

A POSITIVE THEORY OF DISCRETIONARY POLICY, THE COST OF DEMOCRATIC GOVERNMENT AND THE BENEFITS OF A CONSTITUTION

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We offer an explanation of government's preference for discretionary policy action. The main elements are asymmetric information and the ability and desire of governments to maximize reelection prospects. Discretionary policy imposes a social cost. We show that the cost is eliminated if all voters have the same information as the government. An optimal, state contingent policy rule that precommits government through a constitution eliminates the cost by removing government's opportunities to exploit its informational advantage. Rules of this kind, and constitutional restrictions, are difficult to enforce in the presence of uncertainty and different information available to government and the public.

I. INTRODUCTION

A main implication of recent developments in economic theory is that governments can increase welfare by using rules, usually state contingent rules, instead of discretion. The bases for this conclusion range from the formal demonstration of dynamic inconsistency, introduced by Kydland and Prescott [1977], to the more general argument that discretion increases the public's uncertainty.

While the issue of rules versus discretion is far from closed in economic theory, recent work in the rational expectation tradition has strengthened the case for rules. The case for rules has attracted few practitioners, however. Governments maintain discretionary policies in many areas and resist efforts to adopt monetary and fiscal rules or the fixed tax and subsidy rules to control pollution advocated by many economists. Policymakers appear to prefer discretion to rules even when arguments in favor of precommitments seem compelling. A major purpose of this paper is to explain this phenomenon from a positive point of view and to investigate the welfare implications of retaining discretion.

The economic policies chosen by governments depend on the aims or goals of policymakers and the constraints under which they operate. Here, we take the view that public officials choose the economic policies which

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are most likely to get them reelected. Like the entrepreneur of economics who strives to maximize profits, the politician acts to maximize the likelihood of being reelected.¹ However, unlike the entrepreneur, he must maximize support at a particular point of time viz., when elections are held, so he has an incentive to choose policies that are acceptable to the public when they vote.

In the presence of unanimity about social goals and symmetric information, political competition within a democracy is likely to lead to socially optimal economic policies. Where the public has only imperfect information about the actions of government and the state of the economy, the socially optimal economic policies and the support maximizing choices may diverge. This paper shows that in the presence of uncertainty about the future optimal settings of policy instruments, governments will seek to retain flexibility in the choice of instruments.² Flexibility is achieved in one of two ways. Either the policymaker has discretion, or he is committed in advance to follow a socially optimal, contingent, decision rule. When the policymaker's objective is to maximize social welfare, the result of both arrangements is identical. However, when the policymaker is a politician who strives to maximize support on election day, discretion leads to a socially suboptimal outcome. In what follows we elaborate on the origin of this result.

Governments that have discretionary authority differ in their ability to interpret events and forecast the future. Governments with better forecasting ability are more likely to produce higher welfare, so they are preferred by voters. Since the public has incomplete information on the forecasting ability of an incumbent government, rational voters use the level of welfare experienced under this government as an indicator of its forecasting ability and future performance.³ As a result, an incumbent's reelection depends on welfare generated during his term of office. The incumbent acts to increase welfare by the end of his term even if the policy involves a substantial and above optimal loss of welfare after the election.⁴ The welfare loss is directly traceable to the existence of periodic elections, so we call it "the cost of democracy". It is larger the greater the frequency of elections.

1. This view of the "political entrepreneur" was forcefully developed by Downs [1957]. This is not to deny the possible influence of ideologies on policymaking. However, since ideologies seem less important for the understanding of the preference for discretion we abstract from them. In a later section, we separate individuals according to their preference for activism.

2. This preference for flexibility is analogous to the demand for flexibility by private entrepreneurs facing an irreversible investment decision in an uncertain world. See Cukierman [1980] and Bernanke [1983] for examples.

3. The use of imperfect signals under partial information is the basis of well known work on the business cycle. See Lucas [1973; 1975].

4. There are many examples that fit this paradigm, but an extreme case is the policy of the Israeli government prior to the 1981 elections. Despite a large balance of payments deficit the government maintained the rate of exchange at a low level to keep import prices low. They borrowed foreign exchange and substantially increased international debt. The public reelected the government. Later on foreign exchange controls and other austerity measures were imposed.

Recent literature in political economy provides evidence (1) that current and past economic conditions affect the popularity of governments and (2) that, at times, governments choose economic policies to increase public support at election time.⁵ The paper reconciles this evidence with the view that a rational public should look forward rather than backward when voting. When there are limitations on available information and persistence in the attributes of different governments, the public rationally uses past performance as a signal about future performance.

A constitutional commitment to a socially optimal contingent choice of policy instruments could eliminate the cost of democracy without losing the flexibility needed for the maximization of social welfare. However, a constitution raises serious enforcement problems. Without full transmission of information by government to the agency that monitors and enforces compliance with the constitution, government does not fully bear the cost to the public of discretionary policy. As a consequence even when a socially optimal constitution is enacted, government is often tempted not to abide by it.

In the presence of a voting public with diverse objectives, the government's choice of policy instruments determines both total welfare and its distribution across different groups. A government seeking reelection sets its policy instruments to achieve the distribution of welfare that maximizes its reelection prospects. The government behaves as if it maximizes the welfare of the mean voter during its period in office.⁶ We show that the existence of diversity in the electorate does not eliminate the cost of democracy. The reason is that policy actions that increase the prospects for reelection move the economy away from the Pareto efficient frontier and reduce welfare.

The structure of the model used to illustrate these ideas is presented in section II. The choice of instruments by an apolitical social planner is also presented, as a benchmark, in this section. We show that, in the presence of uncertainty, flexibility in the choice of instruments is necessary for a social optimum. Section III derives the choice of policy instruments by a politically motivated government facing imperfectly informed voters and shows that discretionary policy leads to suboptimal choices of policy instruments. The reason for this result is amplified in section IV where we find that the cost of democracy disappears when the public has the same information as the government. Section V develops the social benefits of a constitution and shows that due to asymmetric information between government and the public, the government is unlikely to adhere strictly to the constitution. An illustration that maps into the general framework of the previous sections is discussed in section VI. It concerns the amount of resources drafted into the

5. For evidence on the effect of economic conditions on the popularity of incumbents see for example Frey and Schneider [1978] and Fischer and Huizinga [1982]. Papers on the political business cycle by Nordhaus [1975], MacRae [1977] and others suggest that the choice of economic policy is not independent of the election cycle. See however McCallum [1978] and Meltzer and Vellrath [1976]. No clear conclusion has emerged from this literature.

6. The mean voter plays the same pivotal role here as the median voter in Meltzer and Richard [1981].

production of a public good. Section VII generalizes the analysis to the case in which various groups in the population differ in the degree of activism they prefer. Some concluding comments complete the paper.

II. THE SOCIAL PLANNER'S PROBLEM

In the economy we consider, social welfare depends on the realizations of a random state variable and on the settings of a policy instrument that is chosen by government. Let x_t and a_t be, respectively, the realization of the state variable and the setting of the policy instrument in period t . The state variable x_t represents events that are beyond the control of either the private sector or the government. Examples of these events are unpredictable changes caused by nature or by other countries.⁷

Government is chosen in a democratic election for an office term of n periods. Elections are held at the end of each office term. The government's main objective is to be reelected. The public is concerned about its welfare and rewards a government for its performance. An incumbent government is more likely to be reelected the higher the level of social welfare during its term of office.⁸

Policies chosen today affect the economy's performance in the current and immediately following periods, so welfare in the current period depends on instrument settings in the past and current period. Formally, social welfare in period t is inversely related to the loss function,

$$(1) \quad L_t = (a_{t-1} - x_t)^2 + (a_t - x_t)^2.$$

Here x_t is a random normal variate with a zero expected value and variance σ_x^2 . Losses increase nonlinearly when $a \neq x$. The fact that past policies affect both past and present welfare is a crucial element of our analysis.

The realization of x_t does not become known to government until the end of period t . The beginning of period t is the latest time at which the policy instrument, a_t , can be set to affect behavior in t . The government can, if it wishes, set a_t at an earlier time by precommitting to a particular path for the policy instruments. By waiting the government obtains additional information. Specifically, at the beginning of period t , the government obtains noisy indicators for x_t and x_{t+1} in the form of observations on the variables

$$(2) \quad y_t^0 = x_t + \epsilon_t^0 \quad \text{and} \quad y_t^1 = x_{t+1} + \epsilon_t^1$$

where ϵ_t^0 and ϵ_t^1 are normally distributed white noise processes with zero mean, variance σ_ϵ^2 and are statistically independent of x and of each other. Section VI discusses a specific illustration of governmental actions and ran-

7. Changes in the parameters of behavioral equations and changes in technology are additional sources of unpredictable changes but are not considered in our formal model.

8. The evidence supporting such a relationship is surveyed in the context of public attitudes towards inflation and unemployment in Schneider and Frey [1984]. See also footnote 5 above. Section III shows that this voting pattern is rational if the public is less than fully informed.

dom state variables that affect social welfare and which map into the general framework presented here.

The government has no incentive to give accurate information about y_t to the public. In fact, complete revelation precludes the use of economic policy to improve election prospects. Even if the public has a noisy indicator of its own, the public's indicator is an imperfect substitute for the government's information. The reason is that the public does not know the government's forecasting ability, so it cannot separate fully the effects of government policy from other forces affecting x_t , or be certain about the information that the government had when it chose policy actions.⁹ In particular, one period before the election the public has incomplete information on the states of nature, x_t , realized during the office period of the incumbent government and the instruments, z_t , chosen by the government. The public experiences changes in welfare, so it knows the level of welfare, L_t , experienced in each period. The public also knows the variance of states of nature, σ_x^2 , but it cannot determine how much of the welfare level is due to nature and how much to either current or past governmental actions. The best it can do is draw inferences about the relative contributions of nature, or chance, and policy to its welfare.

Governments make forecasts as part of the policy making process. Governments differ from each other in their ability to make precise forecasts of future states of nature, and for this reason policies differ. Each government is characterized by a different value of the noise variance σ_e^2 . This variance is unknown to the public, but the public makes inferences about σ_e^2 from the level of welfare experienced during the incumbency period.

To focus on the main issue of the paper with the fewest complications, we assume that the social welfare function is linear in the sum of the L_t . The public is risk neutral and does not have time preference, as in (3). (The qualitative results of the analysis are unaffected by the degree of time preference.) Differences between a and x impose costs that are non-linear, as in (4). Maximization of social welfare by an apolitical benevolent government or social planner that is in office from period 1 through period n involves the following problem:

$$(3) \quad \text{Min}_{(a_1, \dots, a_n)} E_g \sum_{t=1}^n V_t$$

where

$$(4) \quad V_t \equiv (a_t - x_t)^2 + (a_t - x_{t+1})^2,$$

and E_g is the expected value operator conditioned on the information available to government. The government must choose a value of the policy instrument, a_t , before the values of all the state variables are known with

9. The critical point is that there is asymmetry in information available to the public and the government. Canzoneri [1985] uses an assumption similar to ours. In his model, the Federal Reserve's forecast of money demand is private information.

certainty.¹⁰ We restrict attention to the period over which the choice of instruments by a one term government affects the public's welfare.¹¹ All other periods are irrelevant for the decisions to be made by this government.

Although our main interest is the behavior of a government that maximizes the likelihood of being reelected, we require a benchmark or standard to evaluate government action. We use as our standard a social planner who is concerned only with social welfare. A necessary condition for the minimization of the expected value of social losses (maximization of social gains) in (3) is

$$(5) \quad \text{Min}_{(a_t)} E_g V_t, \quad t = 1, \dots, n.$$

We consider, first, the effect on social welfare of a decision to set the value of a_t before the arrival of period t . To evaluate this policy of precommitment, we compare the minimized value of the objective function in (5) for three alternative cases: (i) a_t is precommitted in period $t-j$ where $j \geq 2$; (ii) a_t is precommitted in period $t-1$; (iii) a_t is chosen only in period t after y_t^0 and y_t^1 are revealed to the government. The objective function in (5) specializes in each of these cases:

$$(6) \quad \begin{array}{ll} \text{(a)} & \text{Min}_{(a_t)} E_{g,t-j} V_t, \quad j \geq 2 \\ \text{(b)} & \text{Min}_{(a_t)} E_{g,t-1} V_t \\ \text{(c)} & \text{Min}_{(a_t)} E_{g,t} V_t. \end{array}$$

In (6), the second subscript on the expectation operator denotes the information set available to the social planner when choosing a_t . For example $E_{g,t} V_t$ denotes the expected value conditioned on information available to government at the beginning of period t . The optimal values of the policy instruments for each of the problems in (6) are, respectively,

$$(7) \quad \begin{array}{ll} \text{(a)} & a_t = (1/2)E_{g,t-j}(x_t + x_{t+1}) = 0 \quad \text{for } j \geq 2 \\ \text{(b)} & a_t = (1/2)E_{g,t-1}(x_t + x_{t+1}) = (1/2)\theta y_{t-1}^1 \\ \text{(c)} & a_t = (1/2)E_{g,t}(x_t + x_{t+1}) = (1/2)\theta(y_t^0 + y_t^1) \end{array}$$

where $\theta \equiv \sigma_x^2 / (\sigma_x^2 + \sigma_t^2)$, and $t = 1, \dots, n$.

The unconditional expected value of the minimized objective function in each of the three cases is given by

$$(a) \quad EV_{t_1}^m = E(x_t^2 + x_{t+1}^2) = 2\sigma_x^2$$

10. Equation (1) shows that current welfare depends on current and past policy actions and the current state of nature. Equation (4) shows the contributions to current and future welfare that are affected by the current instrument setting. The latter is more convenient for solution of equation (3).

11. Obviously the last period in which the public's welfare is affected by the policies of the incumbent government is period $n+1$ through the term $(a_n - x_{n+1})^2$.

$$(8) \quad (b) \quad EV_{i2}^m = E\{[(\theta/2)y_{t-1} - x_t]^2 + [(\theta/2)y_{t-1} - x_{t+1}]^2\}$$

$$= [2 - (\theta/2)]\sigma_x^2$$

$$(c) \quad EV_{i3}^m = E\{[(1/2)(x_t + \theta y_t) - x_t]^2 + [(1/2)(x_t + \theta y_t) - x_{t+1}]^2\}$$

$$= (2 - \theta)\sigma_x^2$$

and $t = 1, \dots, n$.

Equations (8a) to (8c) show that the longer decisions are delayed, the smaller the loss of welfare; $EV_{i1}^m > EV_{i2}^m > EV_{i3}^m$. New information about states of the world is useful, so the best result is obtained when the social planner delays the decision regarding his policy in period t to the latest possible time, the start of period t .

Suppose that before taking office a social planner has to decide whether to commit policy instruments to particular values in advance. Since the decision has to be made before the actual values of x_t and y_t^i , $i = 0, 1$ are known, he ranks the three alternatives above using the only information available to him at the time. This information includes only the deterministic and the stochastic structure of the economy, so the planner uses unconditional expected values to rank policies. Cases (i) and (ii) correspond to various degrees of precommitment of policy instruments, while case (iii) can be thought of either as a type of discretionary policy or as a contingent policy rule. Case (iii) requires the decision about the setting of the policy instrument for each period to be made in that period, but case (iii) results also if the planner commits himself to the contingent rule given by (7c).

Our standard for a benevolent planner is at hand. Social welfare is maximized either when the social planner has discretionary powers or when the planner follows a contingent rule that replicates his choice of instruments under discretion.¹² In either case, maximizing social welfare requires flexibility in the choice of settings or values for the policy instrument. Flexibility enables the planner to commit his instruments only after he has the maximum possible amount of information. In view of the above discussion, the social planning problem in (3) can be rewritten

$$(9) \quad \text{Min}_{(a_1, \dots, a_n)} \sum_{t=1}^n E_{g^t} V_t.$$

The optimizing choice of instruments for this problem is given in (7c).

III. A POLITICALLY MOTIVATED GOVERNMENT WITH PARTIALLY INFORMED VOTERS

In models of political economy or public choice, policies are not chosen by benevolent planners. Policymakers maximize their own objective func-

12. This result depends on the assumed "benevolence" of the planner. We show below that when the government has political aims, the social optimum can be achieved by a contingent rule but not by discretion.

tions, which may differ from a well-defined social utility function. This section introduces a politically motivated government (or policymaker) and shows that such a government reduces social welfare below the standard set by the planner.

The government's main concern is to be reelected. The government knows that its prospects for reelection are directly related to its forecasting ability. The public believes that a government with better forecasting ability (lower σ_t^2) is more likely to achieve higher social welfare if reelected.¹³ Since the public does not know σ_t^2 , a_t or x_t , its only source of information about the forecasting ability of the incumbent government is the level of welfare experienced during the period in office. We assume that the probability of reelection is given by

$$(10) \quad P\{L(\underline{a}, \underline{x})\}, P'(\cdot) \equiv (\partial P/\partial L) < 0$$

where

$$\underline{a} \equiv (a_1, \dots, a_n), \underline{x} \equiv (x_1, \dots, x_n)$$

and

$$(11) \quad L \equiv (a_0 - x_1)^2 + \sum_{t=1}^{n-1} [(a_t - x_t)^2 + (a_t - x_{t+1})^2] + (a_n - x_n)^2$$

is the actual cumulative loss experienced by the public during the office period.

Let $u(R)$ and $u(NR)$ be the subjective levels of satisfaction experienced by government if reelected and if not reelected respectively. Following Downs' [1957] view of the "political entrepreneur", we assume that $u(R) - u(NR) > 0$. The incumbent government chooses policies to win reelection by setting the vector of instruments \underline{a} to maximize

$$(12) \quad \text{Max}_{\underline{a}} E_g \{P[(\underline{a}, \underline{x})]u(R) + (1 - P[(\underline{a}, \underline{x})])u(NR)\}.$$

Part I of the appendix shows that (using a linear approximation of $P(\cdot)$) this decision problem is equivalent to

$$(13) \quad \text{Min}_{\underline{a}} E_g L(\underline{a}, \underline{x}).$$

The government chooses the instruments, \underline{a} , to minimize the conditional expected value of the cumulative loss to the public during its term in office. As in Section II, government achieves a better (lower) value of the objective in (13) on average if it delays the choice of a_t , as long as possible. Using this consideration and (11), the problem in (13) can be rewritten

$$(14) \quad \text{Min}_{\underline{a}} \{(a_0 - x_1)^2 + \sum_{t=1}^{n-1} E_{g_t} [(a_t - x_t)^2 + (a_t - x_{t+1})^2] + E_{g_n} (a_n - x_n)^2\}.$$

13. We demonstrate later in this section that this belief is rational in the sense that the actual behavior of a politically motivated government facing such beliefs gives rise to a positive relationship, on average, between welfare during the period in office and the government's ability to forecast.

The first order necessary conditions for an internal minimum yield

$$(15) \quad \begin{aligned} (a) \quad & a_t = (1/2)\theta(y_t^0 + y_t^1) \quad t = 1, \dots, n-1 \\ (b) \quad & a_n = \theta y_n^0 \end{aligned}$$

where, as before, $\theta \equiv \sigma_x^2 / (\sigma_x^2 + \sigma_\epsilon^2)$.

Comparison of (15) with the socially optimal setting of instruments in (7c) suggests that the instruments are set optimally in the first $n-1$ periods but not in the last one. The reason for the divergence in the last period is that the public does not know the government's policy action, the choice of a_n . Consequently, the public does not have sufficient information to use (3) to evaluate policy. The best the public can do is to use information about performance. As a result, the government can improve its reelection prospects by setting a_n without regard for the effect of this choice of a_n on welfare in the period following an election. The government sets $a_n = \theta y_n^0$, lowering welfare. The loss of welfare is directly traceable to the existence of elections and an imperfectly informed public. The public knows that all governments try to appear better than they are. Using private forecasts or anticipating the government's action in period n cannot fully offset the advantage the government gets from having private information, however. The reason is that the government exploits private information for its own advantage. The public can try to evaluate government's performance by using, in addition to (11), the contribution of the choice of a_n to welfare in the first post-election period. This contribution is inversely related to the loss $(a_n - x_{n+1})^2$. The best forecast of this loss by the public prior to the election is $E_{pn}(a_n - x_{n+1})^2$, where the subscripts pn denote the information available to the public in period n . The public knows that a_n is set by the government according to equation (15b), so

$$E_{pn}(a_n - x_{n+1})^2 = E_{pn}(\theta(x_n + \epsilon_n^0) - x_{n+1})^2.$$

An important feature of this expected value is that it depends on the joint distribution of x , ϵ^0 and θ but *not* on the actual choice of a_n which is unknown to the public. Hence the government has no incentive to take welfare in period $n+1$ into consideration when setting a_n . This leads to the policy choice in (15b). Despite the fact that the public is aware of government's tendency to act suboptimally prior to elections, a rational government acts in this way. A government that failed to sacrifice post election welfare for pre-election welfare would be judged less capable than it really is. Since the public believes that all governments tend to disregard post election welfare, the public's evaluation of government's ability is based on this belief.¹⁴

14. This is analogous to the theory of limit pricing under asymmetric information about the costs of an incumbent firm. Since potential entrants take the incumbent firm's price as a signal about its costs, the incumbent has an incentive to set its price below the profit maximizing price. The potential entrant who is aware of this incentive is not fooled on average. Nevertheless, the incumbent practices limit pricing because otherwise he would be judged to have costs that are higher than actual costs. Milgram and Roberts (1982), Roberts (1985). We are indebted to Motty Perry for pointing out this analogy.

Note that since the public cannot determine whether the losses it suffers in a given period are due to current or to past decisions, the incumbent government is penalized for the actions of its predecessor through the term $(a_0 - x_1)^2$ over which it has no control. On the other hand it is not penalized for its contribution to losses in period $n+1$, through the term $(a_n - x_{n+1})^2$, even though it affects this term by the choice of a_n . In addition, the incumbent government is penalized for bad luck (large deviations of ϵ and x from their respective means) and rewarded for good luck.

Substituting the instrument levels chosen in (15) into (11) and rearranging, we obtain the expected value of cumulative losses during the term of office arising from the government's attempt to maximize its reelection prospects,

$$EL^* = 2[(n-1)(1-\theta/2)+1]\sigma_x^2.$$

On average, cumulative welfare increases with the precision of the incumbent government's forecasts (the lower σ_ϵ^2 for a given σ_x^2). The equation shows that there is a positive relationship between σ_ϵ^2 and expected losses during a term of office. This establishes the rationality of the public's beliefs about this relationship. The public is correct to prefer a government with better forecasting ability since, if elected, that government is more likely to achieve a better level of social welfare. Since the public does not know σ_ϵ^2 , it uses the fact that actual welfare during the office period is positively related, on average, to the incumbent government's forecasting ability to evaluate the way the government will perform if reelected. As a result the likelihood of reelection increases with the level of welfare generated during its term of office.

Government is aware of the relationship between reelection and welfare during its office period, so it behaves in a way that sustains the relation. The public's beliefs are rational in the sense that the beliefs are not obviously controverted by observations.¹⁵ Note that although the public is forward looking it evaluates the government in terms of past performance, since this information is pertinent, given the informational limitations, for prediction of future performance. Reliance on past performance is consistent with a vast amount of literature suggesting that the reelection prospects of a government are better the better are economic conditions during its office period.¹⁶

The public's welfare is reduced, however, by the government's concern about reelection. The average loss in social welfare resulting from the government's preelection activity and the public's imperfect information can be quantified. Substituting (7c) and (15b) alternately into (4) for $t = n$, and taking the expected value of the difference between the resulting expressions, we have the expected value of the loss.

$$(16) \quad E\{(\theta y_n^0 - x_n)^2 + (\theta y_n^0 - x_{n+1})^2 - [(1/2)\theta(y_n^0 + y_n^1) - x_n]^2$$

15. This rather general notion of rationality is due to Radner [1977].

16. Schneider and Frey [1984] survey this literature.

$$- [(1/2)\theta(y_n^0 + y_n^1) - x_{n+1}]^2 = \theta\sigma_x^2$$

The loss of welfare is an increasing function of the uncertainty of the states of nature, σ_x^2 ; the higher this uncertainty the more valuable from a social point of view the advance information that government has but does not use to achieve a social optimum. Conversely, the higher σ_x^2 the less accurate is the advance information available to the government; social welfare is not affected much by the neglect of inaccurate information.¹⁷

We have shown that maximizing behavior of a politically motivated government creates a social inefficiency in the presence of asymmetric information. The inefficiency is independent of the source of the asymmetry; the loss can arise either from slow dissemination of information by government, or slow learning or reception by the public, or from any combination of the two. If we introduced a challenger, the loss would not disappear as long as the government retained some informational advantage.

When the public uses realized welfare during incumbency as the criterion for the evaluation of future performance of the government, maximization of the likelihood of being reelected is incompatible with maximization of social welfare. The loss of social welfare is directly traceable to the existence of periodic democratic elections, so we have called it "the cost of democracy".¹⁸ Equation (16) suggests that this cost is higher the more uncertainty there is about future states of nature. Obviously the cost is also higher the shorter the election cycle.

IV. A POLITICALLY MOTIVATED GOVERNMENT WITH FULLY INFORMED VOTERS

This short section locates the reason for the inefficiency that gives rise to the cost of democracy. We show that when everyone has the same information as the government, a politically motivated government sets all instruments at their socially optimal levels and the cost of democracy vanishes.

Suppose all members of the public know $a_1, \dots, a_n, x_1, \dots, x_n$ and $y_1^i, \dots, y_n^i, i = 0, 1$, in the last period before the elections. Armed with this information, they can estimate the forecasting ability of the incumbent government directly by noting that

$$y_t^i - x_{t+1} = \epsilon_t^i \quad \text{for all } t \text{ and } i = 0, 1$$

17. If voters (knowing that government tends to behave differently in the last period before the elections) give less weight to welfare in that period, the government will still have an incentive to set $a_n = \theta y_n^0$ as long as this weight is non-zero. If voters totally discount the welfare of the last period, they give the government an incentive to set $a_{n-1} = \theta y_{n-1}^0$ which creates an inefficiency in period n . More generally any period that is excluded by the public when evaluating the government leads the latter to disregard losses in that period. The loss in welfare is not thereby diminished, since any period that is excluded from the public's evaluation causes an average increase in losses of $\theta\sigma_x^2$. Since, from (16), this is equal to the average reduction in losses due to the exclusion of the last period from the public's evaluation there is no gain in shifting the weights of the evaluation function across periods.

18. Our analysis does not show that democracy is inferior to other viable alternatives. Cost is measured from an ideal point, not from the point achieved under an alternative social arrangement. Further, the benefits of democratic government are neglected.

and by using the series of observations on ϵ for period 1 through $n-1$ to estimate the variance σ_ϵ^2 by means of a statistic like¹⁹

$$\sum_{t=1}^{n-1} (\epsilon_t^0 + \epsilon_t^1) / 2(n-1).$$

The public can now separate the errors introduced by the government's forecasts, so prospects for reelection depend on a direct estimate of σ_ϵ^2 rather than on social welfare attained during the office period.

The government no longer has an incentive to deviate from the socially optimal choice of instruments. When the public has complete information, a government that seeks reelection will choose to maximize social welfare. The incentive to maximize welfare remains only if *all* individuals are as informed as the government. When *some* individuals are not as knowledgeable, and therefore use actual welfare to evaluate government as in Section III, the incentive to deviate from social optimality reappears.

The departure from a social optimum, that we have called the cost of democracy, arises here from differences in information. Our analysis brings out the public good nature of information in a democratic society. The private benefit of information to an individual or a group of individuals may be lower than the private costs of acquiring the information even if the social benefits from more efficient behavior by government are larger than the costs.

V. IMPLEMENTATION OF CONSTITUTIONAL RULES

Many economists advocate some form of precommitment, or rules, for governmental policies. Friedman [1960] and more recently Kydland and Prescott [1977] are examples. Yet governments usually oppose attempts to restrict their freedom to change policies. When there is uncertainty about future states of nature, governments that desire to maximize the probability of being reelected choose to retain as many open options as possible. If they do not behave in this way voters penalize them at election time.

In previous sections we showed that both politically motivated (Section III) and socially motivated (Section II) choices of policy instruments give rise to a demand for flexibility on the part of government. Flexibility is good for social welfare and is also good politics. However, there is a fundamental difference between the type of institutional arrangements used to maintain flexibility in these two cases. Flexibility can achieve a social optimum either through discretion or by means of a contingent rule of the type specified in (7c). With an apolitical social planner who maximizes expected social welfare, it does not matter whether government is precommitted through an appropriate contingent rule or has discretionary powers. In either case social welfare is maximized. But with a politically motivated government, discre-

19. This is a maximum likelihood estimate of the variance.

tion leads to a socially suboptimal result whereas the contingent rule in (7c) achieves a social optimum. Hence a constitution that precommits the government to the contingent rule in (7c) is desirable. However it raises the familiar problem of enforcement.

The problem of implementing or enforcing a constitutional rule arises because the authority that enforces the rule must have the same information as the government to perform its function. In particular, it must know y_t^0 and y_t^1 for each t . Such a complete transfer of information is usually not feasible, since y_t^i , $i = 0, 1$ represents governmental forecasts rather than realizations of objective variables. Even if a complete transfer of information can be made, neither the government nor the public may choose to make the transfer if y_t^i includes information used to set military strategy.²⁰ As a consequence the implementation of a constitutional rule rests ultimately with the ability of the public and the incentives on government to release all available information.

If the government cares more about the current than the future election it will usually be tempted to abandon the constitutional rule in favor of the political behavior described by equation (15). To see this, consider first the extreme case in which government cares only about the next election. As in Section III the public evaluates the forecasting ability of government on the basis of welfare experienced during its period in office, since this measure of welfare is positively correlated with forecasting ability. By following the behavior in equation (15) the government increases the quality of its forecasting ability as perceived by the public and enhances the likelihood of reelection. This behavior is optimal for reelection prospects whether the public believes that the government adheres to the constitutional rule or is fully or partially aware of the fact that government acts in a discretionary manner. Whatever the public's beliefs about the policy regime, government is perceived as having better forecasting ability when it sets $a_n = \theta y_n^0$ than when it sets a_n at the socially optimal level implied by equation (7c). Thus $a_n = \theta y_n^0$ is a dominant strategy from the point of view of government.

This tendency is attenuated to some extent if the government also cares about future elections. In this case, the government knows that, after the election, the public will learn about the loss of welfare resulting from the government's choice of a_n . In the subsequent election, the public's loss of welfare will be costly to the government. Nevertheless, to the extent that the government cares about the present election sufficiently more than about the subsequent election, the temptation to abandon the constitutional rule remains. Even if the public and the government have an identical degree of time preference this is likely to be the case. The reason is that discretionary

20. Defense differs from economic policy because the social cost of distributing information can be larger than the social gain from announcing and following a precommitted plan. The social cost arises from the revelation of forecasts of strategic variables or enemy responses since such forecasts reveal strategies and interpretations to enemies or potential enemies.

behavior reduces the public's welfare immediately after the election, but the penalty to the reelection prospects of government is delayed until the next election. More generally, the bias towards discretion remains whenever the cost of democracy is internalized by government later than by the public.²¹

Thus even if a constitution is enacted, government is tempted to violate it whenever the private costs to government occur at a later date (or more generally are lower) than the costs of discretion to the public. The temptation to act in a discretionary manner is directly traceable to the existence of asymmetric information. If the public had the same information as government, it could estimate the forecasting ability of the latter directly along the lines of Section IV, without having to rely on actual welfare during the period in office. If this occurred, there would be no incentive for government to deviate from the socially optimal behavior given by (7c). When only part of the public is informed, the bias towards discretion reappears. The reason is that the uninformed judge the forecasting ability of government by the level of welfare generated during its time in office. With periodic elections, information is a public good in the sense that the private net benefits of becoming informed are, for some people, lower than the social benefits.

VI. AN EXAMPLE

This section provides an application that maps into the quadratic loss function discussed in previous sections. In this example the random state variable x is the productivity of labor in the production of a public good, and the government's policy instrument is the amount of labor drafted to produce the good. The distribution of x and the structure of information remain as in Section II.

The amount of the public good produced in any period depends on the amount of labor input in the current and the previous period. Labor productivity in the production of the public good is stochastic and not known with certainty in advance. Government obtains labor by directly drafting into the production of the public good.²² An example is a military draft to provide defense. Since the amount of labor currently drafted affects the level of defense provided in both the current and the next period, governments with superior ability to forecast make more efficient decisions. The reason is that a government with better forecasts uses more labor when productivity in this sector is relatively high and less when productivity is relatively low. In countries like Israel, where defense is based on civilian reservists, a government with good forecasting ability drafts reservists only when danger is

21. In practice, another reason for the bias is that an incumbent may not be able to pass his good reputation onto his successor as the party's candidate.

22. The assumption about a labor draft is made to abstract from the distortions created when the public good is financed by taxation. The assumption has greatest descriptive realism when the public good is defense.

imminent. In such periods, productivity in the public good sector is relatively high.

To formalize these notions, we assume that the production function of the public good is

$$(17) \quad g_t = f(Nd_{t-1}, Nd_t, x_t),$$

where g_t , d_t , x_t and N are, respectively, the amount of the public good provided in period t , the amount of labor drafted per individual in period t , the productivity shock in period t and the constant population. Utility of the j th individual is given by

$$(18) \quad u^j(c_{jt}, l_{jt}, g_t)$$

where c_{jt} and l_{jt} are respectively the j th individual's consumption of the private good and his leisure in period t . Each individual is endowed with one unit of time per period. Part of his time is drafted by government, and the rest is distributed between leisure and private production. Each unit of labor in private production produces one unit of the private consumption good. Hence the time constraint of a representative individual can be written

$$(19) \quad l_{jt} = 1 - c_{jt} - d_{jt}, \quad j = 1, \dots, N,$$

The total level of drafting is determined by the government whereas its distribution is determined by the specific institutions in charge of the production of the public good. More precisely the level of drafting of individual j 's time in period t is

$$(20) \quad d_{jt} = d_t(1 + V_{jt})$$

where

$$(21) \quad V_{jt} \geq -1 \text{ for all } j \text{ and } \sum_{j=1}^N V_{jt} = 0.$$

It follows from (20) and (21) that total labor drafted in period t is

$$(22) \quad \sum_{j=1}^N d_{jt} = Nd_t.$$

The total number of draftees is determined by the government's choice of d_t . The distribution of the drafting effort is determined by technical considerations outside the range of governmental jurisdiction so that the V_{jt} are not governmental policy variables. When the public good is defense, this means that the total number drafted is determined by the central government. Given this level, the allocation of the burden is determined by other institutions (the army or draft boards). Individual j knows his own condition, d_{jt} , but cannot use this information to infer the average level of d_t , since V_{jt} is not known to him. Hence as in section III the settings of the government policy instruments are private information.

Given the government's forecast and its current and past decisions, the representative individual maximizes (18) subject to (17) and (19) by solving the following private optimization problem,

$$(23) \quad \text{Max } u^i [c_{it}, 1 - c_{it} - d_{it}, f(Nd_{t-1}, Nd_t, x_t)].$$

The result of the optimization is an indirect utility function that depends on d_{it} , d_t , d_{t-1} , and x_t and which is given by²³

$$(24) \quad I^i(d_{it}, d_{t-1}, d_t, x_t).$$

As in section III, the public evaluates the government on its performance during its term of office. The government's problem is to choose values of d that maximize

$$(25) \quad \text{Max}_{\{d_t, t=1, \dots, n\}} \sum_{t=1}^n E_{g_t} I(d_{t-1}, d_t, x_t).$$

where

$$(26) \quad I(d_{t-1}, d_t, x_t) \equiv \sum_{j=1}^N W_j I^j [d_t(1+V_{jt}), d_{t-1}, d_t, x_t]$$

and

$$(27) \quad W_j \geq 0$$

$$(28) \quad \sum_{j=1}^N W_j = 1.$$

The W_j 's are non-negative weights that reflect the electoral power of individuals of type j .²⁴ The maximization problem in (25) maps into the problem solved by government in equation (14) for a particular specialization of the indirect utility function $I(\cdot)$. Specifically for

$$(29) \quad I(d_{t-1}, d_t, x_t) = A - (d_{t-1} - x_t)^2 - (d_t - x_t)^2$$

and

$$(30) \quad d_t \equiv a_t \text{ for all } t,$$

government's problem in (25) reduces to the minimization problem in (14).

VII. A POLITICALLY MOTIVATED GOVERNMENT FACING VOTERS WITH DIVERSE OBJECTIVES

To this point we have assumed that all individuals have an identical loss function and we have used the loss function of the representative individual as a measure of social loss. This section relaxes that restriction by permitting individual loss functions to differ. Governmental decisions now affect both total welfare and its distribution across individuals. A government seeking

23. Since N is constant, it is subsumed in the function.

24. Since the government takes the distribution parameters V_{jt} as given when choosing d , they are subsumed into the function $I(\cdot)$.

reelection sets its instruments to determine the distribution of welfare across individuals so as to maximize the probability of reelection.

Individuals differ in their preference for activist policy. "Activists" prefer large responses by government to deviations of the state variable, x , from its mean; they favor large changes in a and, *ceteris paribus*, they vote to reelect governments that are "responsive." "Non-activists" prefer small to large changes whenever x deviates from its mean.

Let β_w be the weight assigned by individuals with different preferences for activist policy. The loss function of an individual of type w in period t is

$$(31) \quad L_{t,w} \equiv (a_{t-1} - \beta_w x_t)^2 + (a_t - \beta_w x_t)^2.$$

As in section III, individuals do not directly observe a_t , x_t and the degree of foresight of the incumbent government as summarized by σ_t^2 . Each person knows the level of welfare he experiences during the term of office and also has self-fulfilling beliefs about the relationship between σ_t^2 and the expected value of his own welfare. Each person uses welfare experienced during the incumbent's term to form a rational forecast of his own welfare if the incumbent government is reelected. The likelihood that an individual or group votes for reelection increases with his level of welfare. As before, the probability of reelection is given by equation (10), but equation (11) is replaced by (32).

$$(32) \quad L = \sum_{w=1}^W \psi_w \sum_{t=1}^n L_{t,w},$$

where W is the number of different types of individuals and ψ_w is a coefficient that measures the marginal effect on the probability of reelection of the cumulative welfare experienced by group w during incumbency. Let λ_w be the weight of group w in the population. Obviously,

$$(33) \quad \sum_{w=1}^W \lambda_w = 1,$$

and ψ_w is an increasing function of λ_w . For simplicity and without loss of generality, we set

$$(34) \quad \psi_w = \lambda_w \quad \text{for all } w.$$

Substituting (31) and (34) into (32) and using the same considerations as those that led to equation (14), it follows that maximization of the probability of reelection²⁵ is equivalent to

$$(35) \quad \text{Min}_g \left\{ \sum_{w=1}^W \lambda_w (a_0 - \beta_w x_1)^2 + \sum_{t=1}^{n-1} E_{g^t} \sum_{w=1}^W \lambda_w [(a_t - \beta_w x_t)^2 + (a_{t+1} - \beta_w x_{t+1})^2] + E_{g^n} \sum_{w=1}^W \lambda_w (a_n - \beta_w x_n)^2 \right\}.$$

25. This is the same as maximization of government's objective function in (12).

The first order necessary conditions for this problem yield

$$(36) \quad \begin{aligned} (a) \quad & a_t = (\bar{\beta}/2)\theta(y_t^0 + y_t^1) \quad t = 1, \dots, n-1 \\ (b) \quad & a_n = \bar{\beta}\theta y_n^0 \end{aligned}$$

where

$$(c) \quad \bar{\beta} \equiv \sum_{w=1}^W \lambda_w \beta_w.$$

$\bar{\beta}$ is the (weighted) mean value of the activism parameter for individuals in the population.

The government sets its instruments as if the population was composed of identical individuals all of whom share the preference $\bar{\beta}$ for activism.²⁶ As before, the government does not choose the socially optimal value for the policy instrument in the last period before the election; it chooses $\bar{\beta}\theta y_n^0$. To show that this value is not socially optimal, it is necessary to redefine social optimality in terms of Pareto efficiency since, with differences in tastes, many combinations of welfare are consistent with social efficiency.²⁷ The Pareto efficient frontier is derived by solving the following minimization problem,

$$(37) \quad \text{Min} \sum_w \lambda'_w \sum_{t=1}^n E_{g^t} [(a_t - \beta_w x_t)^2 + (a_t - \beta_w x_{t+1})^2],$$

where the λ'_w are arbitrary positive weights that sum to one. The first order conditions for the problem in equation (37) are

$$(38) \quad a_t = (\bar{\beta}'/2)\theta(y_t^0 + y_t^1)$$

for all t and, in particular, for $t = n$. Here $\bar{\beta}'$ is the weighted, mean value of the β_w using the weights λ'_w .

Comparison of equations (36b) and (38) shows that in the last period before the elections the policymaker chooses a value of a_n that drives the economy inside the Pareto efficient frontier. This result is true in general and, in particular, when $\bar{\beta}' = \bar{\beta}$. As in Section III, the government takes advantage of its superior information at the time of the election to increase the probability of reelection despite the cost to society. The cost, or inefficiency, takes the form of excessive interest in the welfare of the mean voter in period n and complete disregard of the effect on his welfare in the first period after the election.

To evaluate the expected welfare of voter s when government seeks reelection, we compute the expected value of

26. When the distribution of β is symmetric, the mean β is equal to the median and government behaves as if the median voter was an imperfectly informed dictator. This result is similar to that obtained by Meltzer and Richard [1981] in the context of income redistribution with perfectly informed voters.

27. In this context, Pareto efficiency means that it is not possible to improve the welfare of any group of individuals while holding the level of welfare of all the other groups constant.

$$(39) \quad L_s \equiv \sum_{i=1}^n L_{is}$$

for a government that seeks to maximize the probability of reelection. Substituting (36a) and (36b) into (31), substituting the resulting expressions into (39), taking expected values and rearranging, we obtain,

$$(40) \quad EL_s = [2n\beta_s^2 + 2n\bar{\beta}(k(n)\bar{\beta} - \beta_s)\theta]\sigma_x^2$$

where

$$k(n) \equiv (n+1)/2n.$$

Equation (40) divides the population into three groups based on the relative size of β_s . People with $\beta_s = k(n)\bar{\beta}$ are unaffected by the government's ability to forecast as measured by σ_x^2 . Those with $\beta_s > k(n)\bar{\beta}$ gain from improved forecasts (lower σ_x^2). The expected value of their loss, EL_s , declines as σ_x^2 increases. This group includes people with relatively high values of β . Such people favor activist policies, so they prefer government action to inaction. Improved forecasting ability increases policy activism, so the gain from improved forecasting is reinforced by the gain from increased activism. For the remaining group, with $\beta_s < k(n)\bar{\beta}$, the two effects work in opposite directions. Greater precision decreases average losses of the mean voter and may even increase the expected welfare of voters that are not far from the mean. On the other hand, government becomes more activist on average. Increased activism reduces the welfare of all voters with value of β below the mean. For those sufficiently close to the mean the first, positive, effect is dominant. For voters with a sufficiently strong aversion towards activism the second effect dominates, and their expected welfare is lower when the incumbent government is more precise in its forecasts.

Each group uses the actual level of welfare experienced during the government's term of office as an indicator of its expected welfare during a new term. This practice is rational. Actual welfare is an indicator of σ_x^2 , and σ_x^2 determines expected welfare if the government is reelected.

The effect of σ_x^2 on groups with relatively low and high β_s differs, however. Strong activists vote for reelection of a government with good forecasting ability, while strong anti-activists vote against. The latter are a minority. The combined effect, over all groups, is usually positive; governments with better forecasting performance have a better chance to be reelected. This is shown by calculating the conditional expected value of (32) when a government seeks reelection. Using equations (33), (36c), (39) and (40) in (32) and rearranging

$$EL = [2n \sum_{w=1}^W \lambda_w \beta_w^2 + \bar{\beta}^2(1-n)(\sigma_x^2/(\sigma_x^2 + \sigma_e^2))]\sigma_x^2.$$

It follows that (for $n > 1$) governments with better forecasting ability are more likely to be reelected.

VIII. CONCLUDING REMARKS

In a democracy with periodic elections and an imperfectly informed public, discretionary policy does not lead to a socially optimal choice of policy instruments. We call the resulting loss the "cost of democracy". The cost is a gross cost; we make no attempt to compare democracy to other systems, and we neglect all the benefits of democratic government.

The particular cost of democracy that we have identified arises because the public has less information than the government. An optimal state contingent policy rule that precommits government through a constitution, or a similar device, eliminates the cost of democracy by removing the government's opportunity to exploit its information advantage. There are problems of implementation, however. The optimal constitution implied by our model makes governmental actions contingent on the advance information available only to government. Enforcement of a constitutional rule requires full and current knowledge of governmental forecasts. The implementation of the constitution depends, therefore, on the government. Government is tempted not to abide by the constitution when it can improve reelection prospects.

The cost of democracy disappears, without a constitution, when *all* the public are fully informed. Full information by a relatively small group is not sufficient to wipe out the cost, however. The cost reemerges whenever a substantial fraction of voters is uninformed.

We have used a particularly simple framework that abstracts from discounting of future welfare and restricts the length of the lag between policy actions and their effects on welfare. Also, we have used a particular hypothesis to show that monitoring is costly and to give the government an advantage in information. Obviously, there are other sources of informational advantage and other reasons for high costs of monitoring than those we have used.

Our model implies that any government with private information that maximizes the probability of reelection will choose not to maximize social welfare. The public expects the government to increase its welfare before an election, at the expense of a greater loss of future welfare, and it judges the government's competence by its performance in advance of the election. A failure of the government to act in its own interest before the election gives an incorrect inference to the public about the government's competence—measured here by its ability to forecast the performance of the economy.

An example, discussed in section VI, illustrates the qualitative properties of the model in situations where flexibility can increase social welfare. When there are a number of uninformed voters and policy is discretionary, the government's behavior prior to an election is suboptimal. The government uses discretion to increase the probability of reelection at the cost of diminished welfare after the election.

The principles demonstrated have wider application than the specifics of the example used to illustrate the argument or the quadratic loss function

and other hypotheses used to develop the model. We believe the principles apply to any area in which current governmental decisions affect welfare beyond the current period and in which there is asymmetric information.

Even with full transmission of information a constitution of the type considered here requires unanimity with regard to social objectives. When, as in section VII, individuals differ in their views concerning the optimal degree of activism, it may be difficult to agree on the form of the constitution. Making the constitution contingent on the relative power of various groups reduces certainty about future policy, a main advantage of the constitutional rule. Divergence of views within society, differences in information and the electoral advantage to the government from withholding information appear to be sufficiently common to explain why most government policy remains discretionary.

APPENDIX

Derivation of Equation (13)

Since $u(R) - u(NR) > 0$ the maximization problem in (12) is equivalent to

$$(A1) \quad \text{Max}_a E_g P[L(\underline{a}, \underline{x})]$$

Approximating $P[L(\underline{a}, \underline{x})]$ linearly around the point $a = x = 0$

$$(A2) \quad P[L(\underline{a}, \underline{x})] = P[L(0,0)] + P'[L(0,0)][L(\underline{a}, \underline{x}) - L(0,0)]$$

Since from (11) $L(0,0) = 0$ (A2) can be rewritten

$$(A3) \quad P[L(\underline{a}, \underline{x})] = K_0 - KL(\underline{a}, \underline{x})$$

where $K_0 \equiv P[L(0,0)]$ and $K \equiv |P'[L(0,0)]|$. Substituting (A3) into (A1)

$$\text{Max}_a E_g P[L(\underline{a}, \underline{x})] = K_0 - K \text{Min}_a E_g L(\underline{a}, \underline{x})$$

from which it follows that the maximization problem in (A1) is equivalent to the minimization problem in (13). This establishes the equivalence between the latter problem and (12).

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