How An Agenda Setter Induces Legislators to Adopt Policies They Oppose *

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Abstract

This paper addresses the puzzle of why redistributive legislation, which benefits a small minority, may pass with overwhelming majorities. It models a legislature in which the same agenda setter serves for two periods, showing how he can exploit a legislature (completely) in the first period by promising future benefits to legislators who support him. In equilibrium, a large majority of legislators vote for the first-period proposal because they thereby maintain the chance of belonging to the minimum winning coalition in the future. Legislators may therefore approve policies by large majorities, or even unanimously, that benefit few, or even none, of them. The results are robust: some institutional arrangements, such as super-majority rules or sequential voting, limit but do not eliminate the agenda setter's power to exploit the legislature; other institutions such as secret voting do not limit his power.

1 Introduction

Much legislation is usefully viewed as imposing a tax on all legislators (or their constituents) and distributing the benefits among only some groups or individuals. It may therefore appear that proposed legislation can gain majority support only if in a majority of districts the amounts distributed exceed the taxes collected. When this result is violated, say that very few districts benefit from the legislation (as with farm bills), suspicion falls on special interests with extraordinary influence.

We instead show how an agenda setter can induce a majority of legislators to vote for a policy that directly benefits few, or even none, of them: he threatens legislators voting against him in one period that he will exclude them from the winning coalition in a following period. We do not claim that an agenda setter always exploits the legislature; for example, he may not have the agenda-setting powers we discuss, as when he cannot forbid amendments to a policy he proposes. Rather, our analysis can point to conditions which allow for exploitation, and conditions or institutional arrangements which limit it.

A classic example of a legislative leader who long controlled the agenda and used this power, among other powers, to control policy is Joseph Cannon, Speaker of the U.S. House of Representatives from 1903 to 1911, and called at the time the "Tyrant from Illinois." He was reported to punish disloyal members by refusing to schedule their favored legislation, and declining to recognize them to offer amendments or private bills. When chairing the House Rules Committee, he limited amendments that could be made on the floor of the House. Nevertheless, he did not punish all opponents or reward all supporters. Our model can explain how an agenda setter can wield great power even when rewards and punishments are rare or small.

Our analysis is of more than historical interest. Though currently the Speaker has less power than Cannon enjoyed, congressional committees have agenda-setting powers, particularly, when the vote on the floor of the House of Representatives is made under the closed rule. Thus, congressmen with some agenda-setting power enjoy greater pork-barrel spending in their districts. Such politicians include congressmen who are party leaders (Balla et al. 2002; Hird 1991), committee chairs (Ferejohn 1974), and members of prestige committees, especially the Appropriations committee (de Figueiredo and Silverman 2006).

Members of Congress with proposal power—those sitting on the transportation committee—get more spending on transportation projects in their districts than do other congressmen (Knight 2005).[1] A study of earmarks in senatorial bills finds that the number of earmarks Senate majority leader Harry Reid received was more than one standard deviation above the mean number of earmarks for the Senate (Engstrom and Vanberg 2010). In both the Senate and the House, members of the appropriations committees received larger earmarks. In the House, party leaders received more earmarks (Lazarus and Steigerwalt 2009).[2] Similarly, Hardin (1958) argues that farm policy is inefficient, but nevertheless supported in the U.S. Congress, because committee chairmen with agenda power come from farm districts.

Not only legislative leaders have agenda-setting power. Under fast-track legislation in the U.S., the President proposes a treaty that Congress can either accept or reject, but not amend. In the European Union, the Commission has significant agenda-setting power: in some policy domains, only the Commission can propose a policy, and the power of the Council and the Parliament to amend the proposal may be restricted (as by super-majority requirements) depending on the legislative procedure used. Many parliamentary democracies allow the government to propose a policy as a confidence vote, which the legislature can adopt or reject, but not amend. In Germany, Finland, France, Italy, Portugal and Spain, the constitution authorizes the government to make policies questions of confidence. By convention, the government can make the vote on a specific policy a question of confidence in Australia, Canada, the Netherlands, New Zealand, Norway, and the United Kingdom. Other parliaments have procedures permitting votes of confidence. Consider an example from Italy. In 1995, members of the lower house proposed more than 150 amendments to a budget introduced by the Prime Minister. The Prime Minister eventually invoked a confidence vote procedure on his budget package, which the legislature passed without the amendments.[3]

The agenda setter could more generally be the bureaucracy, as in the seminal

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[1]Because, however, different committees may have agenda-setting powers over different policy areas, the benefits members of any one committee can gain may be smaller than the benefits gained by an agenda setter with control over all policy proposals, which we consider. The closed rule is now used for half of the controversial House floor agenda (Doran 2010).

[2]Senate leaders did not receive more earmarks. The difference between the chambers is not surprising given the greater power leaders in the House enjoy than in the Senate.

[3]This discussion of confidence votes is based on Huber (1996).

work by Romer and Rosenthal (1978). But their model underestimates the agenda setter's power, because it assumes voters must be indifferent between the proposal and the status quo, without looking at the bureaucracy's ability to punish opponents. Niskanen (1971) similarly assumes that the executive branch's power is limited to making take-it-or-leave-it offers.

In our model the agenda setter can credibly punish legislators. Such threats are observed. When Senator James Buckley tried to delete forty-four public works projects at the committee stage in the Senate, the members voted down all his amendments, but cut out projects in his home state (as reported by Epple and Riordan 1987). Senator William Proximre was similarly punished for supporting proposals to cut appropriations for the Department of the Interior—a House-Senate Conference Committee deleted the senator's favored project from the Interior appropriations bill (see Ferejohn 1974, p. 114).

Our analysis explains why a district may get more benefits the more closely allied are its representatives with the agenda setter (which can be a political party controlling the central government). Evidence from the United States (see Larcinese, Rizzo and Testa 2006), Spain (see Solé-Ollé and Sorribas-Navarro 2008), Israel (see Rozevitch and Weiss 1993), Brazil (see Brollo and Nannicini 2010), and Japan (see Tamura 2010) show that local governments under the control of the same party as the central government receive higher transfers from the central government.

2 Literature

2.1 Agenda-setting

Studies of agenda-setting have focused on two extreme cases: only one policy is adopted, or else an infinite sequence of policies are adopted. Papers adopting the first approach include important work by Romer and Rosenthal (1978), Baron and Ferejohn (1989), Baron (1989), and Harrington (1990). They assume that any legislator can make a proposal, with proposals considered in a random order. In proposing and voting on policies, a legislator must thus compare the benefits from the proposal to the status quo, and to a future proposal. The sequence of proposal makers gives an early proposer power to gain more benefits to himself than other members of the majority gain.

These models suppose that the amount spent is fixed; because the legislators cannot abolish a program, the issue is only who gets the money. We instead allow for no spending: if the majority votes against a proposal no taxes are imposed. So we can speak of the legislators adopting a proposal that hurts each of them.

The other extreme case has an infinite sequence of policies adopted, and yields exploitation results closer to ours. How legislators can obtain local benefits is discussed by Bernheim, Rangel, and Rayo (2006), who consider the default policy changing from period to period, and the agenda setter in each period offering a policy which depends on the policy that was most recently adopted. The authors show that a majority may support a pork-barrel policy which hurts almost every legislator. Relatedly, Kalandrakis (2004) models a legislature in which a player is selected at random to make a proposal in each round. The proposal is pitted against the status quo, with the winning alternative becoming the status quo in the next round of bargaining. The equilibrium has the proposer eventually extract all benefits for himself in all periods. If, however, a policy can be reconsidered, then legislators have an incentive to protect one another and limit the power of the agenda setter (see Diermeier and Fong 2011 who consider an endogenously evolving default policy).

2.2 Size of winning coalitions

The literature looks at two extreme forms of winning coalitions. One approach, introduced by Riker (1962), predicts the existence of minimum winning coalitions—why should the agenda setter, or for that matter any member of the majority, offer anything to the minority. The agenda-setting models described above also predict minimum winning coalitions.

The other extreme examines conditions under which policies will be passed by very large majorities, with benefits going to almost all legislators. Legislators operating under a "veil of ignorance" (they do not know which coalitions will form in the future) will adopt a norm of universalism that calls for all legislators to benefit from pork barrel projects (Weingast 1979, Shepsle and Weingast 1981, and Grofman 1984). Costs of drafting policy can affect the policies a legislator proposes, by inducing him to propose policies which are supported by a large majority of legislators (Glazer and McMillan 1992), or by proposing policies which other legislators would later not want to amend (Glazer and

McMillan 1990). Tsai and Yang (2010) introduce incomplete information in the Baron and Ferejohn model, showing that oversized coalitions may appear. Relatedly, Norman (2002) considers the Baron-Ferejohn model with sequential voting, showing that any allocation of benefits can constitute an equilibrium. But in their setting no one suffers from adoption of a policy; in our model all legislators prefer that the agenda setter's proposal be rejected (with no tax and no benefits).

2.3 Punishing opponents and rewarding supporters

The idea that a political leader can exercise power by rewarding supporters and punishing opponents is of course not novel. The Introduction mentioned how Joseph Cannon, as Speaker of the House of Representatives, used such tools. The previous papers discussed had an agenda setter ignore how legislators voted in the past in deciding what proposal to make. When such history is considered, punishment strategies can arise, giving an agenda setter much power.

Dal Bó (2007) analyzes how an outside party can influence committee decisions, assuming that bribes can be conditional on the realized voting profile. He shows that a special interest group can generate unanimous approval, although in equilibrium payments are very small. His key insight is that "pivotal bribes," in which a legislator is paid if and only if he casts a decisive vote for the policy, render the voting game a multilateral prisoners' dilemma.[4] Though the analysis below relies on these insights, the influence mechanism differs from his—we allow compensations to be conditioned only on a legislator's vote, which under his model does not allow for costless capture. Moreover, in Dal Bó the special interest is assumed to commit to payments it will make after votes are realized, whereas in our setting compensations are costless for the agenda setter and thus credible. Lastly, whereas Dal Bó allows for cash payments, in much of our analysis the agenda setter is restricted to excluding or including legislators in a minimum winning coalition in a future period. That limitation may appear to limit greatly an agenda-setter's power in earlier periods; we show when it does not.

An agenda setter who can exclude from the majority coalition legislators

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[4]The model is extended by Console-Battilana and Shepsle (2009), who consider payments that either the president or lobbying groups can make to induce legislators to confirm the appointment of a supreme court justice.

who had voted against him can capture a large share of the budget (Baron and Ferejohn 1989, Cotton 2010, and Fan, Ali, and Bernheim 2010). Our results are even stronger: the agenda setter can have much power even under a finite horizon, and in equilibrium the majority in some periods are made strictly worse off by the policy they support.

Bueno de Mesquita et al. (2002) argue that an incumbent, even one who pursues policies that most oppose, can stay in power if members of the incumbent's winning coalition are more likely to become members of the winning coalition in the future than are members of the challenger's coalition. The PRI party in Mexico maintained power by threatening districts which did not support it that they will be denied private benefits from the central government which the PRI controlled (see Diaz-Cayeros, Magaloni, and Weingast 2003). Relatedly, Padró i Miquel shows how a group's fear of later falling under an inefficient and venal ruler that favors another group suffices to discipline supporters. And in discussing governance, Dixit (2009) argues that private order can be sustained by the threat of expulsion. Punishment strategies can be more effective if the principal has some discretion, as we show below in considering entitlements. The importance of discretion as allowing punishment is analyzed by Bernheim and Whinston (1998), who show that in the presence of unverifiability of some outcomes in a contract, efficiency can be enhanced when the obligations of contracting parties are left vague or unspecified.

The power of an agenda setter to punish opponents is considered by Epple and Riordan (1987), who examine repeated interactions, with different individuals having the right to propose policies in different periods, showing that a wide range of allocations can be sustained as equilibria by the threat of political banishment. Like them, we suppose that the punishment for defection is exclusion, which in equilibrium is not invoked. Their result on plutocracy resembles our result about the agenda setter exploiting others. But whereas they consider punishment by multiple legislators, we consider punishment by the agenda setter. They have an infinite horizon whereas we have a finite horizon. And whereas they consider complicated strategies, ours is simple. Moreover, we extend the analysis in several ways, including sequential voting, counter threats, and the agenda setter's decision of whether to privilege the status quo.

3   Assumptions

One person, say the President, or the Speaker of the House, or the majority of a legislative committee, is the agenda setter in each of two periods.[5]

He, and only he, can propose a policy. Votes are public and simultaneous. The cost of any policy is divided equally among all legislators or districts.

The agenda setter maximizes his benefits, subject to the constraint that his proposal is approved only if a majority of legislators vote for it. Each legislator cares only about the net benefits he gets, and votes for a proposal if the present discounted value of voting for the proposal exceeds the present discounted value of voting against.

We look at sub-game perfect, or time-consistent, solutions. Collusion in a two-period model is therefore impossible.

The time line is as follows

1. The agenda setter proposes a policy

2. The agenda setter's proposal is adopted if a majority of legislators vote for it

3. Payoffs are realized

4. The agenda setter again proposes a policy

5. The agenda setter's proposal is adopted if a majority of legislators vote for it

6. Payoffs are realized

4   Illustration

A numerical example illustrates our essential idea. Suppose that in each of two periods the agenda setter proposes a policy which imposes aggregate taxes of

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[5]Consistent with our assumptions, Primo (2002) notes that most political bargaining in the U.S. Congress has only one actor make a formal proposal. Also, consistent with our assumption that the agenda setter remains in power, Cotton (2010) reports that agenda-setting authority in the U.S. Congress rarely changes hands. Since the first U.S. Congress in 1789, for example, there have been only 59 changes in the Speaker of the House, of which no more than 24 can be attributed to the speaker losing support amongst his party. Diermeier and Fong (2011) give further examples of institutions, among them central banks, in which an agenda setter persistently controls proposals.

$1,000,000, divided equally among the 100 districts. Consider a proposal in period 1 which gives $1,000,000 to the agenda setter, and nothing to each of the 100 legislators. Because the net benefit to a legislator of having the policy adopted is $-1,000,000/100 = -$10,000, each prefers that the policy be rejected, and we might expect the legislators to reject the proposal. Such rejection no longer holds when the agenda setter is in power for two periods. He can obtain large support for a similar proposal by providing some legislators a benefit of $1 in the future.

In period 2, the agenda setter proposes to tax each of 100 legislators by $10,000, to give $10,001 to each of 51 legislators, and to give $1,000,000 - (51)(10,001) = $489,949 to himself. Each of the 51 legislators in the majority thus gains $1 in period 2; each of the 49 members in the minority loses $10,000. Since a majority gain, they vote for the policy in period 2.

Now consider again period 1. The agenda setter proposes a benefit to himself of $1,000,000, and says that any legislator who votes against his proposal will be ineligible for the $1 benefit in the future. Suppose that 99 legislators vote for the proposal in period 1. The last legislator could vote for or against. In either case, his vote makes no difference. If he votes against, then in period 2 he will be excluded from the majority coalition, and will lose $10,000. If he votes for the proposal in period 1, then in period 2 he is as likely as any other legislator to become a member of the majority coalition, so that his expected benefit in period 2 is $-10,000 + (51/100)($10,001)= $-4,899.49. That is, a legislator's loss when he votes for the proposal in period 1 is less than when he votes against the proposal. Thus, it is an equilibrium for a legislator to vote for the agenda setter's proposal in period 1. Note that though we supposed that legislators who had supported the proposal in period 1 are equally likely to belong to the winning coalition in period 2, that assumption is stronger than necessary. What is critical is that the probability that a legislator belongs to the winning coalition in period 2 is greater if he voted for the agenda setter's proposal in period 1 than if he did not.

5   Benchmark result

For an analytic solution, suppose that in each of two periods the agenda setter proposes a policy that costs a dollar, and that divides that dollar among the

three legislators and himself. We assume that the agenda setter neither pays taxes nor votes.[6] His proposal is adopted if a majority of legislators vote for it. Denote the intertemporal discount factor by $\delta > 0$. Our solution concept for this game between the agenda setter and the legislators is sub-game perfect equilibrium.

Let the agenda setter use the following strategy. In period 1 he proposes to impose a tax of $1/3$ on each legislator, to give $s \leq 1/3$ to each legislator, and to give the remainder of the budget to himself. Optimization by the agenda setter requires minimizing the side payments s; we will investigate how s depends on the institutional constraints.[7] In period 1 the agenda setter threatens that any legislator who votes against the bill will be politically banished, in the sense that his chance of becoming a member of a future minimum winning coalition is smaller than that of a legislator who voted for the proposal. In period 2, the agenda setter proposes to split a dollar equally with the members of a minimum winning coalition. Any legislator who supported him in period 1 has an equal chance of belonging to the minimum winning coalition in period 2.[8] If a minimum winning coalition requires more members than the number of legislators who supported the proposal in period 1, then the remaining members are chosen with equal probability among the legislators who opposed the agenda setter in period 1. Call this the exclusion strategy.

Consider period 2. No member of the minimum winning coalition gains by rejecting the proposal, and the proposal is supported by a majority.[9]

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[6]The qualitative results of this section are unchanged if the agenda setter were also required to pay taxes, or to vote, and the legislature consisted of at least four members. Were the agenda setter a voting member of the legislature, he would find it even easier to win approval for his proposal—he would need the support of fewer legislators (when the legislature consists of five voters two other legislators are needed as opposed to three when the agenda setter has no vote). The case of three legislators with one of them the agenda setter is special because of the small number of legislators. The equilibrium in Proposition 1 below is still an equilibrium, but in period 1 it is no longer the unique symmetric equilibrium in pure strategies.

[7]In period 1 the agenda setter treats each legislator equally; he cannot target side payments to a subset of legislators or make the payments conditional on votes. This assumption makes it more difficult to explain universal support for the proposal, and so makes our results more striking. For example, in the context of Proposition 2 below, in period 1 the agenda setter could secure approval of his proposal at lower cost to himself by offering s to only two legislators.

[8]Norman (2002) makes a similar assumption. But we make the assumption of equal chances for simplicity; the results hold under weaker assumptions.

[9]Period 2 is a version of a majoritarian ultimatum game. We follow much of the literature in

Turn now to period 1. Given that all legislators face the same situation, we focus on a symmetric equilibrium. Consider a given legislator who expects all other legislators to vote for the proposal. Notice that a single vote does not change the outcome of the collective decision which approves the proposal. A legislator who votes for the proposal has a 2/3 chance of belonging to the minimum winning coalition in period 2, in which case he gets a benefit of 1/3. So, considering the taxes he will pay, his expected net benefit when he votes for the proposal is $-1/3(1 + \delta) + s + \delta 2/9$. A legislator who votes against the proposal will be excluded from the minimum winning coalition in period 2; his payoff is only $-1/3(1 + \delta) + s$. Thus, for any s a legislator strictly prefers to support the agenda setter's proposal in period 1. It is an equilibrium for each legislator to vote for that proposal.[10]

The agenda setter maximizes his surplus by setting $s = 0$; and since he obtains the largest possible surplus, clearly he has no better strategy. In period 1 he obtains the whole surplus, whereas in period 2 his surplus is maximized subject to the constraint that the proposal be accepted. Further reducing the share given members of the minimum winning coalition in period 2 would yield

assuming that a legislator who is indifferent supports the proposal. The condition is stronger than needed. It suffices that with a strictly positive probability the agenda setter's proposal in period 2 is accepted. This assumption rules out an equilibrium of the period 2 voting game in which the legislature rejects the agenda setter's proposal. Acceptance of the period 2 proposal can be justified by several equilibrium refinements. To fix ideas, assume that legislators 1 and 2 are members of the minimum winning coalition proposed in period 2, and that they can gain a penny by approving the proposal. The three Nash equilibria of the period 2 voting stage are (no, no, no), (yes, yes, no) and (yes, yes, yes). Consider a trembling hand equilibrium, and let a legislator vote against his self interest with some small probability. Then in period 2 any one legislator's vote can be decisive with some small probability. So each member of the minimum winning coalition in period 2 prefers to support the agenda setter's proposal and the non-member prefers to use his weakly dominant strategy rejecting the period 2 proposal. Alternatively, notice that (no, no, no) is not a coalition-proof equilibrium, while the other two equilibria are even strong.

[10]We do not have data on whether overwhelming majorities support policies which benefit the agenda setter. But data do show that much legislation is passed with very large majorities. King and Zeckhauser (2003) report that in the 1997-98 session of the U.S. House of Representatives, 324 non-procedural roll-call votes, which constitute 42% of the total, passed with more than 300 votes in a chamber with 435 members. The results are not atypical. Data on the U.S. House of Representatives over the years 1873-1998 show that overwhelming majorities (with ninety percent of those voting on the same side) appear on over forty percent of the roll-call votes in several sessions, and occur on over 25 percent of the roll-call votes in about half of the congressional sessions (Gaines and Sala 2000).

strictly negative benefits to each member, causing them to reject the proposal. The above strategies thus constitute a sub-game perfect equilibrium.

Moreover, a Nash equilibrium in pure strategies cannot have all legislators in period 1 vote against the proposal. Assume they do. Again a single vote does not change the outcome of the collective decision which rejects the proposal. But a legislator who votes for the proposal in period 1 will belong to the minimum winning coalition in period 2. Hence, a legislator who votes for the proposal has zero payoff in period 2. Opposing the proposal reduces the chance of belonging to the minimum winning coalition in period 2, so that total payoffs are $0 + \delta(2/9 - 1/3)$. The difference is $\delta/9 > 0$, which represents the benefit from ensuring membership in the minimum winning coalition in period 2. Thus, a legislator strictly prefers to vote for the proposal in period 1; it is not an equilibrium for all legislators to vote against it.

We summarize with

Proposition 1 *A sub-game perfect equilibrium exists in which*

- *the agenda setter plays the exclusion strategy with $s = 0$ and*

- *in period 1 the legislature unanimously approves the agenda setter's proposal; in period 2 a minimum winning coalition approves the proposal the agenda setter makes in that period.*

Moreover, for any exclusion strategy with $s \geq 0$, it is not an equilibrium for legislators to vote unanimously against the agenda setter's proposal in period 1.

The qualitative results are not a knife-edge; they do not require that in period 2 the agenda setter must be indifferent between including different members in his coalition. First, for emotional reasons, in period 2 the agenda setter may prefer to exclude someone who had voted against him in period 1. Second, all that is needed for the results is that a legislator who voted for the bill in period 1 will more likely belong to the winning coalition in period 2 than a legislator who voted against.

As in many other voting games, our model generates multiple equilibria. For instance, in period 2 a legislator excluded from the minimum winning coalition cannot avoid having the proposal approved, and might as well vote for it. Such behavior would not change the equilibrium payoffs. Other voting behavior in period 1, however, could potentially affect policy.

5.1 Eliminating asymmetric equilibria with side payments

In period 1 there also exist asymmetric equilibria in which one legislator votes for the proposal and free-rides on the negative votes of the two other legislators. In many situations our focus on the symmetric equilibrium seems more reasonable, because in an asymmetric equilibrium identical legislators behave differently. Coordination of legislators on some particular form of asymmetric behavior must be based on some underlying asymmetry which should be modeled explicitly.[11]

If, however, legislators respond to the exclusion strategy (when $s = 0$) by playing asymmetric pure strategies, then the agenda setter's payoffs in period 1 are zero; he could benefit by increasing s. We therefore ask whether some side payment $s \leq 1/3$ eliminates asymmetric equilibria in period 1, and assures approval of the agenda setter's proposal in period 1. And if such an s exists, we determine its minimum value.[12]

Consider the decision of some legislator in period 1. In an asymmetric pure-strategy equilibrium some legislator, whose vote is decisive, votes against the proposal. In voting for the proposal he obtains $-1/3(1+\delta) + s + \delta/3$; opposing yields $-\delta/3 + \delta/6$. A vote in favor is advantageous if and only if $s \geq (2-\delta)/6$. Notice that $(2-\delta)/6$ strictly decreases in δ, and lies in the interval $[1/6, 1/3]$. The more important the future, the more valuable the future benefits of membership in the minimum winning coalition, and the easier it is for the agenda setter to sway the legislator. Moreover, for any $\delta > 0$, some feasible payment yields the agenda setter strictly positive payoffs in period 1, and induces legislators to vote for the proposal. Thus, asymmetric pure-strategy equilibria in period 1 which reject the agenda setter's proposal disappear.

To show that this strategy of the agenda setter and unanimous approval in

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[11] A natural explanation would be a sequential voting procedure. This extension is considered in Subsection 5.2.

[12] Legislators could also respond to the exclusion strategy by playing a symmetric mixed strategy. The Appendix shows that given the agenda setter's strategy with $s = 0$, a mixed-strategy equilibrium exists. Notice that in such an equilibrium, in period 1 the legislature approves the proposal with positive probability, implying that the agenda setter can sometimes exploit the legislature. When the discount factor is sufficiently large, the agenda setter can make side payments that eliminate a mixed-strategy equilibrium, and the equilibrium described in Proposition 1 constitutes the unique symmetric equilibrium for period 1. When the future is not too important, this equilibrium cannot be induced, as for low discount factors such a side payment does not exist. Playing a mixed strategy can thus sometimes protect the legislature from complete exploitation—although it cannot fully eliminate the exploitation.

period 1 are an equilibrium, it remains to consider a given legislator who is not decisive (because he knows or anticipates that none or two other legislators vote in favor). As the vote does not change the outcome in period 1, but increases the legislator's chances of belonging to the minimum winning coalition in period 2, for any s he strictly prefers to vote in favor.

Thus, it is optimal for the agenda setter to offer $s = (2 - \delta)/6$. This value is the smallest payment that in period 1 makes it a (weakly) dominant strategy for each legislator to vote for the proposal. As a result, it overcomes the difficulty that legislators could coordinate on an asymmetric simultaneous voting equilibrium in period 1.

The above strategies thus constitute a sub-game perfect equilibrium. We summarize with

Proposition 2 *a sub-game perfect equilibrium exists in which*

- *the agenda setter plays the exclusion strategy with $s = (2 - \delta)/6$ and*

- *in period 1 the legislature unanimously approves the agenda setter's proposal; in period 2 a minimum winning coalition approves the proposal the agenda setter makes in that period.*

Moreover, in period 1 it is not an equilibrium for the legislators to respond to the exclusion strategy which has $s = (2 - \delta)/6$ by playing an asymmetric pure-strategy equilibrium in period 1.

5.2 Agenda-setting power when each vote is decisive

The equilibria described in Propositions 1 and 2 base the agenda setter's exclusion strategy on two characteristics. First, in equilibrium no individual legislator is decisive and therefore cannot stop the proposal in period 1. Second, the agenda setter can condition future benefits or political exclusion on voting behavior in period 1.[13] To show that what drives our result is the second characteristic, we modify our previous assumptions and suppose that voting is sequential, with voting order 1, 2, 3. As a consequence, under sequential voting in period 1 which approves the proposal, some legislator knows that he is

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[13]Under a secret ballot future benefits or political exclusion can in principle not be conditioned on period 1 voting behavior. Subsection 8.1 discusses conditions under which Proposition 1 continues to hold.

decisive. The individual voting incentives are the same as those in period 1 for legislators who play the asymmetric equilibrium which we analyzed above.

As before, assume that the agenda setter plays the exclusion strategy. Sequential voting does not change the incentives in period 2, and in period 2 a minimum winning coalition will support the proposal.

Suppose the agenda setter sets low payments, say $s = 0$. It is straightforward to see that in period 1 a legislator votes against the proposal if and only if he is decisive. Therefore, legislator 1 votes for the proposal, and free rides on the negative votes of the other two legislators.

On the other hand, Proposition 2 already showed that sufficiently high payments in period 1 make it a (weakly) dominant strategy for each legislator to vote for the proposal in period 1. We thus have the following results:

Corollary 1 *Under sequential voting, a sub-game perfect equilibrium exists in which*

- *the agenda setter plays the exclusion strategy with $s = (2 - \delta)/6$ and*

- *in period 1 the legislature unanimously supports the agenda setter's proposal; in period 2 a minimum winning coalition supports the proposal the agenda setter makes in that period.*

Comparing Corollary 1 to Proposition 1 shows that sequential voting benefits legislators, but does not eliminate the agenda setter's power.

5.3 Agenda-setting power and a legislator's pivotal probability

As shown above, under simultaneous voting (Proposition 1) no legislator is decisive; in contrast, some legislator is decisive under sequential voting (Corollary 1). On the other hand, whereas simultaneous voting does not require side payments, sequential voting does and therefore limits agenda-setting power.

To show that side payments are monotonically increasing (and agenda-setting power is monotonically decreasing) in a legislator's pivotal probability, we make a small change to our previous assumptions and suppose that for some legislator a small benefit in the future may not suffice to induce him to vote for the proposal in period 1. He may have "non-consequentialist" motivations, for

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example, because he wishes to express a preference through the act of voting (see Shayo and Harel (2012) for an overview and experimental evidence for this voting behavior). Assume that with probability p one of the legislators has this attitude and rejects the proposal. The other two legislators are then pivotal, and so p also measures the pivotal probability.[14]

Consider the other two legislators. With probability p they are in the same voting situation as under sequential voting; with probability $1 - p$ the situation is similar to simultaneous voting. It is straightforward to see that the legislators prefer to support the agenda setter's proposal in period 1 if and only if

$$s \geq \tilde{s}(p) \equiv \max\left\{ \frac{2-\delta}{6} - \frac{1-p}{p}\frac{2\delta}{9}, 0 \right\}.$$

The threshold $\tilde{s}(p)$ increases monotonically in the pivotal probability p, until the payments under sequential voting are reached. Notice also that for low values of the pivotal probability, $\tilde{s}(p)$ is constant and zero. Therefore the assumption of completely consequentialist voters who are solely motivated by preferences over policy outcomes can be somewhat relaxed without affecting the result in Proposition 1.

5.4 Observations

Several comments are in order.

First, in the above equilibria the expected benefit of a legislator is $-1/3(1 + \delta) + \tilde{s}(p) + \delta 2/9$. Given the size of the different payments $\tilde{s}(p)$, legislators obtain lower expected payoffs than were both proposals rejected. In period 1 all legislators vote for a policy that hurts all of them.

Second, exploitation is most severe under the conditions of Proposition 1, and exploitation declines with a legislator's pivotal probability. So agenda-setting power is sensitive to the institutions and behavioral conditions under which agenda-setting takes place. Later sections further analyze the sensitivity of our conclusions to variations of our assumptions. The monotonicity of side payments in the pivotal probability suggests that agenda setters are more powerful in large elections, but these issues are not explicitly modeled here.

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[14]The alternative assumption that with probability p any of the three legislators has "non-consequentialist" motivations yields qualitatively the same results. The exposition, however, is more complex because p no longer measures the pivotal probability.

Third, under simultaneous voting (Proposition 1) no legislator is decisive; in contrast, some legislator is decisive under sequential voting (Corollary 1). Thus, the indifference of a legislator who is not decisive strengthens our result, but is not crucial for unanimous approval in period 1.

Fourth, in the basic model (under the conditions of Proposition 1) players do not have a dominant strategy and thus do not find themselves in a multilateral prisoners' dilemma (in which fixing the action of one player, the others are in a prisoners' dilemma). But side payments increase the "incentives for defection," thereby allowing the agenda setter to eliminate the asymmetric voting equilibrium.

Fifth, crucial for unanimous approval is the agenda setter's ability in period 2 to reward a legislator who supported the agenda setter's proposal in period 1. A unanimity rule in period 2 breaks this link between the periods because then in period 2 every vote is needed and no legislator can be excluded. On the other hand, any scarce resource controlled by the agenda setter and valued by legislators could establish such a link. In some situations it is reasonable to interpret the president as the agenda setter. Rewards could then consist, for example, of invitations to the White House, fundraisers, or campaign appearances. In other situations one might think of party leaders as agenda setters, in which case rewards may consist of committee assignments and money from political action committees to reelection campaigns, which are controlled by party leaders.

Sixth, notice that it is not necessary for the result in Proposition 1 that the agenda setter punish with certainty a legislator who opposed the proposal in period 1. It suffices that in period 2 the agenda setter can exclude a legislator with a small but strictly positive probability. This result can reconcile the view by historians that Joseph Cannon, as Speaker of the US House of Representatives, exercised power by punishing opponents, with the findings by Krehbiel and Wiseman (2001) that in making committee appointments Cannon did not consistently reward supporters or punish opponents. For, as we saw, what matters is that when a legislator is not decisive, the cost to him of voting for a policy he dislikes is small or even zero, so that if he expects even a small gain from membership in the winning coalition in a future period, he will support the agenda setter's policy. Strong loyalty can appear under weak punishments and rewards.

6 Generalizations

The benchmark result continues to hold under more general conditions. Here we consider several extensions: a finite number of periods greater than 2, legislators who value the future differently, turnover among legislators, and turnover of the agenda setter.

6.1 Multiple periods of exploitation

The agenda setter's power to exploit the legislature does not depend on offering the reward after just one period of exploitation. Multiple periods allow the agenda setter to exploit the legislature in more periods. We will see that exploitation holds for any finite number of periods.

Consider T periods, denoted by $t = 1, \ldots, T$. A value of $T = 2$ gives the setting of Section 5.

The agenda setter can modify the exclusion strategy in the following way. In all but the last period he proposes to retain the whole budget for himself and threatens that in the last period he will exclude any legislator who had earlier voted against a proposal the agenda setter had made. In the last period, the agenda setter proposes to split the revenue equally with the members of a minimum winning coalition. Any legislator who supported him in all periods before the last one has an equal chance of belonging to the minimum winning coalition in the last period. If a minimum winning coalition requires more members than the number of legislators who supported all proposals before the last period's proposal, then the remaining members are chosen, taking into account the number of times each legislator had voted for the agenda setter's proposals. That is, the two legislators with the most votes in favor participate with probability 1 (in case of ties, equal probabilities are assigned.)

Again, a minimum winning coalition will approve the proposal the agenda setter makes in the last period.

Consider now a given legislator in any period t before the last, with all other legislators voting for the proposal in that period. Because a single vote does not change the outcome of the collective decision which approves the proposal, by voting for the proposal the legislator obtains

$$-\frac{1 - \delta^{T-t}}{3\left(1 - \delta\right)} + \frac{2\delta^{T-t-1}}{9},$$

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the discounted value of tax payments in all periods plus the option value of potential membership in the minimum winning coalition in period T. A legislator who votes against the proposal does not reduce his tax, but excludes himself from future benefits, yielding him expected benefits of

$$-\frac{1-\delta^{T-t}}{3\,(1-\delta)}.$$

Because the difference is strictly positive, a legislator strictly prefers to support the proposals made in periods $t < T$. It follows that there is a sub-game perfect equilibrium in symmetric pure strategies in which each legislator votes for the agenda setter's proposal in each period $t < T$, and in the last period a minimum winning coalition approves the agenda setter's proposal.

It is not an equilibrium for each legislator to oppose the proposal in each period $t < T$. The reason is that any deviation from opposing the proposal in any period assures a legislator of belonging to the minimum winning coalition in the last period. In contrast, a legislator who votes against the agenda setter's proposal in each period will belong to the minimum winning coalition in the last period only with probability 2/3.

6.2   Heterogeneous legislators

Legislators might value the future differently because they have different re-election probabilities in the next election, or because some legislators prefer benefits sooner than others (Tsai and Yang 2010). We suppose now that discount factors differ across legislators, but are (strictly) positive and common knowledge. Notice first that this change in assumptions does not affect the benchmark result in Proposition 1, because the agenda setter's strategy relies only on the discount factors being (strictly) positive.

In the context of Proposition 2, however, side payments are strictly positive and depend on the (common) discount factor. Suppose the agenda setter chooses the size of the common side payments such that it becomes a (weakly) dominant strategy for the two legislators who value the future most to vote for the proposal in period 1. The third legislator will realize that his vote does not affect the outcome in period 1; but he realizes that a positive vote increases his chances to belong to the minimum winning coalition in period 2. The period 1 proposal is therefore unanimously approved. The agenda setter cannot do better because reducing the side payments induces the asymmetric voting equilibrium. The

above strategies thus constitute a sub-game perfect equilibrium, showing the robustness of Proposition 2.

6.3 Term limits and turnover

One might expect that term limits and turnover reduce the agenda setter's ability to punish or reward legislators. For that result to hold, however, the end of the legislators' terms must be close and certain.

Suppose that each district might be represented in the second period by a different legislator. That is, each legislator in period 1 continues only with some probability in period 2. It is easy to see that the result in Proposition 1 is robust, because conditional on continuing to serve, a legislator who votes for the proposal in period 1 enjoys higher expected utility over the two periods than he would by voting against.

Suppose now that between the two periods the identity of the agenda setter may change. More precisely, assume that the probability with which the agenda setter in period 1 continues is q. With probability $1 - q$ in period 2 some other person makes a proposal which is unrelated to voting in period 1, and yields benefits π to the legislator whose voting behavior will be analyzed below.

Let the agenda setter in period 1 use the exclusion strategy. If the agenda setter continues in period 2, his proposal in period 2 will be accepted by a minimum winning coalition.

Consider now a given legislator in period 1, and suppose that all other legislators vote for the proposal. Again, a single vote does not affect the collective decision and the proposal is approved. A legislator who votes for the proposal obtains $-1/3\,(1 + \delta) + \delta(q2/9 - (1 - q)\,\pi)$, whereas voting against yields $-1/3\,(1 + \delta) + \delta\,(1 - q)\,\pi$. The difference is $\delta q2/9 > 0$. When $q = 1$ the trade-off discussed in Section 5 applies. But for any strictly positive probability that the agenda setter continues to serve, a legislator strictly prefers to vote for the proposal in period 1.

If in period 1 each legislator expects all others to vote against the proposal, no single vote would change the outcome of the collective decision which rejects the proposal. But by voting for the proposal a legislator can ensure his membership in the minimum winning coalition in period 2 in case the agenda setter continues. Thus, each legislator strictly prefers to support the proposal in period 1, and it is not an equilibrium for each legislator to vote against it.

Consider now term limits. Term limits which make a legislator leave before the agenda setter leaves means that the legislator will not vote for a policy that benefits the agenda setter.[15] Speaking loosely, term limits may weaken the power of the agenda setter. Instead, the agenda setter would have to form a minimum winning coalition of beneficiaries in each period.[16]

A term limit applying to the agenda setter corresponds to $q = 0$ in the analysis above.[17] Even in this case, the legislators can be exploited. Suppose the current agenda setter will never serve again, but that some current member of the legislature serves as the agenda setter in the future. The current agenda setter can still propose a policy that benefits himself greatly, while giving nothing to all but one legislator. Let the current agenda setter propose a policy that gives benefits to himself and to one other legislator, say P, who may become the agenda setter in the next period. Legislator P would then gain from threatening that when he becomes the agenda setter, he will propose no benefits to any legislator who votes against the benefits proposed to P in period 1. It is therefore an equilibrium for all legislators to vote for the proposal in period 1, and it is not an equilibrium for all to vote against.

7 Institutions that limit the agenda setter's power

7.1 Counter-threats

The analysis so far had the agenda setter threaten legislators with political exclusion, and allowed a legislator to take only one action—vote. A legislator might, however, react to the exclusion strategy with $s = 0$ by making a counter-threat to exclude the current agenda setter if the legislator in question later becomes the agenda setter. The following enriches the basic model to

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[15]Actually, the legislator is indifferent and might as well vote in favor. Proposition 1 is therefore robust, in the sense that it is still an equilibrium to approve the first proposal, and a minimum winning coalition approves the proposal in period 2.

[16]Whereas federal congressmen and senators in the U.S. face no term limits, some states do have term limits for state legislators. Given that these limits are often longer than eight years, they do not seem to restrict the agenda setter's power so much that he must form a minimum winning coalition of beneficiaries in each period.

[17]Office holders may believe that a term limit will not be applied. A recent example of extending term limits is mayor Michael Bloomberg of New York City who won election to a third term.

capture this possibility; we show that in equilibrium the legislators will still be exploited—albeit less than if different agenda setters, serving for two periods each, each play the exclusion strategy with $s = 0$.

Let the legislature consist of five members, with one of them the agenda setter, and with all paying taxes and voting. Voting occurs over two legislative terms, each consisting of two periods. Legislator 1 is the agenda setter in the first two periods; each of the other four legislators is equally likely to be the agenda setter in the following two periods.[18]

Given our assumption of uncertainty over the future agenda setter and the symmetry among legislators who are not the agenda setter in period 1, let each react to the exclusion strategy with $s = 0$ by making the following counter-threat: if the agenda setter in period 1 does not make a payment of s in period 1, he will be excluded from the minimum winning coalition in period 4 in case the legislator making the threat becomes the agenda setter in period 3. If the agenda setter makes the requested payment he will belong to the minimum winning coalition in period 4 with certainty.[19]

Proceeding by backward induction, consider the last period. Notice that even if the two agenda setters are both certain to belong to the minimum winning coalition in the last period, one slot is still open, and the second agenda setter can appropriately reward votes that had been cast in period 3. Note also that the second agenda setter is willing to exclude or to include the agenda setter of periods 1 and 2 in the last period's minimum winning coalition because this costs him nothing. Thus it is an equilibrium for the second agenda setter to play the exclusion strategy with $s = 0$, for the proposal he makes in period 3 to be unanimously approved, and for the proposal he makes in period 4 to be approved by a minimum winning coalition that includes the first agenda setter.

Consider the first term, or periods 1 and 2. The preceding makes it clear that for any exclusion strategy, an equilibrium exists in which the legislature approves the proposals made in periods 1 and 2.

Consider the first agenda setter; call him A1. Suppose that A1 ignores the

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[18]Excluding the possibility of legislator 1 being the agenda setter in the second term makes the counter-threat more credible and exploitation in the first term more difficult.

[19]Again, the agenda setter is supposed to treat each legislator equally, which is here motivated by the uncertainty over the identity of the next agenda setter. Assuming that the agenda setter of the second term is known and that period 1 payments can be individualized would not affect exploitation in period 1, but would affect the distribution within the legislature.

threat, so that $s = 0$ and that A1 will be excluded from the minimum winning coalition in period 4. On the other hand, if A1 gives in, he is assured of belonging to the minimum winning coalition in period 4, at a cost of s. Giving in is better if and only if $-4s + \delta^3/5 \geq 0$, which is equivalent to $s \leq \delta^3/20$.

The optimal counter-threat thus has $s = \delta^3/20$. The above strategies thus constitute a sub-game perfect equilibrium. We summarize with

Proposition 3 *With two terms and a change in agenda setters, a sub-game perfect equilibrium exists in which:*
  In the first term

- *the agenda setter plays the exclusion strategy with $s = \delta^3/20$ and*

- *in period 1 the legislature unanimously approves the agenda setter's proposal; in period 2 a minimum winning coalition approves the proposal the agenda setter makes in that period.*

  In the second term

- *the agenda setter plays the exclusion strategy with $s = 0$ and*

- *in period 3 the legislature unanimously approves the agenda setter's proposal; in period 4 a minimum winning coalition which includes the first agenda setter approves the proposal the agenda setter makes in that period.*

A counter-threat benefits the legislators, but the first agenda setter still obtains at least 4/5 of the period 1 benefits.

7.2 Entitlements

One may think that the agenda setter necessarily gains from committing future policy. But here the opposite occurs. Suppose that whatever policy is adopted in period 1 will also hold in period 2. Roughly speaking, we can think of policies subject to annual appropriations, and of entitlements which remain in force unless explicitly changed. Then the agenda setter in period 1 could no longer threaten to punish in period 2 a legislator who voted against the proposal in period 1. The best the agenda setter could do in period 1 is to propose a policy that gives zero net benefits to members of the minimum winning coalition; that

generates lower benefits to the agenda setter than he could obtain if he had power to set the agenda in both periods.

A different question is what happens if the policy adopted in period 1 continues in force in period 2, unless the agenda setter proposes an amendment, which the legislature supports; that is, the default policy in period 2 is the policy adopted in period 1, rather than no spending in period 2. If in period 1 the legislature adopted a policy that gives all benefits to the agenda setter, in the next period the agenda setter of period 1 would not want to change the policy. By assumption, no one other than the agenda setter in period 1 can propose a new policy in period 2. Therefore, in period 1 no legislator would support the policy that gives negative benefits in period 1, and the best the agenda setter can do in period 1 is to propose a policy that generates zero net benefits to each member of the minimum winning coalition. Put differently, the agenda setter would prefer annual appropriations over entitlements: the default policy strongly affects the agenda setter's power.

8 Institutions that do not limit the agenda setter's power

Some institutional arrangements, such as secret voting, may at first sight appear to greatly restrict, or even to eliminate, the agenda setter's power. We show, however, that they do not.

8.1 Secret ballots

The agenda setter can have much power even if voting is by secret ballot. Under a secret ballot the agenda setter does not know who voted against him, and so cannot later punish a particular defector. It appears that any one legislator would be willing to vote no in period 1, and it appears that he would be willing to do so if with even a small probability he will be decisive. But suppose that each legislator faces a risk of not serving in the next period. The agenda setter can then threaten to give priority to new legislators in the next period if the vote in the current period is not unanimous. That is, in period 2 the minimum winning coalition would include all new legislators, and (if needed) some continuing legislators. Each legislator in period 1 who expects others to

vote for the proposal has an incentive to vote for the proposal. Turnover can increase the agenda setter's power.

The following formalizes this idea. Let a legislator continue in period 2 with probability q. As before, in period 2, each member of the minimum winning coalition gains by supporting the agenda setter's proposal, and it will be adopted. The probability that a legislator belongs to the minimum winning coalition in period 2, conditional on his continuing to serve, is $p^C \equiv 2q^2/3 + (1 - q^2)$ when members of the minimum winning coalition are chosen first from continuing legislators, and $p^N \equiv 2q^2/3 + (1-q)q$ when new legislators have priority in becoming members of the minimum winning coalition.

Consider a given legislator in period 1 and suppose that all other legislators vote for the proposal. In voting for the proposal he obtains $- (1 + \delta q)/3 + q \delta p^C/3$. A legislator who votes against the proposal does not reduce his tax payments, but does cause the agenda setter to give priority to new legislators, yielding the legislator expected benefits of $- (1 + \delta q)/3 + q \delta p^N/3$. Given that $p^C > p^N$, the difference is strictly positive; thus, a legislator strictly prefers to support the agenda setter's proposal in period 1.

Could a symmetric Nash equilibrium in pure strategies have all legislators in period 1 vote against the proposal? Denote by x the number of votes against the proposal in period 1. Suppose the agenda setter threatens that in forming the minimum winning coalition in period 2 he will give priority to new legislators with probability $r(x)$. Assume further that $r(x)$ strictly increases with x. The agenda setter is willing follow such a strategy, because it costs him nothing. Consider period 1 and suppose all legislators vote against the proposal. Again a single vote does not affect the collective decision which rejects the proposal. But a legislator who votes for the proposal increases the chances that a continuing member will belong to the minimum winning coalition. Hence, conditional on continuing to serve, a legislator's expected utility in period 2 is

$$\frac{1}{3}\delta \left(-1 + (1 - r(x))p^C + r(x)p^N\right).$$

The legislator will have to pay taxes in period 2, and his chances of belonging to the minimum winning coalition decline with $r(x)$. Voting for the proposal makes $x = 2$, whereas opposing the proposal makes $x = 3$. The legislator will strictly prefer to vote in favor if and only if $r(3) > r(2)$. Hence, a legislator strictly prefers to vote for the proposal in period 1; unanimous opposition is not

an equilibrium.

8.2 Large legislatures, and partisan benefits

Consider the agenda setter's power when the legislature consists of more than three members. For simplicity let the number of legislators, n, be an odd number.[20] As before, assume simple majority voting, and let the agenda setter play the exclusion strategy. Again, a minimum winning coalition will support his proposal in period 2.

Consider period 1. Suppose all legislators vote for the proposal, so that no individual vote is decisive. The expected utility of a legislator who votes for the proposal is $-(1+\delta)/n + \delta(n+1)/(2n^2)$. The first term is the taxes paid in both periods, as both proposals are approved. The second term represents the expected value of obtaining δ/n with probability $(n+1)/(2n)$. Voting against the proposal in period 1 yields $-(1+\delta)/n$. The difference $\delta(n+1)/(2n^2)$ is strictly positive. Again, a legislator will strictly prefer to support the period 1 proposal: it is an equilibrium for each legislator to vote for the proposal in period 1. We see that the agenda setter benefits from larger legislatures, as $(n+1)/(2n)$, the share of the surplus given to the minimum winning coalition in period 2, decreases with n.

As in our previous analysis, in period 1 this is the unique equilibrium with symmetric pure strategies. A legislator who expects all others to vote against the proposal strictly prefers to vote in favor, because his vote does not change the outcome but assures the legislator of belonging to the minimum winning coalition in period 2. Voting against the proposal makes him belong to this coalition with the smaller probability $(n+1)/(2n)$.

Large legislatures allow us to consider super-majority rules. As now approval of the proposal in period 2 requires more legislators, the agenda setter can extract a smaller surplus in period 2.[21] It is, however, straightforward to see

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[20]This assumption is to simplify the exposition. Proposition 1 extends to even-sized legislatures with at least four members requiring $n/2+1$ votes for approval. A two-person legislature is special because majority rule effectively becomes a unanimity rule and both legislators are pivotal.

[21]In the context of Proposition 1, the agenda setter makes no payments in period 1. With more than three legislators the payments in period 1 in the context of Proposition 2 become $1/n - \delta(n-m)/(n(n-m+1))$, where m is the number of votes in favor necessary for approval. These payments increase with m.

that if the majority requirement is less than unanimity, the preceding argument applies, and in period 1 all legislators vote for a policy that hurts all of them.

The results continue to hold when the agenda setter restricts benefits to members of the majority party. Suppose a majority party has n members and a minority party has m members, with $n > m + 2$.[22] Minority party members expect to be excluded from a future minimum winning coalition because the agenda setter plays the exclusion strategy but promises future benefits only to members of the majority party.[23] It is straightforward to see that the analysis described at the beginning of this Section can be applied, and conclude that the following constitutes a sub-game perfect equilibrium: the agenda setter plays the exclusion strategy restricted to members of the majority party; the proposal in period 1 is approved with the votes of the majority party; the agenda setter's proposal in period 2 is approved by a minimum winning coalition (excluding at least one member of the majority party).

Partisan behavior makes our assumption of a finitely repeated game (rather than of an infinitely repeated game) seem appropriate. An election after period 2 might change the majority party and the agenda setter. In the next term the new agenda setter and legislature might play a similar sub-game perfect equilibrium.

8.3   Separation of budgetary powers

Our results do not require that in each period the decisions on taxation and spending are bundled. Let spending in each of the two periods be fixed at one dollar, so that the three legislators vote only on how to allocate the dollar.[24] In any period in which the proposal is rejected, each legislator gets zero benefits. Assume that the agenda setter plays an exclusion strategy in which he offers in period 2 a small benefit $b > 0$ to members of the winning coalition.

In period 2, no member of the minimum winning coalition gains from opposing the proposal, and the legislature passes it. Consider now a given legislator in period 1, with all other legislators voting for the proposal. When the legislator

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[22]For simplicity take n to be an odd number.

[23]That appears to be the strategy followed by Speaker Joseph Cannon, discussed above, who allowed the leader of the minority party to appoint the minority members of committees. See Finocchiaro (2002).

[24]An analogous result holds if an entitlement program sets benefits to all legislators, but in each period the legislature decides how to allocate taxes among its members.

in question votes for the proposal he gets $b\delta 2/3$, whereas in voting against he gets nothing. Thus, a legislator strictly prefers to support the agenda setter's proposal in period 1, and it is an equilibrium for each legislator to vote for that proposal.[25]

Could a Nash equilibrium in symmetric pure strategies have all legislators in period 1 vote against the proposal? If they do, a legislator who votes for the proposal will belong to the minimum winning coalition in period 2, obtaining $b\delta$. Opposing the proposal reduces the chance of belonging to the minimum winning coalition in period 2, so that total payoffs are $b\delta 2/3$. Thus, a legislator strictly prefers to vote for the proposal in period 1; it is not an equilibrium for all legislators to vote against it.

Put differently, the agenda setter would prefer separation of budgetary powers over combined taxation and spending decisions.

9 Conclusion

It is well known that an agenda setter enjoys power which he can use to his own benefit. But this paper showed much more, suggesting that under not-crazy assumptions the agenda setter in the initial period can gain all the benefits from legislation, impose large costs on all legislators, while getting large majorities to support such a selfish policy. An implication for interpreting observed behavior is that wide support for policy need not mean wide benefits from that policy. The result is surprisingly robust: it holds for multiple periods, and for situations where the agenda setter may later lose power.

Agenda-setting models can also apply to an autocrat in a nondemocratic regime, because even an autocrat needs support for his policies from a part of the society, say the political elite (see e.g. Diermeier and Fong 2011). With such an interpretation our analysis implies that the autocrat might be less constrained in exploiting the elite than commonly thought. Moreover, the autocrat prefers that his future power be restricted. For if he had dictatorial powers in the final period, then he could not credibly promise future rewards and would get little benefits in earlier periods. Paradoxically, the expectation of more formal power endows the proposer with less real power. Put differently, weakness creates

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[25]A technical issue concerns the existence of the optimal amount to offer. That may be solved by making the realistic assumption that a smallest monetary unit exists.

strength.

The qualitative effects of our model can explain some stylized facts. For example, the agenda setter does better for himself, and garners stronger majorities, in earlier periods of power than in his last term. That fits the pattern of a lame duck president losing power. The results can also explain why an agenda setter may not constrain future policy; the ability to change policy in the future is precisely what gives the agenda setter the ability to threaten legislators in earlier periods.

The results of this paper can be viewed in at least three ways. First, the model could explain the power that some agenda setters possess, as exemplified by Speaker Cannon discussed in the Introduction. Second, the model can be viewed as predicting that because an agenda setter can exercise so much power, institutions may arise to limit such power. That indeed happened when the House of Representatives changed its internal rules to reduce Speaker Cannon's power. Or, for example, a legislature may constrain an agenda setter by allowing amendments from the floor. Third, the results can suggest that though an agenda setter has the power to induce a legislature to adopt policies which benefit him alone, agenda setters often have goals other than personal benefits. Earlier we had discussed how an agenda setter may favor members of his own party. Or, as Margolis (1984) suggests, political leaders may be altruistic at least in part, aiming to further the public good, or to go down in history as benefactors of the country.

Appendix

Under majority rule, the equilibrium in period 1 can also have each legislator vote for the proposal with positive probability less than 1. A mixed strategy allows for trading off the increased chance of belonging to the minimum winning coalition in period 2 with the increased probability that an exploitive policy is approved in period 1. This appendix explores, analogously to Proposition 2, the conditions under which a mixed-strategy equilibrium exists, and explores whether the agenda setter can offer sufficient side payments s to induce the equilibrium in Proposition 1.

Consider a given legislator and suppose the other two legislators vote with probability x for the proposal. If the legislator votes for the proposal, his chances of becoming a member of the minimum winning coalition in period 2 are higher, the more often the realizations of the other legislators' mixed strategies specify a vote against the period 1 proposal. More precisely, expected payoffs are given by

$$x^2 \left(-\frac{1}{3} + s + \delta \left(\frac{2}{9} - \frac{1}{3} \right) \right) + 2x(1-x) \left(-\frac{1}{3} + s + \delta \left(\frac{1}{3} - \frac{1}{3} \right) \right) + (1-x)^2 \delta \left(\frac{1}{3} - \frac{1}{3} \right),$$

which simplifies to

$$-\frac{1}{3} \left(2x - x^2 + \frac{x^2 \delta}{3} \right) + sx(2 - x).$$

On the other hand, a legislator who votes against the proposal has a chance of belonging to the minimum winning coalition in period 2 only when at least one other legislator votes against, in which case the proposal in period 1 is rejected. Expected payoffs are thus

$$x^2 \left(-\frac{1}{3} + s - \frac{\delta}{3} \right) + 2x(1-x)\delta \left(\frac{1}{6} - \frac{1}{3} \right) + (1-x)^2 \delta \left(\frac{2}{9} - \frac{1}{3} \right),$$

which simplifies to

$$-\frac{1}{3} \left(x^2 + \frac{\delta}{3} \left(x^2 + x + 1 \right) \right) + sx^2.$$

A legislator is indifferent between voting for and against the proposal if and only if

$$x^2 - x \left(1 - \frac{\delta}{6} \right) + \frac{\delta}{6} + 3x(1-x)s = 0.$$

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Since this equation is quadratic, there exist two equilibria in mixed strategies. Given the unique symmetric pure strategy equilibrium described in Proposition 1, in period 1 the number of symmetric equilibria is therefore three.

Figure 1 shows these equilibria for different side payments s and discount factors δ. Given a side payment, say $s = 0$, which indicates the right-most discontinuous curve, for any δ the two mixed-strategy equilibria have very different comparative statics. For the first equilibrium (the lower part of the discontinuous curve), an increase in the discount factor δ increases the probability that a legislator votes for the proposal; in the second equilibrium (the upper part of the discontinuous curve) the opposite holds.[26] As δ increases the mixed-strategy equilibria converge towards each other.

Interestingly, with more legislators and a discount factor smaller than 1, this convergence might be complete: mixed-strategy equilibria appear not to exist for high discount factors. When the future is important enough, the legislator strictly prefers to increase his chances of membership in the minimum winning coalition in period 2 rather than to reduce the probability that an exploitive policy is approved in period 1. For example, with five legislators and an agenda setter, for a mixed-strategy equilibrium to exist the discount factor must be smaller than 0.6.[27]

The right-most discontinuous curve in Figure 1 applies when $s = 0$; curves further to the left are based on higher payments. The most the agenda setter is willing to pay to each legislator in order to induce the equilibrium in Proposition 1 is $t = (1 - x^3 - 3x^2(1 - x))/3$, because $x^3 + 3x^2(1 - x)$ is his expected payoff

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[26]One could argue that the first equilibrium is more appealing than the second. First, it is plausible that as the future becomes more important the period 1 proposal is more often approved. Second, as the discount factor goes to zero, the first equilibrium converges to the symmetric pure strategy equilibrium in which the proposal is unanimously rejected. The second equilibrium converges to unanimous approval. For $\delta = 0$, unanimous approval is only sustained in equilibrium because of a coordination failure. Third, for any discount factor the expected payoffs are strictly higher at the first equilibrium. Lastly, when there is a collective mistake in which everyone mixes with slightly different probability, the first equilibrium is stable, whereas the second equilbrium is unstable.

[27]With five legislators, a mixed strategy allows for trading off the increased chance of membership in the minimum winning coalition in period 2, given by $\delta(1 - x)^4 2/25 + \delta x(1 - x)^3 1/10 + \delta x^2(1 - x)^2 2/15 + \delta x^3(1 - x)3/20 + \delta x^4 3/25$, with the increased probability that an exploitive policy is approved in period 1, $x^2(1 - x)^2/5$. The former is always larger than $\delta(1/2)^4(16/75)$, whereas the latter is at most $(1/2)^4(1/15)$. Equality can therefore not hold for large δ.

in period 1 from the mixed-strategy equilibrium.

The figure shows that when the discount factor is sufficiently large (roughly greater than 0.6), the agenda setter can avoid a mixed-strategy equilibrium by making side payments. For low discount factors, however, the equilibrium in Proposition 1 cannot be induced. When the future is not sufficiently important, a legislator little values membership in the minimum winning coalition in period 2, and strictly prefers to reduce the probability that an exploitive policy is approved in period 1. In these situations playing a mixed strategy can thus protect the legislature from complete exploitation—although it cannot eliminate the exploitation completely.

References

[1] Balla, Steven J., Eric D. Lawrence, Forrest Maltzman, and Lee Sigelman (2002) "Partisanship, blame avoidance, and the distribution of legislative pork." *American Journal of Political Science*, 46(3): 515-525.

[2] Baron, David P. (1989) "A noncooperative theory of legislative coalitions." *American Journal of Political Science*, 33(4): 1048-1084.

[3] Baron, David P. and John A. Ferejohn (1989) "Bargaining in legislatures." *American Political Science Review*, 83(4): 1181-1206.

[4] Bernheim, B. Douglas, Antonio Rangel, and Luis Rayo (2006) "The power of the last word in legislative policy making." *Econometrica*, 74(5): 1161-1190.

[5] Bernheim, B. Douglas and Michael D. Whinston (1998) "Incomplete contracts and strategic ambiguity." *American Economic Review*, 88(4): 902-932.

[6] Binmore, Ken, Martin J. Osborne, and Ariel Rubinstein (1992) "Noncooperative models of bargaining." In R.J. Aumann and S. Hart, eds. *Handbook of Game Theory*, Volume 1, pp. 179-225. Elsevier Science Publishers B.V.

[7] Brollo, Fernanda and Tommaso Nannicini (2010) "Tying your enemy's hands in close races: The politics of federal transfers in Brazil." Working paper no. 358, Department of Economics, Bocconi University.

[8] Bueno de Mesquita, Bruce B., James Morrow, Randolph Siverson, and Alastair Smith (2002) "Political institutions, policy choice and the survival of leaders." *British Journal of Political Science*, 32(4): 559-590.

[9] Console-Battilana, Silvia and Kenneth A. Shepsle (2009) "Nominations for sale." *Journal of Theoretical Politics*, 21(4): 413-449.

[10] Cotton, Christopher (2010) "Dynamic legislative bargaining with endogenous agenda setting authority." Working paper, Department of Economics, University of Miami.

[11] Dal Bó, Ernesto (2007) "Bribing voters." *American Journal of Political Science*, 51(4): 789-803.

[12] de Figueiredo, John M., and Brian S. Silverman (2006) "Academic earmarks and the returns to lobbying." *Journal of Law and Economics*, 49(2): 597-626.

[13] Diaz-Cayeros, Alberto, Beatriz Magaloni, and Barry R. Weingast (2003) "Tragic brilliance: Equilibrium hegemony and democratization in Mexico." Hoover Institution, Stanford University.

[14] Diermeier, Daniel, and Pohan Fong (2011) "Legislative bargaining with reconsideration." *Quarterly Journal of Economics*, 126 (2): 947-985.

[15] Dixit, Avinash (2009) "Governance institutions and economic activity." *American Economic Review*, 99(1): 5-24.

[16] Doran, Michael (2010) "The closed rule." *Emory Law Journal*, 59(6): 1363-1454.

[17] Engstrom, Erik J. and Georg Vanberg (2010) "Assessing the allocation of pork: Evidence from congressional earmarks." *American Politics Research*, 38(6): 959-985.

[18] Epple, Dennis and Michael H. Riordan (1987) "Cooperation and punishment under repeated majority voting." *Public Choice*, 55(1-2): 41-73.

[19] Fan, Xiaochen, Nageeb Ali, and B. Douglas Bernheim (2010) "Predictability and power in legislative bargaining."

[20] Ferejohn, John (1974) *Pork Barrel Politics: Rivers and Harbors Legislation, 1947-1968*. Stanford: Stanford University Press.

[21] Finocchiaro, Charles J. (2002) "Majoritarianism, partisanship and the Cannon speakership: Committee assignments during the partisan era of the U.S. House." Paper presented at the annual meeting of the American Political Science Association.

[22] Gaines, Brian J. and Brian R. Sala (2000) "A further look at universalism and partisanship in congressional roll-call voting." *Political Analysis*, 8(4): 399.

[23] Glazer, Amihai and Henry McMillan (1990) "Optimal coalition size when making proposals is costly." *Social Choice and Welfare*, 7(4): 369-380.

[24] Glazer, Amihai and Henry McMillan (1992) "Amend the old or address the new: Broad-based legislation when proposing policies is costly." *Public Choice*, 74(1): 43-58.

[25] Grofman, Bernard (1984) "The general irrelevance of the zero sum assumption in the legislative context." In M. Holler (ed.) *Coalitions and Collective Action*, Physica-Verlag, Würzburg, pp. 99-112.

[26] Hardin, Charles M. (1958) "Farm political power and the U. S. governmental crisis." *Journal of Farm Economics*, 40(5): 1646-1659.

[27] Harrington, Joseph E. (1990) "The power of the proposal maker in a model of endogenous agenda formation." *Public Choice*, 64(1): 1-20.

[28] Hird, John A. (1991) "The political economy of pork: Project selection at the U.S. Army Corps of Engineers." *American Political Science Review*, 85(2): 429-456.

[29] Huber, John D. (1996) "The vote of confidence in parliamentary democracies." *American Political Science Review*, 90(2): 269-282.

[30] Kalandrakis, Anastassos (2004) "A three-player dynamic majoritarian bargaining game." *Journal of Economic Theory*, 116(2): 294-322.

[31] King, David C. and Richard J. Zeckhauser (2003) "Congressional vote options." *Legislative Studies Quarterly*, 28(3): 387-411.

[32] Knight, Brian (2005) "Estimating the value of proposal power." *American Economic Review*, 95(5): 1639-1652.

[33] Krehbiel, Keith and Alan Wiseman (2001) "Joseph G. Cannon: Majoritarian from Illinois." *Legislative Studies Quarterly*, 26(3): 357-389.

[34] Larcinese, Valentino, Leonzio Rizzo, and Cecilia Testa (2006) "Allocating the U.S. federal budget to the states: The impact of the president." *Journal of Politics*, 68(2): 447-456.

[35] Lazarus, Jeffrey and Amy Steigerwalt (2009) "Different Houses: The distribution of earmarks in the U.S. House and Senate." *Legislative Studies Quarterly*, 34(3): 347-372.

[36] Margolis, Howard (1984) *Selfishness, Altruism, and Rationality.* Chicago: University of Chicago Press.

[37] Niskanen, William (1971) *Bureaucracy and Representative Government.* Chicago: Aldine-Atherton.

[38] Norman, Peter (2002) "Legislative bargaining and coalition formation." *Journal of Economic Theory* 102(2): 322-353.

[39] Padró i Miquel, Gerard (2007) "The control of politicians in divided societies: The politics of fear." *Review of Economic Studies*, 74(4): 1259-1274.

[40] Primo, David M. (2002) "Rethinking political bargaining: Policymaking with a single proposer." *Journal of Law, Economics, and Organization*, 18(2): 411-427.

[41] Riker, William H. (1962) *The Theory of Political Coalitions.* New Haven: Yale University Press.

[42] Romer, Thomas, and Howard Rosenthal (1978) "Political resource allocation, controlled agendas and the status quo." *Public Choice*, 33(4): 27-43.

[43] Rozevitch, Simon and Avi Weiss (1993) "Beneficiaries from federal transfers to municipalities: The case of Israel." *Public Choice*, 76(4): 335-346.

[44] Shayo, Moses and Alon Harel (2012) "Non-consequentialist voting." *Journal of Economic Behavior & Organization*, 81(1): 299-313.

[45] Shepsle Kenneth A. and Barry R. Weingast (1981) "Political preference for the pork barrel: A generalization." *American Journal of Political Science*, 25(1): 96-111.

[46] Solé-Ollé, Albert and Pilar Sorribas-Navarro (2008) "The effects of partisan alignment on the allocation of intergovernmental transfers: Differences-in-differences estimates for Spain." *Journal of Public Economics*, 92(12): 2302-2319.

[47] Tamura, Kenichi (2010) "Testing the partisan bias in the Japanese fiscal equalization system." Presented at the GLOPE II International Symposium on the Political Economy of Institutions and Expectations, Waseda University, Tokyo.

[48] Tsai, Tsung-Sheng and C.C. Yang (2010) "On majoritarian bargaining with incomplete information." *International Economic Review*, 51(4): 959-979.

[49] Weingast, Barry R. (1979) "A rational choice perspective on congressional norms." *American Journal of Political Science*, 23(2): 245-262.
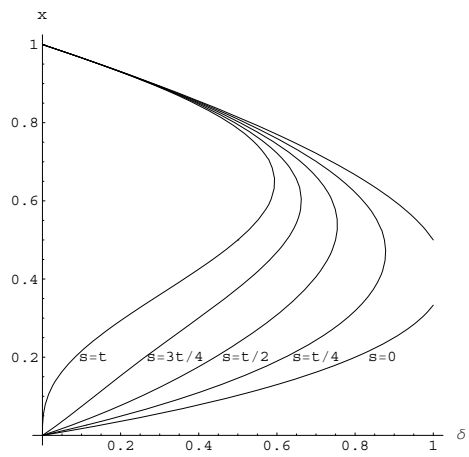
Figure 1: Mixed-strategy equilibria for different values of δ and s.