic policies the gain from reform is independent of which of them is in power in period 2. Hence, $\bar{\bar{F}}_X = \bar{F}_X$. footnote However, when $\xi^B \neq \xi^A$ the lemma stated above implies that $\bar{F}_X - \bar{\bar{F}}_X$ is positive. Moreover, it is an increasing function of $\xi^A - \xi^B$; the more polarised the preferences of *A* and *B* are, the smaller is *A*'s gain from reform when *B* forms the government in period 2. Since $\bar{F}_X$ does not depend on the degree of polarisation it follows that $\bar{\bar{F}}_X$ goes down as $\xi^A - \xi^B$ increases. footnote Finally, since the expected gain from reform falls when π goes down, $\bar{\bar{F}}_X$ decreases as the probability of *A* staying in power decreases.

In sum, when the probability that the incumbent is re-elected is independent of the period 2 efficiency of the public sector, political instability and polarisation weakens his incentives to undertake efficiency-enhancing reforms compared to the yardstick of no instability.

Electoral Incentives for Institutional Reform

Let us now look at the case $\tilde{\xi} \neq \xi^I$. Then, as long as $\xi^B \neq \xi^A$, $\widetilde{\Delta V}(\chi_2)$ is a function of χ_2 and so is π. In the following I assume $\xi^B = 1 - \xi^A$, i.e., that the preferences of *A* and *B* are inversely symmetric. Then $\xi^I = \frac{1}{2}$ (c.f. (9)). This allows me to do comparative statics with respect to $\xi^A - \xi^B$ while holding $\xi^A + \xi^B$, and thus ξ^I, constant.

When the probability of re-election depends on whether the efficiency-enhancing reform is implemented in period 1, the cut-off level for the fixed cost of reform becomes

$$(14)\bar{\bar{\bar{F}}}_X = \pi\left(\underline{\chi}\right)V^A\left(\underline{\chi};A\right) + \left[1-\pi\left(\underline{\chi}\right)\right]V^A\left(\underline{\chi};B\right) - \{\pi(\bar{\chi})V^A(\bar{\chi};A) + [1-\pi(\bar{\chi})]V^A(\bar{\chi};B)\}.$$

As above, the critical value is just the difference in the expected values of *A*'s objective function with and without reform. Of course, if there is no political polarisation, political uncertainty still does not matter. When $V^A(\chi_2;A) = V^A(\chi_2;B)$, $\bar{\bar{\bar{F}}}_X = \bar{F}_X$.

When the preferences of *A* and *B* diverge, however, the probabilities that *A* is re-elected in the two possible scenarios did and did not reform become important determinants of the value of $\bar{\bar{\bar{F}}}_X$. We already know that $\bar{\bar{\bar{F}}}_X = \bar{\bar{F}}_X$ in the special case of $\pi\left(\underline{\chi}\right) = \pi(\bar{\chi})$. Moreover, $V^A\left(\underline{\chi};A\right)$ is the highest possible value of *A*'s objective function in period 2; he benefits from reform whether or not it is in power in period 2, and the value of his objective function is higher if it forms the government instead of *B* in that period. Hence, from (14) it is clear that if $\pi\left(\underline{\chi}\right) < \pi(\bar{\chi})$, the incentives to reform are reduced even more than was the case when $\pi\left(\underline{\chi}\right) = \pi(\bar{\chi})$.

On the other hand, if $\pi\left(\underline{\chi}\right) > \pi(\bar{\chi})$ the incentives for reform are increased compared to the case investigated in the last section. Most interestingly, if implementing efficiency-enhancing reforms increases the probability of re-election sufficiently, the likelihood of their being undertaken might even *increase* compared to the base-case of no instability.

To see why, notice that by (12) and (14) $\overline{F}_X - \overline{\overline{\overline{F}}}_X = \left[1-\pi\left(\underline{\chi}\right)\right]\Delta V^A\left(\underline{\chi}\right) - [1-\pi(\overline{\chi})]\Delta V^A(\overline{\chi})$. From this expression, it is easily seen that there are values of $\pi\left(\underline{\chi}\right)$ and $\pi(\overline{\chi})$ such that $\overline{F}_X < \overline{\overline{\overline{F}}}_X$, e.g. $\pi\left(\underline{\chi}\right) = 1$ and $\pi(\overline{\chi}) = 0$. Proposition 2 states this result more precisely:

Proposition 2

When $\widetilde{\xi} \neq \xi^I$ and $\xi^B \neq \xi^A$, π is a function of χ_2. Then there exists $\pi^* \in (\pi(\overline{\chi}), 1)$ such that

a) for $\pi\left(\underline{\chi}\right) < \pi^*$, $\overline{F}_X > \overline{\overline{\overline{F}}}_X$;

b) for $\pi\left(\underline{\chi}\right) > \pi^*$, $\overline{F}_X < \overline{\overline{\overline{F}}}_X$.

In words, there exists a critical value of the probability that A is re-elected such that if the probability of A being re-elected after having implemented the reform is lower than this, the incentives for undertaking the investment is lower when there is political instability. On the other hand, if A's probability of reelection after having invested in increased efficiency in the production of good X exceeds this critical value then his reform incentives are stronger when there is political uncertainty. Note that Proposition 2 implies that not only must there be an electoral gain from reform, i.e., $\pi\left(\underline{\chi}\right) > \pi(\overline{\chi})$; the gain must be ”large”. That is why we have already seen that reform incentives are weaker when there is political uncertainty and $\pi\left(\underline{\chi}\right) = \pi(\overline{\chi})$. In that case, as in the benchmark, reform has only one effect: to increase expected period 2 utility. Since this gain is lower when there is polarisation and potential instability, reform incentives are weaker than in the benchmark. However, in the current case investing in efficiency-enhancing measures has a second effect: it affects the probability of re-election. Proposition 2 states that there is an electoral gain from reform which is large enough to compensate for the lower ”direct” benefit of reform under polarisation and instability, namely $\pi\left(\underline{\chi}\right) - \pi(\overline{\chi}) = \pi^* - \pi(\overline{\chi})$. Then reform incentives are unchanged compared to the benchmark, and if the electoral gain is larger than this polarisation and instability actually spur reforms.

Remark:

$\widetilde{\xi} > \xi^I$ is a necessary condition for $\pi\left(\underline{\chi}\right) > \pi^*$.

That the average group of voters being A-supporters is a necessary condition for reform incentives under political instability and polarisation to be strengthened compared to the benchmark is not surprising. It follows from the fact that if reform incentives are to be stronger in the presence of these phenomena than in their absence, there must be an electoral gain to the incumbent from reform. And we already know that an efficiency-enhancing reform, which polarises the electorate, increases the re-election probability of A if and only if the average group of voters prefers his economic policies to those of candidate B. Accordingly, to have $\pi\left(\underline{\chi}\right) > \pi^* > \pi(\overline{\chi})$, it must be the case that $\widetilde{\xi} > \xi^I$ because otherwise $\pi\left(\underline{\chi}\right) \leq \pi(\overline{\chi})$.

Proposition 3:

Assume that ϵ is uniformly distributed on $[-f, f]$ and that $\widetilde{\xi} - \xi^I \in \left(\frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\overline{\chi}}+\frac{2}{\zeta_2}}, \frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\zeta_2}}\right)$. Then there exists $\widehat{\pi} < \pi^*$ such that for $\pi\left(\underline{\chi}\right) > \widehat{\pi}$, $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial\left(\xi^A - \xi^B\right)} > 0$.

What Proposition 3 states is that when the conditions given are fulfilled, the incumbent's incentives for reform are *increasing* in the degree of political polarisation. The resons for this are the following. Rewrite $\overline{\overline{\overline{F}}}_X$ as $\overline{F}_X - \left(\overline{F}_X - \overline{\overline{\overline{F}}}_X\right) = \overline{F}_X + \Delta V^A\left(\underline{\chi}\right)\left[\pi\left(\underline{\chi}\right) - \pi^*\right]$. That is, the extent to which $\overline{\overline{\overline{F}}}_X$ deviates from the benchmark is determined by $\Delta V^A\left(\underline{\chi}\right)\left[\pi\left(\underline{\chi}\right) - \pi^*\right]$, the product of the gain from being in power after having undertaken the reform and the deviation of the probability of re-election upon reform from the critical value π^*. Since $\overline{F}_X$ is independent of the degree of polarisation, the effect of polarisation on $\overline{\overline{\overline{F}}}_X$ can be gauged by its effect on $\Delta V^A\left(\underline{\chi}\right)\left[\pi\left(\underline{\chi}\right) - \pi^*\right]$: $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial\left(\xi^A - \xi^B\right)} = \frac{\partial \Delta V^A\left(\underline{\chi}\right)}{\partial\left(\xi^A - \xi^B\right)}\left[\pi\left(\underline{\chi}\right) - \pi^*\right] + \Delta V^A\left(\underline{\chi}\right)\frac{\partial\left[\pi\left(\underline{\chi}\right) - \pi^*\right]}{\partial\left(\xi^A - \xi^B\right)}$.

When there is no polarisation, $\Delta V^A\left(\underline{\chi}\right) = 0$ and political instability does not matter for reform incentives: $\overline{\overline{\overline{F}}}_X = \overline{F}_X$. Since in this case $\widetilde{\Delta V}(\chi_2) = 0$ regardless of the value of χ_2,

$\pi\left(\underline{\chi}\right) = \pi(\overline{\chi})$. Denote this value of A's probability of re-election by π^0. At very small, but positive, degrees of polarisation, there is a gain to A from winning the election and implementing his own policies ($\Delta V^A\left(\underline{\chi}\right) > 0$). When $\tilde{\xi} > \xi^I$, an increase in the degree of polarisation from zero also implies $\widetilde{\Delta V}\left(\underline{\chi}\right) > \widetilde{\Delta V}(\overline{\chi}) > 0$. Thus, $\pi\left(\underline{\chi}\right) > \pi(\overline{\chi}) > \pi^0$. Still, for arbitrarily small values of $\xi^A - \xi^B$, $\pi\left(\underline{\chi}\right)$ is very close to $\pi(\overline{\chi})$ as regardless of the price of X_2 the average group of voters does not care strongly about having A in office in period 2 instead of B. On the other hand, π^* is strictly greater than $\pi(\overline{\chi})$. Therefore, the electoral gain from reform is so small that the "direct" effect of polarisation - the possibility of having "inferior" policies in period 2 - dominates, and thus reform incentives are weaker than in the absence of potential political instability. Formally, at $\xi^A - \xi^B = 0$ $\Delta V^A\left(\underline{\chi}\right) = 0$, $\frac{\partial \Delta V^A\left(\underline{\chi}\right)}{\partial\left(\xi^A - \xi^B\right)} > 0$, and $\pi\left(\underline{\chi}\right) - \pi^* < 0$. footnote Hence, $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial\left(\xi^A - \xi^B\right)} < 0$.

As $\xi^A - \xi^B$ increases, both $\widetilde{\Delta V}\left(\underline{\chi}\right)$ and $\widetilde{\Delta V}(\overline{\chi})$ go up (since $\tilde{\xi} > \xi^I$). However, the former goes up by more than the latter: both greater polarisation in terms of economic policy preferences across candidates and greater efficiency serve to polarise the electorate's derived preferences over the political alternatives, and these factors reinforce each other. The assumption that ϵ is uniformly distributed ensures that this translates into greater increases in $\pi\left(\underline{\chi}\right)$ than in $\pi(\overline{\chi})$. In turn, because π^* rises with $\pi(\overline{\chi})$ but less than one-for-one, footnote $\pi^* - \pi\left(\underline{\chi}\right)$ goes down with polarisation. Hence, as $\xi^A - \xi^B$ increases the direct, negative effect of increased polarisation declines in importance and the indirect, positive effect of a greater probability of re-election after having reformed becomes more important. Proposition 3 states that eventually these two effects cancel out. That this happens for $\pi\left(\underline{\chi}\right) < \pi^*$ some can be seen by noting that at $\pi\left(\underline{\chi}\right) = \pi^*$, the direct effect is zero but the electoral gain is still increasing in polarisation. Thus, here $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial\left(\xi^A - \xi^B\right)} > 0$. Further increases in polarisation imply $\pi\left(\underline{\chi}\right) > \pi^*$, and hence both terms in the derivative are positive. footnote

Hence, contrary to both intuition and the case when the probability of re-election is constant, the incentive for reform can be an *increasing* function of political polarisation. When the conditions required for this to happen apply, the main driving force is the increase in the electoral gain from reform caused by polarisation. However, when that gain becomes large enough, the increase in the gain from being in power after reform caused by greater polarisation serves to reinforce the effect of larger electoral gains from reform.

In combination, propositions 2 and 3 inform us that when undertaking an institutional reform changes the incumbent's probability of re-election, the likelihood that he implements it can either increase or decrease compared to the benchmark case of no political uncertainty. On the face of it, the latter is the least surprising result. That "unpopular" reforms stand less of a chance of being implemented due to electoral considerations is part of the conventional wisdom. However, many reforms are "unpopular" because they have negative consequences for the income of sizeable portions of the electorate, either abolutely or relatively. In contrast, the reform studied here is efficiency-enhancing: it reduces the amount of resources needed to generate a given level of consumption of X. This benefits *all* voters regardless of who is in office in period 2. In addition, there is an induced effect on voter utility caused by changes in the optimal policies of the candidates after reform. Since both A and B supply inoptimal levels of X from the perspective of almost all voters, these changes could be negative for some voter groups if a lower level of χ_2 moves X_2^{A*} and/or X_2^{B*} even further away from what these groups think is the optimal level. However, only "extremist" B-supporters suffer losses from reform regardless of which candidate wins, and there are always some "moderate" B-supporters who benefit irrespective of the outcome of the election. footnote Still, because it is *relative* performance that matters, even a candidate who by reforming the public sector can better the lot of most voters might lose electoral support by undertaking it if his opponent does even better in the eyes of voters afterwards. As we have seen, even those B-supporters who benefit from reform under A

are more likely to support *B* after a reform because their utility increase even more with the latter in power. Thus, if the average group of voters is among these, *A* suffers an electoral loss from reform which weakens his incentives to invest in efficiency-enhancing measures compared to both the other cases we have analysed.

On the other hand, if this pivotal group of voters prefer *A*'s economic policies to *B*'s they will be more strongly inclined to vote for him if he undertakes the reform. This makes it more likely that *A* implements the reform compared to the case when the probability of re-election is independent of the decision on reform. Moreover, provided this electoral gain is strong enough, the analysis above demonstrates that it is even possible that the likelihood of reform is *greater* when there is potential political instability than when he is certain to continue in office. Thus, intriguingly, in this case elections work like an incentive mechanism supporting reform. Proving that the effect of this mechanism on incentives is magnified when politicians are partly office-motivated is straightforward. Suppose that the utility function of candidate *k* is $U(C_t, X_t, Z_t; \xi^k) + \gamma$, where $\gamma > 0$ are the non-policy benefits of being in office. Then the term $\left[\pi\left(\underline{\chi}\right) - \pi(\overline{\chi})\right]\gamma$ is added to $\overline{\overline{\overline{F}}}_X$. Hence, if candidates covet political office not only for the sake of determining policies, winning the election becomes even more important: if $\pi\left(\underline{\chi}\right) < \pi(\overline{\chi})$ reform incentives will be even weaker than implied by the analysis above, while if $\pi\left(\underline{\chi}\right) > \pi(\overline{\chi})$ they will be even stronger. footnote

A normative evaluation of the impact of elections on reform incentives is beyond the scope of this paper. Instead, I will end this section with a final comment on the possible importance of electoral incentives for reform. Moe (1990) and Moe and Caldwell (1994) argue that institutional politics is interest group politics par excellence. That is, due to the fact that institutional change raises complex technical issues which require levels of expertise that ordinary voters do not posess (or care to acquire), the fate of such reforms will be determined by the strength of various groups with a vested interest in public sector institutions (such as bureaucrats or big business). Taken at face value, their argument suggests that the electoral fate of incumbent politicians is not affected by their decisions on institutional reform. If that is the case, the model developed here presents a clear conclusion: political instability and polarisation reduces the likelihood of reforms being undertaken.

While the argument that voters are likely to be poorly informed due to a lack of expertise and weak incentives for gathering information on complex issues (which, in any case, they are unlikely to have much influence on) has some merit, it does not follow that institutional reforms will have no impact on their voting behaviour. Researchers such as McKelvey and Ordeshook (1985a,b) have shown that by taking cues from informed actors with known preferences, such as a public sector union, voters can make decisions which are well founded. Thus, public debate on public sector reform can inform voters of what their interests are. While it is unlikely that minor reforms will engender such debate, this argument implies that the merits of major reforms, which always are politically controversial, are likely to be brought to the electorate's attention by knowledgeable stakeholders. In this way, electoral incentives for or against reform are established and the analysis of this section applies.

Final Remarks and Conclusions

Individual versus Collective Political Decision-Making

The logic outlined above applies not only to the bureaucracy or the executive branch more generally. Reforms of the judiciary, say to speed up the processing of cases or root out corruption, is another important class of institutional changes that is likely to suffer the effects of potential political instability and political polarisation. The same goes for changes in political institutions, e.g. budget institutions. Such institutions regulate the relationship between spending ministries and the Treasury and between the government and the legislature, and include both laws and procedural rules. Devising optimal changes necessitates spending on planning and implementation, but potential gains will not materialise until these stages have been completed.

Changes in institutions such as these will usually involve many actors. While the process by which a conclusion is drawn will of course be different, there is no reason to believe that this will change the nature of the benefits and costs of reforms in a manner which will make their undertaking more likely. It is of course immediate that if collectives are treated as single units as in models of competition between single-party governments, the situation is completely analogous to the situation modelled here. footnote

If anything, modelling collective decision-making explicitly should strengthen the main conclusion of this paper about the disincentives to reform created by potential political instability. The reason is that the benefits are likely to be diluted in the process of reform or that the consequences of political instability might be more dramatic than in the formal model presented above. For example, in majoritarian parliamentary systems, a government investing in the creation of organisations which are to produce goods and services which its supporters value highly might find that a change of government will lead to the dissolution of these organisations or that a new government will have them produce output the supporters of the former government do not value as much. In the context of considerable political polarisation such changes in mandates might approach equivalence with dissolution. In proportional representation systems, which often produce coalition or minority governments, and separation-of-powers systems gathering the requisite support for a reform might require compromises with other politicians. It should be readily apparent that such compromises cannot increase the benefits that the supporters of the reform receive and that in most cases they will be reduced. There is no reason to believe that a corresponding reduction results on the cost side of the balance sheet. footnote

Of course, this does not mean that there are no mechanisms that work towards increasing political reform incentives. One obvious example is the majoritarian impetus towards collectivising the costs of public programmes while concetrating their benefits. footnote Thus, if groups that are not important to incumbents politically or personally can be made to pay for reforms to some extent, their adoption becomes more likely. footnote The point I am trying to make is simply that collective political decision-making should be as likely to be influenced by political instability and polarisation as the calculus of individual politicians empowered with the right to decide on reforming some public sector institution. To determine whether net reform incentives are too strong or too weak in any specific instance, one would require both an explicit model of the relevant institutions and a normative benchmark.

Conclusions

In this paper, I have demonstrated the potentially adverse effects of political instability and polarisation on public sector institutional development. If the probability of staying in office is unaffected by the incumbent's investment decision, political instability increases the hurdle that has to be surpassed for such resource-use to be optimal. The adverse effects are aggravated by political polarisation, and the disincentive generated by polarisation is larger the greater the disagreement between incumbent and challenger. Only if the relationship between political uncertainty and reforms is such that investment significantly raises the probability of staying in power will such uncertainty be conducive to reforms. The reason is that the gain from an increase in the probability of retaining office then outweighs the direct negative effect of the presence of political uncertainty. If this is the case, political polarisation will actually spur investment.

While the model is simple, I believe that the issue discussed here is important because uncertainty is an integral part of every political environment no matter its formal characteristics. Furthermore, recent research emphasises the empirical importance of public sector institutions for economic performance. Moreover, Svensson (1998) has tested the predictions of his model of public sector institutional reform and political instability. As noted in section 2, this model is similar to mine with two major exceptions: i) he models judicial reforms which have a direct impact on private investment and ii) political instability is exogenous. In the empirical analysis, however, he takes into account the possibility of reverse causality from economic performance to political stability. He finds that political instability and polarisation has a negative impact on public sector institutional quality and total investment in his sample.

That risk-averse investors respond negatively to uncertainty about the returns to investment is well-known. In this paper I have pointed out that such effects are present in the public sector as well even though politicians do not enjoy property rights over those institutions. Uncertainty about control rights generates the same kind of consequences. Moreover, it interacts with political disagreement between politicians who compete for the same office, a factor not present in the calculus of private investors. The model presented here also demonstrates the possibility of reversing the impact of insecure returns to investment, a less obvious result. This can happen when investment influences the probability distribution of its ”returns”. It is difficult to come up with examples of a similar effect in the context of private investment decisions. footnote

The word reform has positive connotations. Furthermore, in this paper I have spoken about the disincentives to reform generated by political uncertainty while noting that in some cases we might see ”over-investment” compared to the yardstick of complete security of tenure. Therefore, by way of conclusion, let me emphasise that the results obtained here should not be interpreted in a normative manner. For instance, while my model predicts that in conditions of political uncertainty and conflict there might be comparatively fewer reforms of public sector institutions relative to more stable environments, in and of itself this need not be a bad thing. Reforms do not have to constitute an improvement compared to some status quo when evaluated according to a normative theory such as welfare economics. For example, when reforms are sought for purely partisan purposes, say to benefit some constituency of the politicians in power, overall welfare need not improve. Polarisation of preferences might then result in public sector institutions serving purposes which are at odds with the goals of a large part of the citizenry. If power does change hands rapidly, a sizeable share of the resources commanded by the public sector might be wasted on undoing the administrative reforms of the previous governments and putting up structures and procedures to serve the current office-holders. By reducing the gains from reforms and thus the incentives to engage in the restructuring of institutions created by past decision-makers, political uncertainty might actually be welfare-improving. It goes without saying that the conclusion would be the opposite if inefficient institutions prevail because would-be reformers are not certain that the benefits they see will be realised in the future. Hence, the merits of (non-)reform must be judged in the context of concrete cases.

Appendix

A period 2 government of type k maximises the lagrangian function

$$(A1)\Lambda^k = Y_2 + \xi^k\sqrt{X_2} + (1-\xi^k)\sqrt{Z_2} + \lambda_2[B - Y_2 - \chi_2 X_2 - \varsigma_2 Z_2]$$

with respect to Y_2, X_2, Z_2, and λ_2. The first-order conditions are

$$(A2a)\frac{\partial\Lambda^k}{\partial\lambda} = B - Y_2 - \chi_2 X_2^{k*} - \varsigma_2 Z_2^{k*} = 0;$$

$$(A2b)\frac{\partial\Lambda^k}{\partial\theta_2} = -1 + \lambda_2^{k*} = 0;$$

$$(A2c)\frac{\partial\Lambda^k}{\partial X_2} = \frac{1}{2}\frac{\xi^k}{\sqrt{X_2^{k*}}} - \lambda_2^{k*}\chi_2 = 0;$$

$$(A2d)\frac{\partial\Lambda^k}{\partial Z_2} = \frac{1}{2}\frac{(1-\xi^k)}{\sqrt{Z_2^{k*}}} - \lambda_2^{k*}\varsigma_2 = 0.$$

By $(A2b)$, $\lambda_2^{k*} = 1, k = A, B$. Then solving $(A2c)$ yields X_2^{k*} and Z_2^{k*} follows from $(A2d)$. Inserting these in $(A2a)$ gives us Y_2^{k*}. The specific solutions are given as $(8a - c)$. Inserting these in (1) gives us the indirect utility function of voters in group i as a function of $\mathbf{p_2} = \{\chi_2, \zeta_2\}$ and the identity of the government in power:

$$(A3) V^i(\mathbf{p_2};k) = Y_2^{k*} + \xi^i \sqrt{X_2^{k*}} + (1-\xi^i)\sqrt{Z_2^{k*}}$$
$$= B + \left(\frac{\xi^k}{2\chi_2}\right)\left(\xi^i - \frac{\xi^k}{2}\right) + \left(\frac{1-\xi^k}{2\zeta_2}\right)\left[1-\xi^i - \frac{(1-\xi^k)}{2}\right].$$

The derivative of this function with respect to χ_2 is

$$(A4) \frac{\partial V^i(\mathbf{p_2};k)}{\partial \chi_2} = -\frac{\partial Y_2^{k*}}{\partial \chi_2} + \frac{1}{2}\frac{\xi^i}{\sqrt{X_2^{k*}}}\frac{\partial X_2^{k*}}{\partial \chi_2}$$
$$= -X_2^{k*} + \left(\frac{\xi^i}{\xi^k} - 1\right)\chi_2 \frac{\partial X_2^{k*}}{\partial \chi_2}$$
$$= X_2^{k*}\left(1 - 2\frac{\xi^i}{\xi^k}\right).$$

The first equality follows by differentiating the public sector budget constraint and using $(A2b)$ and $(A2c)$ to replace $\frac{1}{2\sqrt{X_2^{k*}}}$. The last equality follows from defining k's "own-price elasticity of demand" for , $\Xi_{\chi_2}^{X_2^{k*}} \equiv \frac{\chi_2}{X_2^{k*}}\frac{\partial X_2^{k*}}{\partial \chi_2}$, and calculating its value, which is -2. Hence $\frac{\partial V^i(\mathbf{p_2};k)}{\partial \chi_2} \gtreqless 0 \Leftrightarrow \frac{1}{2}\xi^k \gtreqless \xi^i$. Only voters in groups which attaches a very low weight to the utility of X-consumption might benefit from an increase in the price of this good. As explained in the main text, this is because an increase in χ_2 drives X_2^{k*} towards their optimal level of supply, and since $X_2^{k*} - X_2^{i*}$ (approximated by $1 - \frac{\xi^i}{\xi^k}$) is large for these groups, this positive indirect effect outweighs the negative direct effect of higher taxes due to X becoming more expensive.

The difference in the indirect utility of a voter in group i when A is in power in period 2 instead of B is

$$(A5) \Delta V^i(\mathbf{p_2}) \equiv V^i(\mathbf{p_2};A) - V^i(\mathbf{p_2};B)$$
$$= \frac{(\xi^A - \xi^B)}{2}\left(\frac{1}{\chi_2} + \frac{1}{\zeta_2}\right)\left[\xi^i - \frac{1}{2}(\xi^A + \xi^B)\right].$$

Obviously, if $\xi^B = \xi^A$ $\Delta V^i(\mathbf{p_2}) = 0\ \forall i$. For $\xi^B \neq \xi^A$, $\Delta V^B(\mathbf{p_2}) < 0$, $\Delta V^A(\mathbf{p_2}) > 0$, and $\frac{\partial \Delta V^i(\mathbf{p_2})}{\partial \xi} = \sqrt{X_2^{A*}} - \sqrt{X_2^{B*}} + \sqrt{Z_2^{B*}} - \sqrt{Z_2^{A*}} > 0$. Hence, $\exists \xi^I \in (\xi^B, \xi^A)$ such that $\Delta V^I(\mathbf{p_2}) = 0$. That is, voters in this group are indifferent between A and B when it comes to their economic policies. From $(A5)$, the preferences of these voters in terms of public goods can be seen to be given by $\xi^I = \frac{1}{2}(\xi^A + \xi^B)$, and $\Delta V^i(\mathbf{p_2}) \gtreqless 0 \Leftrightarrow \xi^i \gtreqless \xi^I$. Note that ξ^I is independent of $\mathbf{p_2}$.

The derivatives of $\Delta V^i(\mathbf{p_2})$ with respect to χ_2 and $\xi^A - \xi^B$ are

$$(A6a) \frac{\partial \Delta V^i(\mathbf{p_2})}{\partial \chi_2} = \frac{(\xi^A - \xi^B)}{2(\chi_2)^2}\left[\frac{(\xi^A + \xi^B)}{2} - \xi^i\right];$$
$$(A6b) \frac{\partial \Delta V^i(\mathbf{p_2})}{\partial(\xi^A - \xi^B)} = \frac{1}{2}\left(\frac{1}{\chi_2} + \frac{1}{\zeta_2}\right)\left[\xi^i - \frac{(\xi^A + \xi^B)}{2}\right].$$

For $\xi^i = \xi^I$, both derivatives are zero. ξ^I does not depend on χ_2 and ζ_2, and, being the average of ξ^A and ξ^B, does not depend on the degree of polarisation. For "A-supporters" ($\xi^i > \xi^I$), $(A6a)$ is negative and $(A6b)$ is positive. For "B-supporters" ($\xi^i < \xi^I$), it is the other way around. As explained in the main text, the sign pattern of $(A6a)$ is the result of calculating the net of the direct loss in terms of lower consumption of Y_2 caused by higher public expenditure when χ_2 goes up, which is higher under A for all voters, and the indirect gain or loss to different voter groups from the movements in X_2^{A*} and X_2^{B*} caused by a higher price of X. The sign pattern of ($A6b$) follows from the fact that as long as $\xi^A \neq \xi^B$ all voters for which $\xi^i \neq \xi^I$ prefer one or the other candidate; and the gain from having one's preferred candidate in office in period 2 is increasing in the degree to which he differs from the other candidate.

The cut-off rates are derived by calculating $\Omega^A(q_X)$ for two different values of q_X, $q_X = 0$ and $q_X = F_X$, taking into account that the optimal period 1 policies of A are completely analogous to his period 2 policies. When there is no instability, $\Omega^A(q_X) = V^A(\mathbf{p_1};A) - q_X + V^A(\mathbf{p_2}(q_X);A)$. When there is instability but π is independent of q_X, $\Omega^A(q_X) = V^A(\mathbf{p_1};A) - q_X + \pi V^A(\mathbf{p_2}(q_X);A) + (1-\pi)V^A(\mathbf{p_2}(q_X);B)$. Finally, when q_X affects π by changing χ_2, $\Omega^A(q_X) = V^A(\mathbf{p_1};A) - q_X + \pi(q_X)V^A(\mathbf{p_2}(q_X);A) + [1-\pi(q_X)]V^A(\mathbf{p_2}(q_X);B)$. Since the value of A's indirect utility in period 1 is separable and linear in q_X, the cut-off rates are the critical values at which the gain in expected period 2 utility is exactly outweighed by the fixed cost of reform.

Proof of Lemma:

Since A prefers his own policies to B's, $\frac{\partial \Delta V^A(\mathbf{p_2})}{\partial \chi_2} < 0$, c.f. ($A6a$). Thus, $\Delta V^A(\underline{\chi}) > \Delta V^A(\overline{\chi})$ - the gain from being in power is increasing in the efficiency of the public sector - or, equivalently, $\left[V^A(\underline{\chi};A) - V^A(\overline{\chi};A)\right] > \left[V^A(\underline{\chi};B) - V^A(\overline{\chi};B)\right]$ - the gain from reform is higher when continuing in office than when being replaced. This is part a) of the lemma in the main text. Part b) follows from this equivalence and $\frac{\partial \Delta V^A(\mathbf{p_2})}{\partial(\xi^A - \xi^B)} > 0$.

Proof of Proposition 1:

Part a) of Proposition 1 is trivial. Part b) follows from taking the difference $\overline{F}_X - \overline{\overline{F}}_X = (1-\pi)\{\left[V^A(\underline{\chi};A) - V^A(\overline{\chi};A)\right] - \left[V^A(\underline{\chi};B) - V^A(\overline{\chi};B)\right]\}$ and applying part a) of the lemma. Proving part c) of Proposition 1 starts from the observation that $\overline{F}_X$ is independent of $\xi^A - \xi^B$. Hence, $\frac{\partial\left(\overline{F}_X - \overline{\overline{F}}_X\right)}{\partial(\xi^A - \xi^B)} = -\frac{\partial \overline{\overline{F}}_X}{\partial(\xi^A - \xi^B)}$. Using part b) of the lemma on $\overline{F}_X - \overline{\overline{F}}_X$ then completes the proof. Finally, part d) is the result of using part a) of the lemma to evaluate $\frac{\partial \overline{\overline{F}}_X}{\partial \pi} = \left[V^A(\underline{\chi};A) - V^A(\overline{\chi};A)\right] - \left[V^A(\underline{\chi};B) - V^A(\overline{\chi};B)\right]$.

Proof of Proposition 2:

$\overline{F}_X - \overline{\overline{\overline{F}}}_X = \left[1 - \pi(\underline{\chi})\right]\Delta V^A(\underline{\chi}) - [1-\pi(\overline{\chi})]\Delta V^A(\overline{\chi})$. Setting this equal to zero yields $\pi(\underline{\chi}) = 1 - [1-\pi(\overline{\chi})]\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})} \equiv \pi^*$. By ($A5$) and ($A6a$) $1 > \frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})} > 0$. Thus, as $\pi(\overline{\chi}) \in (0,1)$, $\pi^* \in (\pi(\overline{\chi}),1) < 1$. Since $\frac{\partial\left(\overline{F}_X - \overline{\overline{\overline{F}}}_X\right)}{\partial \pi(\underline{\chi})} = -\Delta V^A(\underline{\chi}) < 0$, $\overline{F}_X \gtreqless \overline{\overline{\overline{F}}}_X \Leftrightarrow \pi(\underline{\chi}) \lesseqgtr \pi^*$.

Proof of Proposition 3:

Rewrite $\overline{\overline{\overline{F}}}_X$ as $\overline{F}_X - \left(\overline{F}_X - \overline{\overline{\overline{F}}}_X\right) = \overline{F}_X + \Delta V^A(\underline{\chi})\left[\pi(\underline{\chi}) - \pi^*\right]$. Since $\overline{F}_X$ is independent of $\xi^A - \xi^B$, $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial(\xi^A - \xi^B)} = \frac{\partial \Delta V^A(\underline{\chi})}{\partial(\xi^A - \xi^B)}\left[\pi(\underline{\chi}) - \pi^*\right] + \Delta V^A(\underline{\chi})\frac{\partial\left[\pi(\underline{\chi}) - \pi^*\right]}{\partial(\xi^A - \xi^B)}$.

When $\xi^A = \xi^B$, $\widetilde{\Delta V}(\chi_2) = 0\ \forall \chi_2$. Then $\pi(\chi_2) = \Pi(0) \equiv \pi^0\ \forall \chi_2$. By ($A5$) and ($A6a$), $\widetilde{\Delta V}(\chi_2) > 0$ and $\frac{\partial \widetilde{\Delta V}(\chi_2)}{\partial \chi_2} < 0$ when $\xi^B < \xi^A$ and $\tilde{\xi} > \xi^I$. Hence, $\widetilde{\Delta V}(\underline{\chi}) > \widetilde{\Delta V}(\overline{\chi})$. Since $\Pi'(\bullet) > 0$, $\pi(\underline{\chi}) > \pi(\overline{\chi}) > \pi^0$ in this case. However, for $\xi^A - \xi^B$ arbitrarily close to zero, $\pi(\underline{\chi}) \approx \pi(\overline{\chi})$ and $\pi(\overline{\chi}) \approx \pi^0$. As $\pi^* > \pi(\overline{\chi})$, for arbitrarily small positive values of $\xi^A - \xi^B$ $\pi^* > \pi(\underline{\chi})$. Because $\overline{\overline{\overline{F}}}_X = \overline{F}_X\ \forall \pi(\underline{\chi})$ when $\xi^A = \xi^B$, π^* is not well defined at this point, but the argument just made demonstrates that setting $\pi^* = 1 - [1-\pi^0]\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})}$ here does not affect the results. Thus, at $\xi^A = \xi^B$ $\pi^* > \pi(\overline{\chi}) = \pi^0$. By ($A5$) and ($A6b$), $\Delta V^A(\underline{\chi}) = 0$ and $\frac{\partial \Delta V^A(\underline{\chi})}{\partial(\xi^A - \xi^B)} > 0$ at $\xi^A = \xi^B$. Accordingly, here $\frac{\partial \overline{\overline{\overline{F}}}_X}{\partial(\xi^A - \xi^B)} = \frac{\partial \Delta V^A(\underline{\chi})}{\partial(\xi^A - \xi^B)}\left[\pi(\underline{\chi}) - \pi^*\right] < 0$.

Note that the definition just made makes π^* a continuous function of $\pi(\overline{\chi})$. Since $\pi(\overline{\chi})$ is a continuous function of $\widetilde{\Delta V}(\chi_2)$, which is a continuous function of $\xi^A - \xi^B$, π^* is a continuous function of $\xi^A - \xi^B$. $\frac{\partial\left[\pi(\underline{\chi}) - \pi^*\right]}{\partial(\xi^A - \xi^B)} = \frac{\partial \pi(\underline{\chi})}{\partial(\xi^A - \xi^B)} - \frac{\partial \pi^*}{\partial(\xi^A - \xi^B)}$. $\frac{\partial \pi(\underline{\chi})}{\partial(\xi^A - \xi^B)} = \Pi'\left(\widetilde{\Delta V}(\underline{\chi})\right)\frac{\partial \widetilde{\Delta V}(\underline{\chi})}{\partial(\xi^A - \xi^B)}$. By

$(A6b)$ $\frac{\partial\widetilde{\Delta V}(\underline{\chi})}{\partial(\xi^A-\xi^B)} > 0$ when $\tilde{\xi} > \xi^I$. From $(A5)$ it can be seen that $\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})}$ is independent of $\xi^A - \xi^B$. Hence, $\frac{\partial\pi^*}{\partial(\xi^A-\xi^B)} = \frac{\partial\pi(\overline{\chi})}{\partial(\xi^A-\xi^B)}\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})} = \Pi'\left(\widetilde{\Delta V}(\overline{\chi})\right)\frac{\partial\widetilde{\Delta V}(\overline{\chi})}{\partial(\xi^A-\xi^B)}\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})}$. When ϵ is uniformly distributed, $\Pi'\left(\widetilde{\Delta V}(\underline{\chi})\right) = \Pi'\left(\widetilde{\Delta V}(\overline{\chi})\right)$. Therefore, $sign\frac{\partial[\pi(\underline{\chi})-\pi^*]}{\partial(\xi^A-\xi^B)} = sign\left[\frac{\partial\widetilde{\Delta V}(\underline{\chi})}{\partial(\xi^A-\xi^B)} - \frac{\partial\widetilde{\Delta V}(\overline{\chi})}{\partial(\xi^A-\xi^B)}\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})}\right]$. From $(A6b)$, derive $\frac{\partial^2\widetilde{\Delta V}(\underline{\chi})}{\partial(\xi^A-\xi^B)\partial\chi_2} = -\left[\frac{\tilde{\xi}-\xi^I}{2(\chi_2)^2}\right] < 0$. So when $\tilde{\xi} > \xi^I$, $\frac{\partial\widetilde{\Delta V}(\underline{\chi})}{\partial(\xi^A-\xi^B)} > \frac{\partial\widetilde{\Delta V}(\overline{\chi})}{\partial(\xi^A-\xi^B)}$. In combination with $\frac{\Delta V^A(\overline{\chi})}{\Delta V^A(\underline{\chi})} < 1$ this implies $\frac{\partial[\pi(\underline{\chi})-\pi^*]}{\partial(\xi^A-\xi^B)} > 0$. Thus, at $\pi\left(\underline{\chi}\right) = \pi^*$, $\frac{\partial\overline{\overline{\overline{F}}}_X}{\partial(\xi^A-\xi^B)} = \Delta V^A\left(\underline{\chi}\right)\frac{\partial[\pi(\underline{\chi})-\pi^*]}{\partial(\xi^A-\xi^B)} > 0$. As $\frac{\partial^2\Delta V^i(\underline{\chi})}{\partial(\xi^A-\xi^B)^2} = 0\ \forall i$ (c.f. $(A6b)$), $\frac{\partial^2\overline{\overline{\overline{F}}}_X}{\partial(\xi^A-\xi^B)^2} = 2\frac{\partial\Delta V^A(\underline{\chi})}{\partial(\xi^A-\xi^B)}\frac{\partial[\pi(\underline{\chi})-\pi^*]}{\partial(\xi^A-\xi^B)} > 0$. It follows that for some $0 < \widehat{(\xi^A-\xi^B)} < (\xi^A-\xi^B)^*$, $\frac{\partial\overline{\overline{\overline{F}}}_X}{\partial(\xi^A-\xi^B)} = 0$, where $(\xi^A-\xi^B)^*$ is the level of polarisation at which $\pi\left(\underline{\chi}\right) = \pi^*$. Or, equivalently, for $\pi^0 < \pi\left(\underline{\chi}\right) = \hat{\pi} < \pi^*$, $\frac{\partial\overline{\overline{\overline{F}}}_X}{\partial(\xi^A-\xi^B)} = 0$.

The assumption $\tilde{\xi} - \xi^I > \frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\overline{\chi}}+\frac{2}{\zeta_2}}$ ensures that $\pi\left(\underline{\chi}\right) > \pi^*$ when polarisation is maximised (i.e., $\xi^A - \xi^B = 1$) and thus that $(\xi^A-\xi^B)^*$ exists. That is, when $\xi^A - \xi^B = 1$ and $\tilde{\xi} - \xi^I = \frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\overline{\chi}}+\frac{2}{\zeta_2}}$, $\pi\left(\underline{\chi}\right) = \pi^*$. Since $\frac{\partial\widetilde{\Delta V}(\underline{\chi})}{\partial(\tilde{\xi}-\xi^I)} > 0$, $\tilde{\xi} - \xi^I > \frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\overline{\chi}}+\frac{2}{\zeta_2}} \Leftrightarrow \pi\left(\underline{\chi}\right) > \pi^*$ at $\xi^A - \xi^B = 1$. The assumption $\tilde{\xi} - \xi^I < \frac{2f}{\frac{1}{\underline{\chi}}+\frac{1}{\zeta_2}}$ ensures that $\pi\left(\underline{\chi}\right) < 1$ when $\xi^A - \xi^B = 1$ and thus that the assumption $\pi\left(\underline{\chi}\right) \in (0,1)\ \forall\chi_2$ is not violated.

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