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# GUNS AND VOTES

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## ABSTRACT

Why are U.S. congressmen reluctant to support gun control regulations, despite the fact that most Americans are in favor of them? We argue that re-election motives can lead politicians to take a pro-gun stance against the interests of an apathetic majority of the electorate, but in line with the interests of an intense minority. We develop a model of gun control choices in which incumbent politicians are both office and policy motivated, and voters differ in the direction and intensity of their preferences. We derive conditions under which politicians support gun control early in their terms, but oppose them when they approach re-election. We test the predictions of the model by analyzing votes on gun-related legislation in the U.S. Senate, in which one third of the members are up for re-election every two years. We find that senators are more likely to vote pro gun when they are close to facing re-election, a result which holds comparing both across and within legislators. Only Democratic senators "flip flop" on gun control, and only if the group of pro-gun voters in their constituency is of intermediate size.



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# 1 Introduction

For decades there has been a heated debate about gun control in the United States. On the one hand, gun control supporters argue that stricter regulations are needed to reduce violence. On the other hand, gun rights advocates argue that gun controls violate Second Amendment rights and are unlikely to be effective at reducing violent crimes.[1]

Opinion polls reveal that most Americans support stricter gun regulations. While most citizens oppose an all-out ban on guns, they clearly favor a series of less extreme gun-control measures. The extent of support varies across measures: in an ABC News-Washington Post poll carried out in January 2013, 88% of respondents favored background checks on firearms purchased at gun shows, 76% supported checks on buyers of ammunition, 71% backed a new federal database to track gun sales, and 58% favored a ban on high-capacity magazines. Support for gun regulations also varies over time: according to Gallup polls between 1999 and 2012, support for background checks at gun shows increased from 83% to 92%. Admittedly, poll results depend crucially on the way in which the question is framed. When they are asked about specific gun regulations, most respondents—in the country as a whole as well as in individual states—are in favor of them. When instead asked to choose between gun controls and gun rights, respondents tend to be equally split.[2] Overall, however, a vast majority of the electorate has long been in favor of a range of stricter gun regulations.

Why are then U.S. congressmen often reluctant to support even mild gun control measures, against the interests of a majority of their electorate? For example, a poll carried out between April 11 and 14, 2013 showed that 86% of respondents supported a law requiring background checks on people buying guns at gun shows or online (ABC News-Washington Post). Yet, less than a week later many senators voted against an amendment to require background checks for commercial gun sales. This dichotomy was

[1] During the past 30 years, there have been at least 70 mass shootings, in which four or more people were killed by a gunman not involved in a conventional crime. More than 75% of the guns possessed by the shooters were obtained legally and included dozens of assault weapons and semiautomatic handguns ("Broken hearted," *The Economist*, December 15, 2012). Gun rights advocates argue that gun regulations may actually increase violence, if criminals are deterred when potential victims are more likely to possess a firearm.

[2] A survey carried out in January 2013 by the Pew Research Center shows that 85% of Americans supported background checks for private and gun show sales; in all but two states (Delaware and North Dakota), a majority of respondents were in favor of background checks; in 42 states, support was at least 70%. The poll also shows that 80% of Americans supported laws to prevent people with mental illness from purchasing guns; in all but one state (Delaware), a majority of respondents were in favor of these laws; in 40 states, support was at least 70%. The same Pew Survey asked the question "What do you think is more important – to protect the right of Americans to own guns, or to control gun ownership?"; 51% of respondents said that it is more important to control gun ownership, 45% said it is more important to protect gun rights, and 5% were unsure or did not reply.

pointed out by President Obama after the vote: "The American people are trying to figure out: How can something have 90% support and yet not happen?"

In this paper, we show that electoral incentives can help to explain this "gun control paradox" (Schuman and Presser, 1978). We argue that understanding politicians' stance on gun control requires taking into account not only the direction of voters' preferences, but also their *intensity*. As stressed by Goss (2006, p. 6), "American gun owners are intense, well organized, and willing to vote for or against candidates purely on the basis of their position on gun control." They represent a "highly motivated, intense minority," who prevails over a "larger, relatively apathetic majority."[3] This can lead politicians to support the interests of a minority of pro-gun voters.[4]

To formalize this idea and guide our empirical analysis, we describe a simple model of gun control choices, in which incumbent politicians are both office and policy motivated. There are two groups of voters in the electorate: anti-gun voters, who represent a majority of the electorate and care less about gun control than about other policy issues; and pro-gun voters, who are a minority of the electorate and care more intensely about gun control policies.[5] Minority voters may also be better informed about politicians' choices on gun control.

We consider first a one-period model and show that re-election incentives might induce politicians to support the interests of the pro-gun minority, against both the interests of the majority of the electorate and their own policy preferences. We then extend the model to a setting in which politicians serve two-period terms, and their choices in the second period—when they are closer to facing re-election—have a larger impact on voters' decisions. We examine the impact of election proximity on gun control decisions. We show that politicians might support gun regulations in the first period, but oppose them in the second period. Only anti-gun politicians, who face a tradeoff between

[3]In a recent national survey conducted by the Pew Research Center in January 2013 among 1,502 adults, most respondents ranked gun control relatively low on their priority list (18th out of 21 policy goals tested). Similarly, in the latest survey from Gallup, also conducted in January 2013, just 4% of respondents listed guns when asked for the most important issue facing the country.

[4]Similar arguments are often raised by the media: "Why aren't the polling numbers on gun control swaying more members of Congress? Many of the poll numbers don't capture the nuances of public opinion. For example, there is a significant difference in the level of passion of voters on the two sides of the issue. While members of the National Rifle Association or conservative gun owners home in on this issue, gun-control proponents may not register that sort of excitement" ("How Democrats got gun control polling wrong," *National Journal*, April 18, 2013).

[5]Goss (2006) argues that gun control is a "missing movement" in America. Even though there are some organized gun-control groups, such as the Brady Campaign to Prevent Gun Violence or the Coalition to Stop Gun Violence, their membership pales in comparison to gun-rights groups. Membership figures are difficult to obtain, but Goss estimates that total membership in gun control organizations was 268,000 in 2005. By contrast, the NRA had approximately 4 million members in 2004.

their policy preferences and re-election motives, should "flip flop" on gun control—and only if the group of pro-gun voters in their constituency is of intermediate size. Election proximity should have no impact on politicians who are not concerned about re-election and on pro-gun politicians, whose policy preferences are aligned with re-election motives.

To assess the validity of these predictions, we exploit the staggered structure of the U.S. Senate, in which senators serve six-year terms and one third of them is up for re-election every two years. This provides a quasi-experimental setting to verify whether election proximity affects the voting behavior of incumbent politicians on gun-related legislation. For any given vote, it is possible to compare the behavior of senators who belong to three different "generations," i.e. who face elections at different times. We can also study whether election proximity affects the stance of individual senators, exploiting the fact that senators cast multiple votes on gun control during their terms in office.

To select the votes in our sample, we rely on Gun Owners of America (GOA), a non-profit lobbying organization formed in 1975 to preserve and defend the Second Amendment rights of gun owners. Since 1994, GOA has been keeping track of key gun votes in Congress, indicating whether or not they support them.[6] We study the voting behavior of U.S. senators on these votes for nine consecutive congresses. Our main sample covers the period 1995-2010, but in robustness checks we include votes from 1993.

First, we examine the impact of election proximity on the voting behavior of senators at large. We find that the last generation is significantly more likely to vote pro gun than the previous two. The effect is sizable: senators who are in the last two years of their mandates are between 3.4 and 9.6 percentage points more likely to vote in favor of pro-gun policies than senators in the first four years, depending on the specification. These changes imply that the predicted probability of voting pro gun increases by between 5.5 and 17.6 percent when senators approach re-election. The pro-gun effect of election proximity continues to hold when, rather than exploiting variation in the voting behavior of different senators, we compare the behavior of the same senator over time: flip flopping by individual senators is both common and recurrent.[7] Inter-generational differences in senators' votes on gun control are also robust to using different econometric methodologies and samples of votes, and including a wealth of controls to account for

[6]The National Rifle Association (NRA), the most well-known pro-gun lobby, publishes information on gun ratings of politicians, but does not keep track of key gun votes in Congress.

[7]Senators often change their stance on gun control more than once. For example, Senator Tom Daschle (Democrat from South Dakota) voted anti-gun in 1993 on 2 votes and in 1995 on 1 vote, when he belonged to the first and second generation, respectively. He then voted pro-gun on 2 out of 4 votes in 1998, when he belonged to the third generation. Following re-election, he voted again anti-gun in 1999 on 4 votes, when he belonged to the first generation.

characteristics of legislators (e.g. party affiliation, gender, age, contributions received from gun-rights and gun-control lobbies), states (e.g. subscriptions to gun magazines, violent crime rate), and votes (e.g. margin of passage or rejection) that might affect senators' voting behavior.

To verify whether inter-generational differences in senators' voting behavior on gun control are driven by electoral incentives, we focus on legislators who have announced their retirement. According to our model, election proximity should have no impact on the voting behavior of legislators who are not concerned about losing office, and should then always vote according to their policy preferences. In line with this prediction, we find that inter-generational differences disappear for senators who are not seeking re-election.

We next explore party differences and show that election proximity has no effect on the voting behavior of Republican senators. By contrast, the probability that Democratic senators vote pro gun increases by between 16.6 and 18.9 percent in the last two years of their mandate.[8] Yet, the effect of election proximity for Democratic senators is non-monotonic: it is only present when the group of pro-gun voters is of intermediate size. These results are consistent with the predictions of our theoretical model. Republican senators should take a pro-gun stance throughout their mandate, since their policy preferences (or those of their party) are aligned with their re-election motives. By contrast, Democratic senators might flip flop on gun control, since they face a tradeoff between voting in line with their gun-control preferences and their re-election prospects. When the pro-gun group in their constituency is neither too small nor too large, they should vote in favor of gun regulations at the beginning of their terms, but oppose them at the end.

Our analysis suggests that electoral incentives can lead politicians to support the interests of an intense minority of voters, on policy issues that the majority cares less intensely about. The lack of congruence between the policies chosen by incumbent legislators and the preferences of the median voter can in principle also be explained by the financial pressure of deep-pocketed lobby groups. Our empirical results show that senators who receive larger amounts of campaign contributions from gun-rights lobbies are indeed more likely to take a pro-gun stance. However, contributions by lobby groups do not account for the pro-gun effect of election proximity on senators' voting behavior

[8]This result confirms anecdotal evidence that Democratic senators are often afraid of supporting gun control, particularly if they seek re-election in pro-gun states. For example, pointing to Heidi Heitkam—a Democratic senator from North Dakota—Larry Sabato, director of the University of Virginia's Center for Politics, said: "You think she's going to vote for gun control and have a prayer for re-election?" ("Gun control efforts are expected to be revived in Congress," *Times Union*, December 15, 2012).

on gun control.

The remainder of the paper is organized as follows. Section 2 briefly reviews the related literature. Section 3 presents the theoretical model. Section 4 describes the dataset and variables used in our empirical analysis. Section 5 discusses our empirical strategy, while Section 6 presents the results. Section 7 concludes.

# 2 Related literature

Our paper is related to several strands of the literature.

The idea that electoral incentives may affect politicians' choices on secondary policy issues has already been emphasized by List and Sturm (2006). They develop a theoretical model in which politicians use secondary policies to attract single-issue voters, and test their predictions by exploiting gubernatorial term limits across U.S. states. They argue that term-limited governors implement policies closer to their ideal points, while those who can be re-elected manipulate their policies in order to retain office.

Our paper differs from List and Sturm (2006) in three ways. First, in their infinite horizon model voters are uncertain about the preferences of politicians on the secondary policy issue, so incumbents engage in reputation building. In our finite horizon model, there is no uncertainty about the preferences of politicians and thus no scope for reputation building. In light of our empirical findings, this difference appears to be far from innocuous. The theoretical model by List and Sturm (2006) can explain why politicians may override their private preferences on gun control to retain office, i.e. why Democratic senators seeking re-election in a state with a large pro-gun group may oppose gun regulations. However, it cannot provide an explanation for our main empirical finding: the fact that politicians flip flop on gun control *during* their terms in office.[9] Second, List and Sturm examine the impact of electoral incentives on environmental policy choices, while we focus on gun-control policies. Finally, they verify the effect of re-election incentives on secondary policy issues by exploiting gubernatorial term limits across U.S. states. Our empirical strategy exploits instead the staggered structure of the U.S. Senate.[10]

[9] In a reputation building model, voting anti-gun early would reveal the anti-gun preferences of the incumbent to the voters as much as a full anti-gun platform; incumbents should thus adopt a full anti-gun or a full pro-gun platform during their terms. Using the model by List and Sturm (2006), it would thus be hard to explain why individual senators change their voting behavior on gun control during their terms in office. It would also be hard to rationalize why their flip flopping behavior is recurrent.

[10] Our empirical strategy builds on a vast literature that examines the impact of election proximity on legislative behavior (e.g. Amacher and Boyes, 1978; Thomas, 1985; Glazer and Robbins, 1985; Levitt, 1996; Bernhard and Sala, 2006). Rather than focusing on senators' choices on specific policy

Our analysis is also related to a large body of work that studies political obstacles to reforms. One of the seminal contributions in this area is the paper by Fernandez and Rodrik (1991), which shows that ex-ante uncertainty about the gains and losses can lead a rational electorate to oppose a reform ex ante, even if the reform would be supported by a majority ex post. Several other papers have examined the political viability of reforms in the presence of distributional effects and uncertainty (e.g. Alesina and Drazen, 1991; Dewatripont and Roland, 1995). Our paper shows that, in the presence of an intense minority, re-election motives can deter politicians from implementing reforms that are supported by a majority of their electorate.

Our empirical findings are reminiscent of the predictions of theoretical models of political business cycles. These emphasize the importance of electoral calendars when politicians are office motivated: close to elections, incumbent politicians manipulate fiscal and monetary policies to signal their competence (Rogoff and Sibert, 1988; Rogoff, 1990). Our paper shows that proximity to election can lead office-motivated politicians to support the interests of vocal minorities on secondary policy issues.

Our paper also contributes to the literature examining the determinants of the voting behavior of U.S. congressmen. The pioneering contribution by Peltzman (1985) studies senators' voting patterns on federal tax and spending. Recent contributions include Washington (2008), who investigates the effect of parenting daughters on the likelihood that House members will vote for reproductive rights, and Mian *et al.* (2010), who examine legislators' votes on two bills introduced in the aftermath of the recent financial crisis. Closest to our analysis is the paper by Conconi *et al.* (2014a), which exploits inter-cameral differences in term length and the staggered structure of the Senate to show that electoral incentives deter legislators from supporting trade liberalization reforms.

Finally, the paper contributes to the empirical literature on gun control. Various papers focus on the effectiveness of gun control policies on crime, often reaching conflicting conclusions. In two influential studies, Lott and Mustard (1997) and Lott (1998) conclude that Carrying Concealed Weapons (CCW) laws have reduced violent crime. This finding has been disputed by Duggan (2001), among others.[11] A recent paper by

issues, these papers analyze how election proximity affects senators' ideological positions, captured by summary indexes of their voting record on a broad set of issues (e.g. ADA scores, D-Nominate and W-Nominate scores). Other studies compare senators' voting scores to various measures of their constituencies' preferences and examine how election proximity affects the gap between the two.

[11]The argument of Lott and Mustard (1997) and Lott (1998) is that CCW laws deterred crime by increasing the likelihood that potential victims would be carrying a firearm. Using information on the geographic circulation of firearms magazines as a proxy for gun ownership, Duggan (2001) finds no evidence that CCW laws led to increases in the rate of gun ownership or in the frequency with which gun owners carried their guns.

Duggan *et al.* (2011) examines the localized effect of gun shows, which allow vendors to sell firearms without background checks in some U.S. states, showing that these events do not increase homicides (within three weeks, in or near the zip code where shows take place). Another strand of the literature examines gun trafficking within the United States (e.g. Webster *et al.*, 2009; Knight, 2013) or internationally (DellaVigna and La Ferrara, 2010; Dube *et al.*, 2013). Few studies have examined U.S. legislators' voting behavior on gun control, focusing on specific bills and on the role of lobbies' contributions and constituencies' characteristics (e.g. Langbein and Lotwis, 1990; Kahane, 1999; Lipford, 2000). This is the first paper to consider a large set of gun-related votes and study the role of electoral incentives.

# 3 Theory

In this section, we describe a simple theoretical model to guide our empirical analysis. First, we introduce a one-period version of the model, to formalize the idea that re-election motives can lead politicians to support the interests of an intense pro-gun minority, against the interest of an apathetic majority who favors gun regulations. Second, we extend the model to two periods, to derive predictions about the impact of election proximity on gun control choices.

## 3.1 One-period model

### 3.1.1 Setup

We describe a simple model of gun control choices, in which politicians are both office and policy motivated and voters differ in the direction and intensity of their preferences. Our analysis builds on standard probabilistic voting models (e.g. Enelow and Hinich, 1982; Lindbeck and Weibull, 1987; Dixit and Londregan, 1995; Grossman and Helpman, 1996). To keep the model as simple as possible, we adopt a formulation similar to Persson and Tabellini (2001) and Stromberg (2004).

As discussed in the introduction, opinion polls reveal that a majority of U.S. citizens supports a range of gun regulations. However, to most voters, gun control is an issue of secondary importance. Only an intense minority of pro-gun voters is willing to vote for or against candidates purely on the basis of their position on gun control. Our theoretical model captures these facts in a stylized way.

We consider an incumbent who has to vote "yea" (1) or "nay" (0) on two policy issues: a primary policy issue ($p$), which a majority of the electorate cares relatively

more about; and a secondary policy issue ($s$), which a minority cares more intensely about.[12] The choice $s \in \{0, 1\}$ can be interpreted as a vote in favor ($s = 0$) or against ($s = 1$) stricter gun regulations (e.g. supporting or opposing background checks on sales at gun shows).

We assume a structure of preferences that allows us to focus our attention on politicians' voting behavior on the secondary issue, which captures gun control. In particular, there are two groups of voters, $j \in \{M, m\}$, in a population of size 1. Group $j$ constitutes a fraction $n_j$ of the electorate. The two groups differ in *size*, with $M$ representing the majority group: $n_M > n_m$. We assume that the utility of a group-$j$ voter is:

$$W_j(p, s) = -|p_j - p| - \alpha_j |s_j - s|, \tag{1}$$

where $(p_j, s_j)$ is the bliss point of any $j$ voter. We also assume that the two groups differ in the relative *intensity* of their preferences: $\alpha_M < 1 < \alpha_m$. Thus the majority cares relatively more about the primary issue, while the opposite is true for the minority. Finally, voters in the two groups differ with respect to the *direction* of their preferences. In particular, we assume that their bliss points coincide with respect to the primary issue ($p_M = p_m$), but diverge on the secondary issue: $s_M = 0$, $s_m = 1$. This assumption allows us to drop the primary issue from the rest of the analysis, and focus our attention on politicians' voting behavior on the secondary issue.[13] We refer to voters in group $M$ as the *anti-gun* voters and to voters in group $m$ as the *pro-gun* voters.

Besides policy, voters care about other characteristics of the incumbent politician. The total utility of voter $i$ in group $j$ under the incumbent is

$$W_j(s) - \sigma_{ij} - \mu,$$

with $\sigma_{ij} \sim U[-\frac{1}{2\phi_j}, \frac{1}{2\phi_j}]$ and $\mu \sim U[-\frac{1}{2\gamma}, \frac{1}{2\gamma}]$. The parameter $-\sigma_{ij}$ represents an individual's ideological preference in favor of the incumbent, while $-\mu$ represents her general popularity.[14] As usual in probabilistic voting models, there is an implicit assumption

[12] We do not analyze the behavior of a challenger competing against an incumbent when the latter is up for re-election. However, in our framework, it is easy to formally introduce a challenger and analyze her behavior. All our results continue to hold in this alternative specification.

[13] Our results continue to hold if the two groups of voters have different preferences on the primary policy issue, i.e. if their bliss points are $(p_M, s_M) = (0, 0)$ and $(p_m, s_m) = (1, 1)$, or alternatively $(p_M, s_M) = (1, 0)$ and $(p_m, s_m) = (0, 1)$.

[14] We could allow for a group-specific bias against or in favor of the incumbent by introducing a non-stochastic shifter, say, $\psi_j$ in the distribution of $\sigma_{ij}$, i.e. $\sigma_{ij} \sim U[-\frac{1}{2\phi_j} - \psi_j, \frac{1}{2\phi_j} - \psi_j]$. This could capture differences in the average popularity of the incumbent with different groups of voters, e.g. Republican candidates are more popular among pro-gun voters than anti-gun voters. Introducing such bias would not affect our results, since the incentives of the incumbent would not change at the margin.

that, for any incumbent, there are always voters that can be swung at the margin, i.e. the support of $\sigma_{ij}$ is large enough. However, one could imagine situations in which, due to strong ideological divergences, some pro-gun voters may never vote for an incumbent, even if she adopts a pro-gun stance. Our results continue to hold (at least qualitatively) if we introduce such "partisan voters" in the model.

At the end of the incumbent's mandate, voters decide whether to re-elect her or vote for a challenger. However, not all voters know what the incumbent did during her mandate. Let the variable $\xi_{ij} = 1$ if voter $i$ in group $j$ knows what the incumbent has done, and $\xi_{ij} = 0$ otherwise. Following Stromberg (2004), the decision of re-electing the incumbent is based on a simple rule: each voter $i$ in group $j$ casts the ballot in favor of the incumbent if her utility under the incumbent has met some minimum standard $\bar{u}_j$:[15]

$$\xi_{ij} W_j(s) - \sigma_{ij} - \mu \geq \bar{u}_j. \tag{2}$$

For each individual $i$ in group $j$, the incumbent assigns a probability $\chi_j$ that the voter knows what she has done during her mandate.[16]

We focus on scenarios in which the "intense minority" of pro-gun voters prevails over the "apathetic majority"of anti-gun voters. To this purpose, we impose the following restriction: $n_m \alpha_m \chi_m \phi_m > n_M \alpha_M \chi_M \phi_M$. A sufficient condition for this assumption to hold is that the minority more than compensates for its smaller size by caring relatively more about gun control. Yet, minority voters may have other advantages that reduce the required difference in preference intensities: they may be more informed about politicians' decisions on gun control ($\chi_m > \chi_M$) or more homogeneous in their ideological preferences ($\phi_m > \phi_M$).

For any given $\mu$, we can compute $\pi_j$, the fraction of each group voting for the incumbent. Using these fractions, we can compute the probability of re-election of the incumbent (re-election requires a majority of the votes):

$$\Pi(s) = \Pr_{\mu}\left(\sum_j n_j \pi_j \geq \frac{1}{2}\right) = \frac{1}{2} + \frac{\gamma}{\phi}\sum_j n_j \phi_j \left(\chi_j W_j(s) - \bar{u}_j\right), \tag{3}$$

where $\phi = \sum_j n_j \phi_j$.

[15] Our results do not rely on this specific retrospective voting rule. Indeed, as mentioned above, we can easily rewrite our model as a forward-looking voting model in which two candidates credibly commit to a policy platform. In such a specification, $\bar{u}_j$ would simply be replaced by voter $i$'s utility when the challenger wins the election.

[16] See Appendix A.3 for an extension of the model in which $\chi_m$ is a function of the information provided by a lobby representing the interests of pro-gun voters.

The politician cares about being re-elected, but also about the ballot she casts. Her utility is

$$U(s) = \Pi(s) + \theta\omega(s), \tag{4}$$

where $\omega(s)$ captures the incumbent's policy preferences, and $\theta(\geq 0)$ is the relative importance of those policy preferences for the incumbent.[17] This assumes that the incumbent cares about how she votes on any policy issue (e.g. Levitt, 1996; Ansolabehere *et al.*, 2001; Washington, 2008). Alternatively, $\omega(s)$ can be interpreted as the preferences of the incumbent's party. In this case, $\theta$ is the relative importance of the party line (e.g. Levitt, 1996; Snyder and Groseclose, 2000; Ansolabehere *et al.*, 2001).

We consider two different types of incumbents. An *anti-gun incumbent* has policy preferences similar to voters in the anti-gun group: $\omega(0) > \omega(1)$. A *pro-gun incumbent* has policy preferences similar to voters in the pro-gun group: $\omega(1) > \omega(0)$. If we interpret $\omega(s)$ as the importance of the party line, given the historical positions of U.S. parties on gun control, anti-gun and pro-gun incumbents can be thought of Democratic and Republican politicians, respectively.

### 3.1.2 Equilibrium analysis

In this subsection, we show that anti-gun incumbents might choose to oppose gun restrictions to increase their probability of re-election. These politicians face a tradeoff between doing what they think is right (or what their party leaders want), and maximizing their chances of retaining office. As a result, they *might* support the interests of the pro-gun minority, against the interests of most voters.

**Proposition 1** *For an anti-gun incumbent, the strategy $s^* = 1$ is an equilibrium if and only if*

$$\frac{\gamma}{\phi}\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right) \geq \theta\left(\omega(0) - \omega(1)\right).$$

*For $\theta = 0$, this is always true.*

**Proof**: see Appendix A.1.

To understand the intuition of this result, it is easier to start with the case in which the incumbent cares only about her probability of re-election, i.e. $\theta = 0$. When choosing

[17] By varying the size of $\theta$ we can capture different political situations. For instance, $\theta = 0$ captures the case of an incumbent who does not care about the ballot she casts, as long as she gets re-elected. $\theta \to \infty$ captures the case of a retiring incumbent, who does not care about re-election, but only about voting according to her policy preferences.

between "yea" and "nay", the incumbent has to weigh the effect of her choice on her probability of being re-elected. Voting "yea" instead of "nay" would convince some pro-gun voters to vote for her, and some anti-gun voters not to vote for her. In expectation, the net gain in re-election prospects depends on the sign of $n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M$. Notice that the effect is always positive since, by assumption, $n_m\phi_m\chi_m\alpha_m > n_M\phi_M\chi_M\alpha_M$. Therefore, the incumbent votes in line with the interests of the minority, opposing gun regulations. When $\theta > 0$, the difference $n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M$ has to be large enough to compensate the policy preference of the anti-gun incumbent in favor of voting "nay", i.e. $\theta(\omega(0) - \omega(1)) > 0$.

In Appendix A.2, we analyze the social optimality (from a utilitarian welfare standpoint) of incumbents' choices. The bottom line is that, depending on the values of the parameters, supporting the interests of the pro-gun minority may or may not be socially efficient. We also identify the two reasons underlying socially inefficient choices by the incumbent in our model: i) differences in how the two groups are informed about the incumbent's actions, and ii) differences in the homogeneity of the two groups.

## 3.2 Two-period model

In this subsection, we extend the model to a setting with two-period terms, where politicians' choices in the second period have a greater impact on their re-election chances. This allows us to derive predictions about the impact of election proximity on the voting behavior of incumbent politicians.

### 3.2.1 Setup

The model is very similar to the one introduced in the previous section. Hence, we only highlight the differences.

There are now two periods. In each period, the incumbent has to cast a vote on gun control. We denote with $s_1$ and $s_2$ her votes on gun regulations in the two periods. The utility of a voter belonging to group-$j$ is a weighted sum of her utility in both periods:

$$W_j(s_1, s_2) = -\alpha_j(\delta|s_j - s_1| + |s_j - s_2|). \tag{5}$$

We assume that $\delta \in (0, 1)$, implying that voters put more weight on the incumbent's policy choice that are made closer to the election. Several remarks are in order about this assumption. First, it is in line with theoretical studies emphasizing that voters suffer from a recency bias, following the so-called "what have you done for me lately?"

principle (e.g. Fiorina, 1981; Weingast *et al.*, 1981; Ferejohn, 1986; Shepsle *et al*, 2009). Second, empirical and experimental evidence provides strong support for the existence of such bias (e.g. Lewis-Beck and Stegmaier, 2000; Huber *et al.*, 2012; Healy and Lenz, 2014). Third, in this version of the model, the recency bias directly enters voters' utility function, i.e. voters care less about earlier decisions of politicians. This is for the sake of simplicity. Indeed, we obtain similar results in a model in which voters care equally about the two periods ($\delta = 1$), but know more about the choices of the incumbent in the second period. The fact that voters may be more informed about second-period policy choices could be due to their limited memory or to increased media coverage of policy choices close to elections. Fourth, we assume the same $\delta$ for all voters. This is again for the sake of simplicity. Indeed, all we need for our results to arise is that the discount factor of minority voters is less than 1. Finally, one may argue that a lobby, representing the interests of its members, may compensate for any recency bias by providing them with information about what the incumbent did during her mandate before they go to the polls. In Appendix A.3, we extend the model to allow for such informational lobbying. We show that the lobby's optimal information effort is affected by voters' recency bias (or limited memory/information)—even though the lobby does not suffer from such a bias—and that our results might be amplified by the existence of such lobbying.[18]

Finally, we need to adapt the assumption about the policy preferences of the two types of incumbents $\omega(s_1, s_2)$. As long as incumbents do not suffer from a recency bias, there is no reason for them to differentiate between $(1, 0)$ and $(0, 1)$. Therefore, we have

$$\omega(0,0) > \omega(0,1) = \omega(1,0) > \omega(1,1) \tag{6}$$

for an anti-gun incumbent, and

$$\omega(1,1) > \omega(1,0) = \omega(0,1) > \omega(0,0) \tag{7}$$

for a pro-gun incumbent.

### 3.2.2 Equilibrium analysis

We analyze the voting behavior of both anti-gun and pro-gun incumbents when they vote in the two periods.

[18]See Sarafadis (2007) for a detailed analysis of the strategic release of information in settings with agents having memory imperfections.

First, we can show that an incumbent who cares mostly about her policy preferences does not flip flop, i.e. she votes in the same way in the two periods. This is because re-election incentives are swamped by policy preferences. The following result follows directly from (4), (6), and (7):

**Proposition 2** *There is always a $\theta$ sufficiently large such that $(s_1^*, s_2^*) = (0,0)$ is the unique equilibrium for an anti-gun incumbent, and $(s_1^*, s_2^*) = (1,1)$ is the unique equilibrium for a pro-gun incumbent.*

When re-election motives matter, they can lead politicians to flip flop on gun control. In particular, there are situations in which an anti-gun incumbent will vote anti-gun in the first period, but not in the second one:

**Proposition 3** *For an anti-gun incumbent, the strategy $(s_1^*, s_2^*) = (0,1)$ is an equilibrium if and only if*

$$\begin{aligned} \theta\left(\omega\left(0,1\right) - \omega\left(1,1\right)\right) &\geq \frac{\gamma}{\phi}\delta\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right) \\ \frac{\gamma}{\phi}\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right) &\geq \theta\left(\omega\left(0,0\right) - \omega\left(0,1\right)\right), \end{aligned}$$

*which is never true if $\theta = 0$. The strategy $(s_1^*, s_2^*) = (1,0)$ is never an equilibrium.*

**Proof**: see Appendix A.1.

Three features of the model are crucial for this result to hold: i) the incumbent has policy preferences ($\theta > 0$); ii) voters put more weight on the incumbent's choices close to the election ($\delta < 1$); and iii) the minority compensates for its smaller size by caring relatively more about gun control, and possibly being better informed about politicians' choices on gun control and more homogeneous ideological preferences ($n_m\phi_m\chi_m\alpha_m > n_M\phi_M\chi_M\alpha_M$). The intuition is as follows: the anti-gun incumbent would like to vote "nay" in both periods to satisfy her policy preferences. However, this is costly in terms of re-election prospects, since it would swing away many pro-gun voters and attract fewer anti-gun voters. The anti-gun incumbent votes according to her policy preferences in the first period, when her choice has a smaller impact on her re-election prospects. In the second period, she votes according to the interests of the vocal minority, to maximize her chances of retaining office.

We can also show that a pro-gun incumbent will never vote differently on gun regulations in the two periods:

**Proposition 4** *For a pro-gun incumbent, neither $(s_1^*, s_2^*) = (0,1)$ nor $(s_1^*, s_2^*) = (1,0)$ are equilibrium strategies.*

**Proof**: see Appendix A.1.

The intuition is straightforward. A pro-gun incumbent would like to vote "yea" in both periods to satisfy her policy preferences. This is also the best strategy in terms of her re-election prospects, since it would attract many pro-gun voters and swing away fewer anti-gun voters ($n_m\phi_m\chi_m\alpha_m > n_M\phi_M\chi_M\alpha_M$). The pro-gun incumbent can thus afford to oppose gun regulations in both periods.

As pointed out in Appendix A.2, an incumbent who is flip flopping cannot be adopting a socially optimal policy (from a utilitarian welfare standpoint). Importantly, this neither means that an anti-gun incumbent always behaves inefficiently, nor that a pro-gun incumbent always behaves efficiently. Indeed, voting in the same way in the two periods may actually be a worse policy than flip flopping.

Finally, we can also show that anti-gun incumbents will only flip flop if the group of pro-gun voters is neither too small nor too large:[19]

**Proposition 5** *For $\delta(\omega(0,0) - \omega(0,1)) < \omega(0,1) - \omega(1,1)$, there exist $\underline{n}_m$ and $\overline{n}_m$, with $\underline{n}_m < \overline{n}_m$, such that for an anti-gun incumbent*
*1. $(s_1^*, s_2^*) = (0,0)$ is an equilibrium if and only if $n_m < \underline{n}_m$;*
*2. $(s_1^*, s_2^*) = (0,1)$ is an equilibrium if and only if $n_m \in (\underline{n}_m, \overline{n}_m)$;*
*3. $(s_1^*, s_2^*) = (1,1)$ is an equilibrium if and only if $n_m > \overline{n}_m$.*

**Proof**: see Appendix A.1.

The intuition for this result is as follows. When the vocal minority is small enough ($n_m < \underline{n}_m$), voting pro-gun, even if only in the second period, does not lead to a large enough increase in the probability of re-election to compensate the anti-gun incumbent for the cost of voting against her policy preferences. When instead the group of pro-gun voters is large enough ($n_m > \overline{n}_m$), an anti-gun incumbent find it worthwhile to support its interests in both periods. Therefore, only in the intermediate range $n_m \in (\underline{n}_m, \overline{n}_m)$ the incumbent finds it worthy to flip flop on her policy choices.

# 4 Data

To assess the validity of the model's predictions, we have assembled a novel dataset that allows us to link U.S. senators' voting behavior on gun control to a wealth of

[19] Proposition 5 shows that three types of equilibria may exist, but that the equilibrium is generically unique. For $\delta(\omega(0,0) - \omega(0,1)) > \omega(0,1) - \omega(1,1)$, it is easy to prove a similar result: the equilibrium is generically unique, and it can be of two types (proof available upon request).

characteristics of the legislators and their constituencies. In this section we describe our data, starting from our dependent variable. Tables B-1 and B-2 in Appendix B.1 provide definitions and descriptive statistics for all the variables used in our regressions.

## 4.1 Roll-call votes on gun-related legislation

We examine the voting behavior of U.S. Senators on gun-related legislation. To determine the votes in our sample, we rely on the list of gun votes assembled by Gun Owners of America (GOA), a lobby whose main goal is to protect and defend the Second Amendment rights of gun owners. Since 1994, GOA has been keeping track of key votes in the U.S. Congress. Based on legislators' decisions on these votes, GOA rates politicians on their gun positions. For the years 1994-1996, we obtain key votes from GOA's newsletters, which report voting records for senators on key legislation. For subsequent years, we obtain the list of votes from GOA's website.

One of the advantages of using this source is that we can directly identify votes that are supported by gun-rights groups: GOA lists all the votes it supported, i.e. for which it wanted congressmen to vote "yea."[20] These include two different types: votes to strengthen the rights of gun owners, and votes to reject gun-control legislation that threatens these rights. An example of the first type is the vote cast in the Senate on July 22, 2009 to pass an amendment introduced by Senator John Thune (R-SD), allowing individuals to carry concealed firearms across state lines. An example of the second type is the vote on May 12, 1999 to table an amendment introduced by Senator Frank Lautenberg (D-NJ) to ban the private sales of firearms at gun shows unless buyers submitted to background registration checks.[21]

In our empirical analysis, we will study the determinants of GOA-supported votes, which fit the kind of decisions faced by politicians in our theoretical model. The rationale for this is twofold. First, these votes capture well politicians' positions on gun control: senators' decisions on votes supported by GOA are a strong predictor of their ratings by gun-rights organizations (see Appendix B.2). Second, these votes concern gun regulations on which there is a clear party divide: based on the definition of bipartisan cosponsorship from Harbridge and Malhotra (2011), none of these votes was bipartisan.[22]

[20] As mentioned earlier, the NRA does not keep track of key gun votes in Congress. In robustness checks, we include votes from Project Vote Smart, which includes only votes that receive considerable media attention and are passed or defeated by a close margin (see discussion at the end of Section 6).

[21] In the U.S. Congress, a request to "table" a pending motion is a procedure to suspend consideration of the motion. A vote to table gun-control legislation is thus classified as a pro-gun vote by GOA.

[22] A vote is coded as bipartisan if at least 20% of its cosponsors are from a different party than that

Table B-4 in Appendix B.2 lists the 19 votes included in our main sample, as well as the description of each vote provided by GOA. Notice that 4 of these votes do not involve decisions on gun regulations, but are important for GOA as a lobby group. In some of our regressions, we will exclude votes that are not directly related to gun control.

GOA also lists votes that it did not support, i.e. for which it wanted congressmen to vote "nay." These votes are not included in our empirical analysis, since they are not congruent with our theoretical model. Senators' decisions on these votes have a much smaller impact on their ratings by gun-rights organizations than votes supported by GOA (see Appendix B.2). Moreover, many of these votes involve relatively uncontroversial gun-control measures, often sponsored by legislators from both parties. An example is the vote in 1999 on an amendment to force gun sellers to include trigger locks with every handgun sold, which passed by a large margin (78-20) and was introduced by Senator Herb Kohl (D-WI) and co-sponsored by Orrin Hatch (R-UT) and John Chafee (R-RI).[23]

## 4.2 Characteristics of legislators

Our primary interest is to examine the impact of election proximity on the voting records of U.S. senators. As discussed above, senators serve six-year terms, and one third of them are up for re-election every two years (together with the entire House of Representatives). We define those senators facing election within two years as belonging to the third generation; those who face elections next belong to the second generation, while the first generation includes senators facing elections in no sooner than four years. The main regressors of interest for our analysis are thus the indicator variables $SenateG_{it}$, $G \in \{1, 2, 3\}$, capturing the generation to which senator $i$ belongs in year $t$.

We also include information on senators' party affiliation, which is known to be a strong predictor of a politician's support for gun rights, with Republicans being systematically more pro gun than Democrats (e.g. Lipford, 2000). To assess the role played by a senator's ideological position, we employ the dummy variable $Republican_{it}$, which is equal to one if senator $i$ belongs to the Republican party.[24] We also control for the role of demographic characteristics, by including the variables $Female_i$ and $Age_{it}$ in our analysis.

of the original sponsor. Notice that this definition can only be applied to votes on bills or amendments.

[23]Based on the definition by Harbridge and Malhotra (2011), almost 30% of the votes on bills and amendments that GOA did not support had bipartisan cosponsorship.

[24]We allow this variable to be time varying, since three senators in our sample switched from or to the Republican party: Ben Nighthorse Campbell, Jim Jeffords and Arlen Specter. Four senators switched from one of the parties to being independent: senators Joe Lieberman and Bernard Sanders (coded as Democrats), and senators Robert Smith and James Jeffords (coded as Republicans).

Contributions from interest groups may also affect senators' voting behavior. To account for this, we gather data of campaign contributions from gun-rights and gun-control lobbies from the Center for Responsive Politics. *Gun-rights contributions*$_{it}$ and *Gun-control contributions*$_{it}$ record campaign contributions received by senator $i$ in year $t$ from gun-rights and gun-control lobbies (in thousands US$), respectively.[25]

To verify the role of electoral incentives, we construct the dummy variable *Retiring*$_{it}$, which takes the value of 1 for the mandate in which a senator decides to retire. These data come from Overby and Bell (2004), augmented using information from the website rollcall.com.[26]

In robustness checks, we include two additional controls for legislators. The variable *Margin of victory*$_{it}$ measures the difference in votes between the winner (senator $i$) and the runner-up in the last election.[27] Finally, the variable *Tenure*$_{it}$ measures the number of congresses a senator has served.

## 4.3 Characteristics of constituencies

We include a set of variables to control for differences across senators' constituencies.

To proxy for the size of the pro-gun minority, we use state-level data of subscriptions to gun magazines. These data come from audit reports of circulation from the Alliance for Audited Media. *American Rifleman* is published by the NRA and is the gun magazine with the largest circulation.[28] The variable *Gun magazine subscriptions*$_{jt}$ is the number of subscriptions to *American Rifleman* per 1,000 inhabitants in state $j$ and year $t$. Figure 1 shows that there is significant variation in per capita subscriptions across states. Somewhat surprisingly, per capita subscriptions to gun magazines are higher in some Democratic-leaning states (e.g. Oregon, Washington) than in some Republican-leaning states (e.g. Texas, Georgia).[29] This can partly be explained by the fact that

[25] The Center for Responsive Politics provides information on the contributions received by individual politicians for each Congress. In our analysis, we assign to each year of a Congress the total amount of contributions received in that Congress.

[26] Following Overby and Bell (2004), we classify as retiring those senators who voluntarily departed (for personal reasons or to pursue other office), excluding those who were expelled or defeated in either primary or general elections.

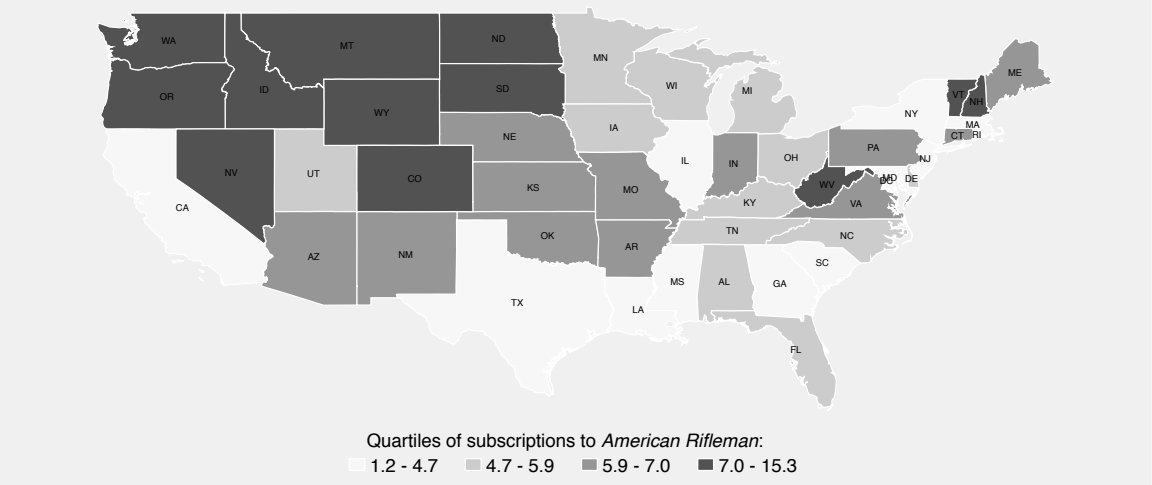
[27] More precisely, *Margin of victory*$_{it} = \frac{v_i - v_r}{v_i + v_r}$, where $v_i$ and $v_r$ denote respectively the votes received by the incumbent and the runner-up.

[28] *American Rifleman* is the default magazine that individuals receive when joining the NRA. In 2010, *American Rifleman* had 53% of the total circulation of NRA magazines, followed by *American Hunter* with 30% and *America's 1st Freedom* with 17%. It was also the leading magazine in 49 of the U.S. states (the exception was Wisconsin, in which *American Hunter* was the leading one). Our results are unaffected if we use subscriptions to *American Hunter* instead of *American Rifleman*, or if we sum subscriptions to both magazines to proxy for the size of the pro-gun minority.

[29] For each of the four Presidential elections that have occurred during our sample period, we have

subscriptions to gun magazines tend to be higher in rural states.[30]

**Figure 1:** Subscriptions to *American Rifleman* magazine per 1,000 inhabitants




*Notes:* The figure shows quartiles of the average number of subscriptions to *American Rifleman* magazine per 1,000 inhabitants for each of the 48 contiguous U.S. states. The corresponding numbers for Alaska and Hawaii are 16.5 and 3.0, respectively. The average is taken over the period 1993–2010.

The variable $Crime\ rate_{jt}$ is the number of violent crimes (murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault) per 1 million inhabitants in state $j$ and year $t$, from the Federal Bureau of Investigation (FBI).

The variable $Education_{jt}$ indicates the proportion of the population of state $j$ in year $t$ with a college degree. The sources are the Current Population Survey (CPS) for years 1994–2006 and the American Community Survey (ACS) for years 2007–2010.

In some specifications we also include the dummy variable $Swing\ state_{jt}$, which is equal to 1 if in state $j$ the margin of victory in the last presidential election was less than 5%.[31]

## 4.4 Characteristics of votes

Snyder (1992) argues that, when interest groups list key votes in Congress, they select a disproportionate number of close votes, exaggerating the degree of extremism and

computed the share of votes for the Republican candidate in each state. The correlation between this variable and $Gun\ magazine\ subscriptions_{jt}$ is 0.27.

[30] Using information from the U.S. Census Bureau, we find that the correlation between the share of each state's population living in rural areas and per capita subscriptions to gun magazines is 0.39.

[31] We can also construct the variable $Gun\ production_{jt}$, using information from the Bureau of Alcohol, Tobacco, Firearms and Explosives. Unfortunately, this is only available for the period 1998-2010, so including it in our analysis would dramatically reduce the size of the sample. When we tried including it, it was never significant and our main results were unaffected.

bipolarity. This does not seem to be a concern for our sample of votes, since GOA includes many votes that passed or were rejected by a wide margin (the margin of passage or rejection for votes supported by GOA ranges between 2 and 91 votes, with a median of 24). Nevertheless, in robustness checks, we include the dummy variable *Close vote*$_v$, which takes the value of 1 if the vote was approved or rejected with a margin smaller than the median margin of passage or rejection for all votes in our sample.

In some specifications, we also control for the direction of the vote by including the dummy variable *Accept*$_v$, which is equal to 1 if vote $v$ is to accept pro-gun legislation (rather than to reject gun-control legislation).

# 5 Empirical strategy

## 5.1 Testable hypotheses

We exploit the staggered structure of the U.S. Senate to assess the validity of our model's predictions. For the purposes of our empirical analysis, the first testable hypothesis of our theoretical model can be restated as follows:

**Prediction 1** *Senators who are closer to re-election should be more likely to vote pro gun.*

Proposition 2 implies that election proximity should have no impact on the voting behavior of senators who are not seeking re-election, who should vote according to their policy preferences throughout their last term in office. This leads to our second prediction:

**Prediction 2** *Election proximity should have no impact on the voting behavior of retiring senators.*

Given the historical positions of U.S. political parties on gun control, Propositions 3 and 4 support the following prediction:

**Prediction 3** *Election proximity should only have a pro-gun effect on the voting behavior of Democratic senators.*

A final prediction follows from Proposition 5:

**Prediction 4** *Election proximity should only affect the voting behavior of Democratic senators if the group of pro-gun voters in their constituency is of intermediate size.*

## 5.2 Identification

We follow two complementary strategies to identify the effect of election proximity of senators' votes on gun control. First, we exploit variation in the voting behavior of *different senators*, depending on which generation they belonged to at the time of the vote. We estimate the following probabilistic model:[32]

$$Pr(Vote_{ijvt} = 1) = \Phi(\beta_0 + \beta_1 Senate3_{it} + \beta_2 \mathbf{X}_{it} + \beta_3 \mathbf{W}_{jt} + \beta_4 \mathbf{Z}_v + \nu_j + \eta_t + \epsilon_{ijvt}) \quad (8)$$

where $\Phi(\cdot)$ is the cumulative normal distribution. The dependent variable $Vote_{ijvt}$ is equal to 1 if senator $i$ from state $j$ votes pro gun on vote $v$ in year $t$. In our main sample, this occurs when a senator votes "yea" on a GOA-supported vote (either to introduce pro-gun legislation or to reject gun-control measures).[33]

The main variable of interest is $Senate3_{it}$, the dummy variable for the third generation of senators, identifying legislators who are closest to facing re-election. For ease of exposition, we combine the first and second generations of senators into one omitted category.[34] Our theoretical model suggests that there should be inter-generational differences in senators' voting behavior. In particular, if election proximity increases the probability that a legislator votes pro-gun, as suggested by the first prediction of our model, the coefficient of the variable $Senate3_{it}$ should be positive and significant.

The matrix $\mathbf{X}_{it}$ includes additional controls for legislators (e.g. party affiliation, gender, age), $\mathbf{W}_{jt}$ is a matrix of state-specific characteristics (e.g. crime rate, education), and $\mathbf{Z}_v$ includes vote-specific controls (e.g. whether the vote was close).

In our benchmark specifications, we include two sets of fixed effects: $\nu_j$ are state dummies, capturing time-invariant characteristics of constituencies that may affect senators' voting behavior (e.g. rural); $\eta_t$ are year dummies, which allow us to account for year-specific variables (e.g. share of Democratic senators in Congress). In alternative specifications, we either replace the year dummies with vote dummies or add interactions between state and year dummies. Notice that, when we include such interactions, we identify the effect of election proximity based on differences in the voting behavior of senators from the same state in the same year.[35] We cluster standard errors at the state

[32] In Section 6.5 we discuss the results of estimating a linear probability model.

[33] There are 55 instances in which a senator did not cast a vote, representing 3% of the total number of votes. Our results are unaltered if we include these observations, coding them as voting against the bill (i.e. "nay").

[34] The results are virtually identical when including $Senate2_{it}$ in the regression: $Senate3_{it}$ remains positive and significant and $Senate1_{it}$ and $Senate2_{it}$ are not statistically different from each other.

[35] For simplicity, when discussing the regression results, we will drop all $i$, $j$, $t$ and $v$ sub-indexes.

level. Our results are very similar if we cluster standard errors at the vote level instead.

Our first identification strategy relies on the staggered structure of the Senate. This guarantees that, whenever a vote is cast in the Senate, a third of its members are close to facing re-election, i.e. belong to the third generation. However, one might be concerned that the timing of the votes could be correlated with characteristics of senators who belong to the third generation. In particular, GOA-supported votes may be more likely to occur when many pro-gun senators are close to re-election. If this is the case, a positive correlation between belonging to the third generation and voting pro gun may be driven by selection effects rather than the impact of election proximity.

Our second empirical strategy, in which we compare the voting behavior of *individual senators* over time, deals with this concern. In this case, if we find evidence of inter-generational differences in senators' voting behavior, they cannot be driven by selection effects. We thus estimate the following specification:

$$Vote_{ijvt} = \lambda_0 + \lambda_1 Senate3_{it} + \lambda_2 \mathbf{X}_{it} + \lambda_3 \mathbf{W}_{jt} + \lambda_4 \mathbf{Z}_{vt} + \rho_i + \eta_t + \epsilon_{ijvt}, \tag{9}$$

in which we include senator fixed effects ($\rho_i$), year fixed effects, and time-varying controls for legislators and their constituencies. In this estimation, the effect of election proximity is identified by comparing the voting behavior of the same senator over time, when he or she belonged to different generations.[36] We allow for correlation over votes of the same legislator by clustering standard errors at the senator level.

# 6 Empirical results

## 6.1 Inter-generational differences

Table 1 presents our benchmark regressions, in which we verify the pro-gun effect of election proximity, comparing the voting behavior of senators who are closest to the end of their term when casting their vote (for whom the dummy variable $Senate3_{it}$ is equal to 1) with that of senators who are further away from re-election. The various specifications differ in terms of regressors, fixed effects included or sample of votes. In column 1 we report the results of a parsimonious specification in which we only include our key regressor of interest and year and state effects, while in column 2 we include additional controls for senators and their constituencies. In column 3 we replace year fixed effects with vote fixed effects (in our sample there are some years with more than

[36] To estimate these regressions, we use a linear probability model, since the estimates of a probit model would suffer from the incidental parameter problem.

one vote). In column 4 we include *Year*×*State* dummies, identifying the effect of election proximity only based on differences in the voting behavior of senators representing the same state. Finally, in columns 5-8 we reproduce the same specifications as in columns 1-4, but restricting the analysis to votes that are directly gun-related (e.g. excluding votes to reject regulations on lobbying activities).

Focusing first on our key regressor, we see that the estimated coefficient for $Senate3_{it}$ is always positive and statistically significant. The corresponding marginal effects—reported at the bottom of the table—imply that senators in the last two years of their term are between 3.4 and 9.6 percentage points more likely to vote pro gun, compared to senators in their first four years. The analogous increase in the predicted probability, also reported at the bottom of the table, ranges between 5.5 and 17.6 percent. Notice that these results capture the impact of election proximity on the voting behavior of *all* senators, independently of their party affiliation. We will later show that the effect is much larger when focusing on Democratic senators. Regarding the other regressors, we find—as expected—that Republican senators are much more likely to vote pro gun. Age has a negative and significant effect, while the coefficient on gun-rights (respectively gun-control) contributions is positive (respectively negative), though significant only in some specifications. State-level variables are never significant because their limited variation is captured by the state dummies. If we remove these dummies from the specifications in columns 2-4 and 6-8, the estimated coefficient for gun magazine subscriptions becomes positive and highly significant. Education, on the other hand, becomes negative and significant, while crime rate remains statistically insignificant.

**Table 1:** The pro-gun effect of election proximity, comparing across senators

| Dep. variable: | $\text{Vote}_{ijvt}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | All | | | | Directly gun-related | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\text{Senate3}_{it}$ | 0.279*** | 0.270*** | 0.320*** | 0.361** | 0.382** | 0.334*** | 0.440*** | 0.377** |
| | (0.097) | (0.095) | (0.117) | (0.156) | (0.152) | (0.109) | (0.126) | (0.174) |
| $\text{Republican}_{it}$ | | 2.561*** | 3.102*** | 2.508*** | | 2.285*** | 2.825*** | 2.114*** |
| | | (0.305) | (0.422) | (0.349) | | (0.309) | (0.441) | (0.346) |
| $\text{Male}_{i}$ | | 0.318 | 0.442 | 0.349 | | 0.417 | 0.530 | 0.492 |
| | | (0.268) | (0.346) | (0.488) | | (0.420) | (0.522) | (0.630) |
| $\text{Age}_{it}$ | | -0.029*** | -0.038*** | -0.039*** | | -0.026*** | -0.033** | -0.031** |
| | | (0.009) | (0.012) | (0.012) | | (0.010) | (0.013) | (0.013) |
| $\text{Gun-control contributions}_{it}$ | | -0.164*** | -0.305*** | -0.190* | | -0.151*** | -0.297*** | -0.147 |
| | | (0.054) | (0.107) | (0.107) | | (0.058) | (0.100) | (0.095) |
| $\text{Gun-rights contributions}_{it}$ | | 0.022* | 0.058** | 0.028 | | 0.022 | 0.056** | 0.021 |
| | | (0.012) | (0.023) | (0.029) | | (0.017) | (0.026) | (0.028) |
| $\text{Gun magazine subscriptions}_{jt}$ | | 0.083 | 0.032 | | | 0.184 | 0.230 | |
| | | (0.139) | (0.205) | | | (0.183) | (0.266) | |
| $\text{Violent crime rate}_{jt}$ | | 0.015 | 0.022* | | | 0.007 | 0.005 | |
| | | (0.011) | (0.013) | | | (0.014) | (0.017) | |
| $\text{Education}_{jt}$ | | -0.053 | -0.075 | | | -0.064 | -0.075 | |
| | | (0.048) | (0.069) | | | (0.061) | (0.078) | |
| $\text{Senate3}_{it}$ (marginal effects) | 0.060*** | 0.041*** | 0.034*** | 0.087** | 0.078** | 0.050*** | 0.047*** | 0.096** |
| | (0.020) | (0.014) | (0.013) | (0.038) | (0.031) | (0.016) | (0.013) | (0.044) |
| Predicted probability | 0.616 | 0.614 | 0.613 | 0.548 | 0.622 | 0.621 | 0.621 | 0.546 |
| Year dummies | yes | yes | no | yes | yes | yes | no | yes |
| State dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| Vote dummies | no | no | yes | no | no | no | yes | no |
| Year×State dummies | no | no | no | yes | no | no | no | yes |
| Observations | 1,767 | 1,767 | 1,767 | 829 | 1,281 | 1,281 | 1,281 | 616 |
| Pseudo R-squared | 0.421 | 0.596 | 0.710 | 0.381 | 0.446 | 0.594 | 0.711 | 0.347 |

*Notes:* The table reports coefficients of a probit model, with robust standard errors in parentheses, adjusted for clustering at the state level. The dependent variable $vote_{ijvt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

As discussed above, we can also identify the role of election proximity by exploiting changes in the voting behavior of the same senator over time, when he or she belonged to different generations. Notice that in these specifications we cannot include senators' time-invariant characteristics like gender (which are already accounted for by the senators' fixed effects) and age (since we always include year dummies). However, we are able to keep party affiliation since some senators changed party during our sample period.[37]

**Table 2:** The pro-gun effect of election proximity, comparing within senators

| Dep. variable: | $Vote_{ijvt}$ | | | | | |
|---|---|---|---|---|---|---|
| | All | | | Directly gun-related | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Senate3_{it}$ | 0.040** | 0.042** | 0.038* | 0.062** | 0.064** | 0.062** |
| | (0.019) | (0.020) | (0.020) | (0.024) | (0.030) | (0.030) |
| $Republican_i t$ | | 0.200** | 0.197** | | 0.184** | 0.183** |
| | | (0.097) | (0.097) | | (0.084) | (0.084) |
| Gun-rights $contributions_{it}$ | | -0.000 | 0.000 | | -0.001 | -0.001 |
| | | (0.000) | (0.000) | | (0.002) | (0.002) |
| Gun-control $contributions_{it}$ | | 0.006 | 0.006 | | 0.006 | 0.006 |
| | | (0.007) | (0.007) | | (0.008) | (0.008) |
| Gun magazine $subscriptions_{jt}$ | | 0.000 | 0.001 | | -0.014 | -0.015 |
| | | (0.020) | (0.021) | | (0.023) | (0.023) |
| Violent crime $rate_{jt}$ | | 0.006*** | 0.006*** | | 0.006** | 0.006** |
| | | (0.002) | (0.002) | | (0.002) | (0.002) |
| $Education_{jt}$ | | -0.010 | -0.010 | | -0.018 | -0.018 |
| | | (0.009) | (0.009) | | (0.011) | (0.011) |
| Senator dummies | yes | yes | yes | yes | yes | yes |
| Year dummies | yes | yes | no | yes | yes | no |
| Vote dummies | no | no | yes | no | no | yes |
| Observations | 1,840 | 1,840 | 1,840 | 1,363 | 1,363 | 1,363 |
| R-squared | 0.190 | 0.201 | 0.317 | 0.223 | 0.230 | 0.350 |

*Notes:* The table reports coefficients of a linear probability model, with robust standard errors in parentheses, adjusted for clustering at the senator level. The dependent variable $Vote_{ijvt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

The results of six specifications estimated using this alternative methodology are reported in Table 2. The estimated coefficients for *Senate3* are always positive and statistically significant. Since these are the estimates of a linear probability model, they provide an immediate quantification of the effects of the regressors on the likelihood of voting pro gun. They indicate that the probability that an individual senator supports

[37] See footnote 24. The *Republican* dummy captures the effect of senators switching parties. Our results on the effect of election proximity remain unchanged if we exclude party affiliation or remove these senators.

pro-gun policies increases between 3.8 and 6.4 percentage points when close to re-election –which is very similar to the marginal effects obtained in Table 1, when comparing the voting behavior of different senators. Notice that these results are solely identified by senators flip flopping on gun control, i.e. changing their voting behavior throughout their terms.

Concerning the other controls, one difference with Table 1 is that contributions from lobbies no longer have a significant impact on senators' voting behavior, suggesting that there is little variation in the amount of money received by individual senators during their mandates. In addition, an increase in violent crime rate in a senator's constituency is associated with more support for pro-gun policies.

In conclusion, we find that election proximity has a robust pro-gun effect on senators' voting behavior. This result is identified both by comparing the behavior of different senators voting on the same legislation and the behavior of individual senators across different votes. Inter-generational differences in senators' voting behavior are also robust to the inclusion of several control variables for the legislators and their constituencies.

## 6.2 Retiring senators

The empirical results presented so far provide clear support for the first prediction of our theoretical model: third-generation senators are more likely to vote in favor of pro-gun policies. In order to verify whether the pro-gun effect of election proximity is driven by electoral incentives, we exploit information on senators who are not seeking re-election. Our second prediction states that retiring legislators should be immune from electoral incentives and thus vote according to their preferences throughout their terms.

In Table 3 we include the dummy variable *Retiring*, as well as its interaction with *Senate3*. In columns 1 and 2 we include state fixed effects, while in columns 3 and 4 we include senator fixed effects. The estimated coefficients for *Senate3* are significant and larger than the corresponding ones in Table 1, indicating that non-retiring senators are more likely to vote pro gun in the last two years of their mandate. Retiring senators, on the other hand, do not change their voting behavior in the last two years of their mandate: in all specifications, the test for the sum of *Senate3* and $Senate3 \times Retiring$ is not significant.[38]

[38]Crucially, this result is not driven by the lack of precision of the estimates for $Senate3 \times Retiring$. As we show in the following subsection, the effect of election proximity varies by party. As our theory would in fact suggest, the effect of *Retiring* on the likelihood of voting pro gun also varies by party, with retiring Democrats being significantly less likely to vote pro gun, and retiring Republicans being unaffected. If we allow for triple interactions between $Senate3$, *Republican*, and *Retiring*, we are

**Table 3:** The pro-gun effect of election proximity, retiring senators

| Dep. variable: | $Vote_{ijvt}$ | | | |
|---|---|---|---|---|
| | All | Directly gun-related | All | Directly gun-related |
| | (1) | (2) | (3) | (4) |
| $Senate3_{it}$ | 0.296*** | 0.387*** | 0.045** | 0.074*** |
| | (0.104) | (0.116) | (0.018) | (0.025) |
| $Retiring_{it}$ | -0.144 | -0.051 | -0.012 | -0.030 |
| | (0.245) | (0.283) | (0.048) | (0.084) |
| $Senate3_{it} \times Retiring_{it}$ | -0.181 | -0.607 | -0.052 | -0.120 |
| | (0.310) | (0.477) | (0.056) | (0.099) |
| $Republican_{it}$ | 2.531*** | 2.241*** | 0.189 | 0.153 |
| | (0.306) | (0.314) | (0.116) | (0.126) |
| $Male_i$ | 0.342 | 0.454 | | |
| | (0.260) | (0.401) | | |
| $Age_{it}$ | -0.027*** | -0.023** | | |
| | (0.010) | (0.011) | | |
| Gun-rights $contributions_{it}$ | 0.020 | 0.019 | -0.000 | -0.002 |
| | (0.012) | (0.017) | (0.000) | (0.002) |
| Gun-control $contributions_{it}$ | -0.160*** | -0.130** | 0.006 | 0.005 |
| | (0.052) | (0.053) | (0.005) | (0.005) |
| Gun magazine $subscriptions_{jt}$ | 0.080 | 0.159 | 0.001 | -0.013 |
| | (0.140) | (0.181) | (0.024) | (0.027) |
| Violent crime $rate_{jt}$ | 0.015 | 0.008 | 0.006*** | 0.005* |
| | (0.010) | (0.013) | (0.002) | (0.003) |
| $Education_{jt}$ | -0.053 | -0.071 | -0.011 | -0.019 |
| | (0.048) | (0.060) | (0.010) | (0.011) |
| Test $Senate3_{it}$+$Senate3_{it}$*$Retiring_{it}$=0 (p-value)[a] | 0.682 | 0.621 | 0.892 | 0.625 |
| $Senate3_{it}$, not retiring (marginal effects) | 0.044*** | 0.057*** | | |
| | (0.016) | (0.017) | | |
| $Senate3_{it}$, retiring (marginal effects) | 0.017 | -0.034 | | |
| | (0.042) | (0.070) | | |
| Predicted probability, not retiring | 0.617 | 0.624 | | |
| Predicted probability, retiring | 0.587 | 0.585 | | |
| Year dummies | yes | yes | yes | yes |
| State dummies | yes | yes | no | no |
| Senator dummies | no | no | yes | yes |
| Observations | 1,767 | 1,281 | 1,840 | 1,363 |
| R-squared[b] | 0.597 | 0.596 | 0.201 | 0.232 |

*Notes:* Columns 1-2 report coefficients of a probit model, with robust standard errors in parentheses, adjusted for clustering at the state level. Columns 3-4 report coefficients of a linear probability model, with robust standard errors in parentheses, adjusted for clustering at the senator level. The dependent variable $Vote_{ijt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.
[a] $\chi^2$-test in columns 1-2, F-test in columns 3-4. [b] Pseudo R-squared in columns 1-2.

The marginal effects and predicted probabilities reported at the bottom of the table for columns 1 and 2 indicate that senators running for re-election are between 4.4 and 5.7 percentage points more likely to vote pro-gun at the end of their terms. The

able to precisely estimate the effect of $Senate3 \times Retiring$ and can still reject flip flopping for retiring Democrats. These results are available upon request.

corresponding increase in the predicted probability ranges between 7.1 and 9.1 percent. We find similar results in columns 3 and 4, with non-retiring senators increasing their probability of voting pro gun by between 4.5 and 7.4 percent.

## 6.3 Party differences

We now move to assess the validity of the third prediction of our model: inter-generational differences should be stronger for members of the Democratic party. As in the previous sections, we carry out this exercise on the samples of all votes and directly gun-related votes, including year dummies and either state or senator dummies.

To allow for different effects of electoral calendars between parties, in Table 4 we introduce an interaction term between *Senate3* and *Republican*. In this setup, the estimated coefficient for *Senate3* captures the effect of election proximity on Democratic senators, while the corresponding effect for Republican senators is found by summing up this coefficient with the interaction term (see the tests at the bottom of the table).

Columns 1 and 2 include state dummies, and therefore, as in Table 1, quantify the effect of electoral proximity across senators. In columns 3 and 4 we include senator dummies, which allow us to quantify the effect of electoral proximity for a given senator (as in Table 2). Notice that identification of the interaction term *Senate3* $\times$ *Republican* does not rely on senators switching parties (we obtain similar results if we remove these senators). When focusing on either all GOA votes (columns 1 and 3), or directly gun-related votes (columns 2 and 4), we find that election proximity has no impact on the stance of Republican senators: the tests at the bottom of the table indicate that Republican senators are not more likely to vote pro gun in the last two years of their mandate, compared to the previous four years (the only exception is column 1 where the $\chi^2$-test marginally rejects no flip-flopping with a p-value of 0.096). By contrast, election proximity has a pro-gun effect on the voting behavior of Democratic senators: in all specifications, the coefficient of the variable *Senate3* is positive and significant. These findings are in line with the third prediction of our model: Republicans' policy preferences are aligned with their re-election motives, so they should vote pro gun throughout their terms in office; by contrast, Democrats face a tradeoff between their policy preferences and their re-election prospects, so they should be more likely to vote pro gun at the end of their terms, when their policy choices have a greater impact on their probability of retaining office.

The results of Table 4 indicate that inter-generational differences are only driven by changes in the voting behavior of Democratic senators. This implies that, for these

**Table 4:** The pro-gun effect of election proximity, party differences

| Dep. variable: | Vote$_{ijvt}$ | | | |
|---|---|---|---|---|
| | All | Directly gun-related | All | Directly gun-related |
| | (1) | (2) | (3) | (4) |
| Senate3$_{it}$ | 0.297** | 0.388** | 0.080** | 0.098** |
| | (0.141) | (0.153) | (0.039) | (0.045) |
| Republican$_{it}$ | 2.579*** | 2.320*** | 0.245** | 0.228** |
| | (0.297) | (0.283) | (0.104) | (0.092) |
| Senate3$_{it}$ × Republican$_i$ | -0.078 | -0.139 | -0.067 | -0.074 |
| | (0.211) | (0.293) | (0.043) | (0.053) |
| Male$_i$ | 0.309 | 0.401 | | |
| | (0.267) | (0.416) | | |
| Age$_{it}$ | -0.029*** | -0.027*** | | |
| | (0.009) | (0.010) | | |
| Gun-rights contributions$_{it}$ | 0.024* | 0.025 | -0.000 | 0.000 |
| | (0.013) | (0.018) | (0.000) | (0.002) |
| Gun-control contributions$_{it}$ | -0.173*** | -0.166** | 0.002 | 0.002 |
| | (0.059) | (0.069) | (0.007) | (0.008) |
| Gun magazine subscriptions$_{jt}$ | 0.088 | 0.193 | 0.002 | -0.011 |
| | (0.138) | (0.182) | (0.021) | (0.023) |
| Violent crime rate$_{jt}$ | 0.015 | 0.007 | 0.007*** | 0.005** |
| | (0.011) | (0.014) | (0.002) | (0.002) |
| Education$_{jt}$ | -0.055 | -0.067 | -0.011 | -0.019* |
| | (0.047) | (0.060) | (0.009) | (0.011) |
| Test Senate3$_{it}$+Senate3$_{it}$ ×Republican$_{it}$=0 (p-value)[a] | 0.096 | 0.244 | 0.472 | 0.459 |
| Senate3$_{it}$, Democrats (marginal effects) | 0.061** | 0.075** | | |
| | (0.029) | (0.031) | | |
| Senate3$_{it}$, Republicans (marginal effects) | 0.027* | 0.034 | | |
| | (0.016) | (0.027) | | |
| Predicted probability, Democrats | 0.367 | 0.396 | | |
| Predicted probability, Republicans | 0.850 | 0.809 | | |
| Year dummies | yes | yes | yes | yes |
| State dummies | yes | yes | no | no |
| Senator dummies | no | no | yes | yes |
| Observations | 1,767 | 1,281 | 1,840 | 1,363 |
| R-squared[b] | 0.596 | 0.594 | 0.203 | 0.232 |

*Notes:* Columns 1-2 report coefficients of a probit model, with robust standard errors in parentheses, adjusted for clustering at the state level. Columns 3-4 report coefficients of a linear probability model, with robust standard errors in parentheses, adjusted for clustering at the senator level. The dependent variable *Vote*$_{ijt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.
[a] $\chi^2$-test in columns 1-2, F-test in columns 3-4. [b] Pseudo R-squared in columns 1-2.

legislators, the impact of election proximity is much larger than what found in Tables 1-2 for senators at large. The marginal effects in Table 4 imply that the probability that Democratic senators vote pro gun increases by between 16.6 and 18.9 percent in the last two years of their terms, an effect more than twice as large as the one found for the "average" senator in Table 1 (columns 2 and 6) or Table 2 (columns 2 and 5).

## 6.4 Heterogenous effects across constituencies

Our results in the previous sections show that election proximity has a pro-gun effect on the voting behavior of senators, and that this result is driven by senators who are seeking re-election and who belong to the Democratic party. In this section, we examine whether the size of the vocal pro-gun minority in a constituency, proxied by per capita subscriptions to gun magazines, has a non-monotonic effect on the probability that Democratic senators flip flop on gun control, in line with the fourth prediction of our model.

**Table 5:** The pro-gun effect of election proximity on Democratic senators

| Dep. variable: | $\text{Vote}_{ijvt}$ | | | |
|---|---|---|---|---|
| | American Rifleman | | American Hunter | |
| | All | Directly gun-related | All | Directly gun-related |
| | (1) | (2) | (3) | (4) |
| $\text{Senate3}_{it}$ | -1.317 | -3.051 | -0.759 | -1.361 |
| | (1.526) | (2.738) | (0.720) | (1.340) |
| $\text{Senate3}_{it}$*Gun magazine $\text{subscriptions}_{jt}$ | 0.590 | 1.394 | 0.499* | 1.008** |
| | (0.421) | (0.901) | (0.261) | (0.509) |
| $\text{Senate3}_{it}$*Gun magazine $\text{subscriptions}^2_{jt}$ | -0.048* | -0.125* | -0.045** | -0.108** |
| | (0.029) | (0.074) | (0.022) | (0.045) |
| Gun magazine $\text{subscriptions}_{jt}$ | 0.891** | 1.258** | 1.307** | 2.663*** |
| | (0.383) | (0.552) | (0.551) | (0.976) |
| Gun magazine $\text{subscriptions}^2_{jt}$ | -0.036** | -0.067*** | -0.062* | -0.162*** |
| | (0.015) | (0.017) | (0.036) | (0.056) |
| $\text{Male}_t$ | -0.033 | 0.201 | -0.050 | 0.253 |
| | (0.402) | (0.710) | (0.378) | (0.625) |
| $\text{Age}_{it}$ | -0.029*** | -0.044*** | -0.033*** | -0.052*** |
| | (0.010) | (0.012) | (0.012) | (0.014) |
| Gun-rights $\text{contributions}_{it}$ | 0.083*** | 0.084 | 0.098*** | 0.138*** |
| | (0.028) | (0.058) | (0.027) | (0.050) |
| Gun-control $\text{contributions}_{it}$ | -0.262** | -0.191 | -0.289** | -0.228 |
| | (0.133) | (0.191) | (0.133) | (0.168) |
| Violent crime $\text{rate}_{jt}$ | -0.006 | 0.006 | -0.006 | 0.005 |
| | (0.022) | (0.025) | (0.024) | (0.028) |
| $\text{Education}_{jt}$ | 0.048 | 0.100 | -0.006 | -0.041 |
| | (0.092) | (0.155) | (0.084) | (0.166) |
| Joint test for $\text{Senate3}_{it}$ and interactions (p-value) | 0.005 | 0.000 | 0.006 | 0.000 |
| Year dummies | yes | yes | yes | yes |
| State dummies | yes | yes | yes | yes |
| Observations | 703 | 548 | 703 | 548 |
| Pseudo R-squared | 0.511 | 0.601 | 0.512 | 0.604 |

*Notes:* The table reports coefficients of a probit model, with robust standard errors in parentheses, adjusted for clustering at the state level. The dependent variable $vote_{ijvt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. The variable *Gun magazine subscriptions*$_{jt}$ is the number of magazine subscriptions to *American Rifleman* in columns 1 and 2, and *American Hunter* in columns 3 and 4, per 1,000 inhabitants. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

To this end, we restrict our sample to only Democratic senators and we interact *Senate3* with *Gun magazine subscriptions* and its square term.[39] According to Prediction 4, we should find an inverted U-shape relationship between the probability that a Democratic senator flip flops and per capita subscriptions to gun magazines in her state. This implies that, when interacting the variable *Senate3* with linear and quadratic terms of *Gun magazine subscriptions*, the estimate for the linear term should be positive, while the square term should have a negative sign. To identify this non-monotonic relationship, we exploit the fact that Democratic senators are elected in a wide range of states in terms of our proxy for the size of the pro-gun minority. Figure 1 in Section 4 shows that there is significant variation in per capita subscriptions across states. When looking at Democratic senators in our sample, we find that many are elected in states that are traditionally Democratic leaning, which have either low (e.g. California and New Jersey) or high levels of per capita subscriptions to gun magazines (e.g. Oregon or Vermont). Some are even elected in states that are traditionally Republican leaning and have high per capita subscriptions (e.g. Montana and North Dakota).

The results of the four specifications reported in Table 5 clearly support the last prediction of our model. In the first two columns we use subscriptions to *American Rifleman* magazine to proxy for the size of the vocal pro-gun minority and we consider all GOA votes (column 1) or only directly gun-related votes (column 2). Although the coefficients of interest are not precisely estimated, the test at the bottom of the table indicates that *Senate3* and the two interaction terms are jointly significant at 1%.

Since the results on the heterogenous effects across constituencies hinge on the proxy for the size of the pro-gun minority, in the last two columns of Table 5 we re-estimate the same specifications using per capita subscriptions to *American Hunter* magazine, which, as discussed earlier, is the second most important gun magazine after *American Rifleman*. This set of results is very similar to the first two columns.

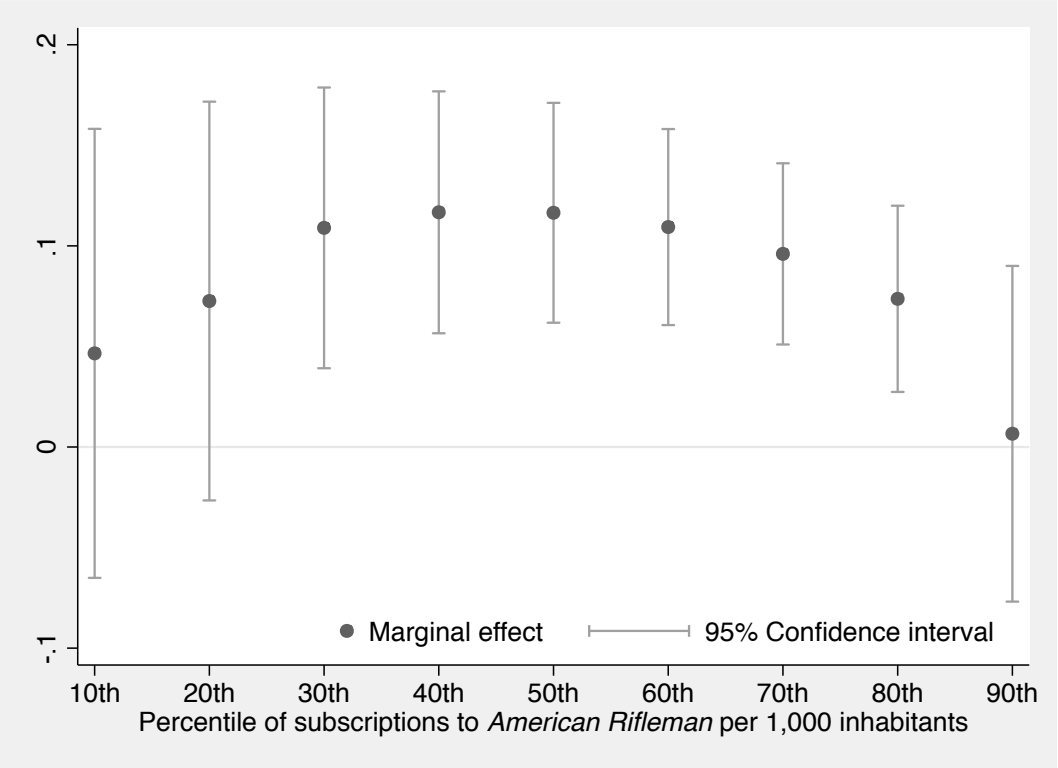
We provide a graphical representation of these results in Figure 2, based on the specification of column 2. This figure shows the marginal effects for Democratic senators belonging to *Senate3* for different percentiles of the distribution of gun magazine subscriptions. This allows us to illustrate how the impact of election proximity on senators' voting behavior varies with the size of the pro-gun minority in their constituency.

Figure 2 clearly supports the non-monotonic relationship implied by Prediction 4: election proximity only affects the voting behavior of Democratic senators if the pro-gun group in their constituency is neither too small nor too large. In particular, there is

[39] We obtain similar results if we instead use the entire sample and introduce additional interactions with *Republican*. The results are also similar if we exclude retiring senators from the sample.

no effect in constituencies with per capita subscriptions to *American Rifleman* in the bottom 20th percentile. On the other hand, the minority has to be quite large (i.e. above the 80th percentile) to eliminate flip-flopping behavior.[40]

**Figure 2:** The pro-gun effect of election proximity on Democratic senators




*Notes:* The figure shows average marginal effects for various percentiles of gun magazine subscriptions. These are computed using estimates from column 2 in Table 5. Error bars are ±95% confidence intervals.

## 6.5 Additional robustness checks

In what follows, we discuss the results of a series of additional estimations to verify the robustness of our main finding, i.e. the impact of election proximity on senators' voting behavior. The results of these regressions can be found in Appendix B.3.

First, in Table B-6 we reproduce the same specifications of Table 1 using a linear probability model, so that marginal effects are easily interpreted. Our results are unaffected when employing this alternative methodology, and the point estimates for *Senate3*

[40]The qualitative results would be identical if the figure were based on any other specification of Table 5.

are very similar to the marginal effects computed using a probit model. The only differences are the loss of significance of the contributions from lobby groups and the crime rate being now significant for the sample of all votes.

Second, in Table B-7 we add two sets of additional votes to our original sample. In columns 1 to 4 we include two key votes on gun control that were cast in 1993, the year before GOA started collecting congressional votes. The first vote was on an amendment "Prohibiting the Possession of Semi-Automatic Assault Weapons" (S Amdt 1152), which introduced restrictions on the manufacture, transfer, and possession of certain semiautomatic assault weapons and large capacity ammunition feeding devices. The second vote was on the "Brady Handgun Violence Prevention Act Federal" (H.R. 1025), which instituted federal background checks on firearm purchasers in the United States. The bill was named after James Brady, who was shot during an attempted assassination of President Ronald Reagan on March 30, 1981 (see Lipford, 2000 for more details). In columns 5-8, we include all gun-related votes listed by Project Vote Smart, a non-profit organization dedicated to disseminate information about candidates and elected officials. Project Vote Smart keeps track of key U.S. congressmen's decisions on various policy issues. Key votes are identified based on various criteria, including whether they received media attention and whether they passed by a small margin. For gun control, Project Vote Smart lists 14 votes between 1993 and 2010.[41] In all columns of Table B-7 we find that the coefficient on *Senate3* is positive and statistically significant. Even though the size of the coefficient decreases in the Vote Smart sample (columns 5-8), the marginal effects are comparable to those reported in Table 1.

Finally, in Table B-8 we include additional controls to account for other potential drivers of senators' voting behavior on gun control. In columns 1 and 5, we include the state-specific variable *Swing state*$_{jt}$, which identifies battleground states (i.e. states in which no Presidential candidate had an overwhelming majority in the previous election). In columns 2 and 6, we include two senator-specific variables: *Margin of victory*$_{it}$, which captures the gap in votes between senator $i$ and the runner-up in the last election; and *Tenure*$_{it}$, which accounts for senators' length of service. In columns 3 and 7, we add two vote-specific controls: the dummy variable *Close vote*$_{v}$, which takes the value of 1 if the vote was closer than the median margin of passage or rejection for all votes in our sample; and the dummy variable *Accept*$_{v}$, which identifies votes to accept pro-gun

[41] Unfortunately, Project Vote Smart does not specify the direction of the vote, so we manually code votes as pro or anti gun. We exclude one vote ("Charging Teens as Adults for Crimes Involving a Firearm" (S Amdt 1117), co-sponsored by senators Carol Moseley Braun (D-IL) and Christopher Bond (R-MO)) that is also listed as a key crime vote, since senators may have opposite views on guns and crime.

legislation (rather than to reject gun-control legislation). Finally, in columns 4 and 8, all variables are included together. The results presented in Table B-8 show that including these additional controls does not affect our main result concerning the pro-gun effect of election proximity, as *Senate3* remains positive and highly significant. The other regressors are also unaffected. Among the new controls, only the estimated coefficients for *Close vote*$_v$ and *Accept*$_v$ are statistically significant in some specifications.

# 7 Conclusions

In this paper, we have argued that electoral incentives can help explain the "gun control paradox," i.e. why U.S. congressmen are reluctant to support even mild gun-control regulations, notwithstanding broad public support for these measures.

The general idea is that politicians may prefer to support the interests of a vocal minority of voters, on issues that are of secondary importance to the rest of the electorate. In the case of gun control, although a majority of voters favors stricter regulations, a minority opposes them with greater intensity.

To capture this idea, we have described a simple model of gun control choices, in which incumbent politicians are both office and policy motivated. There are two groups of voters in the electorate: anti-gun voters, who represent a majority of the electorate and care less about gun control than about other policy issues; and pro-gun voters, who are a minority of the electorate and care more intensely about gun control. The model delivers testable predictions about the impact of election proximity on politicians' voting behavior on gun regulations.

To assess the validity of these predictions, we have studied the voting behavior of U.S. senators on gun-related legislation since the early 1990's. The staggered structure of the U.S. Senate, in which members serve six-year terms and one third is up for re-election every two years, allows to compare the voting behavior of different generations of senators. We have obtained four main results. First, senators who are closer to facing re-election are more likely to vote pro gun. Second, election proximity has no effect on the voting behavior of senators who are retiring. Third, only Democratic senators flip flop on gun control during their terms in office. Finally, election proximity has an impact on the voting behavior of Democratic senators only when the pro-gun group in their constituency is neither too small nor too large. Our results are robust to focusing on different subsets of gun votes, using alternative econometric methodologies to identify the impact of election proximity, and including a rich set of controls for legislators and their constituencies.

Our analysis suggests that in representative democracies policy choices may often diverge from what the majority of the electorate wants. This is because citizens have only one vote to make representatives accountable on a bundle of issues. Besley and Coate (2008) argue that direct initiatives allow to unbundle policy issues, improving the congruence between citizens' preferences and policy outcomes. One might thus expect to see stricter gun regulations in the sixteen U.S. states that allow for direct initiatives.[42] However, there are at least three reasons to believe that the outcome of initiatives on gun control may not always coincide with the preferences of the majority of voters. First, there may be a pro-gun bias in terms of which propositions end up on the ballot. This is because organizing initiatives is very costly in terms of both time and money, and citizens who strongly oppose gun regulations may be more willing to incur such costs.[43] In addition, gun-rights lobbies can provide them with the means to successfully organize initiatives.[44] Second, gun-related initiatives are likely to suffer from a pro-gun bias in voters' turnout, if citizens who are against gun regulations are more willing to incur the costs of voting (e.g. spending time to register, rearranging work schedules, getting to the polls, and gathering information on the candidates). Finally, opponents of initiatives to introduce even mild gun regulations can be very effective at framing them as a threat to citizens' fundamental rights and freedoms.[45] Notwithstanding these issues, several ballot propositions did result in the introduction of stricter gun regulations.[46]

[42]The direct initiative process allows ordinary citizens to draft a petition in the form of a legislative bill or constitutional amendment. If the petition receives sufficient popular support, the measure is then placed directly on a ballot, without the need to first submit it to the legislature.

[43]Organizing an initiative is a complex legal process, involving several steps: 1) preliminary filing of a proposed petition with a designated state official; 2) review of the petition for conformance with statutory requirements and, in several states, a review of the language of the proposal; 3) preparation of a ballot title and summary; 4) circulation of the petition to obtain the required number of signatures of registered voters, usually a percentage of the votes cast for a statewide office in the preceding general election; and 5) submission of the petition to the state officials, who must verify the number of signatures. Organizing a successful initiative is also financially very costly, e.g. it usually requires hiring specialized firms to run opinion polls before drafting the petition and to collect the required number of signatures.

[44]An example of a pro-gun initiative is I-591, which was filed in the state of Washington on May 23, 2013 by Protect Our Gun Rights, a group organized by several gun-rights organizations. If approved on the November 4, 2014 ballot, initiative I-591 would prevent the government from confiscating firearms without due process and from implementing background checks deemed more stringent than those at the federal level. Opponents to I-591 filed a competing initiative, Washington Universal Background Checks for Gun Purchases (I-594), which will be voted on the same date. This seeks to regulate firearms sales between private individuals, including implementing extensive background checks.

[45]See "Gun safety versus gun control," *The Economist*, January 24, 2013.

[46]For example, in 1990 84,5% voters in Florida supported a constitutional amendment to introduce a mandatory period of three days between retail purchase and delivery of any handgun. Similarly, in 1998 72% of voters in Florida supported constitutional amendment to introduce a three-day delay between retail purchase and delivery of any handgun. Background checks for transfers of firearms were also introduced in Oregon through an initiative in 2000.

An important avenue for future research is to explore the role of lobbies on secondary policy issues. Financial contributions from gun-rights groups do not account for the pro-gun effect of election proximity on senators' voting behavior. However, gun-rights organizations such as the NRA or GOA can affect politicians' decisions through other channels.[47] The intensity of preferences of pro-gun voters can explain why "the NRA is considered by many the most powerful lobbying group in the country, despite relatively modest financial resources and just 4 million members. (...) The NRA focuses almost exclusively on gun control, which enables its leaders to doggedly pursue their legislative ends. Perhaps more important, many NRA members are as single-minded as the organization itself. Polls often show that more Americans favor tightening gun control laws than relaxing them, but gun rights advocates are much more likely to be single-issue voters than those on the other side of the question. As a result, the NRA can reliably deliver votes."[48]

The logic of our theoretical model can be used to analyze the role of electoral incentives on other policy issues such as environment, which only a minority of the electorate cares intensely about (Conconi *et al.*, 2014b). However, more work is needed to understand politicians' choices on other secondary policy issues such as abortion, for which there are intense minorities of voters on both sides.

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[47] Lobbyists may help to mobilize their members to influence policy decisions in Congress (Kollman, 1998). They may also provide access to politicians to special interests, and issue-specific information to politicians (Blanes-i-Vidal *et al*, 2012; Bertrand *et al*, 2014).

[48] "Why is the NRA so powerful? How the gun lobby leverages modest resources into outsized influence" (*Slate*, June 29, 2012).

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# Appendix

## A.1 Proofs

### Proof of Proposition 1

From (3) and (4) , we have that $U(1) \geq U(0)$ if and only if

$$\frac{1}{2}+\frac{\gamma}{\phi}\sum_j n_j\phi_j\left(\chi_j W_j(1)-\bar{u}\right)+\theta\omega(1) \geq \frac{1}{2}+\frac{\gamma}{\phi}\sum_j n_j\phi_j\left(\chi_j W_j(0)-\bar{u}\right)+\theta\omega(0).$$

From (1), this boils down to

$$\frac{\gamma}{\phi}\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right) \geq \theta\left(\omega(0)-\omega(1)\right).$$

■

### Proof of Proposition 3

**The strategy** $(s_1^*, s_2^*) = (0,1)$ **is an equilibrium** for an anti-gun incumbent. From (3) and (4) , we have that $U(0,1) \geq U(0,0)$ if and only if

$$\frac{1}{2}+\frac{\gamma}{\phi}\sum_j n_j\phi_j\left(\chi_j W_j(0,1)-\bar{u}\right)+\theta\omega(0,1) \geq \frac{1}{2}+\frac{\gamma}{\phi}\sum_j n_j\phi_j\left(\chi_j W_j(0,0)-\bar{u}\right)+\theta\omega(0,0).$$

From (1), this boils down to

$$\frac{\gamma}{\phi}\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right) \geq \theta\left(\omega(0,0)-\omega(0,1)\right).$$

From (3) and (4) , we have that $U(0,1) \geq U(1,0)$ if and only if

$$\gamma\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M + \delta\left(n_M\phi_M\chi_M\alpha_M - n_m\phi_m\chi_m\alpha_m\right)\right) \geq \theta\left(\omega(1,0)-\omega(0,1)\right).$$

which is always satisfied since $\omega(1,0)-\omega(0,1)=0$, $n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M > 0$, and $\delta < 1$.
From (3) and (4) , we have that $U(0,1) \geq U(1,1)$ if and only if

$$\theta\left(\omega(0,1)-\omega(1,1)\right) \geq \frac{\gamma}{\phi}\delta\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right).$$

**The strategy** $(s_1^*, s_2^*) = (1,0)$ **is never an equilibrium**: From (3) and (4) , we have

that $U(1,0) \geq U(0,1)$ if and only if

$$\theta\left(\omega(1,0)-\omega(0,1)\right) \geq \frac{\gamma}{\phi}(1-\delta)\left(n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M\right),$$

which is never satisfied since $\omega(1,0)-\omega(0,1)=0$, $n_m\phi_m\chi_m\alpha_m - n_M\phi_M\chi_M\alpha_M > 0$, and $\delta < 1$. ■

## Proof of Proposition 4

**For a pro-gun incumbent, neither** $(0,1)$ **nor** $(1,0)$ **are equilibrium strategies:** From (3) and (4), we have that $U(0,1) \geq U(1,1)$ if and only if

$$\frac{\gamma}{\phi}\delta\left(n_M\phi_M\chi_M\alpha_M - n_m\phi_m\chi_m\alpha_m\right) \geq \theta\left(\omega(1,1)-\omega(0,1)\right).$$

which is never satisfied since $n_M\phi_M\chi_M\alpha_M - n_m\phi_m\chi_m\alpha_m < 0$ and $\omega(1,1)-\omega(0,1) > 0$ for a pro-gun incumbent.

From (3) and (4), we have that $U(1,0) \geq U(1,1)$ if and only if

$$\frac{\gamma}{\phi}\left(n_M\phi_M\chi_M\alpha_M - n_m\phi_m\chi_m\alpha_m\right) \geq \theta\left(\omega(1,1)-\omega(1,0)\right).$$

which is never satisfied since $n_M\phi_M\chi_M\alpha_M - n_m\phi_m\chi_m\alpha_m < 0$, and $\omega(1,1)-\omega(1,0) > 0$ for a pro-gun incumbent. ■

## Proof of Proposition 5

The proof is in four steps. First, we define $\underline{n}_m$ and $\overline{n}_m$, and show that $\underline{n}_m < \overline{n}_m$. Second, we identify the conditions under which $(s_1^*, s_2^*) = (0,0)$ is an equilibrium. Third, we do the same for $(s_1^*, s_2^*) = (1,1)$. Finally, we show that there is a unique equilibrium for the different values of $n_m$.

**First, we define** $\underline{n}_m$ **and** $\overline{n}_m$**, and show that** $\underline{n}_m < \overline{n}_m$**.** Let

$$\begin{aligned}
\underline{n}_m &= \frac{1}{\phi_m\chi_m\alpha_m}\left(\frac{\theta\phi}{\gamma}\left(\omega(0,0)-\omega(0,1)\right) + n_M\phi_M\chi_M\alpha_M\right), \text{ and} \\
\overline{n}_m &= \frac{1}{\phi_m\chi_m\alpha_m}\left(\frac{\theta\phi}{\gamma\delta}\left(\omega(0,1)-\omega(1,1)\right) + n_M\phi_M\chi_M\alpha_M\right).
\end{aligned}$$

From $\delta\left(\omega(0,0)-\omega(0,1)\right) < \omega(0,1)-\omega(1,1)$, we have that $\underline{n}_m < \overline{n}_m$.

**Second, conditions for** $(s_1^*, s_2^*) = (0,0)$ **to be an equilibrium.** From (3) and (4), we have that $U(0,0) \geq U(0,1)$ if and only if $n_m < \underline{n}_m$, and that $U(0,0) \geq U(1,1)$ if

and only if

$$\theta\left(\omega\left(0,0\right)-\omega\left(1,1\right)\right)\geq\frac{\gamma}{\phi}\left(1+\delta\right)\left(n_{m}\phi_{m}\chi_{m}\alpha_{m}-n_{M}\phi_{M}\chi_{M}\alpha_{M}\right).$$

From $\delta<1$, it is obvious that $U\left(0,0\right)\geq U\left(1,0\right)$.

**Third, conditions for $\left(s_{1}^{*},s_{2}^{*}\right)=\left(1,1\right)$ to be an equilibrium.** From (3) and (4), we have that $U\left(1,1\right)\geq U\left(0,1\right)$ if and only if $n_{m}>\overline{n}_{m}$, and that $U\left(1,1\right)\geq U\left(0,0\right)$ if and only if

$$\frac{\gamma}{\phi}\left(1+\delta\right)\left(n_{m}\phi_{m}\chi_{m}\alpha_{m}-n_{M}\phi_{M}\chi_{M}\alpha_{M}\right)\geq\theta\left(\omega\left(0,0\right)-\omega\left(1,1\right)\right).$$

From $\delta<1$, it is obvious that $U\left(1,1\right)\geq U\left(1,0\right)$.

**Finally, for any $n_{m}$ there is a unique equilibrium.** From Proposition 3 and the two first steps of its proof, it is straightforward to see that $\left(s_{1}^{*},s_{2}^{*}\right)=\left(0,1\right)$, $\left(s_{1}^{*},s_{2}^{*}\right)=\left(1,1\right)$, and $\left(s_{1}^{*},s_{2}^{*}\right)=\left(0,0\right)$ never coexists. It remains to prove that an equilibrium always exists. We proceed in two steps.

First, from steps two and three in this proof, we have that if $n_{m}<\overline{n}_{m}$, then $\left(s_{1}^{*},s_{2}^{*}\right)=\left(0,0\right)$ is the unique equilibrium only if $n_{m}<\underline{n}_{m}$. Otherwise $\left(s_{1}^{*},s_{2}^{*}\right)=\left(0,1\right)$ is the unique equilibrium.

Second, from step three in this proof, we have that if $n_{m}>\overline{n}_{m}$, then $\left(s_{1}^{*},s_{2}^{*}\right)=\left(1,1\right)$ is the unique equilibrium only if

$$n_{m}>\frac{1}{\phi_{m}\chi_{m}\alpha_{m}}\left(\frac{\theta\phi}{\gamma\left(1+\delta\right)}\left(\omega\left(0,0\right)-\omega\left(1,1\right)\right)+n_{M}\phi_{M}\chi_{M}\alpha_{M}\right).$$

This condition is always satisfied when $n_{m}>\overline{n}_{m}$. Indeed, from $n_{m}>\overline{n}_{m}$, we have that

$$\frac{\gamma}{\phi}\delta\left(n_{m}\phi_{m}\chi_{m}\alpha_{m}-n_{M}\phi_{M}\chi_{M}\alpha_{M}\right)>\theta\left(\omega\left(0,1\right)-\omega\left(1,1\right)\right).$$

From $\underline{n}_{m}<\overline{n}_{m}$, we have that $n_{m}>\overline{n}_{m}$ implies $n_{m}>\underline{n}_{m}$. Therefore, we have

$$\frac{\gamma}{\phi}\left(n_{m}\phi_{m}\chi_{m}\alpha_{m}-n_{M}\phi_{M}\chi_{M}\alpha_{M}\right)>\theta\left(\omega\left(0,0\right)-\omega\left(0,1\right)\right),$$

Together, these two conditions give

$$\frac{\gamma}{\phi}\left(1+\delta\right)\left(n_{m}\phi_{m}\chi_{m}\alpha_{m}-n_{M}\phi_{M}\chi_{M}\alpha_{M}\right)>\theta\left(\omega\left(0,0\right)-\omega\left(1,1\right)\right).$$

■

## A.2 Social welfare implications

In this appendix, we discuss the implications of our theoretical results from a utilitarian welfare standpoint. The utilitarian social welfare is given by the sum of the utility of all citizens.[49] We will say that a policy is socially efficient if it corresponds to the utilitarian optimum.[50]

The utilitarian optimum is influenced both by the number of citizens with given preferences, and by the intensity of those preferences. For instance, for gun regulations, the weight of the anti-gun group is $n_M\alpha_M$ whereas the weight of the pro-gun group is $n_m\alpha_m$. On any issue, the optimal policy is the one preferred by the group with the highest weight.

### One-period model

In the one-period model, the utilitarian social welfare is

$$U^{SW}(s) = -n_M\alpha_M|s_M - s| - n_m\alpha_m|s_m - s|, \tag{A.1}$$

where $s_M$ and $s_m$ are the bliss points of majority and minority voters, respectively. The following proposition characterizes the utilitarian optimum:

**Proposition 6** *When $n_M\alpha_M \geq n_m\alpha_m$, $s = 0$ is socially efficient. When $n_m\alpha_m \geq n_M\alpha_M$, $s = 1$ is socially efficient.*

**Proof**: From A.1, we have that $U^{SW}(0) \geq U^{SW}(1)$ if and only if $n_M\alpha_M \geq n_m\alpha_m$. We also have that $U^{SW}(1) \geq U^{SW}(0)$ if and only if $n_M\alpha_M \leq n_m\alpha_m$. ■

Comparing Propositions 1 and 2 with Proposition 6, we directly notice that the policy platform implemented by an anti-gun incumbent may not be socially efficient. For instance, when $\chi_m\phi_m$ is sufficiently larger than $\chi_M\phi_M$, it is possible that $s = 1$ is the strategy adopted by an anti-gun incumbent even if $s = 0$ is the socially efficient platform. Similarly, for $\chi_m\phi_m$ sufficiently smaller than $\chi_M\phi_M$, it is possible that $s = 0$ is the strategy adopted by an anti-gun incumbent even if $s = 1$ is the socially efficient platform.

This comparison highlights the two reasons underlying socially inefficient choices by the incumbent in our model: i) differences in how the two groups are informed about the incumbent's actions, and ii) differences in the homogeneity of the two groups.

[49]The results in this appendix continue to hold under the assumption that the social welfare function does not take into account the recency bias of citizens, i.e. for $\delta = 1$.

[50]This efficiency concept is subject to the same criticism as any social welfare function: it suffers from problems surrounding interpersonal utility comparisons, as first pointed out by Robbins (1938).

## Two-period model

In the two-period model, the utilitarian social welfare is

$$U^{SW}(s_1, s_2) = -n_M\alpha_M\left(\delta|s_M - s_1| + |s_M - s_2|\right) - n_m\alpha_m(\delta|s_m - s_1| + |s_m - s_2|) \quad \text{(A.2)}$$

The following proposition characterizes the utilitarian optimum in the two-period model, and shows that it never involves flip flopping:[51]

**Proposition 7** *When* $n_M\alpha_M \geq n_m\alpha_m$, $(0,0)$ *is socially efficient. When* $n_m\alpha_m \geq n_M\alpha_M$, $(1,1)$ *is socially efficient. Generically, neither* $(0,1)$, *nor* $(1,0)$ *is socially efficient.*

**Proof**: From A.2, we have that $U^{SW}(0,1) \geq U^{SW}(0,0)$ if and only if $n_m\alpha_m \geq n_M\alpha_M$, and that $U^{SW}(0,1) \geq U^{SW}(1,1)$ if and only if $n_m\alpha_m \leq n_M\alpha_M$. This proves that, generically, $(0,1)$ is not a maximizer of the utilitarian social welfare function. We can prove in a similar fashion that, generically, the same is true for $(1,0)$.

From A.2, we have that i) $U^{SW}(0,0) \leq U^{SW}(1,1)$ if and only if $n_m\alpha_m \geq n_M\alpha_M$, ii) $U^{SW}(1,1) \geq U^{SW}(1,0)$ if and only if $n_m\alpha_m \geq n_M\alpha_M$, and that iii) $U^{SW}(1,1) \geq U^{SW}(0,1)$ if and only if $n_m\alpha_m \geq n_M\alpha_M$. This proves that $(1,1)$ is the utilitarian optimum when $n_m\alpha_m \geq n_M\alpha_M$. Similarly, we can prove that $(0,0)$ is the utilitarian optimum when $n_m\alpha_m \geq n_M\alpha_M$. ■

Proposition 7 has an interesting implication in terms of social efficiency: an incumbent who is "flip flopping" during his mandate cannot be adopting an optimal policy. Under our working assumptions, Propositions 3 and 4 show that only an anti-gun incumbent is likely to behave in that specific inefficient way. Yet, this neither means that an anti-gun incumbent will always behave inefficiently, nor that a pro-gun incumbent will always behave efficiently. First, it is easy to show that there are values of the parameters such that an anti-gun incumbent adopts the socially efficient policy, i.e. voting "yea" in both periods when $n_m\alpha_m > n_M\alpha_M$, and "nay" in both periods when $n_m\alpha_m < n_M\alpha_M$. Second, we can show that for all values of the parameters under consideration, a pro-gun incumbent always votes "yea" in both periods. This is so even when voting "yea" in both periods is socially inefficient, i.e. $n_m\alpha_m < n_M\alpha_M$.

The propositions underlying Predictions 1-2 can be proven both for i) $\alpha_M = \alpha_m$ and $\phi_M\chi_M < \phi_m\chi_m$, and ii) $\alpha_M < \alpha_m$ and $\phi_M\chi_M = \phi_m\chi_m$. Therefore, finding empirical support for those three hypotheses does *not* allow us to make any statement regarding the relative efficiency of the policies implemented. In particular, even if observing "cycling" by some incumbents does suggest the existence of social inefficiencies, observing no cycling by other incumbents might be a sign of even more inefficiencies. This would be the case if an incumbent were to vote "yea" in both periods (which is always the case for pro-gun incumbents), whereas the social optimum is to vote "nay" in both periods. From a utilitarian standpoint, such an outcome would be worse than "cycling."

[51] The only case in which flip flopping can occur is when the two groups have the exact same weight, i.e. $n_M\alpha_M = n_m\alpha_m$. This is a non-generic case, in which all combinations of policies are optimal.

## A.3 Informational lobbying

The two-period version of the model shows that, if voters suffer from a recency bias, an anti-gun incumbent may support gun regulations in the first period, but oppose them in the second. One might argue that such a recency bias would be compensated by a lobby providing its members information about what the incumbent did during her mandate when they go to the polls. In this appendix, we extend the model to allow for such "informational lobbying". Our objective is twofold: we want to get some insights about the impact of informational lobbying on the behavior of voters and verify whether cycles in politicians' behavior persist.

We assume that voters who care intensely about gun regulations are able to overcome the free-riding problem described by Olson (1965) and form a lobby. The lobby maximizes the utility of its members and provides them with information about the incumbent's policy choices. Importantly, the lobby does not suffer from a recency bias:

$$W_l\left(s_1, s_2\right) = -\alpha_m\left(\left|s_m - s_1\right| + \left|s_m - s_2\right|\right). \tag{A.3}$$

The lobby chooses a level of effort $e$ that affects $\chi_m$, the fraction of group $m$ voters who know what the incumbent has done during her mandate. The relation between $\chi_m$ and $e$ is as follows: $\chi_m = \bar{\chi}e$, where $\bar{\chi} \in (0,1)$. The higher the effort, $e$, the higher the fraction of informed voters in group $m$. For the sake of simplicity, we also assume that $\chi_M = \bar{\chi}$.

Following Persson and Tabellini (2001), the objective function of the lobby is

$$\max_e \ \Pi\left(s_1, s_2\right) W_l(s_1, s_2) + \left(1 - \Pi\left(s_1, s_2\right)\right)\bar{u}_l - \frac{1}{2}e^2, \tag{A.4}$$

where $\bar{u}_l$ is the (exogenously given) utility of lobby members when the incumbent is not reelected. Solving for the optimal $e$ for a given $(s_1, s_2)$ (under the constraint that $e \geq 0$), we get

$$e^*(s_1, s_2) = \begin{cases} \frac{\gamma}{\phi} n_m \phi_m \left(\bar{\chi} W_m\left(s_1, s_2\right)\right)\left(W_l\left(s_1, s_2\right) - \bar{u}_l\right) & \text{if positive} \\ 0 & \text{otherwise} \end{cases}$$

We thus have

$$\begin{aligned} e^*\left(0,0\right) &= \frac{\gamma}{\phi} n_m \phi_m \bar{\chi} \alpha_m \left(1+\delta\right)\left(2\alpha_m + \bar{u}_l\right), \\ e^*\left(0,1\right) &= \frac{\gamma}{\phi} n_m \phi_m \bar{\chi} \alpha_m \delta \left(\alpha_m + \bar{u}_l\right), \\ e^*\left(1,0\right) &= \frac{\gamma}{\phi} n_m \phi_m \bar{\chi} \alpha_m \left(\alpha_m + \bar{u}_l\right), \\ e^*\left(1,1\right) &= 0. \end{aligned}$$

To avoid corner solutions, we work under the assumption that $\alpha_m + \bar{u}_l > 0$. This ensures that $e^*(s_1, s_2) \geq 0 \ \forall s_1, s_2$. We can directly observe that $e^*(1,1) < e^*(0,1) < e^*(1,0) < e^*(0,0)$. This means that the lobby makes sure that pro-gun voters know more about the action of the incumbent when she behaves "badly" from the viewpoint of pro-gun voters. Interestingly, the lobby's optimal $e$ is affected by the recency bias even though the lobby's planner does not suffer from such a bias. This is because pro-gun voters are more sensitive to information when $(s_1, s_2)$ is "bad".

The incumbent maximizes her expected utility taking into account the lobby's reaction:

$$\max_{s_1,s_2} \frac{1}{2} + \frac{\gamma}{\phi}\left(n_M \phi_M \left(\bar{\chi} W_M(s_1,s_2) - \bar{u}_M\right) + n_m \phi_m \left(\bar{\chi} e^*(s_1,s_2) W_m(s_1,s_2) - \bar{u}_m\right)\right) + \theta\omega(s_1,s_2).$$

In order to verify how informational lobbying affects our results concerning the cycling behavior of the incumbent, we consider a situation in which $(s_1^*, s_2^*) = (0,1)$ is *not* an equilibrium without lobbying (i.e. when $\chi_M = \bar{\chi} = \chi_m$) but may be an equilibrium with lobbying (i.e. when $\chi_m = \bar{\chi} e^*(s_1, s_2)$). In particular, suppose that

$$\alpha_M = \alpha_m = 1, \ \phi_M = \phi_m, \text{ and } n_M > n_m. \tag{A.5}$$

For the sake of expositional clarity, we also assume that $\theta = 0$.[52] Under the assumption in (A.5), it is easy to show that, without lobbying, any incumbent chooses $(s_1^*, s_2^*) = (0,0)$, i.e. the platform preferred by anti-gun voters.

The following proposition shows that this is not necessarily the case when informational lobbying is allowed:

**Proposition 8** *The strategy $(s_1^*, s_2^*) = (0,1)$ is an equilibrium if and only if*

$$\frac{1}{(1+\delta)(1+\bar{u}_l)} \leq \frac{(n_m)^2}{n_M}\bar{\chi}\gamma \ \leq \ \frac{1}{\delta(1+\bar{u}_l)}.$$

*There are values of the parameters such that these conditions are simultaneously satisfied.*

**Proof**: The first part of the proof is very similar to the proof of Proposition 4. We therefore omit the details of how we obtain the following three conditions, that are

[52] That assumption alone is enough to prevent the existence of an equilibrium in which $(s_1^*, s_2^*) = (0,1)$ without lobbying.

necessary and sufficient for $(s_1^*, s_2^*) = (0, 1)$ to be an equilibrium:

$$\begin{aligned}
\frac{(n_m)^2}{n_M}\bar{\chi}\gamma &\geq \frac{1}{(1+\delta)^2(2+\bar{u}_l) - \delta^2(1+\bar{u}_l)}, \\
\frac{(n_m)^2}{n_M}\bar{\chi}\gamma &\leq \frac{1}{\delta(1+\bar{u}_l)}, \\
\frac{(n_m)^2}{n_M}\bar{\chi}\gamma &\geq \frac{1}{(1+\delta)(1+\bar{u}_l)}.
\end{aligned}$$

Given that

$$\left(1+\delta+\delta^2\right)(1+\bar{u}_l) < \left(1+2\delta+\delta^2\right)(2+\bar{u}_l)$$

is always satisfied (from $\delta > 0$ and $1+\bar{u} > 0$), we have that

$$\frac{1}{(1+\delta)^2(2+\bar{u}_l) - \delta^2(1+\bar{u}_l)} < \frac{1}{(1+\delta)(1+\bar{u}_l)}.$$

Therefore, we only have to check that

$$\frac{1}{\delta(1+\bar{u}_l)} \geq \frac{(n_m)^2}{n_M}\bar{\chi}\gamma \geq \frac{1}{(1+\delta)(1+\bar{u}_l)}$$

is possible. This requires

$$(1+\delta)(1+\bar{u}_l) > \delta(1+\bar{u}_l),$$

which is always true. It remains to check that $\frac{(n_m)^2}{n_M}\bar{\chi}\gamma$ can belong to $[\frac{1}{(1+\delta)(1+\bar{u}_l)}, \frac{1}{\delta(1+\bar{u}_l)}]$. There is no constraint on the parameters' values that excludes such a possibility. This is so even when both $\frac{1}{\delta(1+\bar{u}_l)}$ and $\frac{1}{(1+\delta)(1+\bar{u}_l)}$ are larger than 1. Indeed, given $\bar{\chi} \in (0,1)$, this requires $\frac{(n_m)^2}{n_M}\gamma > 1$, which is satisfied if $n_m > 1$, or $\frac{(n_m)^2}{n_M} < 1$ and $\gamma > 1$. ■

The intuition for this result is as follows. First, note that the additional information provided by the lobby decreases the probability of re-election of the incumbent. Second, remember that the lobby provides more information when the platform is "bad" than when it is good, i.e. $e^*(1,1) < e^*(0,1) < e^*(1,0) < e^*(0,0)$. Obviously, this gives incentives for the incumbent to move away from "bad" platforms (i.e. $(0,0)$ and $(1,0)$) toward "good" platforms (i.e. $(0,1)$ and $(1,1)$). The proposition shows that this effect might be strong enough so that the incumbent neither adopts $(0,0)$ nor $(1,0)$, but not so strong that she adopts $(1,1)$. Thus, even under the presence of a pro-gun lobby that does not suffer from a recency bias, we can have $(s_1^*, s_2^*) = (0,1)$ as an equilibrium.

## B.1 Variables and descriptive statistics

**Table B-1:** Definition of variables and sources

| Variable | Definition | Source |
|---|---|---|
| $\text{Vote}_{ijvt}$ | Dummy equal to 1 if senator $i$ from state $j$ votes "yea" ("nay") on pro-gun (anti-gun) vote $v$ | GOA (website and newsletters), Voteview and Project Vote Smart |
| $\text{Senate3}_{it}$ | Dummy equal to 1 if senator $i$ is in the last two years of his or her mandate | Congressional Directory |
| $\text{Republican}_{i}$ | Dummy equal to 1 if congressman $i$ is a Republican | Biographical Directory of the U.S. Congress |
| $\text{Male}_{i}$ | Dummy equal to 1 if senator $i$ is male | Biographical Directory of the U.S. Congress |
| $\text{Age}_{it}$ | Age of congressman $i$ in year $t$ | Biographical Directory of the U.S. Congress |
| Gun-rights $\text{contributions}_{it}$ | Contributions in thousands US$ received by senator $i$ in year $t$ from gun-rights lobbies | Center for Responsive Politics |
| Gun-control $\text{contributions}_{it}$ | Contributions in thousands US$ received by senator $i$ in year $t$ from gun-control lobbies | Center for Responsive Politics |
| $\text{Retiring}_{it}$ | Dummy equal to 1 if senator $i$ retires (voluntarily leaves office) at the end of the mandate | Overby and Bell (2004) and http://www.rollcall.com |
| Margin of $\text{victory}_{it}$ | Difference in votes of winner and runner-up in last election | Statistics of the Congressional Elections |
| $\text{Tenure}_{it}$ | Senators' length of service in number of congresses | Biographical Directory of the U.S. Congress |
| Gun magazine $\text{subscriptions}_{jt}$ | Number of subscriptions to American Rifleman per 1,000 inhabitants in state $j$ and year $t$ | American Audited Media |
| Violent crime $\text{rate}_{jt}$ | Number of violent crimes per 1 million inhabitants in state $j$ and year $t$ | Federal Bureau of Investigation (FBI) |
| $\text{Education}_{jt}$ | Proportion of the population of state $j$ with a college degree | CPS (1994-2006) and ACS (2007-2010) |
| Swing $\text{state}_{jt}$ | Dummy equal to 1 if in state $j$ the margin of victory in the last presidential election was less than 5% | Leip (2008) |
| Close $\text{vote}_{v}$ | Dummy equal to 1 if the margin of passage or rejection for vote $v$ was smaller than the median margin | Voteview |
| $\text{Accept}_{v}$ | Dummy equal to 1 if vote $v$ was to accept pro-gun legislation (rather than to reject gun-control legislation) | GOA (website and newsletters) and Voteview |

**Table B-2:** Summary statistics

| Variable | | | | |
|---|---|---|---|---|
| **A. Senator-level characteristics** | | Democrats | Republicans | All |
| Vote (1= pro gun) | | 0.300 | 0.883 | 0.595 |
| Senate3 | | 0.323 | 0.348 | 0.336 |
| Male | | 0.838 | 0.928 | 0.883 |
| Age | | 60.7 | 60.8 | 60.7 |
| Republican | | 0 | 1 | 0.501 |
| Gun Rights contributions | | 0.270 | 4.712 | 2.493 |
| Gun Control contributions | | 0.414 | 0.029 | 0.221 |
| Retiring | | 0.151 | 0.139 | 0.145 |
| Margin of victory | | 0.219 | 0.247 | 0.233 |
| Tenure | | 7.06 | 6.21 | 6.64 |
| **B. State-level characteristics** | Mean | St. Dev. | Min | Max |
| Gun magazine subscriptions | 6.36 | 2.78 | 2.38 | 22.50 |
| Violent crime rate | 44.8 | 21.8 | 6.7 | 121.0 |
| Education | 25.0 | 5.0 | 11.4 | 40.4 |
| Swing State | 0.227 | 0.419 | 0 | 1 |
| **C. Vote-level characteristics** | | | | |
| Close vote | 0.53 | 0.51 | 0 | 1 |
| Approve | 0.53 | 0.51 | 0 | 1 |

*Notes:* See definition of variables in Table B-1. Panel A reports averages of senator-year observations, while Panel B reports averages of state-year observations.

## B.2 Gun votes and ratings

As discussed in Section 4, since 1994 Gun Owners of America (GOA) has been keeping track of key votes in the U.S. Congress, classifying them into two categories. The first category includes votes supported by GOA, which are meant to strengthen the rights of gun owners or to reject existing of proposed gun-control legislation. The second category includes votes not supported by GOA, which often involve relatively uncontroversial gun-control measures.

In what follows, we show that senators' decisions on the first category of votes have a larger impact on their ratings by gun-rights organizations. Both GOA and the NRA produce ratings on the pro-gun position of politicians. In particular, GOA produces ratings for all senators by assigning a letter grade from A+ for a "Pro-Gun Leader" to F- for "Philosophically committed anti-gunner." Similarly to GOA, the NRA rates

politicians on a scale from A+ for someone "who has also made a vigorous effort to promote and defend the Second Amendment" to F for a "True enemy of gun owners' rights." However, the NRA only produces ratings for senators who are up for re-election, i.e. are in the last two years of their mandate.

We construct the dummy variable *Pro-gun rating*$_{ijt}$, which takes the value of 1 when a senator receives a letter grade C- or above.[53] We then regress this variable on the senators' voting behavior. In particular, we construct two variables: *In favor of votes supported by GOA*$_{ijt}$, which captures the share of "yeas" in votes supported by GOA; and *Against votes not supported by GOA*$_{ijt}$, which measures the share of "nays" in votes not supported by GOA.

In the first four columns of Table B-3 we report regressions based on GOA ratings, including different sets of dummy variables. The last two columns show the results for NRA ratings. These are based on a much smaller sample, since NRA ratings are only available for a shorter period and only for senators who are up for re-election. Notice that the coefficient for the variable *In favor of votes supported by GOA*$_{ijt}$ is always positive and highly significant, indicating that a "yea" on GOA-supported votes increases the probability of being rated as a gun-rights supporter. A "nay" on votes not supported by GOA has a much smaller impact on senators' gun ratings. In all regressions, this difference is statistically significant, as indicated in the tests at the bottom of the table. Looking at the coefficients from column 4, we find that a one standard deviation increase in the variable *In favor of votes supported by GOA* raises the predicted probability that a senator is rated as pro-gun by 32 percent. By contrast, an analogous increase in the variable *Against votes not supported by GOA* only raises the predicted probability of a pro-gun rating by 13 percent.

Even in the smaller sample of NRA ratings (columns 5 and 6), the weight attached to a "yea" on GOA-supported votes is significantly larger than a "nay" on votes that GOA did not support These results provide evidence that senators' decisions on GOA supported votes better capture their stance on gun control.

[53]We choose C- as the pro-gun/anti-gun threshold based on GOA's description of each letter grade: C and C- are given to senators leaning GOA's way occasionally, while D and D- are given to senators usually against GOA's interests. For the NRA ratings, we similarly choose C- as the threshold since a senator is described as "anti-gun candidate" starting with the letter grade D.

**Table B-3:** Gun ratings and votes

| Dep. variable: | Pro-gun rating$_{ijt}$ | | | | | |
|---|---|---|---|---|---|---|
| Source for ratings: | GOA | | | | NRA | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| In favor of votes supported by GOA$_{ijt}$ | 4.557*** | 4.432*** | 4.166*** | 4.190*** | 4.947*** | 4.809*** |
| | (1.366) | (1.369) | (1.508) | (1.488) | (1.400) | (1.504) |
| Against votes not supported by GOA$_{ijt}$ | 1.428*** | 1.426*** | 1.546*** | 1.555*** | 1.771*** | 2.326*** |
| | (0.284) | (0.283) | (0.378) | (0.381) | (0.494) | (0.587) |
| Republican$_{it}$ | 2.454*** | 2.393*** | 2.419*** | 2.440*** | 1.327*** | 0.723 |
| | (0.335) | (0.334) | (0.558) | (0.584) | (0.510) | (0.534) |
| Male$_i$ | 1.197*** | 1.162*** | 1.116** | 1.141** | -0.600 | -0.968* |
| | (0.353) | (0.350) | (0.484) | (0.545) | (0.514) | (0.500) |
| Age$_{it}$ | -0.049*** | -0.048*** | -0.102*** | -0.103*** | 0.026 | 0.039 |
| | (0.011) | (0.011) | (0.022) | (0.023) | (0.025) | (0.029) |
| Gun-rights contributions$_{it}$ | | 0.000 | | -0.000 | | 0.087** |
| | | (0.000) | | (0.000) | | (0.044) |
| Gun-control contributions$_{it}$ | | -0.000 | | -0.000 | | |
| | | (0.000) | | (0.000) | | |
| Test In favor of votes supported by GOA$_{ijt}$ = Against votes not supported by GOA$_{ijt}$ (p-value) | 0.023 | 0.028 | 0.085 | 0.079 | 0.015 | 0.061 |
| Congress dummies | yes | yes | yes | yes | yes | yes |
| State dummies | no | no | yes | yes | no | no |
| Observations | 478 | 478 | 305 | 305 | 75 | 75 |
| Pseudo R-squared | 0.721 | 0.722 | 0.789 | 0.789 | 0.637 | 0.686 |

*Notes:* The table reports coefficients of probit regressions, with robust standard errors in parentheses. The dependent variable *Pro-gun rating*$_{ijt}$ is coded 1 when senator $i$ from state $j$ is assigned a letter grade above C- in congressional period $t$. *In favor of votes supported by GOA*$_{ijt}$ (respectively *Against votes not supported by GOA*$_{ijt}$) is the proportion of votes supported by GOA (resp. not supported by GOA) in which senator $i$ from state $j$ voted "yea" (resp. "nay") during Congress $t$. In column 6 the variable *Gun-control contributions* is not included since no senator in the sample receives positive contributions. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

**Table B-4:** List of votes supported by GOA

| Date | Vote | Description provided by GOA | Yeas-Nays | Result | Directly gun-related? |
|---|---|---|---|---|---|
| Nov. 9, 1995 | H.J.R.115, amendment No. 3049 | The Senate rejected a first vote on the Simpson-Istook provision which would restrict welfare to lobby organizations. | 46-49 | Failed | no |
| Nov. 9, 1995 | H.J.R.115, amendment No. 3049 | The Senate passed a compromise version of the Simpson-Istook provision. The compromise which passed would only limit those non-profit groups with budgets of more than $3 million from both lobbying and receiving federal grants. | 49-47 | Passed | no |
| July 21, 1998 | Smith amendment No. 3234 | Pro-gun Senator Bob Smith (R-NH) introduced an "Anti-Brady" amendment. The Smith amendment would prohibit the FBI from using Brady background checks to tax or register gun owners. Further, the amendment requires the "immediate destruction of all [gun buyer] information, in any form whatsoever." | 69-31 | Passed | yes |
| July 21, 1998 | Boxer amendment No. 3230 | Vote to table an amendment that would prohibit the transfer of guns which are not equipped with a locking device. | 61-39 | Passed | yes |
| July 22, 1998 | Durbin amendment No. 3260 | The Senate defeated a "lock-up-your-safety" amendment introduced by Sen. Dick Durbin (D-IL). Durbin's provision would make it a federal crime to keep a firearm and ammunition on your premises under the following conditions: you know or should know that a juvenile can gain access to your firearm, and a juvenile does obtain access to it and does as little as exhibit it. | 69-31 | Passed | yes |
| July 28, 1998 | Feinstein amendment No. 3351 | Senator Dianne Feinstein (D-CA) offered an anti-gun provision as an amendment to S. 2312. Her language would prohibit the importation of firearm magazines holding over 10 rounds that were manufactured before the 1994 ban was enacted. | 54-44 | Passed | yes |
| May 12, 1999 | S. 254 amendment No. 331 | The Senate defeated an amendment introduced by anti-gun Senator Frank Lautenberg (D-NJ). The provision would have banned private sales of firearms at gun shows unless buyers submitted to background registration checks. Draconian restrictions would have also been imposed on gun show promoters. | 51-47 | Failed | yes |
| May 13, 1999 | S. 254 amendment No. 343 | Feinstein Modified Amendment, to provide for a ban on importing large capacity ammunition feeding devices, prohibit the transfer to and possession by juveniles of semiautomatic assault weapons and large capacity ammunition feeding devices, and enhance criminal penalties for transfers of handguns, ammunition, semiautomatic assault weapons, and large capacity ammunition feeding devices to juveniles. | 39-59 | Failed | yes |
| May 13, 1999 | S. 254 amendment No. 344 | Hatch/Craig Amendment No. 344, to provide for effective gun law enforcement, enhanced penalties, and facilitation of background checks at gun shows. | 3-94 | Failed | yes |
| May 14, 1999 | S. 254 amendment No. 350 | Internet firearms sales. Schumer Amendment No. 350, to amend title 18, United States Code, to regulate the transfer of firearms over the Internet. | 50-43 | Passed | yes |

| | | | | | |
|---|---|---|---|---|---|
| July 13, 2006 | H.R. 5441, amendment No. 4615 | The amendment, introduced by Sen. David Vitter (R-LA), provides that no money can be used by federal agents to confiscate firearms during a declared state of emergency. The amendment was added to the Department of Homeland Security appropriations bill (H.R. 5441). | 84-16 | Passed | yes |
| Jan. 18, 2007 | S. 1, amendment 20. | The Senate narrowly passed the Bennett amendment to strike language in S.1 that would infringe upon the free speech rights of groups like GOA. Offered by Sen. Robert Bennett (R-UT), the amendment struck requirements that would have required GOA to monitor and report on its communications with its members, and could easily have led to government demands for GOA's membership list. | 55-43 | Passed | no |
| Sept. 6, 2007 | H.R. 2764, amendment No. 2774 | The Vitter provision stipulates that no U.S. funds can be used by the United Nations – or organizations affiliated with the UN – to restrict or tax our gun rights. Hence, the amendment would give a mildly pro-gun administration the excuse to stop sending US taxpayer funds to the United Nations as soon as they adopt any policy to restrict the Second Amendment rights of Americans. | 81-10 | Passed | no |
| Feb. 25, 2008 | S. 1200, amendment No. 4070 | Vote to adopt an amendment that would prohibit funds in the Indigenous Health Bill (S 1200) from being used to "carry out any anti-firearm program, gun buy-back program, or program to discourage or stigmatize the private ownership of firearms for collecting, hunting, or self-defense." | 78-11 | Passed | yes |
| Feb. 26, 2009 | S. 160, amendment No. 575 | On February 26, the Senate passed a pro-gun amendment offered by Senator John Ensign (R-NV). The Ensign amendment would completely repeal D.C.'s gun ban. The amendment passed as a rider to S. 160, the D.C. Voting Rights Act. That bill that is designed to give Washington, D.C. full voting privileges in the House of Representatives, thus providing one more anti-gun vote in that chamber. | 62-36 | Passed | yes |
| April 2, 2009 | S.Con.Res. 13, amendment No. 798 | Amendment that seeks to reverse a gun prohibition on Amtrak trains. The provision, sponsored by Sen. Roger Wicker (R-MS), passed as part of the annual budget resolution (S. Con. Res. 13). Amtrak regulations prohibit firearms on both checked and carry on baggage, which means that sportsmen who wish to use an Amtrak carrier for a hunting trip cannot take a shotgun even in their checked luggage. | 63-35 | Passed | yes |
| May 12, 2009 | H.R. 627, amendment No. 1067 | The Senate passed a pro-gun amendment – offered by Senator Tom Coburn (R-OK) – that would effectively overturn the gun ban on National Park Service lands. The amendment will in no way change or override state, local or federal law, but will simply allow those laws (enacted by legislation, and not by bureaucrats or judges) to govern firearms possession. | 67-29 | Passed | yes |
| July 22, 2009 | S. 1390, amendment No. 1618 | Vote to pass an amendment allowing individuals who have conceal and carry permits in their home state to carry concealed firearms across state lines. | 58-39 | Failed | yes |
| March 25, 2010 | H.R. 4872, amendment No. 3700 | The U.S. Senate defeated an amendment to repeal the Veterans Disarmament Act on March 25, 2010. During the Clinton Administration, the Department of Veteran Affairs (VA) began sending the names of many of its beneficiaries to the FBI so they could be added to the NICS list, denying these individuals their right to purchase a firearm. To combat this outrage, pro-gun Senator Richard Burr (R-NC) authored S. 669, the Veterans Second Amendment Protection Act, which stipulates that a veteran cannot lose his or her gun rights "without the order or finding of a judge, magistrate, or other judicial authority of competent jurisdiction that such person is a danger to himself or herself or others." | 45-53 | Failed | yes |

*Sources:* Website and newsletters of Guns Owners of America (GOA). In the interest of space, some descriptions have been shortened.

## B.3 Additional robustness checks

**Table B-6:** The pro-gun effect of election proximity, linear probability model

| Dep. variable: | $Vote_{ijvt}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | All | | | | Directly gun-related | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $Senate3_{it}$ | 0.060*** | 0.039** | 0.036** | 0.044* | 0.075** | 0.048** | 0.047** | 0.053* |
| | (0.021) | (0.016) | (0.016) | (0.023) | (0.030) | (0.023) | (0.023) | (0.030) |
| $Republican_{it}$ | | 0.479*** | 0.478*** | 0.480*** | | 0.412*** | 0.412*** | 0.423*** |
| | | (0.044) | (0.045) | (0.065) | | (0.045) | (0.045) | (0.065) |
| $Male_i$ | | 0.048 | 0.046 | 0.033 | | 0.076 | 0.077 | 0.052 |
| | | (0.045) | (0.046) | (0.053) | | (0.051) | (0.052) | (0.061) |
| $Age_{it}$ | | -0.003* | -0.003* | -0.003 | | -0.003* | -0.003* | -0.003 |
| | | (0.002) | (0.002) | (0.002) | | (0.002) | (0.002) | (0.002) |
| Gun-rights $contributions_{it}$ | | -0.000 | 0.000 | -0.000 | | 0.000 | 0.000 | 0.000 |
| | | (0.000) | (0.000) | (0.000) | | (0.002) | (0.002) | (0.003) |
| Gun-control $contributions_{it}$ | | -0.006 | -0.005 | 0.001 | | -0.005 | -0.005 | 0.001 |
| | | (0.007) | (0.007) | (0.012) | | (0.007) | (0.007) | (0.011) |
| Gun magazine $subscriptions_{jt}$ | | 0.027 | 0.027 | | | 0.028 | 0.028 | |
| | | (0.020) | (0.020) | | | (0.025) | (0.025) | |
| Violent crime $rate_{jt}$ | | 0.005*** | 0.005*** | | | 0.004 | 0.004 | |
| | | (0.002) | (0.002) | | | (0.002) | (0.002) | |
| $Education_{jt}$ | | -0.007 | -0.007 | | | -0.006 | -0.006 | |
| | | (0.009) | (0.009) | | | (0.010) | (0.010) | |
| Year dummies | yes | yes | no | yes | yes | yes | no | yes |
| State dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| Vote dummies | no | no | yes | no | no | no | yes | no |
| Year×State dummies | no | no | no | yes | no | no | no | yes |
| Observations | 1,840 | 1,840 | 1,840 | 1,840 | 1,363 | 1,363 | 1,363 | 1,363 |
| R-squared | 0.475 | 0.593 | 0.643 | 0.701 | 0.502 | 0.590 | 0.644 | 0.692 |

*Notes:* The table reports coefficients of a linear probability model, with robust standard errors in parentheses, adjusted for clustering at the state level. The dependent variable $Vote_{ijvt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

**Table B-7:** The pro-gun effect of election proximity, alternative samples

| Dep. variable: | $\text{Vote}_{ijvt}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample: | All GOA + key votes 1993 | | GOA gun-related + key votes 1993 | | All GOA + Votesmart | | GOA gun-related + Votesmart | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\text{Senate3}_{it}$ | 0.200** | 0.193** | 0.249** | 0.233** | 0.196** | 0.140* | 0.247** | 0.183** |
| | (0.084) | (0.096) | (0.124) | (0.108) | (0.076) | (0.078) | (0.105) | (0.082) |
| $\text{Republican}_{it}$ | | 2.329*** | | 2.103*** | | 2.036*** | | 1.888*** |
| | | (0.265) | | (0.268) | | (0.189) | | (0.194) |
| $\text{Male}_{i}$ | | 0.506** | | 0.701* | | 0.442** | | 0.564** |
| | | (0.243) | | (0.374) | | (0.204) | | (0.270) |
| $\text{Age}_{it}$ | | -0.029*** | | -0.028*** | | -0.014** | | -0.014** |
| | | (0.008) | | (0.009) | | (0.006) | | (0.006) |
| $\text{Gun-rights contributions}_{it}$ | | 0.018 | | 0.017 | | 0.013 | | 0.013 |
| | | (0.013) | | (0.016) | | (0.010) | | (0.012) |
| $\text{Gun-control contributions}_{it}$ | | -0.174*** | | -0.156*** | | 0.010 | | 0.011 |
| | | (0.043) | | (0.047) | | (0.061) | | (0.060) |
| $\text{Gun magazine subscriptions}_{jt}$ | | 0.064 | | 0.060 | | 0.066 | | 0.101 |
| | | (0.110) | | (0.131) | | (0.069) | | (0.085) |
| $\text{Violent crime rate}_{jt}$ | | 0.024*** | | 0.028*** | | 0.015* | | 0.016* |
| | | (0.008) | | (0.010) | | (0.008) | | (0.009) |
| $\text{Education}_{jt}$ | | -0.053 | | -0.062 | | -0.061* | | -0.071* |
| | | (0.046) | | (0.053) | | (0.034) | | (0.037) |
| $\text{Senate3}_{it}$ (marginal effects) | 0.044** | 0.030** | 0.054** | 0.036** | 0.047** | 0.026* | 0.059** | 0.034** |
| | (0.019) | (0.015) | (0.027) | (0.017) | (0.018) | (0.014) | (0.025) | (0.015) |
| Predicted probability | 0.597 | 0.595 | 0.598 | 0.596 | 0.548 | 0.547 | 0.545 | 0.544 |
| Year dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| State dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| Observations | 1,957 | 1,957 | 1,467 | 1,467 | 2,523 | 2,523 | 2,113 | 2,113 |
| Pseudo R-squared | 0.411 | 0.585 | 0.425 | 0.582 | 0.377 | 0.524 | 0.389 | 0.524 |

*Notes:* The table reports coefficients of a probit model, with robust standard errors in parentheses, adjusted for clustering at the state level. The dependent variable $Vote_{ijvt}$ is coded as 1 when senator $i$ from state $j$ voted pro gun on vote $v$ in year $t$. ***, ** and * indicate statistical significance at the 99%, 95% and 90%, respectively.

**Table B-8:** The pro-gun effect of election proximity, additional controls

| Dep. variable: | $\text{Vote}_{ijvt}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample: | All | | | | Directly gun-related | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\text{Senate3}_{it}$ | 0.270*** | 0.298*** | 0.272*** | 0.301*** | 0.334*** | 0.318*** | 0.371*** | 0.365*** |
| | (0.096) | (0.107) | (0.096) | (0.107) | (0.108) | (0.119) | (0.112) | (0.124) |
| $\text{Republican}_{it}$ | 2.553*** | 2.400*** | 2.586*** | 2.422*** | 2.286*** | 2.223*** | 2.474*** | 2.422*** |
| | (0.302) | (0.308) | (0.312) | (0.312) | (0.309) | (0.308) | (0.352) | (0.352) |
| $\text{Male}_{i}$ | 0.306 | 0.417 | 0.317 | 0.402 | 0.419 | 0.420 | 0.452 | 0.457 |
| | (0.266) | (0.339) | (0.269) | (0.339) | (0.421) | (0.446) | (0.457) | (0.491) |
| $\text{Age}_{it}$ | -0.028*** | -0.021* | -0.029*** | -0.020* | -0.026*** | -0.017 | -0.029*** | -0.018 |
| | (0.009) | (0.011) | (0.009) | (0.011) | (0.010) | (0.014) | (0.011) | (0.015) |
| $\text{Gun-rights contributions}_{it}$ | 0.021* | 0.018 | 0.023* | 0.018 | 0.022 | 0.023 | 0.027 | 0.028 |
| | (0.012) | (0.013) | (0.012) | (0.013) | (0.017) | (0.017) | (0.017) | (0.018) |
| $\text{Gun-control contributions}_{it}$ | -0.160*** | -0.175*** | -0.171*** | -0.180*** | -0.151** | -0.149** | -0.183*** | -0.187*** |
| | (0.055) | (0.059) | (0.054) | (0.059) | (0.059) | (0.060) | (0.062) | (0.065) |
| $\text{Gun magazine subscriptions}_{jt}$ | 0.068 | 0.036 | 0.081 | 0.026 | 0.186 | 0.127 | 0.162 | 0.097 |
| | (0.128) | (0.127) | (0.140) | (0.123) | (0.182) | (0.170) | (0.204) | (0.187) |
| $\text{Violent crime rate}_{jt}$ | 0.015 | 0.011 | 0.015 | 0.010 | 0.008 | 0.006 | 0.007 | 0.007 |
| | (0.011) | (0.012) | (0.011) | (0.012) | (0.014) | (0.015) | (0.015) | (0.016) |
| $\text{Education}_{jt}$ | -0.051 | -0.029 | -0.053 | -0.029 | -0.065 | -0.054 | -0.063 | -0.058 |
| | (0.049) | (0.050) | (0.048) | (0.051) | (0.061) | (0.062) | (0.064) | (0.067) |
| $\text{Swing State}_{jt}$ | -0.178 | | | -0.103 | 0.020 | | | 0.062 |
| | (0.192) | | | (0.181) | (0.284) | | | (0.318) |
| $\text{Margin of Victory}_{it}$ | | 0.545 | | 0.564 | | 0.265 | | 0.442 |
| | | (0.562) | | (0.559) | | (0.668) | | (0.724) |
| $\text{Tenure}_{it}$ | | -0.028 | | -0.028 | | -0.029 | | -0.037 |
| | | (0.026) | | (0.026) | | (0.029) | | (0.032) |
| $\text{Close vote}_{v}$ | | | 0.165 | 0.188 | | | 1.162*** | 1.200*** |
| | | | (0.167) | (0.167) | | | (0.228) | (0.230) |
| $\text{Accept}_{v}$ | | | 0.454*** | 0.517*** | | | 1.381*** | 1.397*** |
| | | | (0.117) | (0.134) | | | (0.235) | (0.243) |
| $\text{Senate3}_{it}$ (marginal effects) | 0.040*** | 0.047*** | 0.041*** | 0.047*** | 0.050*** | 0.049*** | 0.051*** | 0.051*** |
| | (0.014) | (0.017) | (0.014) | (0.017) | (0.016) | (0.018) | (0.016) | (0.017) |
| Predicted probability | 0.614 | 0.625 | 0.614 | 0.625 | 0.621 | 0.630 | 0.622 | 0.631 |
| Year dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| State dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| Observations | 1,767 | 1,624 | 1,767 | 1,624 | 1,281 | 1,225 | 1,281 | 1,225 |
| Pseudo R-squared | 0.596 | 0.574 | 0.599 | 0.578 | 0.594 | 0.580 | 0.628 | 0.617 |

*Notes:* Same as in Table B-7.