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An Information Rationale for the Power of Special Interests

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Political decisions are often biased in favor of special interests at the expense of the general public, and they are frequently inefficient in the sense that the losses incurred by the majority exceed the gains enjoyed by the minority. This article explains the bias in terms of information asymmetries and the free-rider problem. First, incumbents increase their reelection prospects by biasing policy toward groups that are better able to monitor their activities. Second, because smaller groups are better able to overcome the free-rider problem of costly monitoring, policy will be biased in their favor. Third, the effect of asymmetric monitoring on voter welfare is ambiguous. The inefficiencies created by the policy bias are offset by a positively valued selection bias: Incumbents of above-average quality are more likely to survive voter scrutiny than are low-quality types.

In many areas of public policy, government favors special interests at the expense of the general public. That favor may take the form of subsidies, tax breaks, or market intervention through regulatory or trade policies. The "rural bias" in industrialized democracies illustrates the inequities and inefficiencies that often result. At the expense of taxpayers and consumers, agricultural price supports improve farm income. In the United States, one-third of the earnings from farming are due to protective agricultural policies; the corresponding proportions are one-half and two-thirds for the European Union (EU) and Japan, respectively.

The implied levels of taxation for agricultural support are quite extraordinary. In 1990, the average cost per nonfarm household amounted to \$1,400 a year, and this cost is expected to increase to \$1,800 (in 1990 dollars) by 2000. According to some estimates, a phased reduction of 50% in agricultural protection would increase economic welfare in the United States, the EU, and Japan by \$32 billion (in 1985 dollars); this number captures the increase in consumer surplus net of the loss in producer surplus. Agricultural protection persists in industrialized economies even though farm output contributes only 2–3% to GDP and the percentage of voters who are members of farm households has dwindled into single digits. (Statistics are drawn from Anderson and Tyers 1992 and *Economist* 1992.)

In many developing countries, policy exhibits an urban bias even though the agricultural sector contributes critically to the national economy and farmers are in the majority (Bates 1981; Lipton 1977). Governments intervene in markets to lower the relative price of farm products, in effect taxing the countryside and subsidizing urban consumers. The reverse power-in-numbers effect manifested in rural and urban biases is

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one of the most intriguing puzzles in the political economy of development.

This article is structured as follows. I first review the explanations for policy biases and inefficiencies provided by the literature and argue that these explanations are incomplete. I then present my informational theory as an improvement on existing theories. Next, I develop a formal model, deriving the policy and selection biases that follow from information asymmetries across groups of voters and endogenizing these information asymmetries as resulting from differences in group size. I then outline the argument informally. I subsequently compare the implications of my theory to existing empirical results and discuss how they might be tested empirically. Finally, I present some extensions of the model and discuss the prospects for political reform.

LITERATURE REVIEW

Economists, who denounce the social deadweight losses arising from inefficient redistribution, are quick to identify the potential for Pareto-improvements: Each member of society could be made better off if special interest handouts were eliminated and the people who had gained from them were to compensate the losers. Theoretically, transaction costs can be invoked to explain why Pareto-improvements fail to be realized: It may be prohibitively costly or infeasible for the winners to pay the losers (Coase 1960). To the extent that transaction costs are impossible to measure, this hypothesis is irrefutable and thus vacuous. As a practical matter, the potential gains from eliminating the policy bias toward special interests appear so high as to render the transaction cost hypothesis implausible as an explanation. Instead, social scientists identify various deficiencies in political processes or institutions as the causal factor driving inefficient redistribution.

The Free-Rider Problem of Collective Action

In *Federalist 10*, James Madison raised the specter of democracy turning into a tyranny of the majority, that is, a political majority acquiring benefits at the expense of a political minority. With this admonition in mind, it

is all the more puzzling that politicians cater to narrow special interests at the expense of the electorate at large.

Olson (1965, 127–8) identifies the free-rider problem of collective action as the source of the policy bias toward special interests:

Since relatively small groups will frequently be able voluntarily to organize and act in support of their common interests, and since large groups normally will not be able to do so, the outcome of the political struggle among the various groups in society will not be symmetrical. . . . The small oligopolistic industry seeking a tariff or a tax loophole will sometimes attain its objective even if the vast majority of the population loses as a result. The smaller groups—the privileged and intermediate groups—can often defeat the large groups—the latent groups—which are normally supposed to prevail in a democracy. The privileged and intermediate groups often triumph over the numerically superior forces in the latent or large groups because the former are generally organized and active while the latter are normally unorganized and inactive.

In a democracy characterized by regular free elections, the free-rider problem of collective action is not sufficient to explain why elected politicians cater to special interests. We would expect rational voters to see through political attempts to curry favor with special interests at their expense. A disaffected majority aware of this policy bias could then punish its political representatives by voting them out of office. Therefore, some degree of voter ignorance appears to be a necessary assumption of theories explaining the policy bias. Such theories rely implicitly on voter illusion: Political incumbents can and do systematically fool a majority of voters by favoring special interests while keeping the costs imposed on the majority below some awareness threshold (Becker 1983, 391–4; Wilson 1980, 369).

Alternatively, under the assumption of voter rationality, the electorate can be thought of as ill informed (Downs 1957). If information gathering is costly, then a large portion of voters may not seek to learn about political alternatives that have the characteristic of being a collective good (possibly with differentiated benefits). The problem is exacerbated because the probability that a single vote—informed or not—makes a difference for the election outcome is usually very small.

The argument that the policy bias derives from rational voter ignorance has some surface plausibility but becomes unsustainable under further scrutiny. As a by-product of engaging in various social and economic activities in daily life, voters accumulate costless information about their personal wealth and well-being. Even if they are ill informed about policy details, they nonetheless know how well off they are, and they can base their vote on this knowledge. Indeed, one robust empirical regularity that holds across industrialized democracies is retrospective voting: Incumbents who preside over good economic performance tend to get reelected (Fiorina 1981). The literature on rational retrospective voting interprets such behavior as the result of rational inferences about the quality of polit-

ical representatives, formed on the basis of observed economic performance (Rogoff 1990; Rogoff and Sibert 1988).

In the face of retrospective voting, an incumbent must trade off gains and losses in political support that follow from favoring one group of voters rather than another. It is simply not obvious that an incumbent can generate a net gain in political support by catering to a well-informed minority at the expense of an ill-informed majority, especially if the total losses incurred by the general public exceed the total gains enjoyed by special interests. Such a policy bias reduces the welfare of a majority of voters and decreases the likelihood that they will vote for the incumbent. If economists are correct in identifying the huge deadweight losses associated with political handouts to special interests (*Economist* 1992; Hufbauer and Elliott 1994), then an incumbent who eradicates such inefficiencies will preside over an increase in the standard of living that will ensure reelection. An incumbent who is incompletely informed about voter preferences will have incentives to set policy in an unbiased and efficient way in order to maximize the welfare of his constituents and thereby maximize his reelection chances. If the incumbent is too short-sighted to follow this prescription, then political competition will allow society to break free from inefficient redistributive policies: A political entrepreneur who campaigns for Pareto-improving political reforms will be elected unanimously (Wittman 1989).

Of course, voters do obtain information not only about their personal wealth and well-being but also about the state of the economy and the quality of life in their society. Public opinion polls transmit information held by a subset of voters to the electorate at large (Bartels 1988; McKelvey and Ordeshook 1985). Interest groups and political candidates gather costly information and provide low-cost information cues to the general public. For example, interest groups monitor legislators' voting records and publish ratings, and challengers attack the legislative records of incumbents they seek to unseat (Lupia 1992). Once again, it is not obvious that an incumbent can afford to "shirk" by catering to a well-informed minority at the expense of a majority of voters if the latter are ill informed most of the time but in an election year "vote as if they had full information" (McKelvey and Ordeshook 1985, 57).

Building on Arnold (1990), I seek to undermine this Panglossian perspective on electoral competition, information, and shirking. First, in a complex world there is virtually an infinite amount of information competing for voters' attention. In the presence of some (possibly very small) cognitive cost of information processing, voters do not necessarily process information even if, by some measure, it is publicly available at no cost. We can expect political competition to work well in preventing an incumbent from acting against the interests of constituents only if an issue is salient in the public mind—or if it can be made salient in a future election by an interest group or a challenger; otherwise, incumbents can and do shirk.

For example, when price inflation was low, Congress supported sugar quotas that implied artificially high

sugar prices, enriching U.S. producers and (in effect) imposing a hidden sales tax on consumers. Neither price inflation nor sugar quotas were salient issues in the mind of the American voter. In 1974 and later in that decade, galloping price inflation figured prominently on the electoral agenda; Congress then repeatedly rejected bills to renew the sugar programs of the past. Sugar quotas themselves did not become electorally salient, but legislators feared a future challenger would make a campaign issue out of a vote that could easily be connected with higher prices (Arnold 1990, 123–5).

Second, the causal chain linking actions taken by an incumbent and policy effects experienced by constituents can be very complex. Interest groups and challengers may not be able to communicate effectively that an incumbent has acted against the interests of constituents. Once again, we can be satisfied that political competition will work well if the incumbent shirks in a way that can be described in a ten-second television “bite.” But in many cases voters lack specialized information to understand that the incumbent acted against their interests, and they cannot acquire this specialized information at low cost.

For example, it would be relatively easy for voters to understand how direct transfers improve the income of automobile workers, but some knowledge of politics and economics is necessary to understand how Congress and the president employ a “voluntary export restraint” to save jobs in the automobile industry at the expense of American consumers:

In February 1981, House Budget Committee Chairman James Jones announced that Congress would soon be voting to impose auto import quotas on Japan. In April, Sen. Bob Dole, chairman of the Senate Finance Committee, warned visiting Japanese legislators that Japan must either reduce its exports or face the wrath of Capitol Hill. President Reagan, “seeking to uphold free trade principles,” as the *New York Times* noted, indicated that his administration would not negotiate with Japan over any specific level of restraint. But Reagan also declared that he would welcome “voluntary” action by the Japanese government to reduce auto exports. Japan announced in late April 1981 that it would restrict auto exports to the U.S. (Bovard 1991, 93).

U.S. auto manufacturers subsequently enjoyed record profits. American consumers paid the bill: The voluntary export restraint on Japanese automobiles raised the average price of a new car by \$1,650 (Collins and Dunaway 1987, 159).

Campaign Contributions and Legislative Failure

Two other sources of the policy bias toward special interests have been identified in the literature. One explanation asserts that incumbents favor organized interests in exchange for campaign contributions (Baron 1994; Grossman and Helpman 1996). Another invokes “legislative failure,” that is, legislative norms or organization characteristics that are dysfunctional from

an aggregate welfare perspective.¹ The canonical story has members of Congress approve one another’s inefficient pork-barrel projects in quid-pro-quo logrolls (Weingast, Shepsle, and Johnsen 1981). Alternatively, “high demanders” are said to self-select onto powerful congressional committees that have jurisdiction over the pork-barrel projects that benefit their districts (Shepsle 1978).

There are limitations to the explanatory power of approaches that emphasize the role of monetary contributions made by interest groups or rely on specific features of Congress. The phenomenon to be explained—the policy bias toward special interests—is observed across many countries with different political processes and institutions. Inefficient forms of public policy are common not only in the United States but also in countries where monetary contributions to political candidates play an insignificant role, in some cases because campaigns are publicly financed. Similarly, pork-barrel politics is not restricted to the U.S. Congress; it also occurs in legislatures controlled by strong political parties that enforce majoritarian party-line voting rather than universalistic logrolls or deference to stacked committees.

AN INFORMATION RATIONALE

This article explains the policy bias toward special interests in a framework with rational, utility-maximizing agents. Two ingredients feed into the explanation: electoral competition and information asymmetries. The latter arise endogenously because of the Olsonian free-rider problem.

First, the theory is based on the assumption that agents are rational. This assumption allows voters to be ill informed, but it requires that they understand the nature of the game: Rational voters cannot be systematically fooled. Second, the theory demonstrates why incumbents can achieve a net gain in political support if they bias policy toward a well-informed minority at the expense of an ill-informed majority, even if the losses imposed on the general public exceed the gains enjoyed by special interests. Third, the underlying information asymmetry is derived endogenously and linked explicitly to the free-rider problem. Fourth, the theory is relatively simple and institution-free. It does not rely on specific features of political processes and institutions that govern any one policy issue or country, except for the one feature that modern democracies have in common: regular free elections in which a majority of the electorate can vote the incumbent government out of office. According to the principle of Occam’s Razor (entities should not be multiplied needlessly), a simple explanation is preferable to a more complex one that invokes idiosyncratic distortions.

I argue that special interests prevail because they are better able to monitor the incumbent’s activities than are diffuse interests. For example, farm households in

¹ Of course, we simply shift the problem when we invoke dysfunctional institutions to explain economic inefficiencies: It remains to be explained why Pareto-improving institutional change fails to occur.

developed countries are generally well informed about legislation dealing with agricultural price supports and subsidies, and they can assess fairly accurately whether and how their political representatives contributed to the passage of an agricultural bill or to the size of price supports and subsidies the bill promises to deliver. In contrast, the huge majority of nonfarm households is unlikely to know that an agricultural bill was passed at all, let alone its details or the contributions made by their political representatives. Members of the general public may well notice the decrease in their real disposable income caused by the increase in food prices and taxes, but they can assign political blame for the loss only very imprecisely. In developing countries, in contrast, it is the urban poor who are well aware of the (subsidized) price of bread and other basic foods, while the welfare of farmers depends on random shifts in the demand for and supply of agricultural products in domestic and international markets, which interact in complicated and opaque ways with actions taken by the government.

Because special interests are better able to monitor the quality of their political representation, incumbents have electoral incentives to bias policy toward special interests. By doing so, they can mimic an increase in quality of life for special interests at the expense of an apparent decrease in quality of life for the general public. Compared to the ill-informed majority, the well-informed minority places a higher weight on the possibility that the observed policy outcome is caused by the incumbent's action rather than other random factors. This difference arises because the signal extraction process of special interests has less confounding "noise." As a consequence, incumbents gain more political support among members of the minority than they lose among members of the majority.

The opportunistic behavior of incumbents creates competitive incentives for individuals to acquire better monitors of political performance. If the incentives to become informed are asymmetrical, then political outcomes will be biased in favor of the well informed at the expense of the ill informed. One source of asymmetry is costly information acquisition. Compared to the general public, special interests face a less severe free-rider problem because they are smaller in number and thus end up becoming better informed, with the result that they enjoy the fruits of the policy bias.

Offsetting that advantage are retrospective voting rules, which cause a welfare-improving selection bias. While elections create incentives for incumbents to follow suboptimal policies for reelection purposes, they also serve to get rid of low-quality incumbents. Incumbents of above-average quality are more likely to survive voter scrutiny and remain in office. Here, "quality" stands for some positive-valued attribute that has the potential to improve the well-being of the electorate when the candidate holds power. Examples are leadership skills, competence in forging legislative coalitions, economic or foreign policy expertise, effectiveness in dealing with corruption or government waste, and the ability to create a political environment that is conducive to economic growth.

THE FORMAL MODEL

Policy and Selection Biases

The model consists of N voters indexed $h = 1, \dots, N$, where $N \geq 3$ and is an odd number. The set of voters is denoted \mathcal{N} . The electorate can be decomposed into two homogeneous groups, a majority whose M individual members are indexed by j , and a minority whose $N - M$ individual members are indexed by i , where $j = 1, \dots, M$, $i = M + 1, \dots, N$, and $(N + 1)/2 \leq M < N$. These two groups will also be referred to as the general public (majority, j) and the special interest (minority, i). The members of each group are homogeneous; the parameters that are common to all members of the majority and minority are indexed by J and I , respectively.

Each voter h desires the incumbent policymaker to take a favorable action, \hat{a}_h ; the voter's utility decreases quadratically with the distance between the action taken by the policymaker, $a \in R$, and the voter's ideal point, \hat{a}_h . The general public's preferences over the policymaker's action conflict with those of the special interest: $\hat{a}_j \neq \hat{a}_I$.

Political candidates are characterized by a quality parameter, q , which is randomly drawn from a normal distribution with zero mean and strictly positive but finite variance, σ_q^2 . Voter utility increases with the incumbent's quality.² The majority and the minority thus have a common interest: to ensure that an incumbent of above-average quality sets policy.

In summary, voter h 's indirect utility in each period is equal to

$$U_h = -\frac{1}{2}(a - \hat{a}_h)^2 + q. \quad (1)$$

Neither the general public nor the special interest can directly observe the action taken by the incumbent; they also cannot directly observe candidate quality. The public can, however, form indirect and imperfect inferences about the incumbent's quality based on observed policy outcomes. Formally, I assume that each individual observes an individual-specific outcome of the policy process:

$$\Pi_h = -\frac{1}{2}(a - \hat{a}_h)^2 + q + p_h, \quad (2)$$

where p_h is an individual-specific process shock, which is randomly drawn from a normal distribution with zero mean and strictly positive but finite variance, $\sigma_{p,h}^2$. The individuals' process shocks are independently distributed. In a simple way, the process shock captures the random nature of the interaction of multiple (unmodelled) actors and circumstances that affect the outcome

² For analytical simplicity, candidate quality enters the utility function additively. For some interpretations of candidate quality, the separability of the policymaker's action and quality might be considered implausible. Alternatively, we could have the distance between the policymaker's action and the voters' ideal points depend on the unknown state of the world. High-quality candidates would have more accurate (lower variance) estimates of the state of the world than would low-quality candidates, with positive consequences for the voters' (quadratic) utilities. The qualitative results of the analysis are robust.

of complex political and economic processes and thus have an effect on voter utility.

In practice, special interests are better informed than is the general public: $\sigma_{p,J}^2 > \sigma_{p,I}^2$. They are better able to disentangle whether observed policy outcomes are caused by incumbent action, incumbent quality, or other random factors confounding their inferences. My analysis is not predicated, however, on the assumption that the minority group is better informed than the majority group. Instead, I first derive the equilibrium without specifying which group (if any) enjoys an information advantage: $\sigma_{p,J}^2 \geq \sigma_{p,I}^2$. Later the information asymmetry across groups is derived endogenously by assuming that each individual h can pay a cost, c_h , to lower the variance ($\sigma_{p,h}^2$) of her observation, Π_h .

Political candidates care about aggregate welfare and about holding power. Their indirect utility in each period is given by

$$\sum_{h=1}^N U_h + S, \quad (3)$$

where the sum of individual utilities stands for aggregate welfare, and the index variable S takes on the value \bar{S} if the political candidate is in power in the period under consideration, the value zero otherwise, $\bar{S} \in (0, \infty)$. The parameter \bar{S} captures the degree to which political candidates are office seeking. It is equal to zero if they are concerned only with aggregate welfare and goes to infinity as the (re)election goal becomes dominant.

The expression for aggregate welfare weighs the individual utilities equally. One distinguishing characteristic of special interests might be that they care more strongly about a certain policy issue than does the general public. This possibility is easily integrated into the model by having the incumbent weigh minority utility more heavily. The qualitative results of the analysis, which defines policy and selection biases relative to the benchmark outcome that maximizes aggregate welfare, are not affected; the benchmark would simply shift with higher weights on minority utility. Similarly, the assumption that the incumbent cares about aggregate welfare is not crucial. Alternatively, we might assume that the incumbent represents the majority group (in the sense of sharing its ideal point). The question, then, is to what extent the incumbent will disregard constituency interests and pander to the minority group to increase the chance of reelection.

Finally, I assume that candidates themselves are uncertain about their quality. One plausible interpretation of quality has both candidates and voters imperfectly informed about the fit between the candidates' known positions and the unknown characteristics of the political and economic environment. For example, candidates might differ in their ideology about the workings of the economy (Roemer 1994), in which case quality would stand for the objective accuracy of their ideology.

The assumption that incumbents are uncertain about

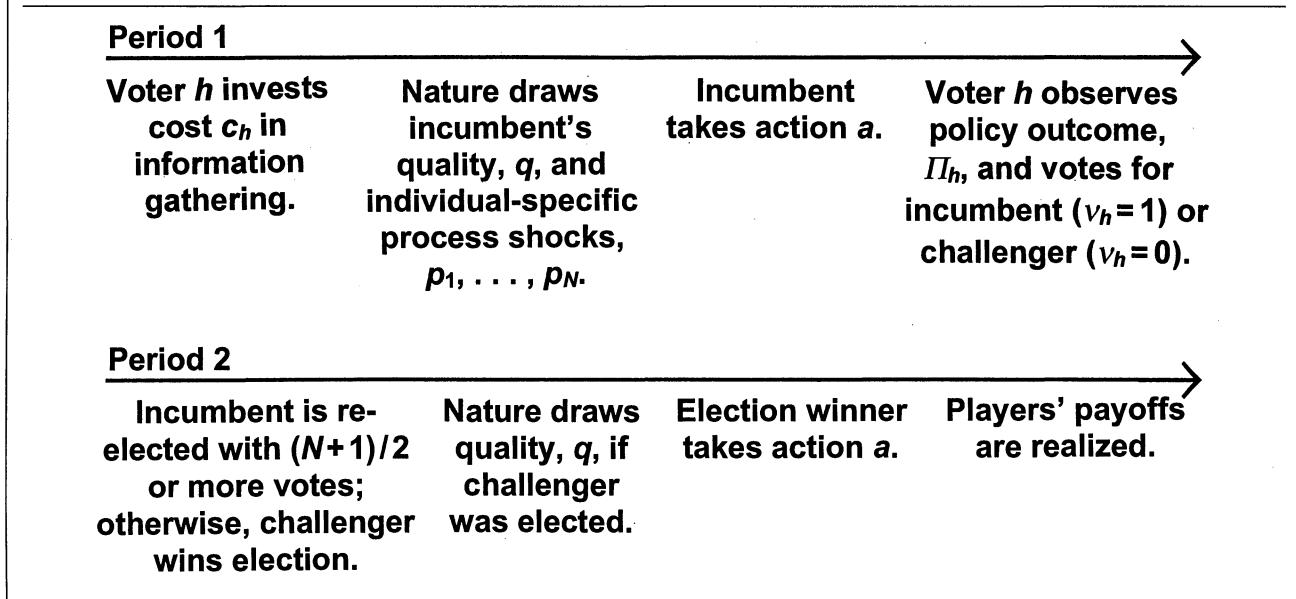
their quality at the time of setting policy serves an important analytical purpose (Lohmann 1998). It isolates the policy bias that arises because incumbents seek to pretend that their quality is higher than it truly is; confounding policy effects would arise if incumbents knew their own quality, but voters did not. In the latter case of asymmetric information, high-quality incumbents would set policy so as to separate themselves from types of lower quality, or low-quality incumbents would mimic the behavior of higher quality types (Rogoff 1990). By excluding such asymmetric information, I demonstrate that the policy bias arises because of the strategic interaction between incumbents and their voters, not because of the strategic interaction between different types of incumbents. The policy bias is driven by incumbents' desire to make voters believe they are of above-average quality, regardless of their actual quality, and not by their desire to separate themselves from lower quality types or mimic the behavior of higher quality types.

The model has two periods, indexed $t = 1, 2$. Supplement 1, available upon request, argues that my conclusions (policy and selection biases and retrospective voting) are robust in the presence of an infinite horizon. Time superscripts are omitted whenever possible to avoid notational clutter. For simplicity, I assume that second-period utilities are not discounted.

Figure 1 lists the sequence of events. In the first period, the incumbent takes an action, a . Then the incumbent's quality, q , and the individual-specific process shocks, p_1, \dots, p_N , are drawn. Voter h does not separately observe the incumbent's action and Nature's draws, only the policy outcome, Π_h , which is jointly determined by the policymaker's action and the quality and process shocks. Voter h then chooses whether to vote for the incumbent ($v_h = 1$) or the challenger ($v_h = 0$). The incumbent remains in power if he receives a majority of the vote, that is, at least $(N + 1)/2$ votes. Otherwise, he is replaced by a challenger. The election winner then takes an action, a . When a challenger wins, his q is a "fresh draw." Finally, the game ends, and the players' payoffs are realized.

The equilibrium concept is a refinement of perfect Bayesian Nash. Voters are restricted to use weakly undominated voting strategies. This refinement is invoked to eliminate implausible voting equilibria of the following kind. Suppose each voter believes that all other voters will vote for one candidate independently of their private information. This candidate will win the election for sure. As a consequence, each voter is indifferent between voting for or against this candidate, and she thus may choose to follow a pure strategy of voting for this candidate independently of her private information. Thus, one candidate may win the election even though it is common knowledge that a majority of voters expect to be better off if the other candidate wins.

Another complication arises in the voting setting analyzed here: the "swing voter's curse" (Feddersen and Pesendorfer 1996). Each voter has private information (the individual-specific realization of the policy outcome, Π_h) about a common value that affects the

FIGURE 1. Election Time Line

utility levels of all voters (the incumbent's quality, q). As a consequence, each individual has incentives to condition her vote on the information implied by her vote being decisive for the election outcome. Voter h 's voting decision is based on her posterior expectation about the incumbent's quality, $E(q|\Pi_h, \sum_{k \in N \setminus h} \nu_k = (N-1)/2)$, where E is an expectations operator. This expectation is conditioned not only on her private information, Π_h , but also on the information implied by exactly $(N-1)/2$ other individuals voting for the incumbent and $(N-1)/2$ other individuals voting for the challenger. (The swing voter's curse besets voters who fail to condition their vote on the information implied by their vote being decisive, analogous to the winner's curse, which besets auction bidders who fail to condition their bids on the information implied by their casting the winning bid.)

Here, I restrict attention to the case in which h votes solely based on her private information without taking into account the information implied by her casting the decisive vote. Supplement 2, available upon request, proves that my conclusions are robust with respect to the swing voter's curse.

DEFINITION. *The unique perfect Bayesian Nash equilibrium, refined to rule out weakly dominated strategies, is given by the incumbent's first-period action, a_1^* ; the individuals' voting rule, $\nu_h^*(\Pi_h)$; and the election winner's second-period action, a_2^* . (The superscript * indexes equilibrium values.) The players' strategies are best responses. The voters use Bayes's rule to update their beliefs.*

PROPOSITION 1. *The unique perfect Bayesian Nash equilibrium, refined to rule out weakly dominated strategies, is given by the incumbent's biased first-period action,*

$$a_1^* = \hat{a}_J \frac{M(1 + \phi_J \bar{S}\epsilon)}{N + M\phi_J \bar{S}\epsilon + (N - M)\phi_I \bar{S}\epsilon} + \hat{a}_I \frac{(N - M)(1 + \phi_I \bar{S}\epsilon)}{N + M\phi_J \bar{S}\epsilon + (N - M)\phi_I \bar{S}\epsilon}, \quad (4)$$

the voters' retrospective voting rule,

$$\nu_h^*(\Pi_h) = \begin{cases} 1 & \text{if } \Pi_h \geq -\frac{1}{2}(a_1^* - \hat{a}_h)^2 \\ 0 & \text{otherwise} \end{cases}, \quad (5)$$

and the election winner's unbiased second-period action,

$$a_2^* = \hat{a}_J \frac{M}{N} + \hat{a}_I \frac{N - M}{N}, \quad (6)$$

where $\phi_h \equiv f_h(0)$, f_h is the probability density function function of $q + p_h$, and

$$\epsilon \equiv \frac{(N-1)!}{\left(\frac{N-1}{2}\right)! \left(\frac{N-1}{2}\right)!} \left(\frac{1}{2}\right)^{N-1}.$$

Proof. The model is solved by backward induction. In the second (and last) period of the game, there are no reelection incentives, so the election winner's action maximizes second-period aggregate welfare. His first-order condition is given by

$$\frac{d \left[E \sum_{h=1}^N U_h^{t=2}(a_2) + \bar{S} \right]}{da_2} = -M(a_2 - \hat{a}_J) - (N - M)(a_2 - \hat{a}_I) = 0. \quad (7)$$

His second-order condition is negative:

$$\frac{d^2 \left[E \sum_{h=1}^N U_h^{t=2}(a_2) + \bar{S} \right]}{(da_2)^2} = -N < 0. \quad (8)$$

It follows that the equilibrium second-period action, a_2^* , given in equation 6, is a weighted average of the two groups' ideal points, with the weights reflecting the groups' relative size.

At the end of the first period, each individual must decide whether to vote for the incumbent or the challenger. Her vote cannot ex post change her first-period utility—it can only influence her second-period utility. The voter supports the incumbent if she expects to be better off if he remains in power. Since the election winner's action is independent of who wins the election, the only difference between the two candidates lies in their expected qualities. The voter has no information (other than her prior beliefs) about the challenger's quality, which is zero in expectation. She cannot directly observe the incumbent's quality, but at the time of the vote she observes the individual-specific policy outcome. The voter supports the incumbent if his estimated q is greater than the expected q of the challenger, which is zero:

$$v_h = \begin{cases} 1 & \text{if } E(q|\Pi_h) \geq E(q) = 0 \\ 0 & \text{otherwise} \end{cases}. \quad (9)$$

The estimate $E(q|\Pi_h)$ is derived using equation 2, which relates q and Π_h . There is no uncertainty about the first-period action, implying that $a_1 = a_1^*$ holds in equilibrium. It follows that equation 2 is equivalent to

$$q + p_h = \Pi_h + \frac{1}{2}(a_1^* - \hat{a}_h)^2. \quad (10)$$

Voter h cannot directly observe the individual components of the left-hand side of equation 10, q and p_h , but she knows that the sum $q + p_h$ is equal to the right-hand side of this equation. She is privately informed about the value of the first term on the right-hand side, Π_h ; the value of the second term, $\frac{1}{2}(a_1^* - \hat{a}_h)^2$, is not directly observed but is known in equilibrium. Her posterior estimate of the incumbent's quality, $E(q|\Pi_h)$, solves the standard signal extraction problem (DeGroot 1970, 167). The value $\Pi_h + \frac{1}{2}(a_1^* - \hat{a}_h)^2$ can be thought of as a random sample from a normal distribution with unknown mean q and variance σ_q^2 , where the prior distribution of the mean q is normal with mean zero and variance $\sigma_{p,h}^2$. Equation 10 thus implies that voter h 's posterior expectation of the incumbent's quality is a function of the observed policy outcome, Π_h :

$$E(q|\Pi_h) = \left(\frac{\sigma_q^2}{\sigma_q^2 + \sigma_{p,h}^2} \right) [\Pi_h + \frac{1}{2}(a_1^* - \hat{a}_h)^2]. \quad (11)$$

Equations 9 and 11 imply that h supports the incumbent if

$$\Pi_h + \frac{1}{2}(a_1^* - \hat{a}_h)^2 \geq 0. \quad (12)$$

The voter thus follows the equilibrium voting rule, v_h^* , given in equation 5.

In the first period, the incumbent trades off the first-period welfare and second-period reelection consequences of his action, a_1 . His first-order condition is given by

$$\begin{aligned} d \left[E \sum_{h=1}^N U_h^{t=1}(a_1) + \bar{S} + E \sum_{h=1}^N U_h^{t=2} + \Pr(S = \bar{S}|a_1)\bar{S} \right] \\ da_1 \\ = -M(a_1 - \hat{a}_J) - (N - M)(a_1 - \hat{a}_I) \\ + \frac{d \Pr(S = \bar{S}|a_1)}{da_1} \bar{S} = 0, \end{aligned} \quad (13)$$

where $\Pr(S = \bar{S}|a_1)$ is the probability that the incumbent survives as a function of his action, a_1 . To examine how this survival probability varies with a_1 , I analyze how h 's vote is affected by a_1 :

$$\begin{aligned} \Pr(v_h = 1|a_1) &= \Pr[\Pi_h \geq -\frac{1}{2}(a_1^* - \hat{a}_h)^2] \\ &= \Pr[q + p_h \geq \frac{1}{2}(a_1 - \hat{a}_h)^2 - \frac{1}{2}(a_1^* - \hat{a}_h)^2] \\ &= 1 - F_h[\frac{1}{2}(a_1 - \hat{a}_h)^2 - \frac{1}{2}(a_1^* - \hat{a}_h)^2], \end{aligned} \quad (14)$$

where F_h is the cumulative distribution function of $q + p_h$. Taking as given the retrospective voting rule, the incumbent can influence the probability that h supports him:

$$\begin{aligned} \frac{d \Pr(v_h = 1|a_1)}{da_1} &= -(a_1 - \hat{a}_h)f_h[\frac{1}{2}(a_1 - \hat{a}_h)^2 \\ &\quad - \frac{1}{2}(a_1^* - \hat{a}_h)^2], \end{aligned} \quad (15)$$

where f_h is the probability density function of $q + p_h$. The incumbent's probability of survival is thus a function of his action, a_1 :

$$\begin{aligned} \frac{d \Pr(S = \bar{S}|a_1)}{da_1} &= -\epsilon M(a_1 - \hat{a}_J)f_J[\frac{1}{2}(a_1 - \hat{a}_J)^2 \\ &\quad - \frac{1}{2}(a_1^* - \hat{a}_J)^2] - \epsilon(N - M)(a_1 - \hat{a}_I)f_I[\frac{1}{2}(a_1 - \hat{a}_I)^2 \\ &\quad - \frac{1}{2}(a_1^* - \hat{a}_I)^2] = -\epsilon M(a_1 - \hat{a}_J)\phi_J \\ &\quad - \epsilon(N - M)(a_1 - \hat{a}_I)\phi_I, \end{aligned} \quad (16)$$

where $\phi_h \equiv f_h(0) = f_h(\frac{1}{2}(a_1 - \hat{a}_h)^2 - \frac{1}{2}(a_1^* - \hat{a}_h)^2)$, noting that $a_1 = a_1^*$ in equilibrium. The parameter ϵ is the probability that a given vote is decisive for the incumbent's survival. Individual h 's vote is decisive if exactly $(N - 1)/2$ voters choose the incumbent and the remaining $(N - 1)/2$ voters choose the challenger. In equilibrium the unconditional probability that h votes for the incumbent, $\Pr(v_h = 1)$, is equal to $1 - F_h(0)$, or one-half. Thus, the probability that her vote is decisive is equal to the binomial probability $b((N - 1)/2; N - 1, 1/2)$ that $N - 1$ Bernoulli trials result in $(N - 1)/2$ successes, with the probability of a success given by one-half, that is,

$$\frac{(N-1)!}{\left(\frac{N-1}{2}\right)!\left(\frac{N-1}{2}\right)!} \left(\frac{1}{2}\right)^{N-1}.$$

The incumbent's first-order condition, equation 13, can now be rewritten as

$$\begin{aligned} d & \left[E \sum_{h=1}^N U_h^{t=1}(a_1) + \bar{S} + E \sum_{h=1}^N U_h^{t=2} + \Pr(S = \bar{S}|a_1)\bar{S} \right] \\ & \quad da_1 \\ &= -M(a_1 - \hat{a}_J)(1 + \phi_J \bar{S}\varepsilon) \\ & \quad - (N-M)(a_1 - \hat{a}_I)(1 + \phi_I \bar{S}\varepsilon) = 0. \end{aligned} \quad (17)$$

His second-order condition is negative:

$$\begin{aligned} d^2 & \left[E \sum_{h=1}^N U_h^{t=1}(a_1) + \bar{S} + E \sum_{h=1}^N U_h^{t=2} + \Pr(S = \bar{S}|a_1)\bar{S} \right] \\ & \quad (da_1)^2 \\ &= -M(1 + \phi_J \bar{S}\varepsilon) - (N-M)(1 + \phi_I \bar{S}\varepsilon) < 0. \end{aligned} \quad (18)$$

The equilibrium first-period action, a_1^* , given in equation 4, follows. Supplement 3, available upon request, proves that the equilibrium is unique. *Q.E.D.*

Two features of the proof are worth highlighting. First, equation 11 contains the central intuition underlying the policy bias. The better informed is voter h , or the lower is the variance ($\sigma_{p,h}^2$) of the process shock (p_h) confounding her inferences, the higher is the weight she places on the observation Π_h , and the lower is the weight she places on her prior expectation of the incumbent's quality, that is, zero. The logic of the signal extraction problem drives the result that a well-informed voter reacts more sensitively to policy favors than does an ill-informed voter, which in turn creates incentives for the incumbent to grant such favors to well-informed voters at the expense of ill-informed voters.

Second, the voter in effect subtracts $\frac{1}{2}(a_1^* - \hat{a}_h)^2$ from the observed policy outcome Π_h , thereby rationally discounting the degree to which the policy outcome is favorable by the amount of the equilibrium policy bias. The incumbent cannot fool the voter: *In equilibrium* the incumbent's attempt to improve his reelection prospects is futile. The unconditional probability that h will support the incumbent's candidacy is equal to $1 - F_h(0)$, or one-half, implying that the incumbent's unconditional probability of survival is equal to

$$\Pr(S = \bar{S}) = \sum_{V=1}^{(N+1)/2} b\left(\frac{(N-1)}{2} + V; N, \frac{1}{2}\right) = \frac{1}{2}. \quad (19)$$

That the incumbent cannot systematically improve his reelection chances follows from the assumption of voter rationality: The voters' signal extraction problem takes into account the effect of the incumbent's manipulations on observed policy outcomes. Nonetheless, the

incumbent is trapped into producing a counterproductive policy bias because voters expect him to favor special interests. If he fails to satisfy their expectations, then he reduces his reelection chances to an unacceptable level. Thus, the voters' expectations are fulfilled in equilibrium.

PROPOSITION 2. *The policy bias is zero if there is no conflict of interest or information disparity between the majority and minority, or if the incumbent places zero weight on the reelection objective:*

$$a_1^* = a_2^* \text{ if } \hat{a}_J = \hat{a}_I, \text{ or if } \sigma_{p,J}^2 = \sigma_{p,I}^2, \text{ or if } \bar{S} = 0. \quad (20)$$

Otherwise, policy is biased toward the well-informed group at the expense of the ill-informed group:

$$\begin{aligned} |a_1^* - \hat{a}_J| &> |a_2^* - \hat{a}_J| \text{ and } |a_1^* - \hat{a}_I| \\ &< |a_2^* - \hat{a}_I| \text{ if } \sigma_{p,J}^2 > \sigma_{p,I}^2; \\ |a_1^* - \hat{a}_J| &< |a_2^* - \hat{a}_J| \text{ and } |a_1^* - \hat{a}_I| \\ &> |a_2^* - \hat{a}_I| \text{ if } \sigma_{p,J}^2 < \sigma_{p,I}^2. \end{aligned} \quad (21)$$

The size of the policy bias increases with the conflict of interest and the information disparity between the two groups and with the weight the incumbent places on the reelection objective:

$$\begin{aligned} \text{sign} \left(\frac{d|a_1^* - a_2^*|}{d|\hat{a}_J - \hat{a}_I|} \right) &= \text{sign} \left(\frac{d|a_1^* - a_2^*|}{d|\sigma_{p,J}^2 - \sigma_{p,I}^2|} \right) \\ &= \text{sign} \left(\frac{d|a_1^* - a_2^*|}{d\bar{S}} \right) > 0. \end{aligned} \quad (22)$$

Proof. The second-period action, a_2^* , which maximizes second-period aggregate welfare, serves as a normative benchmark. A policy bias is obtained if the action taken by an office-seeking incumbent in the first period, a_1^* , differs from this benchmark. The difference is given by

$$a_1^* - a_2^* = \frac{M(N-M)(\hat{a}_J - \hat{a}_I)(\phi_J - \phi_I)\bar{S}\varepsilon}{N + M\phi_J\bar{S}\varepsilon + (N-M)\phi_I\bar{S}\varepsilon}. \quad (23)$$

The conditions under which there is no policy bias, listed in equation 20, follow directly from equation 23, noting that $\phi_J = \phi_I$ is equivalent to $\sigma_{p,J}^2 = \sigma_{p,I}^2$. If none of the conditions in equation 20 are fulfilled, then the incumbent systematically favors the group that is better able to monitor his performance. The conditions determining the direction of the policy bias, listed in equation 21, follow immediately from equation 23; that is, if $\phi_J < \phi_I$ or, equivalently, $\sigma_{p,J}^2 > \sigma_{p,I}^2$, then $\hat{a}_J > \hat{a}_I$ implies $a_1^* < a_2^*$ and $\hat{a}_J < \hat{a}_I$ implies $a_1^* > a_2^*$; and vice versa. The comparative statics listed in equation 22 also follow straightforwardly from equation 23, noting that $|\phi_J - \phi_I|$ is strictly increasing in $|\sigma_{p,J}^2 - \sigma_{p,I}^2|$. (To make sense of this proof, it is useful to recall that $\phi_h \equiv f_h(0)$ is inversely correlated with $\sigma_{p,h}^2$, the variance of the normal density f_h .) *Q.E.D.*

These results demonstrate that the policy bias, $a_1^* \neq a_2^*$, is driven by the conflict of interest, $\hat{a}_J \neq \hat{a}_I$, the information disparity between the majority and minority, $\sigma_{p,J}^2 \neq \sigma_{p,I}^2$, and the incumbent's reelection objective, $\bar{S} > 0$. It is interesting to note that the *direction* of the policy bias depends only on the information disparity between the two groups, while the *size* of the policy bias depends on the conflict of interest and the information disparity between the two groups as well as the weight the incumbent places on the reelection objective.

PROPOSITION 3. *The probability that the incumbent survives the election increases with his quality:*

$$\frac{d \Pr(S = \bar{S}|q)}{dq} > 0. \quad (24)$$

As a result, the expectation of the incumbent's quality conditional on survival is strictly positive:

$$E(q|S = \bar{S}) > 0. \quad (25)$$

The size of this selection bias increases with the degree to which each voter is informed:

$$\frac{dE(q|S = \bar{S})}{d(\sigma_{p,h}^2)} < 0. \quad (26)$$

Proof. Compared with an incumbent of low quality, a high-quality type has better reelection chances because voters are more likely to experience favorable policy outcomes. Formally, equation 24 follows from

$$\begin{aligned} \frac{d \Pr(S = \bar{S}|q)}{dq} &= \varepsilon \sum_{h=1}^N \left[\frac{d \Pr(v_h = 1|q)}{dq} \right] \\ &= \varepsilon \sum_{h=1}^N \left[\frac{d \Pr[\Pi_h \geq -\frac{1}{2}(a_1^* - \hat{a}_h)^2|q]}{dq} \right] \\ &= \varepsilon \sum_{h=1}^N \left[\frac{d \Pr(p_h \geq -q)}{dq} \right] = \varepsilon \sum_{h=1}^N \left[\frac{d[1 - G_h(-q)]}{dq} \right] \\ &= \varepsilon \sum_{h=1}^N [g_h(-q)] > 0, \end{aligned} \quad (27)$$

where G_h is the cumulative distribution function of p_h , and g_h is the probability density function.

A political survivor—a reelected incumbent—tends to be of above-average quality. Formally, equation 28 can be rewritten as

$$E\left(q \mid \sum_{h=1}^N v_h \geq \frac{N+1}{2}\right) > 0, \quad (28)$$

which holds if

$$\Pr(q \geq 0|v_h = 1) > \Pr(q < 0|v_h = 1). \quad (29)$$

Applying Bayes's rule, the expressions on the left- and right-hand sides of equation 29 can be rewritten as

$$\Pr(q \geq 0|v_h = 1)$$

$$= \frac{\Pr(v_h = 1|q \geq 0) \Pr(q \geq 0)}{\Pr(v_h = 1|q \geq 0) \Pr(q \geq 0) + \Pr(v_h = 1|q < 0) \Pr(q < 0)}, \quad (30)$$

$$\Pr(q < 0|v_h = 1)$$

$$= \frac{\Pr(v_h = 1|q < 0) \Pr(q < 0)}{\Pr(v_h = 1|q \geq 0) \Pr(q \geq 0) + \Pr(v_h = 1|q < 0) \Pr(q < 0)}. \quad (31)$$

Noting that $\Pr(q \geq 0) = \Pr(q < 0)$, equations 30 and 31 imply that the inequality in equation 29 holds if

$$\Pr(v_h = 1|q \geq 0) > \Pr(v_h = 1|q < 0). \quad (32)$$

Noting that $\Pr(v_h = 1|q) = 1 - G_h(q)$, equation 32 is equivalent to

$$G_h(-q|q \geq 0) < G_h(-q|q < 0). \quad (33)$$

This establishes the validity of equation 25.

A better informed voter can more readily disentangle the effects of candidate quality and other random factors on observed policy outcomes. Formally, equation 26 holds if

$$\frac{d[\Pr(q \geq 0|v_h = 1) - \Pr(q < 0|v_h = 1)]}{d(\sigma_{p,h}^2)} < 0. \quad (34)$$

Noting that $[\Pr(q \geq 0|v_h = 1) - \Pr(q < 0|v_h = 1)]$ is strictly increasing in $[\Pr(v_h = 1|q \geq 0) - \Pr(v_h = 1|q < 0)]$ (see equations 30 and 31) and that $\Pr(v_h = 1|q) = 1 - G_h(q)$, the inequality in equation 34 holds since

$$\begin{aligned} &\frac{d[\Pr(v_h = 1|q \geq 0) - \Pr(v_h = 1|q < 0)]}{d(\sigma_{p,h}^2)} \\ &= \frac{d[G_h(-q|q < 0) - G_h(-q|q \geq 0)]}{d(\sigma_{p,h}^2)} < 0, \end{aligned} \quad (35)$$

noting that $\sigma_{p,h}^2$ is the variance of the probability density function g_h .

Q.E.D.

PROPOSITION 4. *The policy bias reduces first-period expected aggregate welfare, and the selection bias increases second-period expected aggregate welfare:*

$$\begin{aligned} &E \sum_{h=1}^N U_h^{t=2} - E \sum_{h=1}^N U_h^{t=1} \\ &= \frac{\frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 (\phi_J - \phi_I)^2 \bar{S}^2 \varepsilon^2 M(N - M)}{N[M(1 + \phi_I \bar{S} \varepsilon) + (N - M)(1 + \phi_I \bar{S} \varepsilon)]^2} \\ &\quad + \frac{1}{2} E(q|S = \bar{S}) N. \end{aligned} \quad (36)$$

Proof. First-period expected welfare is given by

$$E \sum_{h=1}^N U_h^{t=1} = -\frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 \frac{M(N-M)[M(1+\phi_J\bar{\epsilon})^2 + (N-M)(1+\phi_I\bar{\epsilon})^2]}{[M(1+\phi_J\bar{\epsilon}) + (N-M)(1+\phi_I\bar{\epsilon})]^2}, \quad (37)$$

and second-period expected welfare is given by

$$E \sum_{h=1}^N U_h^{t=2} = -\frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 \frac{M(N-M)}{N} + \frac{1}{2} E(q|S=\bar{S})N. \quad (38)$$

In the first period there is no potential for a selection bias, only for a policy bias. The expression $-\frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 M(N-M)/N$, which reflects second-period expected welfare minus the expected gains from the selection bias, serves as a normative benchmark that allows us to assess the welfare costs of the first-period policy bias. The first term in equation 38 is equal to the difference between this benchmark and first-period expected welfare. The difference is strictly positive, implying that the policy bias is associated with a welfare loss.

In the second period, there is no potential for a policy bias, only for a selection bias. The second term in equation 38 is equal to the difference between second-period welfare and the benchmark. The difference is strictly positive, implying that the selection bias increases second-period expected welfare. *Q.E.D.*

The voters' retrospective voting rules thus cause a welfare-reducing policy bias and a welfare-improving selection bias. While elections create incentives for incumbents to follow suboptimal policies for reelection purposes, they also serve to get rid of low-quality candidates.

Group Size and Endogenous Information Asymmetries

The results presented so far are based on an exogenously given information disparity between the majority and minority. My analysis is not, however, predicated on the assumption that the members of the minority group are better informed than are the members of the majority group. If, for reasons exogenous to my theory, the majority happens to be better informed, then my theory would imply that policy will be biased in favor of the majority.

This section endogenizes the information asymmetry by examining the incentives of the members of each group to become informed or, equivalently, to acquire a lower-variance monitor of political performance at a cost privately incurred by each individual. Each voter chooses how many resources to invest in gathering information. (Alternatively, we might think of voters as

inhabiting a complex world in which there is virtually an infinite amount of information competing for their attention. In the presence of some, possibly small, cognitive cost of information processing, voters must choose how much costly attention to pay to political information.)

By becoming better informed, the individual achieves two ends. First, she biases policy in favor of her group or contributes toward undoing a policy bias favoring the other group. Second, she improves the selection bias.

The private cost of information gathering in conjunction with the collective implications of the policy and selection biases imply that the individuals' information-gathering decisions are subject to a free-rider problem. This problem is conceptually more complicated than the standard free-rider problem. A within-group free-rider problem is nested in a free-rider problem shared by the entire electorate. With regard to the policy bias, each individual has goals in common with one group of individuals, whereas her goals conflict with those of the other group. A free-rider problem arises because she would prefer other members of her group to bear the costs of information gathering. Yet, she has competitive incentives to gather information so as to undo the effect of the information investments made by the opposing group. With regard to the selection bias, both groups have a common goal: to gather information in order to increase the expected quality of the future incumbent. This collective enterprise is subject to a free-rider problem common to all voters.

Given the importance of group size in standard analyses of the free-rider problem (Olson 1965), it is clearly of interest to examine the degree to which a group is able to overcome this problem as a function of its size. I analyze whether asymmetries in group size translate into an information disparity that in turn causes a policy bias. From a welfare perspective, I examine whether information is under- or oversupplied in equilibrium.

At a stage prior to the game analyzed earlier, voter h decides whether to acquire costly information (see Figure 1). Her choice variable is the private cost of information gathering, c_h , which enters additively into her utility function. The aggregate costs of information acquisition affect the utility function of political candidates who care about aggregate welfare. Because the information costs are sunk at the time of the first-period incumbent's and the election winner's decisions, their equilibrium strategies are not affected.

I now turn to the specification of the information-gathering technology. For an individual h who remains totally uninformed, the variance ($\sigma_{p,h}^2$) of the process shock (p_h) approaches infinity. As the voter gathers more information, the variance decreases, with decreasing marginal returns from information gathering, and goes to zero as the individual becomes fully informed. It is useful to specify the information-gathering technology in terms of the parameter $\phi_h \equiv f_h(0)$, which is inversely correlated with $\sigma_{p,h}^2$; ϕ_h ranges from one to zero as $\sigma_{p,h}^2$ varies from zero to infinity.

For the sake of concreteness, I assume a specific functional form:

$$\phi_h = \sqrt{c_h}, \quad (39)$$

where $c_h \in [0, 1]$; the endpoints of the unit interval correspond to the cases in which voter h remains uninformed and in which she becomes perfectly informed, respectively. Formally, the assumption of positive but diminishing marginal returns from information gathering is reflected in the signs of the first and second derivatives:

$$\frac{d\phi_h}{dc_h} = \frac{1}{2} \frac{1}{\sqrt{c_h}} > 0; \frac{d^2\phi_h}{(dc_h)^2} = -\frac{1}{4} \frac{1}{\sqrt[3]{c_h}} < 0. \quad (40)$$

PROPOSITION 5. *All individuals become partially informed, but each member of the minority invests more resources in information gathering than does each member of the majority:*

$$0 < c_j^* < c_I^* < 1. \quad (41)$$

Proof. The proof makes use of the individual indices, $j = 1, \dots, M$ and $i = M + 1, \dots, N$, even though in equilibrium the members of a given group invest identical resources in information gathering. The reason is that each individual takes as given the equilibrium amount of information purchased by all other individuals, including the members of her own group.

Individual j chooses the cost, c_j , that maximizes her two-period expected utility:

$$\begin{aligned} -c_j + EU_j^{t=1}(\phi_j(c_j)) + EU_j^{t=2}(\phi_j(c_j)) \\ = -c_j - \frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 \\ \frac{(N-M)^2(1+\phi_J\bar{\varepsilon})^2}{[N+\phi_J\bar{\varepsilon}+(M-1)\phi_J\bar{\varepsilon}+(N-M)\phi_I\bar{\varepsilon}]^2} \\ - \frac{1}{2} (\hat{a}_J - \hat{a}_I)^2 \frac{(N-M)^2}{N^2} + \frac{1}{2} E(q|S=\bar{S}). \end{aligned} \quad (42)$$

Her first-order condition is given by

$$\begin{aligned} \frac{d[-c_j + EU_j^{t=1}(\phi_j(c_j)) + EU_j^{t=2}(\phi_j(c_j))]}{dc_j} \\ = -1 + \frac{\partial EU_j^{t=1}}{\partial \phi_j} \frac{\partial \phi_j}{\partial c_j} + \frac{1}{2} \frac{\partial E(q|S=\bar{S})}{\partial \phi_j} \frac{\partial \phi_j}{\partial c_j} \\ = -1 \\ + \frac{(\hat{a}_J - \hat{a}_I)^2(N-M)^2(1+\phi_J\bar{\varepsilon})^2\bar{\varepsilon}}{[N+\phi_J\bar{\varepsilon}+(M-1)\phi_J\bar{\varepsilon}+(N-M)\phi_I\bar{\varepsilon}]^3} \\ - \frac{1}{2\sqrt{c_j}} + \frac{1}{2} \frac{\partial E(q|S=\bar{S})}{\partial \phi_j} \frac{1}{2\sqrt{c_j}} = 0. \end{aligned} \quad (43)$$

Substituting equation 39 into equation 43, and noting that $\phi_j = \phi_J$ and $\phi_i = \phi_I$ in equilibrium, equation 43 can be rewritten as

$$\begin{aligned} -1 + \frac{1}{2\phi_J} \frac{(\hat{a}_J - \hat{a}_I)^2(N-M)^2(1+\phi_J\bar{\varepsilon})^2\bar{\varepsilon}}{[N+\phi_J\bar{\varepsilon}+(N-M)\phi_I\bar{\varepsilon}]^3} \\ + \frac{1}{4\phi_J} \frac{\partial E(q|S=\bar{S})}{\partial \phi_j} = 0. \end{aligned} \quad (44)$$

The corresponding equilibrium first-order condition for an individual of type I is given by

$$\begin{aligned} -1 + \frac{1}{2\phi_I} \frac{(\hat{a}_J - \hat{a}_I)^2M^2(1+\phi_I\bar{\varepsilon})^2\bar{\varepsilon}}{[N+\phi_I\bar{\varepsilon}+(N-M)\phi_J\bar{\varepsilon}]^3} \\ + \frac{1}{4\phi_I} \frac{\partial E(q|S=\bar{S})}{\partial \phi_i} = 0. \end{aligned} \quad (45)$$

Substituting equation 44 into equation 45 and simplifying, the following equation obtains:

$$\begin{aligned} \frac{(\hat{a}_J - \hat{a}_I)^2\bar{\varepsilon}}{[N+\phi_J\bar{\varepsilon}+(N-M)\phi_I\bar{\varepsilon}]^3} \\ [\phi_I(N-M)^2(1+\phi_I\bar{\varepsilon})^2 - \phi_JM^2(1+\phi_J\bar{\varepsilon})^2] \\ = (\phi_J - \phi_I) \frac{1}{2} \frac{\partial E(q|S=\bar{S})}{\partial \phi_h}. \end{aligned} \quad (46)$$

Equation 46 is consistent with exactly one of the following three cases: (1) $M > N - M$ implies $\phi_J = \phi_I$; or (2) $M > N - M$ implies $\phi_J > \phi_I$; or (3) $M > N - M$ implies $\phi_J < \phi_I$. Case 1 contradicts the equality sign in equation 46: $M > N - M$ and $\phi_J = \phi_I$ imply that the left-hand side of equation 46 is strictly negative, while $\phi_J = \phi_I$ implies that the right-hand side is zero. Case 2 also contradicts the equality sign: $M > N - M$ and $\phi_J > \phi_I$ imply that the left-hand side is strictly negative, while $\phi_J > \phi_I$ implies that the right-hand side is strictly positive. It follows that the only case consistent with equation 46 is case 3. Moreover, the assumption of diminishing marginal returns from costly information gathering (see equation 40) eliminates corner solutions, that is, $\phi_J = \phi_I = 0$ or $\phi_J = \phi_I = 1$. It follows that $0 < c_j^* < c_I^* < 1$, as stated in equation 41. Supplement 3, available upon request, shows that the uniqueness-of-equilibrium result continues to hold when the equilibrium play characterized earlier is preceded by an information-gathering stage as specified above.

Q.E.D.

It is worthwhile highlighting that proposition 5 does not imply that the minority group as a whole gathers more information than does the majority group as a whole, nor does it exclude this possibility. Proposition 5 does imply that the information asymmetry $\sigma_{p,J}^2 < \sigma_{p,I}^2$ arises endogenously as a result of special interests being smaller in number than the general public. Along with proposition 1, this implies that policy will be biased toward the minority at the expense of the majority.

PROPOSITION 6. *As the majority increases in size relative to the minority, each member of the majority invests less resources, each member of the minority more resources, in information gathering:*

$$\frac{dc_j^*}{dM} < 0, \quad \frac{dc_i^*}{dM} > 0 \quad \text{for fixed } N. \quad (47)$$

Proof. Equation 47 follows immediately from equation 46, noting that $\phi_h = \sqrt{c_h}$. For fixed N , the case in which an increase in M leads to a decrease in ϕ_j and an increase in ϕ_i is the only case consistent with the equality sign. *Q.E.D.*

There are three reasons a decrease in the relative size of the minority strengthens the minority's, and weakens the majority's, incentives to gather costly information. First, the within-group free-rider problem becomes less severe for the minority, more severe for the majority. Second, the competitive pressures to invest in information so as to offset the information investments made by the other side increase for the minority, which now has fewer members to make such investments, and decrease for the majority, which has more members. Third, the incumbent, who cares not only about reelection but also about aggregate welfare, now places less weight on minority welfare and more weight on majority welfare; the benchmark policy absent differential information investments now becomes more disadvantageous for the minority and more advantageous for the majority. This shift in the benchmark strengthens the minority's, and weakens the majority's, incentives.

The information asymmetry between the special interest and the general public, and thus the policy bias, attains a maximum when the special interest is a single individual ($M = N - 1$) and a minimum when the special interest and the general public are approximately equal in number ($M = (N + 1)/2$). Recall, however, that the policy bias is defined relative to a benchmark that shifts with the number of individuals in each group. In the $M = N - 1$ case, the benchmark policy lies close to the majority's ideal point; in the $M = (N + 1)/2$ case, it lies approximately midway between the ideal points of the two groups. Thus, the comparative statics relating the relative size of the minority group to the size of the information asymmetry and of the policy bias do not translate directly into comparative statics about the location of the equilibrium policy relative to the majority's and minority's ideal points.

PROPOSITION 7. *From an aggregate welfare perspective, information investments driven by the policy bias are oversupplied, while those driven by the selection bias are undersupplied by a factor of N . The net effect is ambiguous:*

$$c_h^* \geq c^W, \quad (48)$$

where c^W is the welfare-maximizing value of c_h .

Proof. Proposition 4 implies that information-gathering efforts driven by the policy bias lead to a welfare loss. From a welfare perspective, the voters should collect zero information for the purpose of influencing the policy bias. Thus, the deadweight cost of information gathering privately incurred by each individual

must be traded off only against the collective gains generated by the resulting increase in the selection bias. Moreover, from a welfare perspective, because of diminishing returns of information gathering, it is optimal for all individuals to be equally well informed: the welfare-maximizing value of c_h , c^W , is identical for all h . This value solves the first-order condition:

$$\begin{aligned} d & \left[-c_h + E \sum_{h=1}^N U_h^{t=1}(\phi_h(c_h)) + E \sum_{h=1}^N U_h^{t=2}(\phi_h(c_h)) \right] \\ & \frac{dc_h}{d\phi_h} \\ & = -1 + 0 + \frac{N}{4\sqrt{c_h}} \frac{\partial E(q|S = \bar{S})}{\partial \phi_h} \\ & = -1 + \frac{N}{4\phi_h} \frac{\partial E(q|S = \bar{S})}{\partial \phi_h} = 0, \end{aligned} \quad (49)$$

where $\phi^W = \sqrt{c^W}$. A comparison of first-order condition 49 with the equilibrium first-order conditions 44 and 45 shows that, in equilibrium, information investments driven by the counterproductive policy bias are oversupplied independent of their size. In contrast, information-gathering efforts driven by the selection bias are undersupplied by a factor of N . The comparison of equations 49, 44, and 45 shows that the net effect is ambiguous. *Q.E.D.*

The result that information may be oversupplied is interesting insofar as it contradicts the standard intuition according to which voluntary and costly contributions to a public good will be suboptimally low. The possibility of oversupply arises because each group has a competitive incentive to outdo the other's information-gathering efforts so as to create a policy bias in their favor. The undersupply of information gathering geared toward the selection bias, by a factor of N , reflects the standard free-rider problem shared by an electorate of size N .

INFORMAL OUTLINE OF THE ARGUMENT

My analysis develops a precise intuition explaining why an incumbent can achieve a net gain in political support when he biases policy toward a minority of voters at the expense of a majority, even if the losses incurred by the general public exceed the gains enjoyed by special interests. Each voter would like to reelect an incumbent of above-average quality, but she cannot fully disentangle the contribution of the incumbent's quality and other forces driving the observed policy outcome. She may experience a favorable policy outcome because the incumbent is a high-quality candidate, because policy is biased in her favor, or because she is lucky. Based on the observed policy outcome, the voter forms an inference about the incumbent's quality. She does so by solving a signal extraction problem that assigns weights to various factors that influence the observed policy outcome, where the weight placed on any one factor decreases with the degree of uncertainty associated with the factor. If the observed outcome is

sufficiently favorable, the voter casts her vote for the incumbent; otherwise she votes for the challenger. The incumbent can mimic an increase in quality vis-à-vis special interests by biasing policy in their favor, at the expense of an apparent decrease in quality vis-à-vis the general public. Compared to the ill-informed majority, the well-informed minority places a higher weight on the possibility that the observed policy outcome is caused by the incumbent's quality. This is because their signal extraction problem is subject to less "noise" confounding their inferences. As a consequence, the incumbent gains more political support among members of the minority than he loses among members of the majority. By continuity, this argument holds even if the policy bias is associated with some inefficiency. The size of the policy bias increases with the information asymmetry between the special interest and the general public.

So far, my theory does not necessarily imply that policy is biased toward special interests. If, for reasons exogenous to the theory, the majority happens to be better informed than the minority, then my theory is consistent with a majoritarian bias. My theory does allow for the possibility that the information asymmetry arises endogenously as a result of individual decisions to gather costly political information (or pay costly attention to political information). The voters' anticipation of policy and selection biases creates incentives to acquire better monitors of political performance. The private costs of information acquisition in conjunction with the collective consequences of policy and selection biases imply that the voters' information-gathering efforts are subject to a free-rider problem. With regard to the policy bias, each individual would prefer other members of her group to bear the costs of information gathering, but she also has competitive incentives to gather information in order to offset the information investments made by the opposing group. Asymmetries in group size translate into an information disparity which in turn causes a counterproductive policy bias: The smaller is the minority relative to the majority, the larger is the bias. From a welfare perspective, information is oversupplied in equilibrium to the extent that the voters' information-gathering efforts are primarily driven by the counterproductive policy bias. With regard to the selection bias, all voters have incentives to become better informed in order to improve the expected quality of the future incumbent. This collective enterprise is subject to the standard free-rider problem. Information is undersupplied in equilibrium to the extent that information acquisition is primarily driven by the selection bias.

EVIDENCE

My theory generates a host of empirical implications, of which three stand out. First, policy is biased in favor of well-informed voters at the expense of ill-informed voters. To the extent that the information asymmetry arises endogenously as a result of individual decisions to gather costly information, special interests, being smaller in number, end up better informed than the

general public. Second, elections give rise to selection effects on the quality of political representatives. Re-elected incumbents tend to be of higher quality than defeated incumbents or the average challenger. Third, voters vote retrospectively, supporting the incumbent, if they experience good policy outcomes, or the challenger, if they experience bad policy outcomes.

Here, I compare the implications of the theory to existing empirical findings and discuss how they might be tested empirically.

Policy Bias

Standard political business cycle theory predicts a policy bias in aggregate economic variables: Incumbents seeking reelection try to manipulate the instruments of economic policy so as to improve the state of the economy before elections (Nordhaus 1975; Rogoff 1990; Rogoff and Sibert 1988). This hypothesis enjoys a strong hold on the scholarly imagination, even though its empirical record is remarkably poor (Alt and Chrysanth 1983). Implicitly or explicitly, the standard theory models the electorate as a unitary actor; by construction, it does not allow for a distributional policy bias. My theory suggests that we should be looking for evidence of preelection effects on redistribution rather than the aggregate economy. For example, Keech and Pak (1989) find an electoral cycle in U.S. veterans' benefits between 1961 and 1978. After 1979, when benefits were indexed to fluctuate automatically with the consumer price index, the cycle disappeared.

There exists abundant anecdotal evidence about preelection handouts to special interests. One month before the 1996 presidential election, the Clinton administration pressured Mexico to adopt a voluntary export restraint that would end the shipment of low-price tomatoes to the United States. The deal provided relief to tomato growers in a swing state, Florida, at the expense of tomato consumers all over the United States (Sanger 1996). Clinton followed a path well trodden by his predecessor. Four years earlier, Bush had traveled the land distributing favors to pivotal groups: In South Dakota, he awarded \$1 billion in subsidies to boost local grain exports; in Texas, he announced approval of a sale of \$4 billion in F-16 fighters to Taiwan, which would guarantee thousands of jobs at the Fort Worth plant of General Dynamics, the aircraft's manufacturer; in Missouri, Bush gave the go-ahead for a long-stalled sale of \$5 billion in F-15 aircraft to Saudi Arabia, which would preserve local McDonnell-Douglas jobs (Cornwell 1992). This kind of "surgical" redistribution, which is carefully tailored to a narrow slice of voters at the expense of the American consumer or taxpayer, may well fail to make a statistically significant dent in aggregate measures of protectionism or government spending.

Moving beyond anecdotal evidence, my theory can be tested with a time-series analysis linking the direction and size of redistributional flows between two groups to asymmetries in the relative levels of political information held by the two groups. Consider, for example, the intergenerational distributional conflict

between the minority of retired older people and the majority of working younger people in the United States. The standard tyranny-of-the-majority argument would imply a policy bias favoring the young at the expense of the old. But by some measures the old are doing well compared to the young:

Since 1973, the real median income of households headed by adults aged sixty-five and over has risen by over 25 percent, while the real median income of households under thirty-five has fallen by over 10 percent. Counting all sources of income, poverty is three times as likely to afflict the very young as the very old.... Per capita federal benefits to the elderly tower twelve to one over benefits to children (Petersen 1996, 142-3).

My theory implies that the federal largesse enjoyed by the old at the expense of the young will vary over time with the degree to which older people are relatively better informed about the activities of elected politicians.

To test this hypothesis, it is necessary to construct empirical measures of the redistributional flows from the young to the old and of the relative levels of political information held by the young and the old. Since these redistributional flows take on the complex form of Social Security and Medicare payments rather than the simple form of direct transfers, their measurement is not straightforward. Standard measures of political information reflect the percentage of respondents who can name their representatives in Congress or accurately position the president and various members of Congress in the "ideological" left-right spectrum. These empirical measures capture my theoretical construct only approximately.

It is also necessary to construct adequate controls for confounding factors so as to disentangle the relative explanatory power of my informational theory and other theories, competing and complementary, that identify economic and political forces shaping the redistributional flows from the young to the old. Economic theory emphasizes as important the relative number of older and younger people, or how many working people support one retiree on average, as well as the output and incentive constraints that define the "possibility frontier" for redistributing income and wealth across these two groups. Political science identifies as important the relative number of older and younger voters, with problems of collective action and the idiosyncrasies of political institutions implying different "weights" for younger and older voters. The political power of the old derives from multiple sources. In the modern era, more and more people are living longer, implying that the ratio of older to younger voters is increasing; older people have higher electoral participation rates than do the young; they are better organized, namely, in the American Association of Retired Persons (AARP); they interact more frequently with members of Congress visiting their home district; and they are more likely to reside in a swing state in presidential elections (Florida) (Conway 1991, chapter 2; Roberts 1994, chapter 12).

Older voters are also favored in the game of redis-

tributive politics because they place high weight on "selfish" (pocketbook) issues and low weight on "ideological" (policy) issues and because their policy positions are distributed around the political center. It thus makes sense for office seekers to "buy" the elderly vote by redistributing income to the old, while "paying off" in ideological currency those voters who place high weight on ideological issues and have extremist policy positions (Dixit and Londregan 1996).

I argue that the political power of older people comes about because they are relatively well informed, especially on issues with important consequences for their wealth and well-being.³ Of two citizens who are otherwise equally well informed about politics and public policy, the citizen over age 64 is more likely to recall news about health insurance than are younger people (Price and Zaller 1993, 156).

Not only do older people have more leisure time to acquire information (that is, for reasons exogenous to my model, they have lower costs of gathering information), but also they receive more information as a result of being better organized. Older people who join the AARP because of the discounts and services it offers receive as a costless by-product of their membership the monthly newsletter, *AARP Bulletin*, and the bi-monthly magazine, *Modern Maturity*. These two communications provide information about the activities of elected politicians, the issue positions of competing political candidates, members' legal rights and entitlements vis-à-vis the government, and the like. The AARP also brings together elected politicians and senior citizens and distributes information about these meetings to members.

Selection Bias

Zaller's (1998) Monte Carlo simulation of congressional career paths provides indirect evidence for the view that elections weed out low-quality candidates. Two initial candidates are assigned "skill" and "luck" scores through random draws from a lottery. The candidate with the higher net score of skill and luck wins the contest and takes on new challengers, who are "fresh draws." Successful candidates keep their skill level throughout their career, but there is a fresh draw of luck for each new contest. Zaller analyzes the patterns of wins and losses and compares the resulting "careers" to actual congressional data. The simulated and empirical data fit on several important dimensions: overall reelection rates, sophomore surges, ten-term survival rates, term-by-term increases in performance,

³ On a tangential note, it is worth mentioning that the political information and participation levels of older people are anomalous. Americans over age 65 are less active in the labor market (they are mostly retired) and less educated than younger generations, and they are disproportionately female (men have a shorter life expectancy). Given the standard empirical correlations between labor market participation, education, and gender, on the one hand, and political information and participation levels, on the other (Conway 1991; Delli Carpini and Keeter 1996; Mayer 1992), we would expect older people to be more ill informed about politics and public policy than they are and to have lower electoral participation rates than they do.

and the relative importance of chance in shaping reelection success.

The selection effects of elections could also be tested by relating the number of times an incumbent is reelected to some measure of competence or quality. For example, we might conjecture that presidents differ in their economic or foreign policy competence. My theory then implies that two-term presidents preside over higher economic growth rates and fewer foreign policy crises, of which a greater number are successfully resolved, compared to one-term presidents. Similarly, we might interpret the quality of a congressional incumbent as standing for skills in pushing legislation through Congress or in "bringing home the pork." My theory then implies that long-term incumbents support or propose more bills, of which a greater number pass, compared to incumbents who lose office soon after their first election. Districts represented by long-term incumbents should enjoy more federal largesse than districts represented by short-term incumbents. To avoid the confounding effects of learning, lame duck status, and seniority, it makes sense to compare the performance of incumbents who subsequently are reelected to the *same-term* performance of incumbents who are not.

Retrospective Voting

The retrospective voting rules in my model are "egocentric," not "sociotropic" (Kramer 1983); that is, voters base their choice on the individual-specific policy outcomes they experience and not on their information about the state of the aggregate economy. My model takes the extreme position that voters only observe individual-specific policy outcomes; they are uninformed about other voters' experiences, and they do not have access to summary statistics reflecting the wealth and well-being of the electorate at large. This extreme assumption is made for the sake of simplicity, not for the sake of empirical realism. If this assumption were relaxed, then the voters' retrospective voting rules would respond to a mix of individual-specific and aggregate concerns.

Empirical tests attempting to discriminate between the egocentric and sociotropic voting hypotheses are beset by the difficulty of measuring how well off an individual voter is along with measuring how she cast her vote. For this reason, much of the evidence relies on survey rather than voting data. For example, Kinder, Adams, and Gronke (1989) employ survey data collected in connection with the 1984 presidential election. They conclude that voters' perceptions of the aggregate economy weighed most heavily, but they also find that individual, group, and national economic well-being constituted related but distinct criteria by which voters assessed the president's performance in office.

A more direct, and persuasive, test of my theory would examine the implication that the vote of special interests responds more sensitively to a given amount of redistribution than does the vote of the electorate at large. The empirical literature on retrospective voting

provides a benchmark: An incumbent can expect to gain X votes with a $Y\%$ increase in constituency income and lose X votes with a $Z\%$ decrease in constituency income. My theory suggests that a $Y\%$ increase ($Z\%$ decrease) in farm income that is causally connected to a farm bill rather than general economic circumstances should increase (decrease) the number of votes in agricultural districts by *more* than X .

EXTENSIONS

Interest Group Organization

One function of political lobbies is to collect information about the activities of elected politicians in a centralized way and then disperse this information among their members. The members may also collect information in a decentralized way, in which case the organization serves to pool their information. Either way, organized interests end up with access to better, or less costly, observations of political performance than do unorganized voters.

Why are some interests better organized than others? My theory of endogenous information gathering can be reinterpreted to address this question. Instead of paying a cost to become better informed, individuals might pay a cost to become organized, with the consequence that they will get information about political and economic factors influencing their wealth and well-being. According to my theory, if the number of people on one side of an issue is smaller than the number on the other side, the smaller group will become better organized than the larger group.

In many settings, the explanatory power of my hypothesis is weak compared to that of an alternative hypothesis: selective incentives. To illustrate the explanatory power of the latter, consider the astonishing fact that approximately half of all Americans over age 50, or 33 million people, are members of AARP. There is a simple explanation: For a nominal fee of \$8 per year, members acquire access to valuable private discounts and services.

But selective incentives alone cannot explain why some interests get organized and others do not. To the extent that older people are winning the redistributive "game" with the assistance of AARP, we need to ask why there is no comparable organization for younger people. Presumably some political entrepreneur could found the American Association of Persons Age 30–45 with at Least Two Kids. For a charge of \$8 a year this entrepreneur could offer attractive discounts negotiated with hotel chains and rental car companies and an array of (money-making) services. Of course, the entrepreneur would pay himself a lucrative salary for his efforts. Persons aged 30–45 with at least two kids would be happy to join because of the selective incentives offered. Once the association has, say, ten million members, it would have the power to lobby Congress for tax exemptions and other handouts to people age 30–45 with at least two children—at the expense of everyone else who does not fit this description.

Of course, there is no end to this logic. Why not have an interest group representing people age 20–35 with at least one child? The problem I identify here is isomorphic to the problem of majority rule cycling. A legislature facing the task of distributing a pie by simple majority rule ends up cycling endlessly: Any proposed distribution that makes a majority better off relative to the previous proposal or the status quo can be beaten by another proposal that makes another majority coalition better off (Condorcet 1785). Theoretical solutions to the problem of majority rule cycling in legislatures build on one of two assumptions: Legislators respect legislative norms (for example, a universalistic norm of reciprocal deference, as in Weingast 1979) or legislative organization (for example, recognition and majority rules, as in Baron and Ferejohn 1991). But there are no analogies to legislative norms and legislative organization in collective action. Thus, selective incentives alone do not tell us why older people are organized, to their advantage, and younger people are not, to their disadvantage.

My informational theory could serve as the stepping-stone to a theory of interest group organization: the degree to which people with shared interests are also informationally homogeneous may be one factor determining whether they get organized and pool information.

Special Interest Gridlock as a Multidimensional Collective Dilemma

Lohmann (1996) extends the analysis to more than one policy dimension, constructing an example with three voters and three policy dimensions. Each voter is a well-informed special interest on one dimension, where she benefits from a policy bias in her favor. On the other two dimensions, the voter is part of the ill-informed general public that suffers under the policy bias.

Now suppose that on a given policy dimension the incumbent takes away one dollar from the general public, or 50 cents from each of the two members of the general public, and gives 90 cents to the special interest, with 10 cents representing the deadweight loss of redistribution. The deadweight loss is a decreasing function of the incumbent's competence. Each voter observes, *with error*, that she was taxed a total of one dollar on her two dimensions as a member of the general public, and she observes, again *with error*, that she received 90 cents on her dimension as a special interest. Because the voter is ill informed about her two general public dimensions, she places a high weight on the possibility that the observed loss is due to the error; because the voter is well informed about her special interest dimension, she places a high weight on the possibility that her gains are due to the incumbent's competence. Because the incumbent cannot observe the errors in the voters' signal extraction problems, from his perspective the probability that a given voter supports his candidacy depends probabilistically on the voter's losses and gains on all three dimensions. Because the voter responds less sensitively to a loss on the

two general public dimensions and more sensitively to a gain on the special interest dimension, the incumbent can generate a net increase in the probability that he is reelected by redistributing resources from the general public to the special interest—despite the deadweight loss of redistribution. This result holds even though, because of the deadweight loss, each voter would be better off if the incumbent refrained from redistributive activities *on all policy dimensions*.

In a stylized way, this example captures a collective dilemma within which modern democracies are trapped. Inefficient government policies favor special interests at the expense of the general public. While special interests form a minority on any one policy dimension, just about every citizen is a member—active or not—of at least one special interest group on some policy dimension. Each citizen prefers being favored by government policy even at the expense of inefficiencies imposed on the society at large. But relative to the status quo involving inefficiencies on all policy dimensions, each citizen would be better off if government did not cater to special interests at all. Voters clamor for government to streamline and reduce the scope of its redistributive activities. They are disgusted with special interest politics and with the limited choice of candidates, all of whom are viewed as beholden to special interests. But any serious attempt to implement the expressed wish of the general public requires cutting someone's "pet" program, and any politician who does so can count on being DOA at the polls with respect to the votes of that group.

Opaque Procedures and Inefficient Policy Instruments

Another extension of my theory allows the incumbent to choose between transparent and opaque procedures or efficient and inefficient policy instruments. By employing opaque procedures, he obfuscates the policy bias toward special interests. For example, "legislators hide their tracks by delegating authority to the executive, by combining all actions into a single omnibus bill, by meeting behind closed doors, or by acting without a recorded vote" (Arnold 1990, 119). In economic policy, opaque instruments are often inefficient. For example, opaque market interventions that increase the relative price of agricultural products so as to improve farm income are inferior to transparent direct income transfers; opaque voluntary export restraints are inferior to transparent tariffs. Reelection incentives thus explain why incumbent policymakers deliberately employ inefficient policy instruments (Arnold 1990; Coate and Morris 1995).

The analysis of Arnold and Coate and Morris complements my analysis. I examine voters' incentives to gather costly information to *reduce* the variance confounding their inferences about the incumbent's type. In my interpretation, Arnold and Coate and Morris examine the incumbent's incentives to *increase* that same variance so as to confound the voters' inferences.

Valence versus Position Issues

My analysis assumes that candidate quality is a “valence issue,” that is, candidates are linked with some condition that is valued positively or negatively by the entire electorate (Stokes 1963). In contrast, “position issues” involve government actions over which voters have conflicting preferences. One extension of my theory allows candidates to be purely policy motivated and to differ in their policy preferences. Each voter is incompletely informed about the candidates’ policy ideal points. She only observes the policy outcome. Based on this observation, each voter forms an estimate of the distance between the incumbent’s policy ideal point and her own. She compares this distance to the expected distance between the challenger’s ideal point and her own and then votes for the candidate whose ideal point is expected to be closer. The incumbent thus faces a tradeoff. On the one hand, he can set policy so as to persuade a majority of voters that his interests coincide with theirs, thereby increasing his chances of survival. Because he is policy motivated, the incumbent derives utility from being reelected because he prefers himself to set policy rather than have policy be set by a candidate with different policy preferences. On the other hand, the more the incumbent accommodates any given voter, the larger is the distance between the policy and the incumbent’s ideal point, and the lower is the incumbent’s first-period utility. The incumbent trades off the second-period selection effects and the first-period policy effects on his utility level. Alesina and Cukierman (1990) develop a model along these lines, albeit without allowing for informational heterogeneity among different groups of voters.

Coups, Riots, Rebellions, and Revolutions

My analysis is institution-free with one exception: I assume that a majority of the electorate can vote the incumbent government out of office in regular free elections. With some modifications, my theory also applies when the opposition seizes power by extralegal means. The logic of retrospective voting that holds in democracies (good economic performance improves the reelection prospects of incumbents) holds more generally for other forms of political participation and for nondemocracies: Good economic performance is negatively correlated with coups, riots, rebellions, and revolutions (cf. Londregan and Poole 1996). My analysis adds informational heterogeneity to the standard logic: Incumbents maintain low food prices, to the advantage of urban interests and at the expense of rural interests, to reduce the probability of urban unrest that would threaten their stay in power (Bates 1981).

Common Agency

The analysis also extends the literature on common agency in political settings (Epstein and O’Halloran 1997) by allowing for differentially well-informed political principals. I develop a principal-agent model

with one agent (the incumbent) and multiple principals (the voters). The voters cannot write incentive contracts for the incumbent. Instead, they can vote him out of office if they are dissatisfied with his performance. The incumbent has one task: to supply a differentiated-benefits collective good. Voters differ in the degree to which they can monitor the incumbent’s performance, which contains information about his quality. As a consequence, the incumbent has an incentive to bias policy in favor of voters who have better monitors of his performance. The logic of this argument carries over, with appropriate modifications, to other common-agency relationships in political settings—a legislator balancing the interests of voters and organized interest groups; a party leader trading off electoral pressures against the ideological demands of intraparty factions; a regulatory agency responding to pressures from Congress, the executive, and the courts.

PROSPECTS FOR POLITICAL REFORM

My informational hypothesis explains why political competition does not allow voters and political candidates to break free of special interest gridlock. At first glance, a political entrepreneur who campaigns on eliminating all the perks enjoyed by special interests will be elected by a majority. But people cannot effectively monitor whether the candidate keeps his promise. Once elected, the incumbent seeking reelection shares the incentives of his predecessors to cater to special interests.

The policy bias could be reduced if well-informed interest groups or political candidates dispersed information to the general public, but political competition is unlikely to eliminate all information disparities across voters. The interests of information providers do not usually coincide with those of the general public, and free-rider concerns may undermine their costly efforts to educate the public. But even if voters were smothered with “costless” information, it is doubtful that they would pay attention and process detailed information about the complexities of public policy they do not care much about. In contrast, special interests are “naturally” better informed; compared to the general public, they get costless information as a by-product of their specialized activities, and they have stronger incentives to invest in costly information gathering, to pay costly attention to complex information, and to invest in costly expertise that allows them to understand such information.

The question, then, is whether reform efforts are better aimed at modifying the policymaker’s response. One necessary condition for the redistributive bias favoring special interests is that the incumbent cares about his reelection prospects. That motive could be removed in one of two ways: lifetime tenancy or term limits. Both solutions are imperfect, for two reasons. First, there is no guarantee that an incumbent who either holds office for life or is subject to a tenure restriction has incentives to maximize aggregate welfare as opposed to favoring special interests. The track record of dictators has not been very promising and

incumbents facing electoral termination may well accommodate special interests who control their future career paths. Second, weakening the electoral connection implies forgoing the selection gains generated by retrospective voting: An incompetent incumbent may remain in office for life, and a competent incumbent may be forced out of office after one term.

To remove electoral influences on public policy, elected politicians may choose to set policy by formula or delegate authority to independent agencies. But rigid formulas require ongoing discretionary adjustments to new and unforeseen circumstances, which opens the door to pork-barrel politics. Similarly, a formally independent agency cannot be perfectly isolated from electoral politics. Threatened with the possibility of "runaway" bureaucracies, or agency drift, politicians are reluctant to give up all political control. They set up ex ante and ex post controls that provide an opening for electoral pressures (McCubbins, Noll, and Weingast 1987). For example, interest groups and citizens disaffected by agency decisions may file complaints with their elected representatives and trigger oversight activities (McCubbins and Schwartz 1984). Here, information asymmetries between political principals and their agents create biases and inefficiencies that must be traded off against the benefits of delegation (Hopenhayn and Lohmann 1996; Lohmann and Hopenhayn 1998).

Proposals for reform are often directed at real or perceived deficiencies of the political process and political institutions. If corrupt campaign finance practices are the root of special interest handouts, then campaign finance reform is the answer. If a dysfunctional Congress is taken to be the driving force for inefficient pork-barrel projects, then the line-item veto giving the president the right to strike such projects out of the government budget offers itself as a solution. While I do not dispute that reform efforts of this kind can have a positive effect at the margin, I contend that the fundamental cause of the policy bias lies elsewhere, namely, with the information asymmetry between the general public and special interests.

Effective political reform would close this information gap by affecting people's incentives to monitor the activities of elected politicians. In a large electorate beset by the free-rider problem, however, the incentives to gather costly information are driven by the competitive race for partisan influence and not by the consensus goal of identifying and reelecting "good" politicians. From a welfare perspective, it may well make sense to accept the existence of a policy bias favoring special interests as the price of a selection process that weeds out bad political candidates and favors the good.

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