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A Political Winner's Curse: Why Preventive Policies Pass Parliament so Narrowly

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Philipp an de Meulen and Christian Bredemeier[1]

A Political Winner's Curse: Why Preventive Policies Pass Parliament so Narrowly

Abstract

Preventive policy measures such as bailouts often pass parliament very narrowly. We present a model of asymmetric information between politicians and voters which rationalizes this narrow parliamentary outcome. A successful preventive policy impedes the verification of its own necessity. When policy intervention is necessary but voters disagree ex-ante, individual politicians have an incentive to loose the vote in parliament in order to be rewarded by voters ex-post. Comfortable vote margins induce incentives to move to the loosing fraction to avoid this winner's curse. In equilibrium, parliamentary elections over preventive policies are thus likely to end at very narrow margins.

JEL Classification: D72, D82

Keywords: Political economy; asymmetric information

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1 Introduction

In the recent financial and sovereign debt crises, most western economies have seen large-scale policy measures which aimed at preventing further damage to the economy. Examples include fiscal consolidation measures, commercial bank bailouts, and credit guarantees supporting high-debt countries. Often, such bills are called "necessary" by leading politicians but are mostly seen more critical by the public. In the political process, it is a recurrent pattern that these preventive policies pass parliament at narrow margins.

A prominent example is the Emergency Economic Stabilization Act (EESA) of 2008, the so called Wall Street bailout bill. The bill was justified with the severe negative consequences of not conducting it. According to former Senator Evan Bayh, "Ben Bernanke warned senators that the sky would collapse if the banks weren't rescued."[1] In congress, however, the bill passed only after a first fail in the house and at a close margin in senate.

Also in Europe, there have recently been a number of close results in parliamentary votes about preventive policies. Italy and Greece for example saw a number of close parliamentary ballots about austerity measures. Similarly, the rescue measures for troubled countries in the European Stability Mechanism (ESM) passed some national parliaments (e.g. in Estonia, Slovakia, and Slovenia) only very narrowly.

This paper rationalizes these political patterns in a context of asymmetric information between politicians and voters. It is reasonable to assume that politicians are better informed about relevant policy issues than the average voter is.[2] This point is taken up by Roemer (1994), Cukierman and Tommasi (1998), and Schultz (1996, 1999, 2002) who adopt the assumption that politicians are better informed about the state of the world or the working of the economy than voters are. Empirical support for this form of asymmetric information is provided e.g. by Nannestad and Paldam (1997), Duch et al. (2000) and Duch and Stevenson (2011). In political sciences, it is a common view that voters

[1] Quote from David Weigel, http://www.slate.com/content/slate/blogs/weigel/2010/12/13/why_glenn_beck_is_like_evan_bayh.htmlv.

[2] See e.g. the seminal contribution by Downs (1957) who pointed out that even small information costs can lead voters to be rationally ignorant and cause pronounced uncertainty about relevant policy issues.

are usually poorly informed about relevant political measures, see e.g. Lupia (1994) and McDermott (1997).

In our set-up, there is a potential threat to the economy which can be prevented by a costly policy measure. Politicians are perfectly informed about whether the threat is real while voters only have an imperfect prior. The preventive nature of the considered policy measure implies a peculiar information structure which is key for our analysis. When the policy is conducted, it is not observable how severe the consequences of not conducting it would have been. In terms of a global game, conducting the policy implies that no new information arrives. Only if the policy intervention is not undertaken and damage can be observed, the true state of the world eventually becomes public knowledge. In Bernanke's terms, since the banks were rescued, we will never know whether the sky would really have collapsed if they weren't.

This information structure puts politicians in a tricky situation. When they know the threat is real but voters disagree ex-ante, politicians' only possibility to convince voters is not running the policy and letting voters observe the damage. But, knowing the severity of the threat ex-post, voters evaluate politicians' behavior negatively. If politicians, however, conduct the preventive policy and save the economy from harm, voters would not be able to update beliefs, continue to oppose the policy, and also evaluate politicians' choices negatively ex-post.

In the other case, if there is no threat, but voters believe so ex-ante, politicians can convince voters by opposing the bill. Eventually, voters change their mind and reward politicians' opposition against an unnecessary policy. However, politicians may as well find it worthwhile to support the bill as voters would then not find out about its needlessness.

In what follows, we focus on the interaction between individual politicians in parliament. Most other politico-economic papers focus on the interaction between government and opposition (e.g. Downs 1957), between clearly defined parties in parliament (e.g. Diermeier and Merlo 2000), or between the parliament as a whole and other bodies of legislation (e.g. Matthews 1989). However, recent voting behavior in parliament requires to zoom more into parliament and to consider delegates individually. Concerning the EESA, for example, neither party voted clearly in either way (D: 172-62, R: 108-91 in the second house vote). Even in continental Europe, where politicians enter parliaments mostly through party lists, deviators from party behavior have been a regular

observation in votes over austerity measures or the ESM. In our paper, each deviation is a rational choice of an office-motivated politician.

Focusing on individual politicians, it is important to analyze their interaction in parliament as a game. When conducting the policy is indeed necessary to prevent damage but voters disagree, a political winner's curse arises for individual politicians as it is best to loose the vote in parliament. If prevention is enacted in parliament, voters do not change their minds and an individual politician opposing the bill, thus loosing the vote, is rewarded by voters ex-post. If the bill does not pass on the other hand, voters will ex-post learn that prevention would indeed have been necessary. Then, supporting the bill, thus again loosing the vote, is rewarded ex-post.

In case of an unnecessary but popular policy intervention, individual politicians seek to win the parliamentary vote even if this implies supporting a costly but needless policy. If the bill does not pass, voters will change their mind and reward opposing politicians ex-post. If it passes, however, voters will stick to their ex-ante opinion. In this case, individual politicians have to support a policy which they know is a waste when they want to be rewarded by voters.

The model can explain why parliamentary votes about preventive policies often end very narrowly. Wider vote margins induce incentives to move to the loosing fraction to avoid the winner's curse described above. Even in the case of an unnecessary but popular policy where politicians seek to win, there is no strictly dominant strategy for individual politicians. Exploiting the expected gains of deviating from majority behavior brings about close vote margins in parliamentary votes over preventive policies in equilibrium.

The remainder of this paper is organized as follows. Section 2 presents the model set-up. Section 3 analyzes individual behavior while the interaction of politicians in parliament is studied in Section 4. Section 5 concludes.

2 Model Set-up

Our model is populated by politicians and voters. Each politician represents a different set of voters in parliament. We denote politician i's representative voter as voter i. The electoral system is characterized by single-member districts. The politician is office-motivated and seeks

	$p=0$	$p=1$
$s=0$	0	$-c_i$
$s=1$	$-d$	$-c_i$

Table 1: Voter's utility u_i in the state-policy space.

support from the representative voter of her district in order to increase her re-election probability.[3] Precisely, the politician chooses her voting behavior as such that the voter agrees with her behavior ex-post.

We consider a situation where there is a potential threat to the economy which can be prevented by taking a costly policy action. Formally, there are two states of the world ($s = 0, 1$) and two policy options ($p = 0, 1$). $s = 0$ denotes the good state where there is no threat to the economy. In this good state, damage does not occur even without prevention. In turn, if the state of the world is bad ($s = 1$), a damage d would arise to the economy if not prevented by conducting an adequate policy. Irrespective of the state of the world s, the policy itself is costly to the economy. Costs of the policy differ (e.g. due to different marginal tax rates) across agents and individual costs are denoted by c_i.[4] As for the two policy options, $p = 0$ denotes policy passivity while $p = 1$ denotes running the preventive policy.

Table 1 summarizes utility of voter i in the four constellations of states and policies. When the state of the world is good ($s = 0$, first row in Table 1), no damage to the economy is imminent and voter i only has to bear the cost of the policy if conducted ($p = 1$). If the state of the world is bad ($s = 1$, second row in Table 1), the economy takes damage if the policy is not conducted ($p = 0$). However, if the policy is conducted ($p = 1$), the damage is prevented and each voter only has to bear her idiosyncratic cost of the preventive policy.

Politicians have an informational advantage compared to voters as in Schultz (2002). While politicians can observe the state of the world, voters only know the ex-ante probability of the bad state, $E_i(\theta) \equiv \tilde{\theta} \; \forall \; i$, and can observe political choices and the outcome u_i. After observing the

[3] Assuming office-motivated politicians goes back to the seminal works by Black (1948) and Downs (1957). With this assumption, politicians in a two-candidate set-up maximize their median voter's utility.

[4] It may as well be reasonable to assume individual damage costs or prior beliefs. However, this would neither affect the analysis nor the main results of the paper.

economic outcome, voters update their beliefs based on this observation.

It is plausible to assume that the information asymmetry can persist ex-post. Politicians' cheap talk is incredible to voters if they suspect politicians to serve some other motives than pleasing voters - may they be ideological (Dixit and Londregan 1998) or serving special interest groups (McCallum and Blais 1987). Dorsch (2012) discusses the latter suspicion in context of the EESA. Schultz (2002) argues that voter uncertainty about politicians' preferences is relevant in particular in presence of important new issues.[5]

The public choice is decided in parliament by simple majority voting. We model the parliament as a group of politicians with individual and potentially different interests. Every politician seeks to be rewarded by voters individually and, to increase her re-election probability, she focuses on her particular representative voter i.

We assume that voters reward politicians according to their ex-post expected utility. Hence, if a politician supported a policy option in parliament which maximizes her representative voter's ex-post expected utility, her re-election probability increases (we denote this reward by $r_i = 1$). If, however, the politician voted for a policy option which does not maximize the ex-post expected utility of her representative voter, she is not rewarded ($r_i = 0$). We thus apply the behavioral assumption that voters are backward looking and judge politicians' past behavior as e.g. in Gaertner (1996).[6] Politicians in turn react rationally to voters' behavior.

The timing of events is summarized in Figure 1. First, nature determines the state of the world s. The realization is observed perfectly by

[5]Cheap talk is known not to be a credible signal when the interests of sender and receiver diverge (Farrell and Rabin 1996). In our context, voters may suspect politicians e.g. to support the policy out of some pro-government ideology. A politician with office motivation and a preference for running the policy always has an incentive to signal that the state of the world is bad. If she convinced voters, she could run her preferred policy without being punished by voters. Suppose the true state of the world is good, then running the policy is costly to voters but beneficial to the pro-government politician.

[6]Smyth, Dua, and Taylor (1994) provide strong empirical evidence for backward-looking behavior in voters' assessment of incumbents. Similarly, Kramer (1971), Frey and Schneider (1978), and Berlemann et al. (2012) find that incumbents' political support depends on current economic conditions thus on past rather than expected future policies.

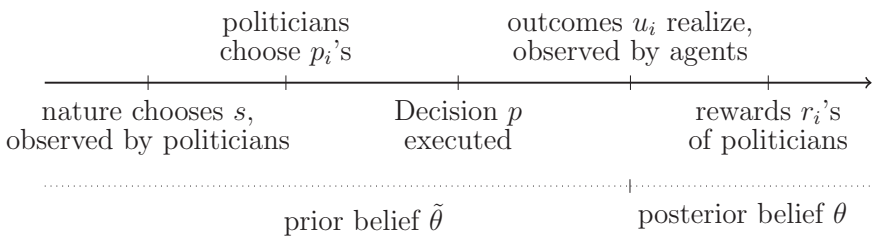

Figure 1: The timing of events and beliefs.

politicians but only imperfectly by voters such that they form a prior belief $\tilde{\theta}$ which does not need to coincide with the true state of the world. Second, politicians decide upon voting behavior. Individual votes are denoted by p_i whereas p denotes the majority's vote. The political decision p is then executed. The outcomes u_i realize (depending on s and p as in Table 1) and are observed by voters. Based on this observation, voters update their beliefs. θ denotes the - potentially updated - probability assigned to the bad state after observing the economic outcome u_i. Given this posterior belief, voters reward or punish their representatives.

3 Individual Behavior

3.1 Voters

Prior to the policy decision, voters determine their attitude towards the policy based on the ex-ante probability of the bad state, $\tilde{\theta}$. We denote voter i's ex-ante preferred policy option by $\widetilde{a}_i$. From Table 1 it follows that voter i ex-ante prefers $p = 1$ over $p = 0$ if the expected economic damage $\tilde{\theta} \cdot d$ exceeds her specific cost of prevention c_i,

$$\widetilde{a}_i = \begin{cases} 1, & \tilde{\theta} \cdot d > c_i \\ 0, & \text{else.} \end{cases} \tag{1}$$

However, the decision of voter i whether to reward the politician representing her depends on her posterior attitude, a_i. This attitude is based on the posterior belief after observing the economic outcome u_i. Whether voters can update their beliefs depends on the political choice p. Only if $p = 0$, the true state of the world becomes public knowledge.

Then, by observing the economic outcome, voters will eventually find out whether the threat was real. By contrast, when the policy is conducted ($p = 1$), the observation of the economic outcome does not carry any information about the state of the world (see second column of Table 1) and beliefs will not be updated. Formally, the ex-post probability assigned by voters to the bad state of the world is

$$\theta = \begin{cases} s, & p = 0 \\ \tilde{\theta}, & p = 1. \end{cases} \tag{2}$$

Ex-post beliefs determine voters' ex-post attitude towards the policy. In case no new information arrives ($p = 1$), beliefs are identical ex-ante and ex-post and so are attitudes. If, however, the true state of the world can be observed due to passive policy ($p = 0$), ex-ante attitudes can either be confirmed or changed. They will change if the true state of the world becomes observable and proves voters' ex ante attitude wrong ($\widetilde{a}_i \neq s$ and $p = 0$). Attitudes are confirmed if the ex-ante preferred policy option indeed equals the "adequate" option ($\widetilde{a}_i = s$). The ex-post preferred option a_i depends on whether or not ex-post expected damage exceeds prevention costs,

$$a_i = \begin{cases} 1, & \theta \cdot d > c_i \\ 0, & \text{else.} \end{cases} \tag{3}$$

Using equations (1) - (3), the relationship between ex-ante and ex-post attitudes can be written as

$$a_i = \begin{cases} \widetilde{a}_i, & p = 1 \cup \widetilde{a}_i = s \\ 1 - \widetilde{a}_i, & p = 0 \cap \widetilde{a}_i \neq s. \end{cases} \tag{4}$$

Here, we focus on situations where $0 < c_i < d$ implying that the policy is justified in the bad state but not in the good state.[7] Most interesting are the cases where the voter's ex-ante attitude does not coincide with the policy option indicated by the true state of the world ($\widetilde{a}_i \neq s$). Only then, voter i's ex-post attitude $\widetilde{a}_i$ may differ from her ex-ante attitude a_i, depending on p. These are the cases where politicians

[7] In the later analysis of the game in parliament we will also allow for costs $c_i < 0$ or $c_i > d$. Independent of the state of the world, these voters and their politicians will either always or never support the policy, respectively.

can convince voters of the true state of the world by letting them observe it through policy passivity. In the good state, this would lead voters to accept that their initially opposed policy choice ($p = 0$) is indeed good. By contrast, if the state of the world is bad ($s = 1$), policy passivity would please voter i's ex-ante attitude but would be proven wrong ex-post. This would induce voters to change their minds, opposing the chosen policy option ex-post.

3.2 Politicians

Politicians seek to be rewarded by voters. An individual politician i receives a positive reward when her policy action p_i coincides with her representative voter's ex-post preferred policy option a_i,

$$r_i = \begin{cases} 1, & p_i = a_i \\ 0, & \text{else.} \end{cases} \tag{5}$$

Note that even for given s and $\widetilde{a}_i$, a_i is determined by the outcome of the parliamentary vote. The reward r_i and thus the optimal choice p_i depend on the choice of the other politicians in parliament. For different combinations of the state of the world and one's voter's ex-ante attitude, Table 2 illustrates the politician's reward in the four combinations of own vote and vote outcome.[8] Formally, the entries in the table can be determined by combining equations (2), (3), and (5).

Politician and voter agreeing ex-ante. In panels (a) and (d) of Table 2, the politician and her representative voter agree ex-ante in the sense that the voters ex-ante attitude towards the policy is justified by the true state of the world. In these cases, the politician's choice is rather simple to determine. The voter's ex-ante and ex-post attitude towards the policy are identical as new information (observing the true state of the world through $p = 0$) will only confirm the voter's ex-ante attitude. Independent of the outcome of the parliamentary vote p, the politician will thus be rewarded only when voting in line with the voter's ex-ante attitude which is thus strictly dominant for the politician.

[8] We again focus on situations where $0 < c_i < d$. Politicians representing voters with $c_i < 0$ or $c_i > d$ have strictly dominant strategies independent of s.

a) $s = 0$ and $\tilde{\theta}d < c_i < d$

	$p = 0$	$p = 1$
$p_i = 0$	$r_i = 1$	$r_i = 1$
$p_i = 1$	$r_i = 0$	$r_i = 0$

b) $s = 1$ and $\tilde{\theta}d < c_i < d$

	$p = 0$	$p = 1$
$p_i = 0$	$r_i = 0$	$r_i = 1$
$p_i = 1$	$r_i = 1$	$r_i = 0$

c) $s = 0$ and $0 < c_i < \tilde{\theta}d$

	$p = 0$	$p = 1$
$p_i = 0$	$r_i = 1$	$r_i = 0$
$p_i = 1$	$r_i = 0$	$r_i = 1$

d) $s = 1$ and $0 < c_i < \tilde{\theta}d$

	$p = 0$	$p = 1$
$p_i = 0$	$r_i = 0$	$r_i = 0$
$p_i = 1$	$r_i = 1$	$r_i = 1$

Table 2: Politician i's reward in the belief-state-vote-policy space

Politician and voter disagreeing ex-ante. In panels (b) and (c) of Table 2, voter i's ex-ante preferred policy option does not coincide with the option indicated by the true state of the world. In these two cases, there is no dominant strategy for politician i. Her reward depends on both, her own voting behavior, and the voting behavior of the other politicians, i.e. the outcome of the parliamentary vote.

In the bad state of the world ($s = 1$), the respective vote-dependent rewards of a politician facing a voter initially opposing the bill ($\tilde{\theta}d < c_i$) are illustrated in panel (b) of Table 2. In case of policy passivity ($p = 0$) voters eventually find out that the threat to the economy was real as the damage realizes. The voter then ex-post perceives that the policy should have been conducted and rewards supporting it.

By contrast, with a majority supporting the policy in parliament ($p = 1$), the damage to the economy is prevented and voters cannot update their beliefs. Sticking to her ex-ante belief, the voter still opposes the policy and rewards opposing it.

Thus, in the bad state, the individual politician is only rewarded by a policy-opposing voter when she votes differently than the majority in parliament. Thus, with $\tilde{\theta}d < c_i$ and $s = 1$, a political "winner's curse" arises and the individual politician will seek to loose the parliamentary vote.

By contrast, in the good state of the world ($s = 0$), politician i "seeks to win" the vote to be rewarded by voters initially supporting the policy ($\tilde{\theta}d > c_i$), see panel (c) of Table 2. When the bill passes

parliament and the policy is conducted, politician i is only rewarded if she votes in favor of the bill, despite she knew better about the true state of the world beforehand. But since voters do not find out about this true state even after the parliamentary vote if $p = 1$ is the outcome, the objectively wrong vote $p_i = 1$ is the only way to be rewarded by the uninformed voter i. In case the bill does not pass parliament, voters receive information on the true state and voter i changes her mind. Ex post, the politician is thus rewarded if she voted against the bill.

4 Interaction in Parliament

We now analyze politicians' interaction in parliament. Let $N > 1$ be the number of politicians in parliament. For simplicity we assume that N is odd. We denote by N_0 and N_1 the number of politicians voting against the policy and in its favor, respectively. The policy needs a majority in parliament to be implemented, i.e. the policy choice is

$$p = \begin{cases} 0, & N_0 > N_1 \\ 1, & N_0 < N_1. \end{cases}$$

4.1 Homogeneous electorate

In order to form the intuition how parliamentary vote outcomes are determined in this model, it is useful to consider first a situation where the electorate is homogeneous in the sense that each politician represents an identical set of voters, i.e. $c_i = c \ \forall i$. We distinguish four constellations (abstracting from the trivial cases $c < 0$ and $c > d$) depending on the state of the world s and voters' ex-ante attitude $\widetilde{a}$. The latter is determined by $\widetilde{\theta}$, d, and c.

In cases where voters and politicians agree ex-ante ($\widetilde{a} = s$), the politicians' voting behavior is simple to determine. In Table 2, these are cases (a) $s = 0$ and $\widetilde{\theta}d < c$ where voters oppose the policy ex-ante and (d) $s = 1$ and $\widetilde{\theta}d > c$ where voters support the policy ex-ante. In both cases, a politician's reward is independent of the public choice p, see Table 2. Hence, politicians vote in line with voter's ex-ante attitude. With a homogeneous electorate, this leads to all politicians voting against the policy (case a) or in its favor (case d). In these cases, the parliamentary vote thus ends unanimously.

In the two cases where politicians and voters disagree ex ante (case

b: $s = 1$ and $\theta d < c$; and case c: $s = 0$ and $\theta d > c$), a politician's reward depends on her own vote and the policy choice implemented, see panels (b) and (c) of Table 2.

4.1.1 Necessary but unpopular policy

In case (b) of Table 2 where the policy is necessary but unpopular ex-ante, politicians are only rewarded by voters when they loose the parliamentary vote. In this "winner's curse" situation, there is obviously no equilibrium in pure strategies. In both such constellations ($N_0 = N$, $N_1 = N$), individual deviation to the loosing side would be profitable for politicians.

We thus consider the game's mixed-strategy equilibrium. As politicians are homogeneous, having identical pay-off structures, the equilibrium of the game between these politicians is symmetric. We denote the probability with which politicians oppose the policy by π_0. Under such randomization, the number of opposing votes from any M politicians follows a binomial distribution with success probability π_0 and M draws, $B(\pi_0, M)$. We denote the probability of exactly n_0 politicians (out of M) voting against the policy as $f(n_0, \pi_0, M)$. $F(n_0, \pi_0, M)$ gives the cumulated probability at n_0, i.e. the probability of no more than n_0 of M politicians voting against the policy.

In the mixed-strategy equilibrium, individual deviation to a pure strategy must not be profitable. To determine the profitability of such deviation, an individual politician considers the probabilities of the two policy options already receiving the necessary number of votes ($\frac{N+1}{2}$) from the other $N-1$ politicians who randomize. Deviation to a pure strategy $p_i \in \{0; 1\}$ pays if at least $\frac{N+1}{2}$ of the other $N-1$ politicians vote in favor of the other option $1 - p_i$ such that the deviator looses the vote since $p = 1 - p_i$.[9] Thus, we need to consider the probabilities of a policy option $1 - p_i$ winning despite the deviator voting against it. We denote these probabilities as $\Pi_{p_i}^{1-p_i}$.

Consider first an individual deviation to voting $p_i = 1$ with certainty while all other agents still randomize with probability π_0. In this case, the deviator's expected reward is the probability of the policy failing in spite of her own support. The deviator looses the election and is

[9] Consider, for example, a vote among three politicians who seek to loose. For any given voting behavior of an individual politician, her reward probability is the probability that both other politicians vote differently than she does.

rewarded if at least $\frac{N+1}{2}$ (thus more than $\frac{N-1}{2}$) of the remaining $N-1$ politicians vote against the policy. This probability is

$$\Pi_1^0 = 1 - F\left(\frac{N-1}{2}, \pi_0, N-1\right). \tag{6}$$

Individually deviating to $p_i = 0$ with certainty in turn induces an expected reward that equals the probability of the bill passing despite the deviator voting against it. It is thus the probability that at most $\frac{N-3}{2}$ of the other $N-1$ politicians also oppose the policy,

$$\Pi_0^1 = F\left(\frac{N-3}{2}, \pi_0, N-1\right). \tag{7}$$

Sticking to the randomization, a politician opposes the policy with probability π_0. Conditional on opposing the policy, her expected reward is given by (7). She supports the policy with probability $1-\pi_0$ in which case her conditional expected reward is given by (6). If, however, politician i randomizes with probability π_0, the unconditional expected reward is $\pi_0 \cdot \Pi_0^1 + (1-\pi_0) \cdot \Pi_1^0$. The expected reward of not deviating is thus a linear combination of the two expected utilities when deviating to one or the other option.

For both deviations not to be (strictly) profitable, these two expected utilities (and hence any linear combination of them) have to be equal. Formally, the equilibrium opposition probability fulfills

$$F\left(\frac{N-3}{2}, \pi_0, N-1\right) = 1 - F\left(\frac{N-1}{2}, \pi_0, N-1\right). \tag{8}$$

Condition (8) states that, in equilibrium, $\frac{N-1}{2}$ is a median of the probability distribution of opposing votes from any $N-1$ randomizing politicians. Furthermore, the probabilities that less than $\frac{N-1}{2}$ politicians and that more than $\frac{N-1}{2}$ politicians vote against the policy are equal. As $N-1$ is even and $\frac{N-1}{2}$ an integer, the only probability fulfilling this is

$$\pi_0 = \frac{1}{2}.$$

This behavior makes both public choices equally likely and individual politicians thus indifferent between the two options. Intuitively, if one

of the two policy options would be less likely, an individual deviation to supporting this option would pay in expectation. Exploiting these expected gains, politicians increase the lower-probability option's chances to win, eventually equalizing the two options' probabilities.

Probability distribution of the vote result. The mixed-strategy equilibrium implies that the result of the parliamentary vote is stochastic. The number of opposing votes from all N politicians, N_0, is Bernoulli distributed with success probability $\frac{1}{2}$, such that the probability of a specific result, $f\left(N_0, \frac{1}{2}, N\right) = \binom{N}{N_0}\left(\frac{1}{2}\right)^N$, is strictly decreasing in the vote margin $|N_0 - N_1|$. Close vote margins are rather likely and wider vote margins rather unlikely. The most likely outcomes (the modes of the binomial distribution) are one-vote margins, the bill either passing or failing with the closest possible margin. The model thus predicts that parliamentary votes about unpopular preventive policies are likely to end at very narrow margins when politicians and voters disagree ex-ante.

4.1.2 Popular but unnecessary policy

In case (c) of Table 2, politicians are rewarded only when they belong to the winning fraction in parliament. This constellation is a coordination game. Both unanimous decisions in parliament ($N_0 = N$ and $N_1 = N$) are Nash equilibria. If politicians however fail to coordinate, the game's mixed-strategy equilibrium becomes relevant.

This equilibrium is derived in a very similar way to the one above. In the mixed-strategy equilibrium, individual deviation to one of the pure strategies must not pay. When politicians seek to win the parliamentary vote, we need to consider the conditional probabilities that a certain policy option wins conditional on the deviator supporting it, $\Pi_{p_i}^{p_i}$.

Here, an individual deviation to voting $p_i = 1$ with certainty while all other agents still randomize with probability π_0 induces an expected reward of $\Pi_1^1 = F\left(\frac{N-1}{2}, \pi_0, N-1\right)$ which is the probability that less than the required $\frac{N+1}{2}$ opposing votes (thus not more than $\frac{N-1}{2}$) come from the remaining $N-1$ politicians such that the deviator belongs to the winning fraction. In turn, deviating to $p_i = 0$ with certainty generates an expected reward of $\Pi_0^0 = 1 - F\left(\frac{N-3}{2}, \pi_0, N-1\right)$ - the probability that at least $\frac{N-1}{2}$ of the remaining M politicians also oppose the policy. As, sticking to the randomization, the expected reward is $\pi_0 \cdot \Pi_0^0 + (1-\pi_0) \cdot \Pi_1^1$, the two expected rewards when deviating to one or the other option

	cost range	good state $s = 0$	bad state $s = 1$
group A	$c_i > d$	$p_i = 0$ strictly dominant	$p_i = 0$ strictly dominant
group B	$\widetilde{\theta}d < c_i < d$	$p_i = 0$ strictly dominant	no dom. strat. *'winner's curse'*
group C	$0 < c_i < \widetilde{\theta}d$	no dom. strat. *'seek to win'*	$p_i = 1$ strictly dominant
group D	$c_i < 0$	$p_i = 1$ strictly dominant	$p_i = 1$ strictly dominant

Table 3: Groups of politicians and their incentives in parliament.

have to be equal in equilibrium,

$$F\left(\frac{N-1}{2}, \pi_0, N-1\right) = 1 - F\left(\frac{N-3}{2}, \pi_0, N-1\right). \tag{9}$$

Condition (9) is identical to condition (8) in the "winner's curse" case of Section 4.1.1. Thus, also in the mixed-strategy equilibrium of the "seek to win" case, the opposition probability is $\pi_0 = \frac{1}{2}$. Also here, both policy choices are equally likely in equilibrium. Furthermore, all other properties of the equilibrium probability distribution of vote results also hold in this equilibrium. In particular, closest vote margins are the most likely vote results also in case of a popular but unnecessary policy when politicians fail to coordinate.

4.2 Heterogeneous electorate

We now analyze the more general case where politicians represent different voters with different prevention costs, c_i. We need to distinguish between four groups of politicians as illustrated in Table 3.

The first group represents voters with prevention costs so high such that they always oppose the policy, i.e. $c_i > d$. The second group represents voters with prevention costs sufficiently high to oppose the policy ex-ante, given the prior probability $\widetilde{\theta}$ of the threat being real, $(\widetilde{\theta}d < c_i < d)$. The third group of politicians represents voters with lower prevention costs, $0 < c_i < \widetilde{\theta}d$, who support the policy ex-ante. The last group has negative prevention costs, i.e. these voters are net profiteers of the policy even if it is unnecessary (e.g. for its distributional consequences) and will thus always support the policy. We denote these groups by A, B, C, and D and their respective numbers of associated

politicians by N^A, N^B, N^C, and N^D which sum up to N. Still we assume N to be odd.

4.2.1 Bad state of the world

When the state of the world is bad, $s = 1$, three groups of politicians have strictly dominant strategies. Next to groups A and D, this is group C who vote in favor of the policy in closed fashion as they agree with their voters ex-ante in supporting the policy, see panel (d) of Table 2.

Group-B politicians disagree with their voters ex-ante and seek to loose the parliamentary vote to avoid the winner's curse, see panel (c) of Table 2. Voting behavior of this group thus depends on whether the policy choice is already determined by the other groups' voting behavior. This is true if either $N^C + N^D > \frac{N}{2}$ or $N^A > \frac{N}{2}$. In the first case, politicians in group B vote against the policy despite knowing that it is in fact necessary. In the second case, group A is sufficiently large to ensure the bill would never pass parliament. Then, group B aligns with groups C and D and opposes the policy. Ex-post, voters find out that the threat was real and group-B politicians are rewarded by their voters.

If, however, group B is decisive for the vote outcome, the only equilibrium incorporates B-group politicians randomizing. As politicians in group B seek to avoid the winner's curse, there cannot be an equilibrium in pure strategies. In order to derive the mixed-strategy equilibrium of this game between politicians in group B, we consider the distribution of the number of opposing votes from this group, N_0^B. For a given opposition probability π_0^B, this number follows a binomial distribution with success probability π_0^B and N^B draws. In parliament, there are surely N^A opposing votes from group A. The bill thus fails when at least $\frac{N+1}{2} - N^A$ politicians from group B also oppose it and it passes otherwise.

Again, we need to consider an individual politician in group B for whom deviation to one of the pure strategies must not pay. In the general case considered here, the expected reward when deviating to opposing the bill is equal to the probability that there are less than $\frac{N-1}{2} - N^A$ (thus not more than $\frac{N-3}{2} - N^A$) opposing votes from the remaining $N^B - 1$ politicians of group B such that the bill still passes despite the deviator opposing it. The conditional expected reward equals the probability of this case, $F\left(\frac{N-3}{2} - N^A, \pi_0^B, N^B - 1\right)$.

By contrast, when the deviator supports the bill, she hopes that it fails in parliament. This is the case if at least $\frac{N+1}{2} - N^A$ (thus more

than $\frac{N-1}{2} - N^A$) of the other $N^B - 1$ politicians from group B oppose the bill. The conditional expected reward in this deviation is thus $1 - F\left(\frac{N-1}{2} - N^A, \pi_0^B, N^B - 1\right)$.

For deviation not to be profitable, the two conditional expected rewards need to be equal,

$$F\left(\frac{N-3}{2} - N^A, \pi_0^B, N^B - 1\right) = 1 - F\left(\frac{N-1}{2} - N^A, \pi_0^B, N^B - 1\right). \tag{10}$$

In equilibrium, π_0^B thus is as such that $\frac{N-1}{2} - N^A$ is a median of the distribution of opposing votes from $N^B - 1$ politicians from group B. If $\frac{N-1}{2} - N^A = \frac{N^B-1}{2}$, the only probability that fulfills condition (10) is $\pi_0^B = \frac{1}{2}$. For $\frac{N-1}{2} - N^A < \frac{N^B-1}{2}$ to be a median, we need $\pi_0^B < 1/2$ and, reversely, $\frac{N-1}{2} - N^A > \frac{N^B-1}{2}$ implies $\pi_0^B > 1/2$.

For the overall vote outcome in parliament, the voting behavior of all N^B politicians in group B is relevant. By first-order dominance, the median of the distribution of opposing votes from group B, N_0^B, is either $\frac{N-1}{2} - N^A$ (when $\frac{N-1}{2} - N^A \leq \frac{N^B-1}{2}$) or $\frac{N+1}{2} - N^A$ (when $F\left(\frac{N-1}{2} - N^A, \pi_0^B, N^B\right) > \frac{1}{2}$).[10] The mode of a binomial distribution is never more than unity away from its median (Kaas and Buhrman 1980) implying that the mode of the distribution is in the interval $\left[\frac{N-3}{2} - N^A, \frac{N+3}{2} - N^A\right]$.

The overall distribution of opposing votes from all N politicians in parliament, $N_0 = N^A + N_0^B$, is a shifted binomial distribution with success probability π_0^B, N^B draws, and a shift of N^A. Its median is either $\frac{N-1}{2}$ or $\frac{N+1}{2}$ which are both one-vote margins. The mode of this distribution is in the interval $\left[\frac{N-3}{2}, \frac{N+3}{2}\right]$ such that the most likely vote result in parliament never corresponds to more than a three-vote margin. The

[10] $B(\pi_0^B, N^B)$ first-order dominates $B(\pi_0^B, N^B - 1)$ as well as $B(1 - \pi_0^B, N^B)$ first-order dominates $B(1-\pi_0^B, N^B-1)$. From (10), we know that $F(\frac{N-3}{2} - N^A, \pi_0^B, N^B - 1) < \frac{1}{2}$ and $F(\frac{N-1}{2} - N^A, \pi_0^B, N^B - 1) > \frac{1}{2}$. The first-order dominances then give $F(\frac{N-3}{2} - N^A, \pi_0^B, N^B) < \frac{1}{2}$ and $F(\frac{N+1}{2} - N^A, \pi_0^B, N^B) > \frac{1}{2}$. Thus either $\frac{N-1}{2} - N^A$ or $\frac{N+1}{2} - N^A$ (or both) are median of $B(\pi_0^B, N^B)$. When $\frac{N-1}{2} - N^A = \frac{N^B-1}{2} \Leftrightarrow \pi_0^B = \frac{1}{2}$, the distribution is symmetric and both candidates are medians. When $\frac{N-1}{2} - N^A < \frac{N^B-1}{2} \Leftrightarrow \pi_0^B < \frac{1}{2}$, then $B(\pi_0^B, N^B)$ is first-order dominated by $B(\frac{1}{2}, N^B)$ so that $F(\frac{N-1}{2} - N^A, \pi_0^B, N^B) > F(\frac{N-1}{2} - N^A, \frac{1}{2}, N^B) = \frac{1}{2}$ and its median is thus $\frac{N-1}{2} - N^A$. When $\frac{N-1}{2} - N^A > \frac{N^B-1}{2} \Leftrightarrow \pi_0^B > \frac{1}{2}$, the symmetric argument yields that the median is $\frac{N+1}{2} - N^A$.

probability distribution of parliamentary vote outcomes is thus centered around very close results.

It is interesting to see that a one-vote margin would also be the outcome when groups were able to decide voting behavior collectively. Such behavior might seem reasonable when one thinks of groups as parties with whip. In a cooperative game, the party would choose a Pareto efficient situation. Only one-vote margins fulfill this requirement for group B as they maximize the number of rewarded politicians from the group.

4.2.2 Good state of the world

In case the state of the world is good, $s = 0$, politicians' voting behavior in parliament is as follows. Groups A, B, and D have strictly dominant strategies. Groups A and D always have and politicians in group B agree with their voters ex-ante and thus oppose the policy to be rewarded, see panel (a) of Table 2.

Voting behavior of politicians in group C depends on group sizes. These politicians face voters who prefer policy intervention ex ante. In the good state of the world, $s = 0$, politicians of this group thus disagree with their voters ex ante. As a consequence, these politicians seek to be in the parliament's majority, see panel (b) of Table 2. If either group A and B form a majority together or group D does so alone, group C votes alongside this majority in closed fashion: That is, group C opposes the policy if $N^A + N^B \geq N/2$ and it supports the policy if $N^D \geq N/2$.

If, however, no such clear majority exists, group C is decisive for the parliamentary vote outcome. Then, there are three possible equilibria. In two of them, C-group politicians coordinate to voting in closed fashion for one of the policies.[11] Without successful coordination, however, the mixed-strategy equilibrium where C-group politicians randomize becomes relevant.

We can derive the mixed-strategy equilibrium in this "seek to win" game between politicians of group C similarly as in the situation above. $N^A + N^B$ politicians vote against the bill with certainty. The bill passes if at most $\frac{N-1}{2} - N^B - N^A$ politicians from group C vote against it and

[11] This is derived by the same logic as in case of the popular but unnecessary policy in Section 4.1. Given $N^A + N^B < \frac{N}{2}$ and $N^D < \frac{N}{2}$, group C voting either way in closed fashion would entail a majority for the respective policy option. In both cases, each group C member belongs to the winning coalition and has no incentive to deviate, which is sufficient to constitute a Nash-equilibrium.

fails otherwise.

From the view point of an individual politician, deviation must not pay in equilibrium. Deviating to voting either way with certainty induces an expected reward which is equal to the probability of the supported policy option winning conditional on one's own support. When deviating to voting in favor of the bill, this is the probability that not more than $\frac{N-1}{2} - N^B - N^A$ of the other politicians in group C oppose the bill, $F\left(\frac{N-1}{2} - N^B - N^A, \pi_0^C, N^C - 1\right)$ where π_0^C denotes the probability with which C-group politicians oppose the bill. Deviating to opposing the bill, the expected reward equals the probability that at least $\frac{N+1}{2} - N^B - N^A$ (thus more than $\frac{N-1}{2} - N^B - N^A$) other members of the group also do so, $1 - F\left(\frac{N-1}{2} - N^B - N^A, \pi_0^C, N^C - 1\right)$.

In equilibrium, the two expected rewards need to be equal,

$$F\left(m, \pi_0^C, N^C - 1\right) = 1 - F\left(m, \pi_0^C, N^C - 1\right), \tag{11}$$

where $m = \frac{N-1}{2} - N^B - N^A$. This equilibrium condition reads very similarly as the ones before, (8), (9), and (10). In equilibrium, $\frac{N-1}{2} - N^B - N^A$ is a median of the probability distribution of opposing votes of all but one politician from group C. By the same logic as in the previous section, this implies that the median number of opposing votes from group C as a whole is in $\left[\frac{N-1}{2} - N^B - N^A, \frac{N+1}{2} - N^B - N^A\right]$ and that the mode is in $\left[\frac{N-3}{2} - N^B - N^A, \frac{N+3}{2} - N^B - N^A\right]$.

The probability distribution of opposing votes from all N politicians in parliament is very similar to the one discussed in the previous section. Here it is a shifted binomial distribution with success probability π_0^C, N^C draws, and a shift of $N^B + N^A$. Its mean is in $\left[\frac{N-1}{2}, \frac{N+1}{2}\right]$ and its mode in $\left[\frac{N-3}{2}, \frac{N+3}{2}\right]$. Thus, also with a heterogeneous electorate, closest vote margins can be very likely vote results in case of an unnecessary policy. This is the case when median groups of the electorate disagree ex ante with their politicians who fail to coordinate.

4.2.3 Summary of results

Table 4 summarizes voting behavior in parliament for different locations of the median politician. The table illustrates that the result of the vote in parliament often is very similar across states of the world, especially in the lower part of the table. This implies that, in these cases, observing a certain outcome in parliament does not allow a substantial revision of the prior.

median politician in	good state of the world	bad state of the world
group A	policy fails with groups A, B, and C opposing it, group D supporting it	policy fails with group A opposing it, groups B, C, and D supporting it
group B	policy fails with groups A, B, and C opposing it, group D supporting it	vote outcome stochastic, group A opposes policy, groups C and D oppose it, group B randomizes
group C	three possible equilibria, groups A and B oppose policy, group D supports it, group C supports, opposes, or randomizes	policy passes, groups A and B oppose the policy, groups C and D support it
group D	policy passes, groups A and B oppose the policy, groups C and D support it	policy passes, groups A and B oppose the policy, groups C and D support it

Table 4: Voting behavior in parliament for different locations of the median politician.

Further note that close-margin results are rather common events in the bad state of the world despite only one of the four cases in Table 4 includes randomization. In fact, a one-vote margin is the (median) result in at least 37.5% of the possible combinations of group sizes.[12] The model thus predicts that parliamentary votes about preventive policies are likely to end very narrowly as observed in recent crises.

5 Conclusion

In recent crises, policies designed to prevent further damage to the economy often passed parliaments only very narrowly. This paper has presented a model which rationalizes this observation.

In our set-up, only politicians know whether a potential threat to the economy actually exists and a costly preventive policy is thus necessary. The preventive nature of the considered policy measure implies

[12]There are $\frac{1}{6}(N+1)(N+2)(N+3)$ different combinations of group sizes. $\frac{1}{16}(N+1)(N+3)(N+5)-1$ of them display one-vote margins as (median) results either because the median politician is in group B or because either N^A or N^C+N^D is exactly $\frac{N+1}{2}$. The ratio of the two numbers converges to $\frac{3}{8}$ from above as $N\to\infty$.

that, when the policy is conducted, it is not observable how severe the consequences of not conducting it would have been.

In the presence of necessary though unpopular policies, this induces a winner's curse for certain politicians. No matter the outcome of the parliamentary vote, voters who oppose the policy ex-ante will reward its losers and punish its winners. Voters can only be convinced of the policy's necessity by observing the damage that results from policy passivity. Policy passivity however would then turn out to be wrong ex-post and voters would punish supporters of this policy action. When the damage is prevented, voters cannot observe any damage to the economy, stick to their ex-ante attitudes of opposing the policy and punish politicians who support it.

In such constellation, narrow margins are rather likely to appear in parliament. Wider vote margins induce incentives to move to the loosing fraction to avoid the winner's curse. The model is thus able to explain the observations made during the recent crises where preventive policies often passed parliaments only very narrowly.

The model can be extended in various directions. Such extensions include analyzing the incentives to deviate from majority behavior in repeated interaction of politicians and in different electoral systems such as proportional representation and party lists. Also collective behavior of parties including the strategic use of individual deviators as well as different incentives to individual deviation in a hierarchy within the party are worth studying. Our framework is basic to such analyses since one has to consider politicians in parliament as individuals with potentially different interests to understand deviators' motives. Furthermore, studying deviation is particularly interesting in the information structure of our model where wider vote margins induce incentives to move to the loosing fraction to avoid the winner's curse.

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