Election Proximity and Voting Behavior of Politicians:

The Case of the U.S. Senate and the Farm Bills

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Abstract

In my thesis I test whether the closeness to an election affects how members of the United States Senate vote in the case of agricultural legislation. I use a simple political agency model to explain the observed behavior of the senators and I show that when the electorates display "recent bias" senators optimally vote in a different way, depending on whether they are closer or farther way from election. I argue that using election proximity as an explanatory variable is a good way to test whether legislator preferences or electoral incentives motivate the voting of the senators.

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"Surely," [Senator] Barkley said, "you remember all these things I have done for you?"

"Yeah," said Farmer Jones sullenly. "But what in hell have you done for me lately?"[1]

1. Introduction

One of the main questions of political science is what the motivations of politicians are. According to several explanations they are affected by lobby groups, opportunistic reasons (office-seeking), the benefits of their constituencies, and by partisanship (ideological reasons) as well (Persson and Tabellini, 2002). By the retrospective voting theory citizens evaluate politicians based on their past performance (Healy and Malhotra, 2013), but empirically it is observed that politicians manipulate the economic or political environment in order to increase their reelection probability at the closeness of elections. A possible explanation is the so-called „recent bias" (also „present bias" or "end-heuristic") of the constituencies (Healy and Lenz, 2014); voters – in order to simplify their retrospective valuations – substitute their perceptions at the end for the whole period. If politicians are opportunistic (office-seeking) they will strategically respond to these psychological traits of the electorate and that may explain the change in their behavior. That is, if senators (or at least some of them) support agricultural legislations because they seek reelection, and they know or

[1](Matthews, 1960, p. 218): conversation between Senator Barkley and one of his voters, who did not support him at the ballot box.

believe that citizens suffer from „recent bias", then we should observe this by examining politicians voting behavior.

In my thesis I test whether the closeness to an election affect how members of the United States Senate vote in the case of agricultural legislation. Agricultural policy is a debated issue, since it is widely observed phenomenon that governments in developed countries highly subsidize their farmers, often at the expenses of consumers (De Groter and Swinnen, 2002). Why do politicians support the inefficient agricultural sector with measures that hurt consumers and developing countries' agricultural sector? One of the explanations of this phenomenon is that farmers are usually well-organized, and more motivated to defend their interests than consumers. That is why politicians support legislation that favor farmers in order to attract the support of them. Farmers are usually less biased ideologically; they are more concerned about policies that affect them directly, for example those related to agricultural subsidies. That is why it is an interesting question whether political competition can induce legislators to support farm bills.

I use a simple political agency model to explain the observed behavior of the senators and to show that in case of retrospective voting and the so-called "recent bias" of the electorates – that is when citizens care more about what happened recently – it is an optimal behavior of the senators to vote in different way when they are closer or farther way from an election. I argue that using election proximity as an explanatory variable is a good way to test whether legislator preferences or electoral incentives motivate the voting of the senators, because we can exploit the exogenous timing of elections in the case of the U.S. Senate. If senators' voting behavior depend on the closeness of the election then one can interpret it as a sign that electoral incentives do matter in case of agricultural legislation.

I use data of roll-call votes on the main agricultural bills in the last twenty years, and the days until the next election of each senator, to test the effect of election proximity on politician behavior. I find that closeness of elections do matter in determining how the legislators vote in case of farm bills. If senators face elections in the near future they are more inclined to vote in favor of bills that support the agricultural sector. I also found that for those incumbent politicians who won with a narrow margin last time, the proximity of elections gives an extra incentive to support farm bills.

The thesis is organized as follows. In the next section I present the most important literature on the topic. In the third section I briefly cover the agricultural policy and related questions in the United States, then the history of U.S agricultural legislation. In the fourth section I introduce a simple model to explain the empirical observations related to the agricultural legislation in the US Senate. In the following section I empirically study the relationship between election proximity and senators' voting behavior. Finally I examine the possibilities for future research and conclude,

2. Related Literature

Several empirical researches were conducted on how electoral institutions affect political behavior. The early work of Thomas (1985) on the relationship of senatorial roll-call voting and election proximity is an important contribution to this field. He argues that by examining whether senators change their votes one can test the hypotheses that (1) incumbent politicians are motivated by *both* reelection and other, probably ideological factors, and (2) voters take into account the recent votes of senators more seriously *or it is also enough* if the legislators believe that their recent votes matter more for their constituencies.

Conconi et al. (2013) tested the dependence of the senators' vote on the election proximity in the case of free trade agreements. Instead of the number of days until the next election they used the classification whether senators face reelection in two years, in more than two but less than four

years or in more than four years. They also compared the voting behavior of House members and senators.

Testing the implication of term limit is another important institutional factor beside election proximity that can affect political decision making. Besley and Case (1995) and List and Sturm (2004) analyzed the effect of gubernatorial term limits on economic policy.

According to retrospective voting theory, citizens assert the performance of politicians based on their past performance. In theory this can be effective to incentivize incumbent politicians to act on the behalf of their constituencies, as shown by Ferejohn (1986). At the same time, the political business cycle theory predicts that politicians alter their behavior before elections and try to manipulate the economy, because citizens are more responsive to events happening then. This can imply that retrospective decision making of voters does not work properly. There are different explanations for the phenomenon. On one hand, it is possible that retrospective decision making does work properly but citizens think that election-year performance of the economy is a better indicator of the abilities of the incumbent politician. On the other hand, citizens may not be fully able to evaluate the whole term of a politician and they use the election year performance of the economy because of its easier cognitive availability (availability heuristic), or they can only imperfectly recall what happened earlier because of the limited working of their memory. The former explanation is used by Rogoff (1990) and Rogoff and Sibert (1987) to build a formal model to analyze political business cycles, while Sarafidis (2007) analyzes the strategic manipulation of information release to memory restricted agents.

Healy and Lenz (2014) and Huber et al. (2012) indeed prove through experiments that people put more weight on recent economic events when they evaluate politicians. Healy and Lenz (2014) call “end-heuristic” the phenomenon when people – in order to simplify their retrospective

valuations – substitute environments at the end for the whole. People want to avoid the cognitive effort it would take them to distinguish the performance of politicians in their last period from the performance through the whole term. These psychological traits of the electorates may be an important explanation of the change in the behavior of the legislators, because they induce politicians to focus more on election-year outcomes. They can also lead to adverse selection, because politicians by manipulating the election-year outcome achieve their reelection even if their incentives differ that of their citizens.[2] Furthermore Huber et al. (2012) argue that the awareness of citizens plays a crucial role in how they interpret their environment. According to them, approaching the elections voters become more aware of the upcoming events and they tend to pay more attention to economic and personal conditions and so put more weight on the recent performance of the politician. They emphasize that even psychological experiences show that people evaluate the process (for example an unpleasant medical examination) by what they felt at the end of it. Moreover the media also exacerbate the biased focus of public attention on the present circumstances during campaign periods.

These psychological traits of the voters can incentivize incumbents to change their behaviors, that is, the strategic response of the politicians is to focus on election-year economy and in the case of legislation, to support those bills that can bring the most votes at next the elections. The existence of political cycles in legislation is studied by Lagona and Padovano (2007), who built a model and prove on Italian data that elections can cause cycles in legislation as well. That is why it seems plausible to examine laws and legislation as an element of the election cycle. Shepsele et al. (2009) also argue that senators tend to change their legislative behavior over the course of their term.

[2] They also argue that the modification of the information environment could improve the accountability of the incumbent politicians.

Recent research that use elections as an explanatory variable for agricultural policy decision includes Klomp and de Haan (2013) and Thies and Porsche (2007). They examine determinants of agricultural spending on the sample of cross-section of countries. To answer the question what determines the votes of the legislators in case of agricultural legislation Bellemare and Carnes (2013)[3] use roll-call vote data and test whether legislators' preferences, electoral incentives or lobbying determine the support for agricultural protection, but they do not consider the election proximity as an explanatory variable.

I contribute to the existing literature by testing whether the closeness of the election in the case of the members of the United States Senate affect how they vote in the case of agricultural legislation. I use the number of days to an election as an explanatory variable to test the effect of election proximity. I argue that it can be a better way to test the effect of election proximity than simply using dummy variable for each class of senators as in the paper of Conconi et al. (2013), because this way I can take into account smaller differences in the explanatory variable. Clearly, senators face different incentives depending on if they run for their seats in six months or in two years. Conconi et al's explanatory variables still assume this. I also use a simple political agency model to explain the observed behavior of the senators and to show that in case of retrospective voting and "recent bias" of the electorates, it is an optimal behavior of the senators to vote in a different way depending on if they are closer or farther way from election.

3. Political Economy of U.S. Agricultural Policy

3.1 Farm bills in the United States

U.S. agricultural policy has a long history of supporting farmers. The first so-called farm bill was the Agricultural Adjustment Act of 1933 at the height of the Great Depression, which was

[3]Bellemare and Carnes (2013) examine the legislation of 2002 and 2008 farm bills in the case of the members of both the Senate and the House of Representatives.

introduced to handle the problems of excess food supply of American farmers (Sumner, 2008). Since then the regular renewal of this law has benn one of the main agricultural policy tools in the United States. The government uses it as a primary form of government intervention in agriculture. Since then it has also been the subject of extensive debate, because it affects wide range of policies. The farm bills usually consists two parts, one that deals with different kind of nutritional programs e.g. food stamps and the other that provides subsidies to farms.[4]

It is a common observation that developing countries tend to tax farmers, while in developed countries farmers usually get some kind of (direct or indirect) support from the government at the expense of the other part of the population. One of the main economic criticisms with regards to the subsidization of agriculture is that it allocates income from consumers to (mostly wealthy) farmers, and that it is inefficient, because it distorts prices. Moreover we can observe huge differences among the level of supports in the case of different agricultural products. Farm bills are mostly criticized because of the high costs and the uneven distribution of subsidies among farmers.

The agricultural assistance to farmers covered by farm bills are direct payments based on the previous year production of the supported crops, countercyclical payments, which tries to mitigate the effects of adverse price shocks, and the so-called marketing loan benefits which is connected to the actual production of the supported crops (Sumner, 2008). In the last decades the legislators have tried to modify the farm bills first to move away from price related support to direct payments

[4]Another important form of the support of agriculture that usually is not part of farm bills is trade barriers. By introducing tariffs or quotas on import of agricultural products, government can protect the farm sector of the country. Conconi et al (2013) analyze the relationship between free trade agreement legislation and elections.

and then to change the structure of support from direct payments towards an insurance type of subsidy.

I examine six agricultural laws in the last twenty years: four farm bills and two related laws in the last two decades (See Table 1 in Appendix C). The four farm bills are the Federal Agriculture Improvement and Reform Act of 1996, the Farm Security and Rural Investment Act of 2002, the Food, Conservation, and Energy Act of 2008, and the Agriculture Act of 2014. The two additional laws accepted during this period are the Agricultural Research, Extension, and Education Reform Act of 1998 and the Agriculture Risk Protection Act of 2000.[5]

The Federal Agriculture Improvement and Reform Act of 1996 was a huge milestone in the case of U.S. agricultural policy, because of the revision and the simplification direct payment programs. It also removed the link between income support payments and farm prices, while it introduced fixed government payments that are independent of current farm prices and production. The main contribution of the Agricultural Research, Extension, and Education Reform Act of 1998 was the revision of federally supported agricultural research, education, and extension programs, while the Agriculture Risk Protection Act of 2000 extended the federal crop insurance program and it also supported emergency assistance to farmers (Womach, 2005). The Farm Security and Rural Investment Act of 2002 expanded the scope of the covered commodities and also increased the support for them (Womach, 2005). The main provisions of Food, Conservation, and Energy Act of 2008 were that it augmented Food Stamp benefits and supported the agricultural research of pests, diseases, and provided additional assistance to needy producers (Harris et al, 2008). Agricultural Act of 2014 cut back Supplemental Nutrition Assistance Program (SNAP), that is

[5]I examine final votes (after joint conference committees), since as Conconci et al (2013) argue, amendments and other not final votes can be affected by other strategic behaviour from the part of the senators.

food stamps program and introduced income caps on farm subsidies, while maintained the price support program for dairy farmers. The bill also stopped the direct payment subsidies (Johnson and Monke, 2013).

3.2 Political Economy of Agricultural Policy

The motivation of this study is the dichotomy between economic theory and the practice of agricultural policy. Why do politicians support the distortional subsidy of agriculture? Why do they transfer income from consumers to farmers? Countries typically support their agriculture through several economic policy tools however in developed countries the support of the sector is quite disproportionate compared to the sector's contribution to the employment or the output of the economy.[6] It is also puzzling that agricultural protectionism exists in developed countries despite the fact that the costs of this kind of measures often outweigh their benefits.

Some recent studies suggest that politicians do use agricultural policy as a strategic tool to gain votes close to elections. Klomp and de Haan (2013) find that public funding to agricultural sector increases closer to elections. They also argue that party ideology and institutional factors (as electoral system) also matter, but the theoretical findings on the relationship of party ideology and agricultural protection are ambiguous. They state that farmers in developed countries often vote in favor of right-wing parties and that is why we may expect that right-wing governments to be more protectionist.

Theories of political economy can at least partly provide answers to these questions. Thies and Porsche (2007) cites the following explanations. First, according to the *theory of collective action* smaller groups can more easily cooperate and they are better at preventing free-riding and

[6] According to the World Bank World Development Indicators database agricultural employment in the U.S. was less than 2% of total employment during the period 2010-2012.

deviation in the group. It can explain the legislators support farmers because agricultural producer groups are typically small compared to those that are hurt by the protectionist measures. Another explanation states that agriculture is more vulnerable to external shocks (like extreme weather or change in terms of trade) than industrial production, and this justifies the protection and support (Thies and Porsche, 2007). They argue that the path dependence of legislation and the fact that it is more difficult to remove support once it has been approved can explain the phenomenon too. It is also common observation that governments tend to treat favourably those sectors that are in decline, and this is true for the agricultural sector as well. The process, that with the increase of the per capita income, the share of food in consumption decreases, explains why consumer become less sensitive to changes in food prices and they are not that motivated to lobby against agricultural protection.

Theoretical models of lobbying emphasize the effects of lobbying groups on the behaviour of legislators and the outcome of elections (Persson and Tabellini, 2002). Lobbying is the part of special interest politics theory that says that groups, which have interests that are not in line with that of the majority of the society can also affect politics if the benefit of the desired policy are more concentrated than the costs of it. It is important in the case of agricultural policy as well. Lobby groups from the agribusiness sector spend huge amounts to support their preferred policies. I found that the average value of support from Agribusiness sector to senators during a typical congressional period (usually about 6 years) is USD 120,000. Moreover agriculture is a typical special interest topic; as I mentioned earlier farmers consist of only a small share of the population in most developed countries and in the U.S alike, while the amount of subsidy provided by the farm bills is very concentrated. That is why one can expect that farmers are more organized, because they have strong incentives to influence politicians.

In the next section I propose a political economic model designed to explain why politicians tend to support agriculture disproportionately, and how this related to their incentives to become re-elected.

4. The Model

4.1 Description

I used and modified the political agency model built by List and Sturm (2004) to illustrate the effect of the closeness of elections on the decisions of incumbent politicians.[7] With their model they illustrate how gubernatorial term limits at the state level in the U.S. affect the environmental policy decisions of politicians. In their model, incumbents' incentives are different as they face re-election or term limit. In my version I did not consider the effect of term limit or how voters update their information about the incumbents but I extended it by the myopia of the electorates. This means that citizens are less able to recall what incumbent did in the period farther away in the past; they can remember only with uncertainty. With this in mind senators who are against the provisions of farm bills will be less incentivized to vote in favor of a farm bill if they are farther away from the next election.

In their model there are both environmentally concerned politicians and citizens (Green) and less environmentally concerned citizens and politicians (Brown). States that have more environmentally oriented voters are the so-called green states. I use these distinctions for pro-agriculture and pro-industry citizens and politicians. In the model there are also "left-wing" and "right-wing" politicians and citizens, but these agents are only concerned by the level of public spending. I assume that pro-agriculture citizens (e.g. farmers) care primarily about the agricultural policy and hence they vote in favor of the incumbent if she supported the farm bill (e = 1) and vote

[7]List and Sturm built their model on Besley and Burgess (2002).

(e = 0) against her if she did not. They get a positive payoff if the farm bill passes and get zero otherwise, while pro-industry citizens behave the opposite way. Incumbents face cost c_i, if they vote against their preference in the case of agricultural policy and they face cost zero, if they vote in line with it. The cost is a binary random variable, which can take value c_H or c_L (high or low).

There are infinite numbers of periods and elections are held in every second period. As stated above, voters reelect the politicians if they implement their preferred policy. However, in my modification of the model, while citizens observe perfectly incumbent's action in period preceding the election (t + 1), they observe the action happened earlier only with uncertainty. The measure of uncertainty is α, where $0< \alpha < 1$.The parameter α may have different interpretation. It can be the probability with which citizens remember (or observe) how the incumbent voted in period t, or the percentage of the pro-agriculture or pro-industry citizens who remember this. It is the consequences of the "recent bias" in the perception of the incumbent's effort. Incumbent knows that if there was a vote in period t, then there will be no other vote before the next election, and if there was no vote in period t, there will be one in period t+1. This means that in the model incumbents cannot wait strategically. That is, $e_1, e_2 \in \{0; 1\}$ $and\ if\ e_1 = 1\ than\ e_2 = 0,\ \ if\ e_2 = 1\ than\ e_1 = 0$. There is a vote in period t with probability p= ½ that determined by Nature, that is incumbent cannot use the timing of vote strategically either, it can only decide whether she votes in favor of the bill or not.[8] The timing of the model is summarized by Figure 1.

[8]This means that I do not use agenda setting power in this model, that is, I assume that the timing of when the legislators vote about the farm bills is exogenous. In this case it can be plausible, because the farm bills have to be renewed in every 5 years, but it is true, that in most of the cases the implementation of the new farm bill took more than 5 years.

Figure 1. Timing of the model

Beginning of period t	t	t+1	End of period t+1
Nature decides the timing of vote on farm bill (t or t+1); Incumbent learns her cost shock	Legislator learns whether there is a vote on farm bill in this period and if yes, she votes	Legislator learns whether there is a vote on farm bill in this period and if yes, she votes	Elections: citizens learn what happened in the previous two periods and decide to reelect the incumbent or not.

If pro-agriculture population is larger than pro-industry population ($\gamma_{A>}\gamma_I$)[9], then a pro-agriculture incumbent will vote for the farm bill always, while the optimal strategy of a pro-industry incumbent will depend on her cost shock (whether c_L is low enough) and the probability of wining.

Figure 2. Summary of the Model

Timing of vote	Action of the incumbent		Observation of citizens		Net share of citizens that vote for the incumbent because of its agricultural policy
in period	t	t+1	α	1-α	
t	1	0	1	?	$\alpha(\gamma_A - \gamma_I)$
t+1	0	1	1	1	$\gamma_A - \gamma_I$
t	0	0	0	?	$\alpha(\gamma_I - \gamma_A)$
t+1	0	0	0	0	$\gamma_I - \gamma_A$

As Figure 2 summarizes if the roll-call vote happens in period t α share of the pro-agriculture citizens (γ_A) observes that the incumbent voted in favor of farm bill in period t and they will support the incumbent with their votes, while 1-α share of the pro-agriculture citizens do not observe this and they will vote according to their preferences toward other policies (on the traditional left-right

[9] It would be similar in the opposite case, that is, when $\gamma_{A<}\gamma_I$.

axis or we can assume that these votes shared symmetrically by the incumbent and the challenger). The opposite is true for pro-industry citizens.

$\Gamma(\gamma_A - \gamma_I)$ is the percentage point increase in the reelection probability of an incumbent if she votes for the farm bill in period t+1 (Derivation of Γ can be found in Appendix A). Similarly $\Gamma(\alpha\gamma_A - \alpha\gamma_I)$ is the increase in the reelection probability of an incumbent if she votes for the farm bill in period t. We can rewrite $\Gamma(\alpha\gamma_A - \alpha\gamma_I)$ as $(\alpha(\gamma_A - \gamma_I))$, and since $\Gamma(.)$ is an increasing function, it follows that $\Gamma(\gamma_A - \gamma_I) > \Gamma(\alpha\gamma_A - \alpha\gamma_I)$ as 1 >α> 0. This implies that the reelection probability of an incumbent increases less by voting in favor of the farm bill in off-election period (t) than in on-election period (t+1). As in most political agency models incumbents receive a so-called "ego rent", λ for holding office. That is, if the incumbent wins the election the payoff for her is βλ, where β is the personal discount factor of the incumbent. If $\Gamma(\gamma_A - \gamma_I)\beta\lambda > \Gamma(\alpha\gamma_A - \alpha\gamma_I)\beta\lambda > c_L$ pro-industry incumbent will always vote in favor of the farm bill even if it is against her preference. If $c_L > \Gamma(\gamma_A - \gamma_I)\beta\lambda > \Gamma(\alpha\gamma_A - \alpha\gamma_I)\beta\lambda$, they will never vote in favor of the farm bill. The more interesting case for us is when $\Gamma(\gamma_A - \gamma_I)\beta\lambda > c_L > \Gamma(\alpha\gamma_A - \alpha\gamma_I)\beta\lambda$.

If condition $\Gamma(\gamma_A - \gamma_I)\beta\lambda > c_L > \Gamma(\alpha\gamma_A - \alpha\gamma_I)\beta\lambda$ holds the pro-industry incumbent will vote in favor of the farm bill, if and only if the vote is held in period t+1, that is, just before the election and will not support farm bill, if the vote is held period t, that is, further way from the next election.

4.2 Implications

In this section I consider the possible implications of the model discussed before. Firstly, larger differences between γ_A and γ_I implies higher value for $\Gamma(\gamma_A - \gamma_I)\beta\lambda$, because $\Gamma(.)$ is an increasing function, hence if γ_I is fixed at zero, then $\frac{\partial\Gamma(\gamma_A)}{\partial\gamma_A} > 0$. This means that the higher the share of the pro-agriculture citizens, the stronger the incentives for the incumbent to support farm bills in

general. *(This can be seen on Figure 1 in Appendix B as the lines have positive slopes.)* In the empirical part of the thesis I am going to use the share of rural population in a state to test this implication.

Secondly, lower value of α implies bigger difference between the two expressions: $\Gamma(\gamma_A - \gamma_B)\beta\lambda \; and \; \Gamma(\alpha\gamma_A - \alpha\gamma_B)\beta\lambda$. That is, the less important are the past events for the citizens, the more pronounced will be the change in the behavior of the politicians. *(The distance between the lines α = 1 and α = 0.9 is always smaller than between the lines α = 1 and α = 0.5 on Figure 1 in Appendix B.)* That is, $\frac{\partial\{\Gamma(\gamma_A-\gamma_I)-\Gamma(\alpha\gamma_A-\alpha\gamma_I)\}\beta\lambda}{\partial\alpha} = -\frac{\partial\Gamma(\alpha\gamma_A-\alpha\gamma_I)}{\partial\alpha}\gamma_A < 0$. The number of days to the next election at the time of the roll-call vote is a possible proxy for the value of α for the empirical testing of this implication.

Moreover the higher the value of α, the higher the probability that pro-industry incumbent politicians will support farm bill, that is $\frac{\partial Pr[\beta\lambda\Gamma(\alpha\gamma_A-\alpha\gamma_I)>c_i]}{\partial\alpha} > 0$.[10] The more pro-agriculture citizen support the pro-industry incumbents after the politicians voted in favor of a farm bill in period t, the more incentives the incumbent has to do so.

The next implication is that larger differences between γ_A and γ_I implies larger difference between the expressions ($\Gamma(\gamma_A - \gamma_I)\beta\lambda \; and \; \Gamma(\alpha\gamma_A - \alpha\gamma_I)\beta\lambda$) as well.[11] The higher the share of the pro-agriculture citizen compared to the share of pro-industry citizens, the more pronounced will be the change in the behavior of the politicians. Pro-industry incumbents are more prone to change their voting behavior in favor of a farm bill if they can gain more votes by it at the next election. (*As*

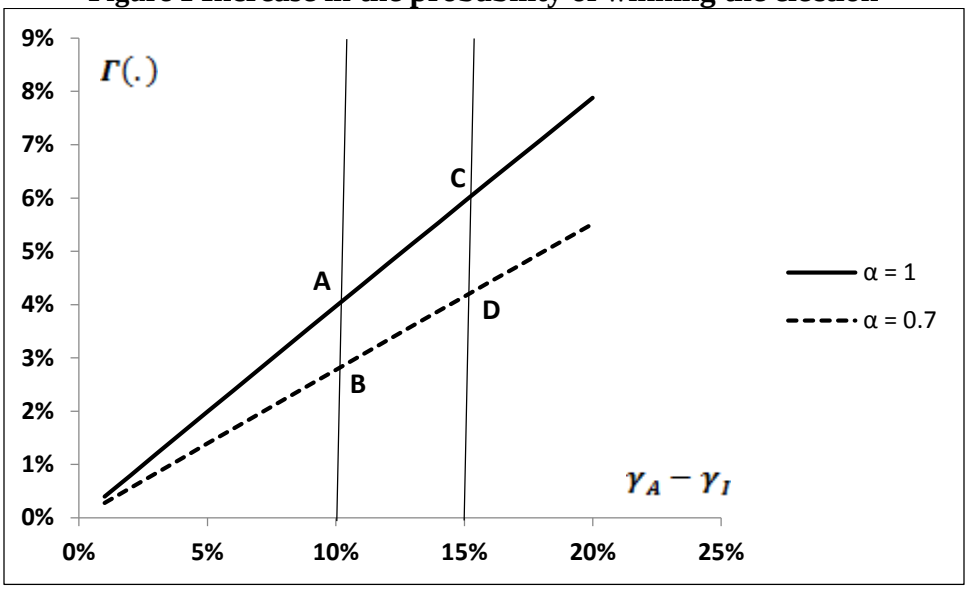
[10] I did not specify the distribution function of the cost shock. If it is not binary, but for example normal random variable then this effect is more pronounced.

[11] This is true if α is between zero and one and $\partial\Gamma/(\partial\gamma_A)$ is homogenous of degree k, where k is smaller than one. This part of the cumulative distribution function should be concave. If the probability distribution function is single-peaked and symmetric at its mean (as it is stated), then the cumulative distribution function is concave above the mean (for example in the case of standard normal distribution).

can be seen on Figure 1 the distance between points A and B is smaller than between C and D, that is, if the difference between the shares of the pro-agriculture citizens and pro-industry citizens is higher.) In order to test this, I also use the interaction term between the share of the rural population of state and the days until the next election of a given senator.

Finally, as List and Sturm argue (2004), since h(ε) – the probability distribution function of the shock (it can be found in Appendix A) –is symmetric around zero and single peaked, $\Gamma(\gamma_A - \gamma_I)$ reaches its maximum when $\gamma_L - \gamma_R$ is close to zero. That is secondary policies (such as agricultural policy) can gain importance when the electoral competition is fierce. They also argue that if at the last election the incumbent won only with a narrow margin. In this case politicians are more incentivized to gain votes from single issue voters. That is why I am going to use the size of the margin with which a senator won her last election to test this implication.

Figure 1 Increase in the probability of winning the election



While I do not consider the type of the politicians in this simple model, a further practical implication is that there is an information asymmetry between voters and politicians. Citizens don't know whether the type of the politicians are pro-agriculture or not. This information asymmetry

can be mitigated by providing information to citizens through a third party. Evidences can be found in the case of agriculture policy as well. Lobby groups disseminate information about the voting behavior of congress members in the case of all agricultural related legislations and provide a score or a friend of farms title to each politician. For example the American Farm Bureau Federation regularly rates legislators

5. Empirics

5.1 Description of the Data

My dataset contains data of roll-call voting on farm bills, and senators and states characteristics. I use an unbalanced panel dataset since senators may vote for one or multiple farm bills depending on how long they were member of the Senate. Final roll-call votes were collected on the main agricultural legislations in the last twenty years; farm bills were passed by the Senate in 1996, 2002, 2008, and 2014, while in 1998 and 2000 two quasi-farm bill (additional agricultural bill) were accepted. I decided to test the effect of election proximity for senators.[12]

The dependent variable is *vote_Aye*, which takes value 1, if senator i voted for a farm bill in year t, and 0 otherwise. Taking the mean of this variable in one year one gets the percentage of senators who voted for the farm bill, but it also shows the probability that a randomly chosen senator from the sample of a given year supported the farm bill.

[12] While it were also possible to include members of the House of Representatives into the analysis, collecting control variables for congressional districts is very problematic. First because they differ from the official statistical units (counties), and second, the exact area of the congressional districts often change. For these reasons, it is more difficult to get proper data for House members but it could be a possible future extension of the analysis. Furthermore the variation in the main explanatory variable is lower, because the theoretically maximum number of days until the next election is 730 in the case of House members.

Among the explanatory variables *days* is the one I am most interested in. It shows how many days a senator has until the next election at the time of the roll-call vote. According to the constitution of the United States each senator is the member of one of three different classes. In every second year one–third of the senators (members of one of these classes) face reelection, while the other two-third have to run for reelection only in two or four years later. Each senator of a given state is assigned to one of the class by the Constitution, so it is exogenously given, the senators cannot modify it. The senate elections are held in every second year (even years) on the first Tuesday after the first Monday of November.

The other explanatory variables are the following: the variable *party* is a dummy that shows the party orientation of the senator. It takes value 1 in case of democratic senators and zero in case of republicans (and independents). The variable *margin* is the margin of victory of a senator during the last election, and it is the gap between the share of votes obtained by the winner and the runner-up, while *rural* is the share of rural population in a given state. I had data for the three census years, (1990, 2000 and 2010) and between these years I extrapolated them. For the estimation I used the 1-year lagged value of the rural population. The variable *seniority* is the number of years since the senator is in office, *gender* is a dummy variable, which takes the value 1 if the senator is a woman and 0 otherwise, and *PACs* shows the amount of contribution of Political Action Committees from the Agribusiness sector to the given senator's election committee and leadership PACs in the period previous the vote. Finally the variable *population* is the inhabitants of the state at the time of the vote.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
vote_aye	598	0.785953	0.410503	0	1
days	598	919.3227	599.3276	166	1736
party	598	0.481605	0.50008	0	1
seniority	598	17.42977	11.09262	0	48
gender	598	0.125418	0.33147	0	1
PACs	583	122673.6	128603.4	-2265	1.48E+06
margin	598	0.247459	0.186789	0	0.767
rural	598	0.283632	0.147842	0.049187	0.685861
population	598	5716783	6305146	480045	3.80E+07

In Table 1 we can see the main descriptive statistics of the senators and the states in the sample. On average 78 percent of the senators accepted the farm bill proposals in these six cases. The average time to the next election was 919 days, around two and a half years, while the minimum was less than six months. The smallest share of rural population during the period examined was five percent (in the case of New Jersey), while the highest share was 69 percent (Vermont). The widest margin of winning at an election was 76 percent, but in cases where there was only one candidate for the position I decided to set the margin to 50 percent, even if the senator got 100 percent of the votes. The longest serving member of the Senate was Senator Byrd from West Virginia who at the date of his last vote for farm bill was 48 years in office. The average PAC support from Agribusiness sector is around 120 000 dollars, while the minimum is zero (or in a few cases, because of repayment it was negative), the maximum is 1.5 million dollar in case of Senator Chambliss from Georgia.

It is also interesting to take a look at the correlations between the potential explanatory variables, and it also helps to detect possible multicollinearity. As we see in Table 2 the highest (negative) correlation is between the population of the state and the share of rural population, that is, states with higher population tend to be more urban. We can also see that republican politicians tend to

get less PAC support from Agribusiness sector. But the main explanatory variable, the days until the next election seems to be poorly correlated with the other explanatory variables as we expected.

Table 2. Correlations between the possible explanatory variables

	days	*party*	*seniority*	*gender*	*margin*	*PACs*	*rural*	*population*
days	1							
party	0.0767	1						
seniority	-0.1231	0.1351	1					
gender	0.1069	0.1904	-0.1089	1				
margin	0.137	-0.0576	0.3735	-0.1224	1			
pacs	-0.0876	-0.333	-0.0854	-0.0116	-0.0337	1		
rural	-0.0939	-0.2304	0.087	-0.0483	0.1088	0.2019	1	
population	-0.0571	-0.1314	-0.1033	0.1475	-0.0895	0.1109	0.0595	1

5.2 Identification Strategy

In the following sections, I examined two implications of the model from section 4.2 to determine the important factors and the expected signs of the coefficients. The first implication of the model was that the higher the share of the pro-agriculture citizen compared to the share of pro-industry citizens, the stronger the incentives for the incumbent to support farm bills in general. I used the percentage of rural population (*rural*) as a proxy for γ_A. The other relevant testable hypothesis was that the lower the value of α, the lower the probability that pro-industry incumbent politicians will support a farm bill. Since I assumed that memory bias is increasing in time, I used the variable *days* as a proxy for α. As a consequence my expectation was that the less days the senator has until her next election date, the more she tries to act in a way to increase her reelection probability. I included additional explanatory variables as well, but the one with the main interest is *days*, because I wanted to test whether there is a difference in the voting behavior of the senators depending on if they face elections in the near future or not. If there is, then electoral competition have an important role in determining the politicians' decisions toward agriculture policy. I expect

that the key explanatory variable days has negative coefficient, because as the date of the next election approaches, that is, as the number of days to election decreases the senators are more prone to vote in favor of farm bills.

The relationship I tested was the following:

$$vote\_Aye_{ijt} = \underbrace{days_{it} + seniority_{it} + margin_{it} + party_i + gender_i + PACs_{it}}_{characteristics\ of\ the\ legislators} + \underbrace{rural_{jt} + populaton_{jt}}_{characteristics\ of\ the\ states} + \underbrace{\mu_j}_{state\ fixed\ effect} + \underbrace{\delta_t}_{year\ foxed\ effect} + \varepsilon_{ijt}$$

One would expect a negative coefficient in the case of the variable *margin*, because if the senator won her last election with a narrow margin, she will put more emphasis on convincing single issue voters, or less ideological voters. This is also supported by the implications of the model in part 4.2. I would expect a positive sign in the case of the coefficient of the *PACs*, since more financial help from the Agribusiness sector would induce the senator to support farm bills. In this case I used the logarithm of the variable.

The source of the identification as I mentioned above is that the members of the United State Senate are elected for six years and they are assigned to one of the three classes by the Constitution. That is, the fact that some of them face reelection in two years, in four years or in six years is exogenously given, senators cannot affect it. The exact day of the Senate elections is fixed as well, since they are hold in every second year (even years) on the first Tuesday after the first Monday of November.

5.3 Estimation

Linear Probability Model

I used both a linear probability model and a probit model to test the effect of the closeness of election on the votes on farm bills. The drawback of the linear probability model is that one can get a predicted value that is above one or below zero that does not have probabilistic meaning, but still the estimated coefficients are easier to interpret. To start with I estimated the following specification:

$$vote\_Aye_{it} = days_{it} + seniority_{it} + margin_{it} + rural_{jt} + party_i + gender_i + PACs_{it} + populaton_{jt} + \varepsilon_{ijt}$$

I included all the explanatory variables without any fixed effects to decide which ones I should continue to work with. Since the coefficients of the *seniority*, *gender* and *population* of the state are not significant as can be seen in Table 3 I dropped them from the following estimations.

Table 3. Baseline estimation

	baseline
days	-0.00007**
	(0.00003)
party	0.19700***
	(0.03993)
seniority	0.00012
	(0.00173)
rural	0.23642*
	(0.12159)
margin	0.21627**
	(0.10166)
PACs	0.07727***
	(0.01573)
population	0
	(0)
gender	0.06544
	-0.05339
State Fixed Effect	No
Year Fixed Effect	No
R^2	0.08934
Observations	562

Standard errors in parenthesis. *** denotes significance at 1% level; ** 5% level; * 10% level.

I continued with including state and year fixed effects as well, and henceforth I used only the variables that were significant in the first regression.

$$vote\_Aye_{it} = days_{it} + +margin_{it} + rural_{jt} + party_i + +PACs_{it} + \mu_j + \delta_t + \varepsilon_{ijt}$$

With the first one I can control for any unmeasured characteristics of a given state that is time-invariant (at least during this time span). For example in some states farmers may be more organized due to historical reasons that may affect the estimation. In the second case I can take into account that each farm bill is different and in each case senators face different legislative, political and economic circumstances. In one congress the Democrats might have a majority while during another congress they might have only the minority of the seats in the Senate. This could also affect the voting behavior of the senators.

Results of the estimations can be seen in Table 4. The positive and significant coefficient of *party* dummy means that democratic senators tend to vote in favor of farm bills more often. After I drop *seniority* and *population* the coefficient of *rural* becomes insignificant in all but one specification. It has the expected positive coefficient if I do not include state fixed effect, but, it changes its sign otherwise. The positive value of the coefficient of *rural* means that in states where rural population is higher senators are more prone to vote in favor of farm bills. We also get the positive sign in the case of *PACs* as we expected and the coefficient is significant. The coefficient of *margin* is also significant at five percent, but the sign is positive. This means that senators that won their last election with higher margins tend to support farm bills. While the other variables lose their significance the days remains significant even if I include both fixed effects.

Table 4. OLS regression

	m0	m1	m2	m3	m4
days	-0.00006**	-0.00007**	-0.00007**	-0.00006*	-0.00005*
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
party		0.21027***	0.11420**	0.21932***	0.13934***
		(0.05049)	(0.0552)	(0.05074)	(0.04969)
rural		0.23597	-0.34269	0.26315	-1.33969
		(0.16853)	(1.4393)	(0.17039)	(1.25991)
margin		0.21169**	0.24246**	0.07756	0.07594
		(0.08787)	(0.10633)	(0.09203)	(0.10225)
PACs		0.07914***	0.04399*	0.07748***	0.04293*
		(0.01964)	(0.02378)	(0.01991)	(0.02277)
State Fixed Effect	No	No	Yes	No	Yes
Year Fixed Effect	No	No	No	Yes	Yes
R^2	0.00778	0.08658	0.2375	0.15439	0.30441
Observations	598	562	562	562	562

Standard errors clustered at state level in parenthesis. *** denotes significance at 1% level; ** 5% level; * 10% level.

I interpret the marginal effect of *days* variable in the case of linear probability model. The effect of the days to the next election is small, however, we have to take into account its meaning; that if the election date is one day closer then the probability that a senator votes in favor of the farm bill increases by 0.006 percentage points. However the effect of one year (365 days) is a 2.19 (0.006*365) percentage point increase in the probability that a senator votes Aye.

Because of the exogenity of the proximity of the elections, we can assume causality, however in the case of the other variables it is not that straightforward. For instance we understand senators

from states with higher share of rural population tend to support farm bills more often. Still, it is difficult to tell whether a senator supports farm bills because of the benefits of them for her constituencies, or because states with a high share of rural citizens tends to elect senators whose preference are more in line with theirs. In later chapter I make an attempt in this direction by looking at the congressional biographies of the senators and including the dummy variable *farmer*, if the senator is a rancher/farmer.

Probit Model

Since the dependent variable *vote_Aye* is binary, that is, it takes value only one or zero, I could continue with the probit model. The advantage of this estimation, compared to the linear probability model is that it always gives a prediction between zero and one. However it is more difficult to interpret the results.

The equation I test here is the following:

$$\Pr(Vote\ Aye = 1|X) = \Phi\left(X'\beta + \mu_j + \delta_t + \varepsilon_{ijt}\right)$$

I asked the same question as before, what is the probability that a senator voted in favor of a farm bill, given the characteristics of the senators and the states (X). Φ denotes the cumulative distribution function of the standard normal distribution. And β is the vector of the estimated coefficients including that of the variable with the main interest, *days*.

Table 5. Probit regression

	p0	p1	p2	p3	p4
days	-0.00021**	-0.00027**	-0.00031**	-0.00024**	-0.00026*
	(0.00009)	(0.0001)	(0.00012)	(0.00011)	(0.00015)
party		0.82059***	0.61384**	0.91246***	0.69710***
		(0.18439)	(0.25941)	(0.18394)	(0.24996)
rural		0.88559	-1.85798	1.05178	-5.70212
		(0.60793)	(5.43206)	(0.65319)	(4.55917)
margin		0.81924**	1.18810**	0.33431	0.34914
		(0.31992)	(0.46885)	(0.37123)	(0.51381)
PACs		0.29213***	0.20178**	0.30077***	0.19621**
		(0.06846)	(0.09988)	(0.07163)	(0.10197)
State Fixed Effect	No	No	Yes	No	Yes
Year Fixed Effect	No	No	No	Yes	Yes
Pseudo $R^2$2	0.0075	0.0878	0.1398	0.1599	0.2385
Observations	598	562	419	562	419
Log likelihood	-308.19023	-271.67623	-219.66819	-250.19824	-194.462
Predicted probability	0.7877478	0.8005863	0.7259235	0.8208492	0.75383

The table reports marginal effects of probit regressions. Standard errors clustered at state level in parenthesis. *** denotes significance at 1% level; ** 5% level; * 10% level.

The evaluation of the coefficients of the probit regression are not so straightforward as in the case of OLS, because the effect changes as the value of the other factors and the value of the given variable change. That is why I evaluate the predicted probability of voting in favor of farm bill at the mean of all the variables. As Table 5 shows the variable days is significant at 5 percent significant level in all but one specification. When I include state-fixed effect it remains significant at ten percent. I get that the coefficient of *party* is highly significant in each specification. The interpretation is that Democrats tend to vote in favor of farm bill, at least in these six cases. The

variable *rural* is significant only at ten percent level in specifications in which state-fixed effect is not included. Since rural-urban distribution changes slowly, state fixed–effect could account for the insignificance. While I expected that the coefficients of the variable *margin* would be negative, I got the opposite. Those senators, who won their last election with a wide margin, tend to support farm bills. Finally, according to the estimations, lobbying contributions (*PACs*) increases the probability of supporting farm bills as well.

Interaction terms

I continue this section by using interaction terms to discover further connections in the data, based on the implications of the model. First, I tested whether the higher the share of the pro-agriculture citizens, compared to the share of pro-industry citizens, the more pronounced will be the change in the behavior of the politicians. Second I examined the argument that agricultural policy can gain further importance if the electoral competition is tight in the state. To test the first implication I used the interaction term *days_rural (rural*days),* while for the second I applied *days_margin (days*margin).*

As we can see in Table 6, in the case of *days_rural* I got positive coefficients, which is opposite to our expectations. It means that the higher is the share of rural population, the less important is the closeness of the elections. One of the possible explanations is that rural states may tend to elect senators that have similar preferences toward agriculture; these senators do not have to change their behaviors depending on whether they are in off-election or on-election period, since they are the pro-agriculture incumbents. Furthermore, if the share of rural population is high enough farm subsidy is not a real special interest politics anymore, it becomes a general interest. But in the case of the term *days_margin* the sign is positive, that means that if the incumbent won the last election with a wide margin than the election proximity matters less for the probability of voting in favor

of farm bills. This is in line with the prediction of the model. If we include additional variables the results do not change further.

Table 6. Interaction terms

	i1	i2	i3	i4
days	-0.00033***	-0.00045***	-0.00039***	-0.00056***
	(0.00011)	(0.00015)	(0.00011)	(0.00015)
days_margin	0.00046*		0.00059**	
	(0.00027)		(0.00027)	
days_rural		0.00100**		0.00109**
		(0.00047)		(0.00048)
party			0.81317***	0.84437***
			(0.17944)	(0.18841)
rural			0.88465	
			(0.60422)	
PACs			0.28687***	0.29599***
			(0.06821)	(0.06765)
margin				0.77516**
				(0.32202)
Pseudo R^2	0.0122	0.0205	0.0852	0.0852
Observations	598	598	562	562
Log likelihood	-306.723	-304.15306	-272.45448	-272.45448
Predicted probability	0.7887465	0.7904844	0.7996073	0.7996073

The table reports marginal effects of probit regressions. Standard errors clustered at state level in parenthesis. *** denotes significance at 1% level; ** 5% level; * 10% level.

5.4 Robustness checks

I also repeated the analysis with other variables to see how the results change. First, instead of *days* I used an explanatory variable that is defined as follows. *senate_1* is a dummy that takes value one if the senator faces election in the next two year and zero otherwise. Similarly, *senate_2* takes value one if the senator faces election between the next two and four years, *senate_3* takes value

one if the senator faces election after the next four year and zero otherwise. The estimation results are in Table 7.

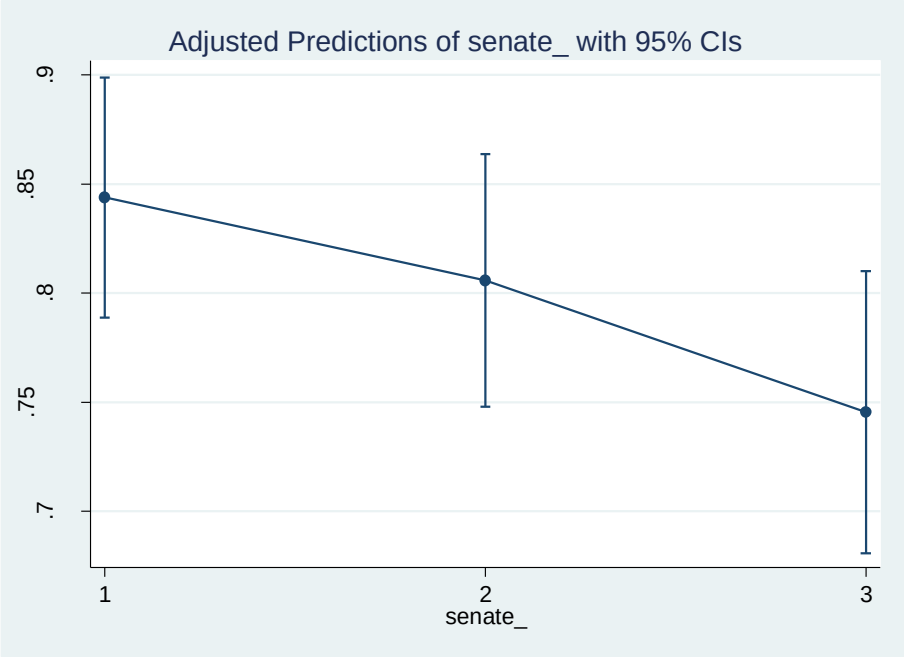
Table 7. Probit regression with senate dummy

	p0_b	p1_b	p2_b	p3_b	p4_b
senate_2	-0.12982	-0.14827	-0.15201	-0.08884	-0.07857
	(0.15315)	(0.15766)	(0.19171)	(0.15706)	(0.197)
senate_3	-0.27038**	-0.35030**	-0.41264**	-0.33993**	-0.36719*
	(0.13407)	(0.15263)	(0.17728)	(0.16463)	(0.21691)
party		0.81568***	0.61133**	0.91559***	0.70878***
		(0.18364)	(0.25809)	(0.18373)	(0.24973)
rural		0.89655	-1.80228	1.06842	-5.68415
		(0.6061)	(5.45594)	(0.65203)	(4.52706
margin		0.81477**	1.17690**	0.32628	0.32643)
		(0.3232)	(0.47517)	(0.37672)	(0.53086)
PACs		0.28998***	0.19669**	0.29837***	0.19614*
		(0.06879)	(0.09981)	(0.07204)	(0.10166)
State Fixed Effect	No	No	Yes	No	Yes
Year Fixed Effect	No	No	No	Yes	Yes
Pseudo R^2	0.0059	0.086	0.1377	0.1606	0.2392
Observations	598	562	419	562	419
Log likelihood	-308.68382	-272.22879	-220.19205	-250.01665	-194.273

The table reports marginal effects of probit regressions. . Standard errors clustered at state level in parenthesis.
*** denotes significance at 1% level; ** 5% level; * 10% level.

The *senate_3* dummy is significant in each specification and its coefficient has a negative sign as we expected. That is, the probability that senators in class 3 vote in favor of farm bill is significantly lower than in the case of class 1 senators. The difference between class 1 and class 2 senators are not significant, but as we expected the probability that senators in class 2 vote in favor of a farm bill is lower than in the case of class 1 senators.

Figure 3. Predicted probability of each class of senators



Plot 2 shows the predicted probability of voting in favor of farm bill in the case of three categories: 1 shows those senators who face election in the next two years (class 1), 2 is the sign of those who face election in four years (class 2) and 3 is for senators who face election after the next four year (class 3). We can see that there is a clear difference between the predicted probability of third class and first class senators.

To test whether my results are robust if I change the sample, I re-estimated the regressions including only the official farm bills (1996, 2002, 2008, 2014) into the estimations. In this case I get that *days* and the *senate_1* variables are not significant, but the sign of each coefficient is in line with the expectations. In this case the sample size also decreased to 371. Since I use the data

only on the final votes (after joint conference committee consideration[13]) on farm bills, for a further robustness check I decided to include previous votes on the same farm bill proposals as well.[14] A possible problem in this case is that the date of roll-call votes are very close to each other (sometimes just in a few days), while other explanatory variables did not change. In this case the coefficient of *days* is significant only at 10 percent significant level, but the sign remains negative.

I also studied how much the roll-call votes are correlated if the Senate voted more than times on a given farm bill proposal. For example in the case of the farm bill of 2008, President George W. Bush vetoed the proposal, so there were three different roll-call votes on the text of this farm bill in the Senate. Eventually the veto was overridden by both the Senate and the House of Representatives and became a law. The correlation between the three votes is quite high, only four senators changed their votes.

For an additional robustness check I included the dummy variable *retiring* that takes value 1 if the senator retired in two years after the roll-call vote and 0 otherwise. I also tried the interaction term between *retiring* and *days*, as I expected these senators – as they planned to retire before their next elections – did not consider the effect of voting on their re-election chances. However both *retiring* and the interaction term were insignificant as can be seen in Table 8. I also included the explanatory variable *farmer* that takes value 1 if the senator is a farmer or rancher and 0 otherwise. With this I intended to control for the personal motivation of the legislators and I also took into account the possibility that citizens purposely elect a senator who was related to agriculture. While I get a

[13] The purpose of the joint conference committees is to unify the text of the bill, if the two houses of the Congress decided on different form of the bill. In my analysis I use the roll-call votes on bills that have been already considered by the joint conference committee.

[14] Sometimes there was only one roll-call vote about a given farm bill, because in previous rounds the Senate decided by voice vote or unanimous consent.

positive sign for the estimation, that is, relatedness to farming increase the probability of voting in favor of a farm bill, the coefficients are insignificant.

Table 8. Additional robustness checks

	r1	r2	r3	r4	r5
days	-0.00021**	-0.00021**	-0.00023**	-0.00023**	-0.00021**
	(0.0001)	(0.0001)	(0.00011)	(0.00011)	(0.0001)
farmer	0.19802		0.13085		
	(0.22062)		(0.25893)		
retire		-0.07509		-0.20761	
		(0.28486)		(0.3704)	
party			0.78649***	0.78303***	
			(0.15885)	(0.15874)	
rural			0.96160*	0.98265*	
			(0.5271)	(0.5222)	
l_pacs			0.27361***	0.27567***	
			(0.05756)	(0.05792)	
days_ret					-0.00041
					(0.00035)
Pseudo R^2	0.0085	0.0076	0.0787	0.0789	0.0096
Observations	598	598	562	562	598
Log likelihood	-307.88229	-308.14799	-274.40753	-274.34273	-307.53391
Predicted probability	0.7880489	0.7877693	0.7978029	0.7978553	0.7879997

The table reports marginal effects of probit regressions. . Standard errors clustered at state level in parenthesis.
*** denotes significance at 1% level; ** 5% level; * 10% level

6. Conclusion

In this thesis I have studied how the proximity of election changes the behavior of politicians. I proposed a simple model to explain that, if the voters are subject to myopia ("recent bias"), incumbent politicians are induced to make efforts to attract the support of voters when they are closer to their next election. I have tested the question in the case of the U.S. Senate, where the political actions under scrutiny were the roll-call votes of senators on farm bills. I have found that the closeness of elections does matter both if I used the explanatory variable days to election (*days*)

or a dummy variable indicating whether the senator faces an election in less than two years (*senate_1*). The estimations shows that if senators face elections in the near future they tend to vote in favor of bills that support agricultural sector. The results remain significant even if I include additional explanatory variables as well. The interaction terms show significance, but the results are in line with the predictions of the model only in the case of *margin* variable. That is, the strategic behavior of senator is not always connected to other factors examined here. So the model applied in the paper is partially able to explain why the senators' votes depend on whether they face election or not in the near future. According to the model, strategic voting optimality is determined by the length of time prior to an election.

In the case of further research, one of the obvious extensions is to collect data for members of the House of Representatives to increase the sample size. Conconi et al. (2013) used this to compare the difference in voting between the two chambers in case of free trade agreements. Collecting additional data about the senators' connection to agriculture prior to their Senate years could also be useful. If instead of a simple dummy variable data were available on how much time they spent in agriculture, which could increase the variation in the explanatory variable. The results can also be affected by the fact that some senators were members of the House of Representatives before they ran for a Senate seat, and they have a voting record on farm bills. Electorates could take into account these factors as well, when they elected the new senator. On the other hand some legislators worked on state level as governors before. This fact might also affect citizens' decisions to assess the candidates' preferences on agriculture policy when they first elected the politician as a senator. By considering the possible extensions of the analysis one could find further results on how electoral incentives form political actions.

Appendix A.

List and Sturm (2004) also include randomness in the model in order to make the election outcome dependent on stochastic shocks as well. They assume that party L has an initial lead ω in the support of the population. They assume that there is a pro-left shock, ε in the case of every election, and it distribute ε percent of the votes to the L.[15] The shock ε has a density function h(ε) and H(ε) is the cumulative distribution function.

According to these, the left-wing candidate win the election if $\omega > -\varepsilon$, that is if $-\omega < \varepsilon$. The probability of this is $Pr(-\omega < \varepsilon)$. Since $H(x) = Pr(\varepsilon < x), Pr(x < \varepsilon) = 1 - H(x)$. Therefore the probability that the left-wing candidate wins the election is $1 - H(-\omega)$, and it increases as ω increases.

If $\gamma_A > \gamma_I$, that is the pro-agriculture population have a higher share of the state's population than the pro-industry population, then the incumbent increases her reelection probability by voting in favor of the farm bill and the other way round if $\gamma_A < \gamma_I$.

If a left-wing politician votes in favor of farm bill then she gains the support of the pro-agriculture electives in addition to the left-wing citizens. That is $\gamma_L + \gamma_A$ percentage of the population supports her. The probability that she wins the election in this case is

$1 - H\left[-\left(\gamma_L + \gamma_A - \frac{1}{2}\right)\right]$. If a left-wing politician votes against the farm bill then she gains the support of the pro-industry electives in addition to the left-wing citizens and the probability that she wins the election is $1 - H\left[-\left(\gamma_L + \gamma_I - \frac{1}{2}\right)\right]$. So the difference in the probability of winning the election depending on support farm bill is:

[15]This means that the initial share of the citizens who support party L is ½+ω, and after the shock it is ½+ω+ε.

$$\left\{1 - H\left[-\left(\gamma_L + \gamma_A - \frac{1}{2}\right)\right]\right\} - \left\{1 - H\left[-\left(\gamma_L + \gamma_I - \frac{1}{2}\right)\right]\right\} = \int_{-\left(\gamma_L+\gamma_I-\frac{1}{2}\right)}^{-\left(\gamma_L+\gamma_A-\frac{1}{2}\right)} h(\varepsilon)d\varepsilon = \Gamma(\gamma_A - \gamma_I)$$

In the model there are "left-wing" and "right-wing" citizens and politicians also have preferences on these issues, that is, they have a preferred level of public goods or public spending, g*.These preferences nevertheless are known for the electorates and hence politicians do not act strategically in the case of these issues.

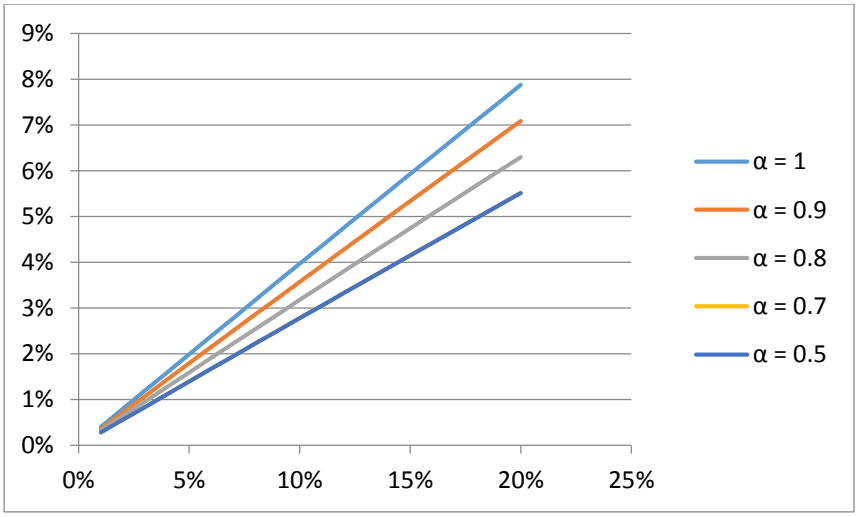
Appendix B.

Simulation

With Standard Normal Distribution

On the horizontal axis we can see the difference between the share of pro-agricultural and pro-industry population. Since here I assumed that the share of pro-industry citizens is zero, that is $\gamma_I = 0$, it is also the share of pro-agriculture population. On the vertical axis we can see the increase in the probability of winning the election if the incumbent voted in favor of the farm bill in the first period ($e_1=1$). The different values for α shows the severity of the "recent bias" in the case of the citizens: if α =1, then there is no such a bias, voters treat the actions in the two periods in the same way. As α decreases the "recent bias" becomes more pronounced and the value of action in the second period increases compared to that in the first period.

Figure 1. Increase in the probability of winning the election in case of standard normal distribution (for different value for the "recent bias")



Appendix C.

Table 1: Votes on Farm bills

Bill	Description	Vote in Senate
P.L. 104-127	Federal Agriculture Improvement and Reform Act of 1996	3/28/1996 (74-26)
P.L. 105-185	Agricultural Research, Extension, and Education Reform Act of 1998	5/12/1998 (92-8)
P.L. 106–224	Agriculture Risk Protection Act of 2000	5/25/2000 (91-4)
P.L. 107-171	Farm Security and Rural Investment Act of 2002	5/8/2002 (64-35)
P.L. 110-234	Food, Conservation, and Energy Act of 2008	5/15/2008 (85-15)
P.L. 113-79	Agricultural Act of 2014	2/4/2014 (68-32)

Table 2. Sources of Variables

vote_Aye	senate.gov	United States Senate
days	bioguide.congress.gov	Biographical Directory of the United States Congress
party	bioguide.congress.gov	Biographical Directory of the United States Congress
rural	census.gov	United States Census Bureau
seniority	bioguide.congress.gov	Biographical Directory of the United States Congress
gender	bioguide.congress.gov	Biographical Directory of the United States Congress
PACs	opensecrets.org	Center for Responsible Politics
farms	census.gov	United States Census Bureau
population	census.gov	United States Census Bureau
retire	bioguide.congress.gov	Biographical Directory of the United States Congress
margin	fec.gov	Federal Election Commission

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