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Abstract

It seems paradoxical that developed countries continue subsidizing agriculture even though their agricultural sectors have been declining in relative importance since the middle of the 20th century. What drives support for agricultural protection in developed countries? We answer this question by testing three competing hypotheses about what drives support for agricultural protection in the US: (i) legislator preferences, (ii) electoral incentives, or (iii) lobbying. Using data on the roll call votes of the members of the 106th through the 110th Congresses (1999-2009) and the scores given to each legislator by the Farm Bureau, our findings suggest electoral incentives explain a great deal of the variation in support for agricultural protection, but that legislator preferences and lobbying play a role, too. Moreover, legislator preferences and electoral incentives appear to be substitutes for one another. Why does Congress support agricultural protection? Because many members have electoral incentives to—and because many of those who do not still have other personal or strategic interests at stake.

Keywords: Agricultural Policy, Agricultural Protection, Farm Bill, Congress, Voting, Lobbying

JEL Classification Codes: Q18, D72

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> "There is some justification at least in the taunt that many of the pretending defenders of 'free enterprise' are in fact defenders of privileges and advocates of government activity in their favor rather than opponents of all privileges. In principle the industrial protectionism and government-supported cartels and agricultural policies of the conservative groups are not different from the proposals for a more far-reaching direction of economic life sponsored by the socialists."
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> – F.A. Hayek (1949), *Individualism and Economic Order*.

1. Introduction

Most developed countries subsidize agriculture heavily even though their agricultural sectors have steadily declined in importance relative to their manufacturing and services sectors since the 1950s. In developing countries, by contrast, the agricultural sector often remains much more important than the manufacturing and services sectors, but governments tend to tax farmers and subsidize food consumers. Scholars have termed this pattern the "development paradox" (Lindert, 1991; Anderson, 1993; Barrett, 1999; Bellemare et al., 2013).

Why should countries be more likely to protect agriculture as their GDP per capita increases (Anderson and Hayami, 1986; World Bank, 1986)? In developing countries, the answer seems to be that urban elites pressure governments to subsidize food consumption, often via the threat of social unrest (Lipton, 1977; Bates, 1981; Bellemare, 2013).[1] In developed countries, however, scholars have struggled to come to a consensus about why agricultural policy is tilted toward agricultural producers.

Four explanations for agricultural protection—the broad array of subsidies to farmers and taxes and quotas imposed on agricultural imports—have so far been suggested (de Gorter and Swinnen, 2002):

[1] Thomson (2013), however, finds that this is largely due to the fact that developing countries are less democratic than developed ones. His theoretical model and empirical results indicate that while authoritarian regimes who face higher rates of urbanization do behave in line with the developmental paradox, authoritarian regimes who face more organized agricultural producers do not. Rather, they behave like the democratically elected governments of developed countries.

1. *Legislator Preferences*: Lawmakers personally prefer agricultural protection.
2. *Electoral Incentives*: Voters prefer agricultural protection, and re-election-oriented policy makers follow their lead (Downs, 1957; Coughlin, 1992).
3. *Lobbying*: Interest groups representing agricultural producers lobby policy makers and contribute to the re-election campaigns of those who support agriculture (Olson, 1971; Becker, 1983).
4. *Institutions*: A country's political institutions encourage agricultural protection.

Scholars have found evidence to support most of these explanations: electoral incentives (Swinnen and de Gorter, 1993; Swinnen, 1994), lobbying (Vesenka, 1989; Abler, 1991; Brooks et al., 1998; Gawande and Hoekman 2006; Bullock and Coggins, 2008), and institutions (Beghin and Kherallah, 1994; Park and Jensen, 2007; Thies and Porche, 2007; Assman et al., 2012; Klomp and de Haan, 2013) all seem to contribute to policy outcomes on agricultural issues. The researchers who have studied each of these explanations, however, have typically focused on just one factor at a time. Moreover, most have focused on aggregate-level measures: although each hypothesis is premised on micro-level theories about how politicians make decisions (e.g., that those who receive more money from agricultural lobbyists tend to support agricultural causes), there has been almost no research on how individual politicians make decisions about agricultural policy.

In this article, we explore how preferences, electoral incentives, and lobbying can influence legislative action on agricultural policy in the United States Congress. We focus on the 106th through 110th Congresses (1999-2009), the period when lawmakers passed two of the most significant agriculture bills in the last few decades, the 2002 Farm Security and Rural Investment (FSRI) Act and the 2008 Food, Conservation, and Energy (FCE) Act. These bills are part of a long legislative tradition of subsidizing farmers via the farm bill, the ongoing "legislative package that renews America's farm

subsidy entitlement system every five years or so" (Paarlberg, 2011). Using data on how individual members voted on these bills and how members were rated by a leading agricultural advocacy organization, the American Farm Bureau Federation, we are able to simultaneously explore the micro-level underpinnings of several explanations for agricultural policy for the first time.

Knowing what drives support for agricultural protection is important for two reasons. First, in this era of budget austerity, it is important to know what determines support for a set of measures which most academic economists decry as wasteful (Schmitz et al., 2010). The 2008 US farm bill cost the average American taxpayer $3,175 over five years, or about $635 annually from 2008 to 2012 (Internal Revenue Service, 2013; US Government Printing Office, 2013a).[2] Second, to the extent that one wants to change the way agricultural policy is made, it is important to know whether one should aim to change who gets involved in politics, change the electoral system, or reform campaign finance to "get money out of politics." And though we cannot claim that our results are causal given our use of observational data, our findings are remarkably consistent across dependent variables and specifications, which somewhat alleviates concerns about endogeneity. As such, our results can help pave the way toward reforming US agricultural policy.

To determine why members of Congress support agricultural protection, we analyze three sets of outcomes: (i) the scores legislators receive from the American Farm Bureau Federation (hereafter referred to as the Farm Bureau), (ii) how legislators voted on the 2002 farm bill, and (iii) how legislators voted on the 2008 farm bill. We focus on three variables of interest: (i) the proportion of a legislator's career spent working as a farmer, which we use as a proxy for a legislator's preference for supporting agriculture, (ii) the proportion of a legislator's constituents who are farm owners, which we use to measure electoral incentives, and (iii) the amount of money a legislator received from agricultural

[2] There were 90.7 million taxpayers in the US in 2008, and the budget of the 2008 farm bill was $288 billion.

political action committees (PACs), which we use to measure lobbying. To help with identification, we also include legislator-specific controls as well as state, chamber, and congressional term fixed effects wherever applicable. Our results suggest that electoral incentives are what primarily drives legislative action on agricultural policy. We also find that lobbying and legislators' own preferences seem to matter, although the evidence is much weaker. In line with Swinnen's (2010) exhortation to focus on the interactions between various explanations for agricultural policy, we also find that a legislator's preferences and electoral incentives appear to be substitutes for one another. Why does Congress support agricultural protection? Because many members have electoral incentives to—and because many of those who don't still have other personal or strategic interests at stake.

2. Background and Theoretical Framework

2.1. A Brief History of US Agricultural Policy

The history of agricultural protection in the United States dates back to 1862, when the Homestead Act and the Morrill Act were adopted and the US Department of Agriculture (USDA) was established by Abraham Lincoln, who called it the "people's department." The Homestead Act gave federal land to settlers under the legal doctrine of homesteading, whereby someone gains ownership of a plot of land by virtue of clearing and cultivating it (Allen, 1991). The Morrill Act, for its part, gave birth to the network of land grant universities, and the Hatch Act of 1887 created a corresponding network of agricultural experiment stations which, to this day, still fund agricultural research. The USDA implements policies related to agriculture, forestry, and food, and it oversees the various agencies in charge of implementing those policies. As Knutson et al. (2007: 87) note, until the Great Depression, US agricultural policy focused largely on "development, research, education, and information."

When the Great Depression hit rural areas especially hard, policy makers expanded agricultural protection. Following the stock market crash of October 1929, agricultural commodity prices fell by

about 60% (Cochrane, 1958). Many individuals were forced to migrate in search of work, a phenomenon Steinbeck immortalized in *The Grapes of Wrath*. Rural households struggled to make a living, and the average farm family's income was less than half that of the average non-farm family (Paarlberg, 2011).

In response, the flurry of New Deal legislation included the Agricultural Adjustment Act (AAA) of 1933, which added a host of agricultural protection measures. The most important were price supports, which set the prices of selected agricultural commodities equal to purchasing power parity for the period 1910-1914, which had seen high commodity prices and farm incomes (Knutson et al., 2007). The AAA was modified and extended in 1938 and then again in 1949. Ever since, the farm bill has been a part of US public policy: "[e]very farm bill since 1949 has been a further amendment to the 1938 act, with a fixed termination date" (Knutson et al. 2007: 88).

When America became involved in World War II, millions of people left rural areas to join the war effort or to take manufacturing jobs in urban centers. Labor became ever scarcer in rural areas and, as a result, the agricultural sector developed several labor-saving technologies that allowed for increasing returns to scale in agriculture. Farms became bigger and fewer in number (Paarlberg, 2011).[3]

Over time, the price supports adopted in 1933 proved unsustainable. At first, they were replaced by flexible price supports, which were set at less than 100 percent of the 1910-1914 parity levels (Knutson et al., 2007). By the 1970s, price supports had effectively become income supports for farmers. Lawmakers allowed prices to fall below the levels they had achieved during the price-support era. In exchange, the government began granting farmers direct payments tied to farm prices, often referred to as "coupled payments." Coupled payments proved too costly, however, and the 1996 farm bill – the

[3] The theory of innovation described here is known as the theory of induced innovation, which posits that increases in the relative price of a given factor of production lead to the development of technologies that will allow to economize on that factor production (Hicks, 1932). See Hayami and Ruttan (1985) for an application to agriculture.

Federal Agriculture Investment and Reform (FAIR) Act of 1996 (US Government Printing Office, 2013b) – decoupled direct payments and food prices and authorized direct payments to farmers regardless of the quantities they produced or the prices of their crop.[4] By decoupling payments from price and quantity, lawmakers hoped to bring an end to the market distortions price supports had created: In principle, farmers could receive government subsidies while still allowing the market to dictate which crops were most valuable. In the span of just a few decades, American agricultural policy had moved from a system of price supports to a system of direct transfers.

This system of direct transfers was renewed and expanded in the 2002 and 2008 farm bills (US Government Printing Office, 2013c and 2013d). The 2002 farm bill renewed the direct payments enacted by the 1996 farm bill, but it also introduced countercyclical payments and commodity loan rates, which were continued in 2008. The 2008 farm bill, which took effect at the height of the 2008 food crisis, added the Average Crop Revenue Election (ACRE) program, a form of revenue insurance for farmers (Schmitz et al., 2010). Food prices reached a 30-year high, and the ACRE program "cleverly used the high income levels of [farmers in] 2008 as a baseline from which farmers would be able to make claims for added compensation in the event prices subsequently fell, which of course they soon did" (Paarlberg, 2011). In short, 2002 and 2008 were good years for agricultural protection.[5]

2.2. The Political Economy of US Agricultural Policy

Why have lawmakers worked so hard to protect agriculture? As Paarlberg (2011) explains, the process by which the farm bill is renewed (and usually expanded) every five to seven years is supported by an iron triangle composed of (i) the House and Senate Agricultural Committees, whose members are more

[4] By then, agricultural protection had largely lost its initial *raison d'être*, since the average American farmer, with a net worth in excess of $600,000 and about 1,800 acres of land, was significantly better off than the average American (Paarlberg, 2011: 98).

[5] Obviously, this brief historical overview of US agricultural policy is in no way meant to be an exhaustive survey. The reader interested in a more exhaustive discussion of US agricultural protection is encouraged to consult Orden et al. (1999), Gardner (2006), Knutson et al. (2007), Schmitz et al. (2010), and Paarlberg (2011).

often than not advocates of agricultural protection, (ii) the USDA, whose very existence is justified in great part by its administering agricultural protection programs, and (iii) the farm lobby, which works to extract as much money as possible for farmers, and which contributes to the campaigns of sympathetic members of Congress.

First, the House and Senate Agricultural Committees draft each farm bill. Paarlberg (2011:100) notes:

> The secret to every farm bill's success in Congress is the lead role played by the House and Senate Agriculture Committees, where members from farm states and farm districts enjoy a dominant presence and are rewarded for their legislative efforts with generous campaign contributions from the farm lobby, which is built around organizations representing the farmers who get the subsidies. The Agriculture Committees draft the legislation that goes to the floor for a final vote, and in the drafting process they take care to satisfy the minimum needs of both Republican and Democratic members to ensure bipartisan support. … The final package is what students of legislative politics call a committee-based logroll.

Once the Agricultural Committees draft a farm bill, the proposed legislation is sent to the House and Senate for floor action. Both the House and Senate place the legislation on their calendars, the bills are debated, and then votes take place. If a majority of the members of a chamber vote "Yea," the bill passes. This is the first of the three most common major votes on any farm bill, and we will refer to this vote as the vote on *passage* for the remainder of this paper.

If the House and Senate pass different versions of the farm bill, the two chambers appoint an ad hoc conference committee to iron out the differences. If the conference committee reaches an agreement, the reconciled bill is then sent to each chamber for approval. This is the second of the three major votes on most farm bills, and we will refer to this vote as the *conference* vote.

If both chambers pass an identical farm bill, it heads to the President who may sign it into law or veto it. If the President vetoes, the bill is sent back to Congress with the President's reason for vetoing the bill. Both chambers then have the option to vote to override the President's veto. This is the third of

the three major votes that are possible on a farm bill, and we will refer to it as the *veto override* vote. The 2002 farm bill, for instance, was passed in slightly different forms in the House and Senate, reconciled in conference committee, then passed in conference votes in both chambers, then signed into law by the president. The 2008 farm bill, on the other hand was, passed in different forms, reconciled in conference, then passed in conference votes, then vetoed by George W. Bush. Congress voted to override President Bush's veto, however, and the extension became law.

Why did members of Congress do so much to shepherd these bills through the legislative process, even at the expense of following through on a veto showdown with President Bush? The four explanations that seem most promising are lawmaker preferences, electoral incentives, lobbying, and political institutions. Perhaps lawmakers personally favor aggressive agricultural protections. Perhaps their constituents pressure them to support agriculture. Perhaps lobbyists do. Or perhaps the institutional environment has somehow stacked the deck in agriculture's favor.

Unfortunately, we cannot test institutional explanations in this paper: the relevant features of the institutional environment (e.g., delegated authority to committees, iron triangles, the different geographical constituencies of the House and Senate, and so on) have been essentially constant during the period when we have relevant data. Instead, we focus on legislator preferences, electoral incentives, and lobbying. All three explanations seem promising. Research on interest groups is well-developed in political science (e.g., Denzau and Munger 1986; Hall and Deardorff 2006; Hall and Wayman 1990) and economics (e.g., Grossman and Helpman 1994). Denzau and Munger argue that interest groups focus on legislators whose constituents are indifferent or rationally ignorant about the groups' preferred policies. In other words, voters who have a preference for those policies not only get their way in their own districts, but also in other districts where voters do not care or are rationally ignorant about those policies. Grossman and Helpman conclude that legislators trade off campaign contributions from

interest groups and the welfare of their constituents (see also Grossman and Helpman, 1996). There are good reasons to suspect that lawmakers' own preferences matter, too: a growing body of research has shown that legislators often vote their own views on the issues before them (for a useful review, see Burden 2007).

3. Empirical Framework

Which of these explanations carries the most weight? To date, scholars have never examined all three in conjunction at the individual level. That is, we do not know how important legislator preferences, electoral incentives, and lobbying are relative to one another when legislators make important decisions about agricultural protection policies.

3.1. Estimation Strategy

In the empirical application below, we model legislative action on major farm bills as a function of all three factors and a host of controls. We focus on five measures of how legislators voted on the 2002 and 2008 farm bills: the passage and committee votes in 2002 and the passage, committee, and veto override votes in 2008.

The core equation we estimate is

$$y_{ijt} = \alpha + \beta_p p_{ijt} + \beta_e e_{ijt} + \beta_\ell \ell_{ijt} + \gamma x_{ijt} + \delta_s d_s + \delta_j d_j + \delta_t d_t + \epsilon_{ijt}, \quad (1)$$

where $y_{ijt} = 1$ if legislator i in state j during Congress t casts a "Yea" vote and $y_{ijt} = 0$ if the legislator casts a "Nay" vote, p is a measure of legislator preference for agriculture, e is a measure of electoral incentives, ℓ is a measure of lobbying, x is a vector of other legislator-specific attributes, d_s is an indicator variable capturing whether a legislator is a senator, d_j is a vector of state fixed effects, d_t is a vector of Congress fixed effects, and ϵ is an error term with mean zero.

Unfortunately, studying individual roll call votes can sometimes obscure larger patterns in legislative conduct on a particular issue. As such, we also use the model above to analyze how our explanatory

variables are related to two composite measures of overall support for agriculture, that is, two measures that are based on a large number of legislative choices. The first is the score given to each legislator by the American Farm Bureau Federation (AFBF). During each Congress, the Farm Bureau selects roughly a dozen roll call votes that it considers important to the interests of farmers, and assigns each legislator a score between 0 and 100 depending on how often the legislator voted for the pro-agriculture position. (To make this measure more comparable to our roll call voting measures, we simply rescaled Farm Bureau scores to range between 0 and 1.) Farm Bureau scores are available electronically for over 200 legislators in the 106th Congress and over 300 in both the 108th and 109th. Altogether, we have 906 observations of this useful measure of legislative conduct on agricultural issues.

Our second composite measure is an indicator for legislators who were identified as "Friends of the Farm Bureau." This distinction is assigned at the end of each congressional term to members nominated by their state Farm Bureaus and approved by the national Farm Bureau Board of Directors, who consider a legislator's "voting records on AFBF's priority issues established by the Board of Directors, [the] number of bills that a member has sponsored and co-sponsored, . . . and how accessible and responsive that member is to Farm Bureau members and leaders."[6]

The Friend of the Farm Bureau indicator is arguably our best overall measure of legislative action on agricultural issues: it covers a wide range of actions both at the floor voting stage and behind the scenes. And it is available for almost every legislator who served during the 106th through 110th Congresses, the timeframe when we have high-quality data on all of our explanatory variables. With any given final passage vote, we have at most 535 observations (435 votes in the House, 100 in the Senate). With the Friend measure, we have 2,699: one for each member in each of five Congresses. (The number slightly

[6] From http://www.fb.org/index.php?action=legislative.112c (accessed June 13, 2013).

exceeds 2,675 – or 5 × 535 – because a few members were replaced due to death or resignation and a few switched parties and therefore appear twice in our dataset.)

Because all but one of our dependent variables are binary (the exception being a legislator's Farm Bureau score), equation (1) is estimated by ordinary least squares, which constitutes a linear probability model (LPM). Although the LPM suffers from two significant shortcomings relative to either the probit or logit– it can yield predicted probabilities outside of the $[0,1]$ interval, and it suffers from heteroskedasticity due to the Bernoulli structure of the variance of binary variables – these shortcomings are irrelevant in this application. First, since we are not interested in forecasting future votes, it does not matter that predicted probabilities can in theory lie outside of the [0,1] interval; what matters instead is to accurately estimate the coefficient associated with each variable of interest. Moreover, our use of robust standard errors throughout eliminates concerns about heteroskedasticity. As such, we opt for LPM, which prevents coefficient estimates from being identified as a result of the specific functional form assumed, and which produces coefficient estimates that can be easily interpreted as elasticities without extra computations.[7]

Of course, we must note several limitations up front. First, our vote-based dependent variables are only proxies for agricultural protection. Farm bills include more than just agricultural protection: they also provide funds for food policy programs such as the USDA's Supplemental Nutritional Assistance Program (SNAP, often still informally called "food stamps"), which helps poor individuals and families feed themselves. Thus, a "Yea" or "Nay" vote at any stage of the 2002 or 2008 farm bills is a vote on more than just agricultural protection. If a legislator's vote were strictly about agricultural protection, we would observe a legislator's "true" vote on agricultural protection y_{ijt}^{*}, where $y_{ijt}^{*} = y_{ijt} + \mu_{ijt}$,

[7] Moreover, in the presence of heteroskedasticity, the use of robust standard errors with the probit or logit (or any other nonlinear procedure) yields inconsistent coefficient estimates. As Giles (2013) informally noted in a discussion of the topic: "What use is a consistent standard error when the point estimate is inconsistent?" See Greene (2012:692) for a formal treatment.

where y_{ijt} is a legislator's vote on a farm bill and μ_{ijt} is an error term capturing a legislator's vote on the portions of a farm bill that are unrelated to agricultural protection. Equation (1) thus becomes

$$y_{ijt} = \alpha + \beta_p p_{ijt} + \beta_e e_{ijt} + \beta_\ell \ell_{ijt} + \gamma x_{ijt} + \delta_s d_s + \delta_j d_j + \delta_t d_t + \upsilon_{ijt}, \quad (1')$$

where $\upsilon_{ijt} = \epsilon_{ijt} - \mu_{ijt}$. But then, if μ_{ijt} is correlated with any of the variables on the right-hand side of equation (1'), the estimated coefficients are biased. Our rich set of controls should substantially alleviate concerns about this source of endogeneity, and our other composite measures are less likely to suffer from this bias (since they are computed by an interest group concerned principally with agricultural protection), but this limitation is nonetheless important to flag up front.

A second limitation is missing data. On each of the five bills we examine, some legislators simply do not cast votes.[8] As a result, many do not have Farm Bureau scores (though almost all have Friend of the Farm Bureau indicators) during the three Congresses for which we have Farm Bureau score data. We can only assume that those legislators' votes are missing at random, a common assumption in the case of missing data. Again, our Friend of the Farm Bureau measure should help to further alleviate concerns about this limitation, but it is worth noting here.

3.2. Identification Strategy

In any application like this one, there are three possible sources of statistical endogeneity that can compromise the identification of causal relationships:

1. *Unobserved Heterogeneity*: The controls on the right-hand side (RHS) of equation 1 fail to account for some important nonrandom differences between legislators, and those differences are correlated with the variables on the RHS of equation 1.

[8] Note that the issue of misclassification (i.e., zero responses recorded as ones or one responses recorded as zeroes) can be a serious threat to identification in an LPM (Hausman et al., 1998). This is not a problem here, however, given that the votes of members of Congress are public, that that those votes are carefully recorded, and that they are under a considerable amount of scrutiny from various stakeholders.

2. *Measurement Error*: One or more of the variables in equation 1 is measured with error.
3. *Reverse Causality*: Changes in the dependent variable cause change in one or more of the explanatory variables.

In most analyses of cross-sectional data, unobserved heterogeneity is the most likely source of prospective endogeneity. Indeed, although the right-hand side of equation 1 includes a rich set of controls, we can never rule out the possibility that we have missed something important. Simply put, our results are not causal estimates; they are associations, which can be useful for testing competing explanations of legislative action (e.g., if lobbying drives legislators to support farms, we should observe an association between lobbying and support for farms) but which are not the same as causal evidence (since we cannot definitively rule out that something correlated with lobbying was really doing the work).

We are less concerned about measurement error. Equation 1 controls for a wide range of factors that should capture a legislator's preferences for food policy programs such as the SNAP: we account for a legislator's age, gender, party affiliation, state, and Congress. For example, one might be tempted to argue that a representative from an urban area or a senator from a more urbanized state might systematically vote in favor of the SNAP, and that since this is unobserved, this causes an endogeneity problem. But the fact that we control for the proportion of a legislator's constituents who are farmers largely controls for the degree of urbanization in that legislator's district, i.e., for within-state variations in urbanization. Likewise, state fixed effects account for the between-state variations in the number of people who receive food stamps, so that the remaining variation is likely to be idiosyncratic legislator support for the SNAP. In other words, although it is certainly possible that the measurement error problem posed by the fact that any legislator's vote on a farm bill encompasses more than her vote on agricultural protection, it is highly unlikely that this significantly compromises the identification of our

results. Our use of Farm Bureau-related variables (i.e., Farm Bureau score, and the indicator for whether a legislator is a Friend of the Farm Bureau) provides a consistency check on the farm bill results, too: those variables home in on agricultural protection and ignore other kinds of food policy.

Finally, except as regards the Farm Bureau-related variables, the issue of reverse causality is largely irrelevant in this context. Indeed, it is highly unlikely that a legislator's vote on a farm bill causes agricultural PACs to have funded that legislator in the past, or that it causes changes in the proportion of that legislator's constituents who work as farmers, and it is simply impossible that it causes the legislator to have spent more time working as a farmer.

Still, the empirical results in this paper rely on observational data, and our research design is not experimental, so we cannot claim to have identified causal relationships between our three variables of interest (i.e., preferences, electoral competition, and lobbying) and support for agricultural protection. If we want to understand what drives agricultural protection in the US, however, we have to start somewhere. We cannot randomly assign legislators to have certain kinds of constituents, certain kinds of preferences, or certain kinds of relationships with interest groups. We can, however, use observational data to determine whether the associations implied by extant theories really exist in the complex world of congressional decision making.

4. Data and Descriptive Statistics

Do lawmakers support agriculture when they personally prefer policies that protect farmers? When their constituents prefer those policies? When agricultural interests lobby them aggressively? Or is the average lawmaker's support for agricultural protection due some combination of the three? To answer these questions, we need data on what lawmakers want, what their constituents want, and how much lawmakers are lobbied by agricultural interests.

Measuring legislators' personal views on public policy can be challenging. The last representative survey that asked members of Congress about their personal opinions was conducted in the late 1950s and early 1960s (Miller and Stokes, 1963). We can easily tap legislators' attitudes toward economic issues like agricultural subsidies, however, by studying what they did for a living before they were elected to Congress. All else equal, legislators who were farm owners themselves should be more likely to support policies that promote agricultural interests.

We identified lawmakers who previously worked as farmers using data from the Congressional Leadership and Social Status (CLASS) dataset (Carnes, 2011), the only existing database that contains detailed information about the professional backgrounds of a large sample of American legislators. The CLASS dataset includes a wide range of biographical data for each of the 783 legislators who served in the 106th through 110th Congresses (1999 to 2008), including information about all of the jobs the legislator had before serving in Congress. We focus here on the percentage of each member's pre-congressional career spent working as a farm owner or manager. If legislators sometimes vote with an eye to their own policy preferences, as Carnes (2012; 2013) shows, former farmers in Congress should be more likely to support policies that benefit farmers.

Likewise, if legislators vote with an eye to their constituents' preferences, those who represent larger numbers of farmers should be more likely to support agriculture. As a simple test of this idea, we examined the CLASS dataset's measure of the proportion of each legislator's constituents who work as farm owners or managers. Of course, most people who work in agriculture are farm employees, not farm owners. We focus here on owners and managers—who stand to reap the most immediate benefits from agricultural subsidies—although studying the concentration of farm employees in a district would probably produce similar findings (since the proportion of farm workers in a district is highly correlated with the proportion of farm owners.) Lawmakers who represent greater numbers of farm owners tend

to represent greater numbers of farm workers, too—and those lawmakers usually have strong electoral incentives to keep federal dollars flowing to agriculture.

To measure lobbying on behalf of agriculture, we simply computed the amount of money each legislator received from agricultural PACs during each congressional term using Federal Elections Commission data compiled by the Center for Responsive Politics (2012). With these data, we can easily determine whether lawmakers who receive more money from farm PACs are more likely to vote to fund agriculture. Table 1 lists the complete descriptive statistics for all of the variables in our analysis during each congressional term and when we pool observations across all five Congresses.

Measured this way, legislator preferences, constituent preferences, and agricultural lobbying each predict substantial differences in how legislators vote on farm issues. In Figure 1, we have simply divided legislators by party (Democrats on the left, Republicans on the right) and then by whether the legislator ever worked as a farm owner or manager before serving in Congress (non-farmers are grey, farmers are black). The first five panels plot the percentages of legislators who voted in favor of agriculture on each of the individual roll call votes we have singled out. The last two panels plot the average Farm Bureau score members received and the percentage of members who were designated "Friends of the Farm Bureau." With one exception (Democrats voting on the conference report for the 2002 agriculture bill), legislators who had worked as farm owners always scored higher on average than those who did not. These gaps were almost always statistically significant for Republican lawmakers,[9] and the difference was significant among legislators from both parties when we examined which members were designated Friends of the Farm Bureau, our most comprehensive measure of support for agriculture.

[9] The gaps between Democrats who had been farmers and those who had not may not have achieved statistical significance in some panels because the data on roll call voting are censored at 100%. Although many of the Republican gaps are significant and many of the Democratic gaps are not, it would probably be a mistake to conclude that a background in agriculture only matters for Republicans.

Consistent with the idea that legislators vote on farm policy with an eye to their preferences, members of Congress who had worked as farmers were consistently more likely to support farmers.

Likewise, members whose constituents included more farm owners were more likely to support pro-agriculture legislation. Figure 2 repeats the analysis in Figure 1, this time dividing lawmakers by whether they represented a district or state where more than 2% of people worked as farm owners or managers (i.e., about double the national average). Across the board, legislators who represented greater numbers of farmers were more likely to support agriculture.

The same was true when we divided legislators by whether they received more than $25,000 from agricultural PACs. As Figure 3 illustrates, lawmakers who received more money from farm groups were more likely to support agriculture in each of the roll call votes we examined and on both of the Farm Bureau scores. Like legislators who worked as farmers and legislators who represented farmers, legislators who received more money from farm PACs were more likely to support agriculture.

5. Estimation Results and Discussion

Of course, there is a great deal of overlap between the three variables: the legislators who receive more money from agricultural PACs are often the legislators who worked as farmers and who represent farmers. To disentangle the effect variables, we estimated the regressions described in equation (1) above.

Table 2 plots the results of four regression specifications that use our most comprehensive measure, an indicator for whether each member was designated a Friend of the Farm Bureau during each of the five Congresses covered by the CLASS dataset. In each specification, we control for each legislator's party (an indicator for whether a legislator is a Republican), the partisanship of the legislator's constituents (the proportion of constituents who identified as Republicans in the National Annenberg

Election Study), the legislator's gender (an indicator for women), the legislators age, the legislator's state (not shown for brevity), whether the legislator is a Senator, and the Congress (also not shown). In the first specification in table 4, we included our measure of the proportion of each legislator's own pre-congressional career he or she spent as working as a farm owner or manager. In the second specification, we included a measure of the proportion of the legislator's constituents who are farm owners or managers. In the third specification, we included the logarithm of the amount of contributions the legislator received from agricultural PACs. The fourth specification we includes all three variables of interest: our measures of legislator preferences, constituent preferences, and lobbying activity.

All three variables of interest were associated with large and significant differences in how legislators voted on agricultural policy in table 2. Legislators who spent the entirety of their pre-congressional career working as farm owners or managers are 38 percentage points more likely to be Friends of the Farm Bureau (column 1), but this decreases to 19 percentage points once other mechanisms of support for agricultural protection are controlled for (column 4). Likewise, for a one percentage point increase in the proportion of a legislator's constituents who work in agriculture, that legislator was 45 percentage points more likely to be a Friend of the Farm Bureau (column 2), but this decreases to 33 percentage points once other mechanisms of support for agricultural protection are controlled for (column 4). Though the estimated coefficients for the proportion of constituents who work in agriculture might seem high, note that this is due to the conditioning domain: for more than 99% of our sample, that proportion was 5%, and the mean of this variable is less 1%. Lastly, for every additional $1,000 tranche received from agricultural PACs, a legislator was 2.9% (column 3) more likely

to be a Friend of the Farm Bureau,[10] but this decreases to 2.5% (column 4) once other mechanisms of support for agricultural protection are controlled for.

In Table 3, we re-estimate the last specification in Table 2 (our most complete specification, which includes all three of our explanatory variables, the controls, as well as state, chamber, and Congress fixed effects), this time using each of the explanatory variables from Figures 1 through 3. Several patterns immediately stand out. First, the Republican indicator—which captures how much more likely Republican lawmaker are to support the legislation in question, how much higher they score on the Farm Bureau scores, or how much more likely they are to be a Friend of the Farm Bureau—changes signs. On each of the major agricultural subsidy bills we examined, Democrats were more likely to support the bill than Republicans. Surprisingly, however, the Farm Bureau tended to rate Republicans more favorably: on the broader set of agricultural policies up for grabs in each Congress, Republicans tend to side with farmers more often than Democrats.

Of the three factors we considered—legislator preferences, constituent preferences, and lobbying—electoral incentives were the most consistently associated with legislative action on farm bills: in all but one specification, the proportion of a legislator's constituents who were farmers was significantly associated with a greater likelihood to support farmers. Legislators' own preferences were significantly associated with pro-farmer voting in three specifications. Lobbying in just two.

In some sense, these results should come as no surprise: when high-profile legislation is on the table, legislators always worry about how their choices might be used against them come election time

[10] Note that in all of our specifications, we regress a binary outcome on the logarithm of the amount of money received from agricultural PACs in 1,000s of dollar. As such, the estimated coefficient for the logarithm of agricultural PAC contributions cannot be interpreted as an elasticity. To be interpreted as such, the estimated coefficient has to be divided by how much money a legislator has received to recover. That is, when $y = \alpha + \beta \ln(x)$, $\partial y / \partial x = \beta / x$. This last ratio can be computed in one of two ways: at means (i.e., computing $\beta / \bar{x}$), or taking the mean thereof (i.e., computing $\sum_{i=1}^{N} (\beta / x_i)$). We opt for the latter approach.

(Arnold 1990). When legislators consider lower-profile policies, however, they have more leeway. When we examine composite measures of how legislators behave on a wide range of important agricultural issues, we find that lobbying, legislator preferences, and constituent preferences all seem to matter. However, when we narrow our focus to roll call voting on two highly-visible bills, the importance of lobbying and legislator preferences is less clear: the coefficients have the expected signs, but the relationships are considerably noisier. Why do lawmakers in the U.S. subsidize agriculture? Part of the explanation seems to be that many of them personally favor agriculture, and part of the explanation seems to be that many of them have strong ties to groups that lobby on behalf of farmers. But the most important single factor seems to be that so many legislators represent constituents who stand to benefit from agricultural subsidies.

Do any of our three variables of interest substitute for or complement one another? As a simple test, Table 4 replicates the regression specifications from Table 3, this time adding terms that interact each pair of our three explanatory variables. Modeled this way, the independent importance of legislator preferences and constituent preferences is clearer: the coefficients for legislators' own backgrounds in farming are statistically significant in three of the roll call vote specifications. Working as a farmer and representing farmers seem to be strong substitutes for one another. A legislator who worked as a farmer *and* represents a large number of farmers will tend to vote like a legislator who only had one of those qualities. When legislators decide to support farmers, it may be because their constituents compel them to, or it may because they personally believe that supporting farmers is good public policy. In places where farming is not a major industry, electing a farmer to Congress boosts the chances that the legislator will support agriculture; in places where agriculture is king, lawmakers tend to support farmers regardless of their backgrounds.

6. Summary and Conclusions

Starting from the observation that as GDP per capita increases, a country is more likely to support agriculture – the so-called developmental paradox (Lindert, 1991; Barrett, 1999) – this paper has sought to answer the question "Why do members of Congress support agricultural protection?" Using data on the members of the 106th through 110th US Congresses, we have tested three hypotheses. Specifically, we have looked at whether legislator preferences, electoral competition, or lobbying drive two sets of measures related to agricultural protection, roll call votes on the 2002 and 2008 farm bills, Farm Bureau scores, and the "Friend of the Farm Bureau" designation.

Although all three of our competing hypotheses explain some of the variation in support for agricultural protection, the one explanation that almost always explains support for agricultural protection is the electoral pressure a legislator faces, i.e., the proportion of her constituents who are farm owners or farm managers. Moreover, we find that a legislator's preferences for agricultural protection and the degree of electoral competition he faces are substitutes for one another.

This is not to say that lobbying does not matter. If agricultural PAC contributions were irrelevant to legislative outcomes, those PACs would find other ways to spend their money. *At the margin*, however, agricultural PACs do not seem to be simply "buying votes." As others have noted, PACs give to legislators not to change their votes but to influence who gets elected (Abler 1991) and to mobilize allies to do work behind the scenes (Hall and Wayman 1990). Generally speaking, our findings are close to those of Vesenka (1989), who found that PACs explain very little but that ideology (i.e., party affiliation) explains quite a bit of variation in support for agricultural protection.

Of course, our approach has a few important limitations. First and foremost is our inability to make causal statements. Our data are observational and we do not have an experimental research design: it would be a mistake to conclude that the relationships discussed above are causal. This is simply an

inherent feature of most studies of legislative decision making. Our observational data can help us test the observable implications of causal theories about agricultural protection in Congress, but a complete causal statement will have to wait for future research.

Second, much of the action on any given farm bill occurs at the committee level, i.e., well before the vast majority of legislators cast a vote, and our data do not allow us to study what goes on in committees. Another promising direction for future research, then, might be to explore in greater detail the role of the House and Senate Agricultural Committee membership.

Finally, although our results are not causal, they have important practical implications for reformers. The most consistent predictor of support for agricultural protection is the proportion of a legislator's constituents who are farm owners or farm managers. But those voters can only play an important role in the policy-making process if other voters are in the dark about the costs they shoulder when Congress enacts agricultural protections (Becker, 1983). The solution, then, may be to educate voters about the costs and benefits of agricultural policy. In addition, our findings have clear implications for advocates of agricultural protection as well. Those who want to see more support for agriculture in Congress should try to elect more farm owners.

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Figure 1. Do Legislators Who Were Farmers Vote Differently?

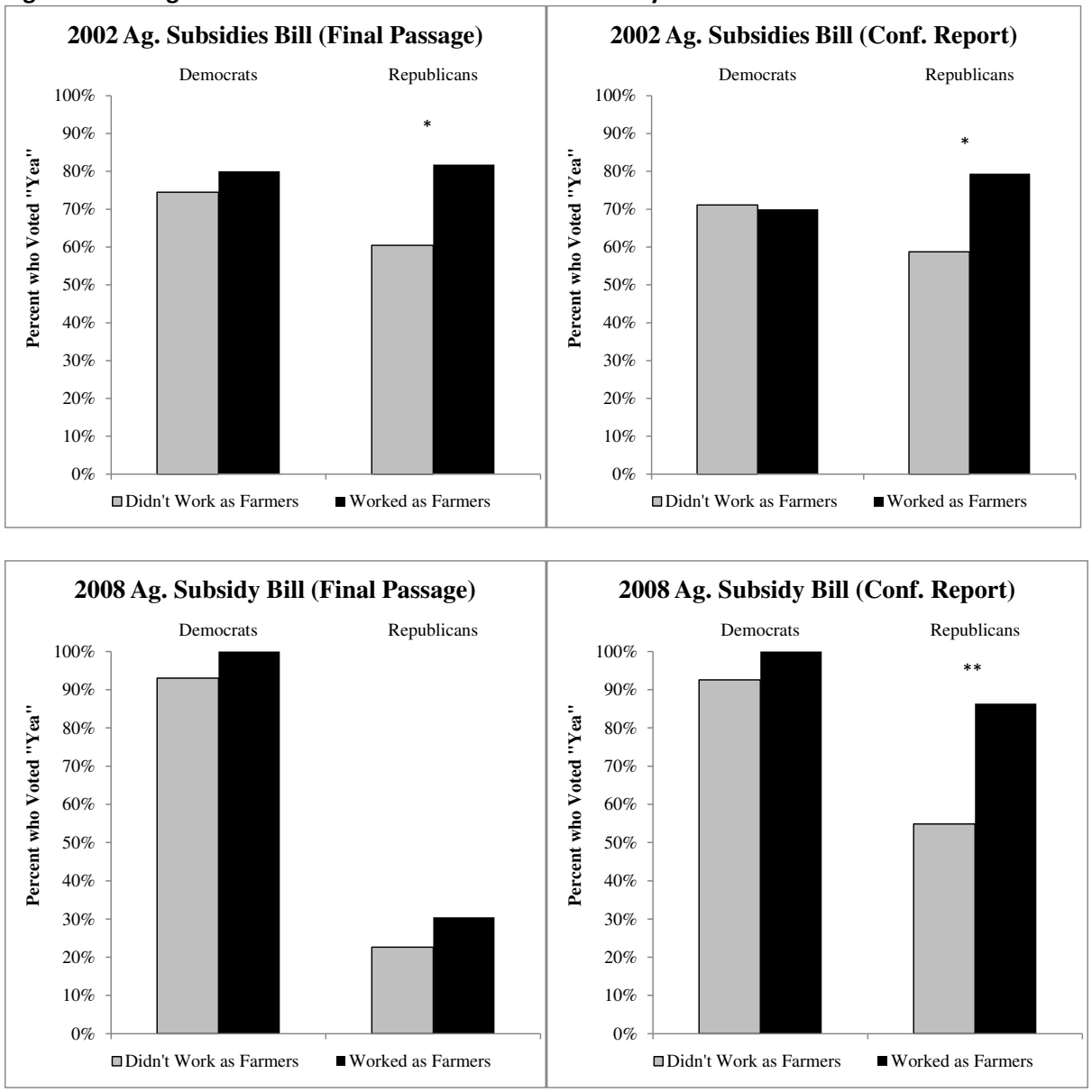
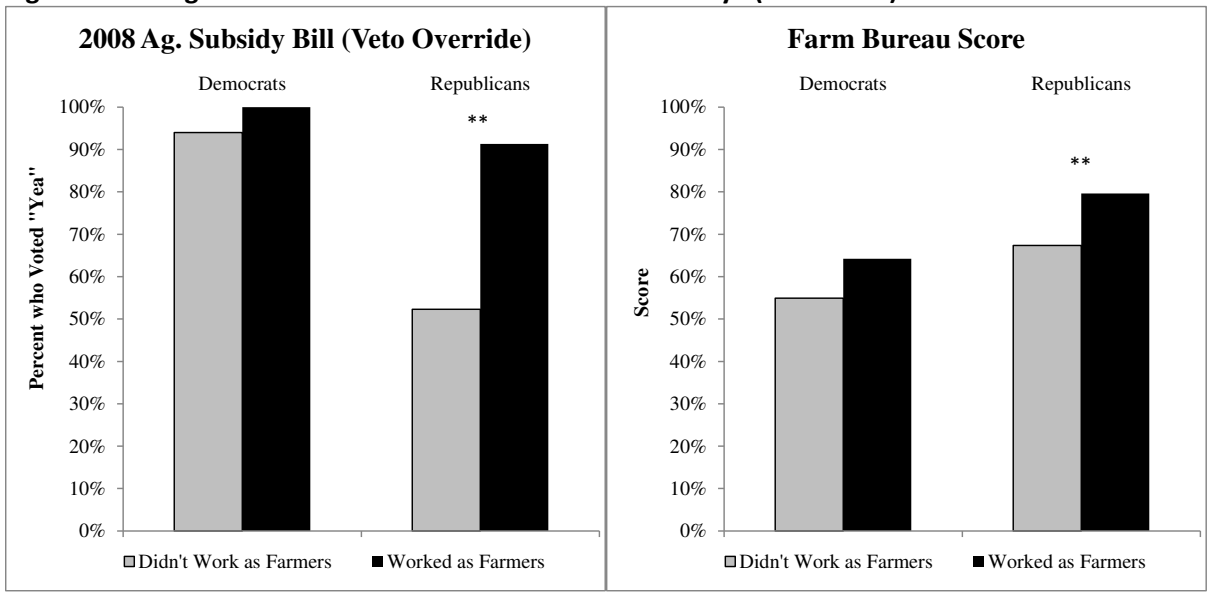


Figure 1. Do Legislators Who Were Farmers Vote Differently? (Continued)



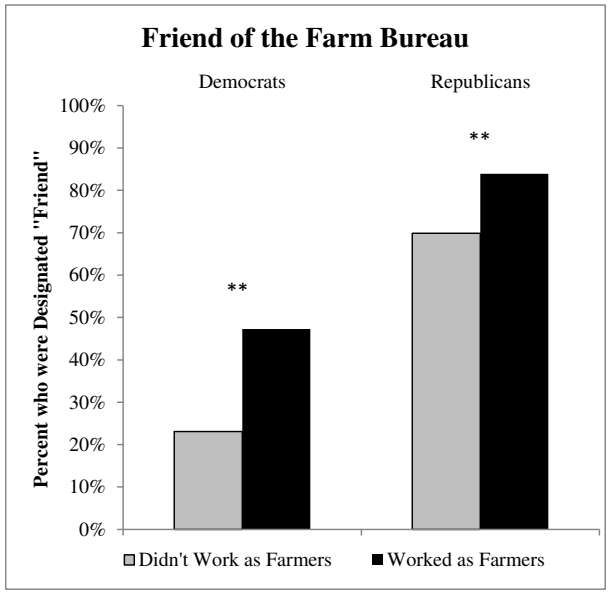
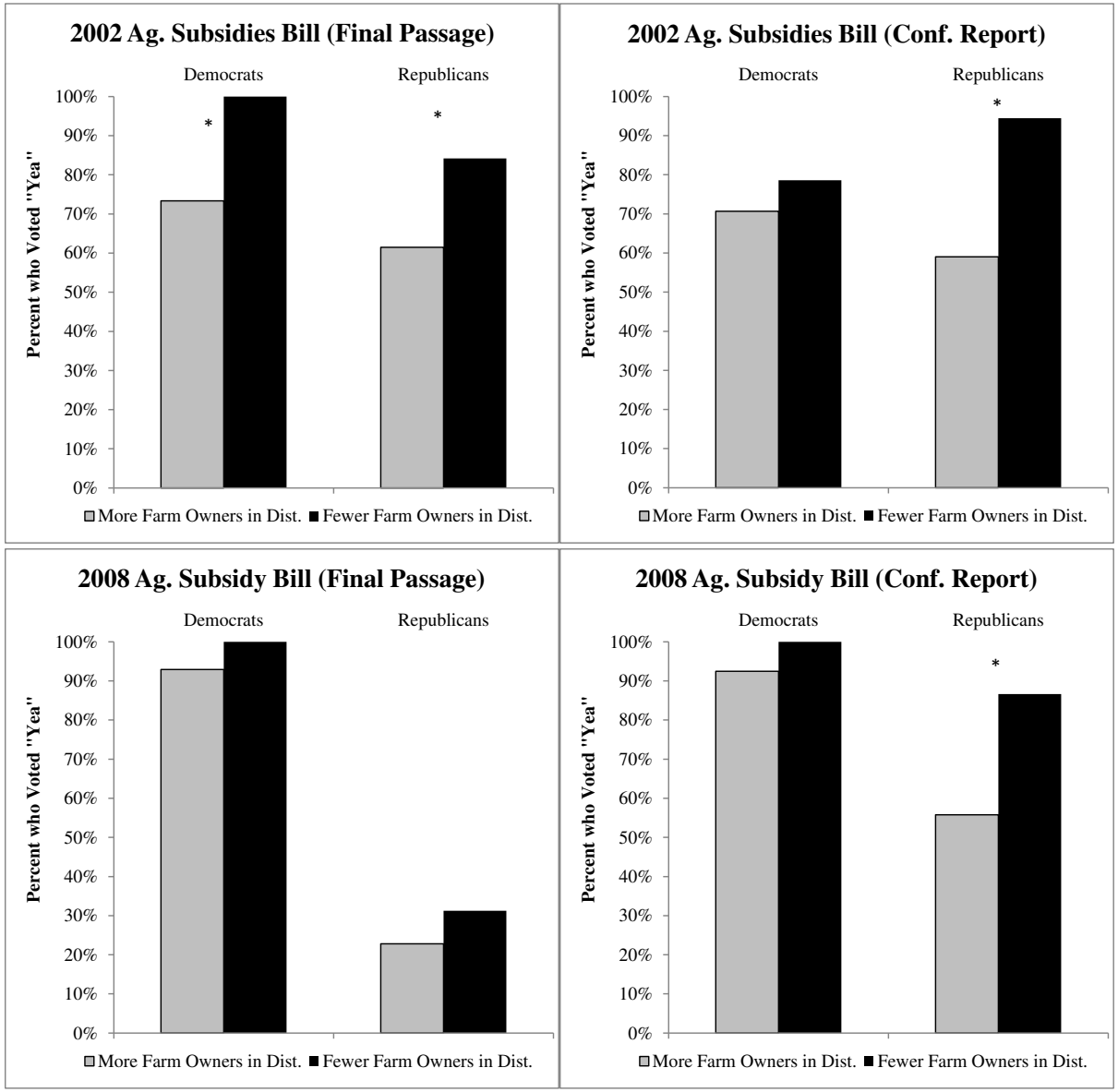


Figure 2. Do Legislators from Districts with a Larger Share of Farmers Vote Differently?



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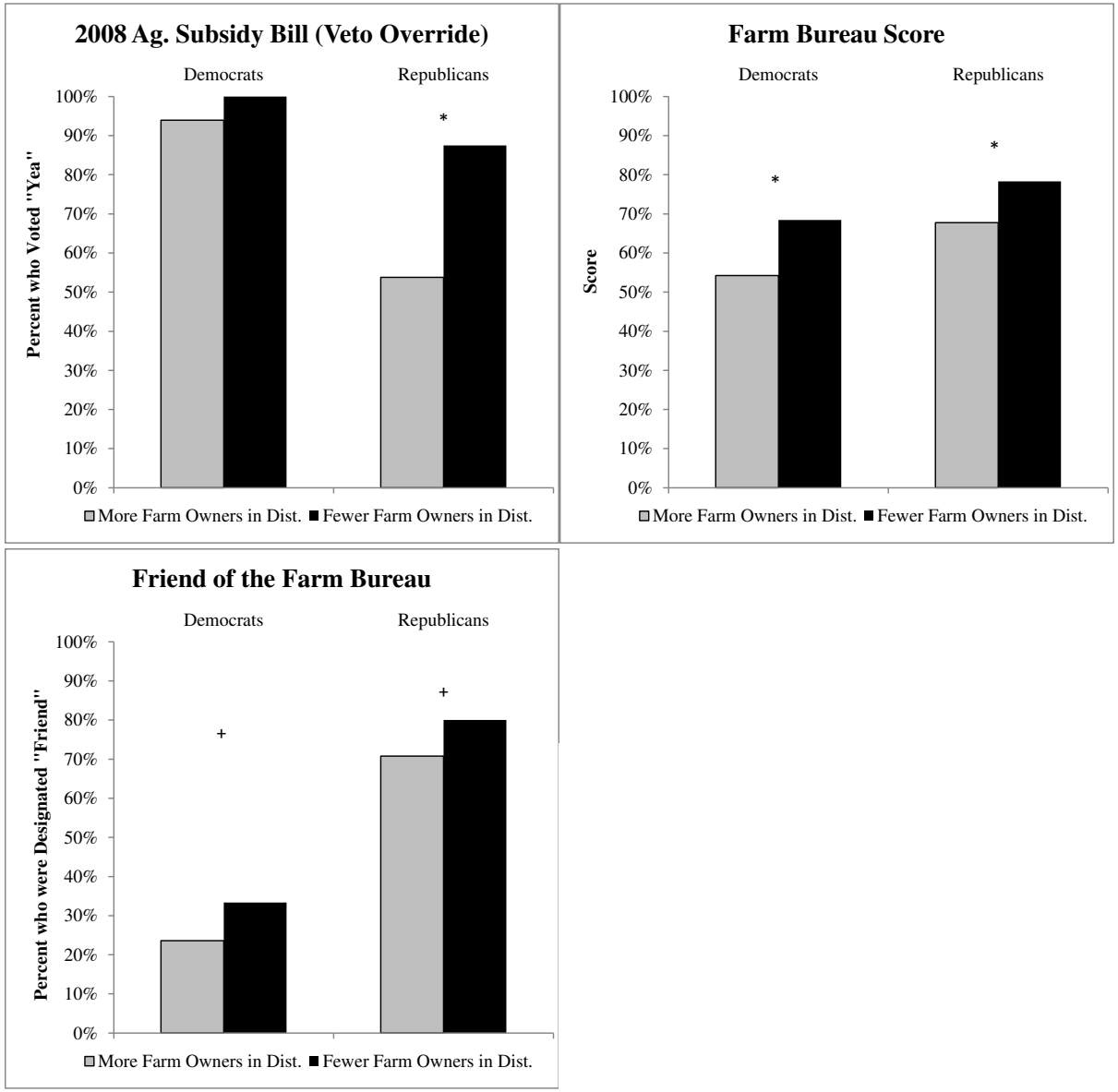


Figure 3. Do Legislators who Receive Substantial Amounts of Agricultural PAC Money Vote Differently?

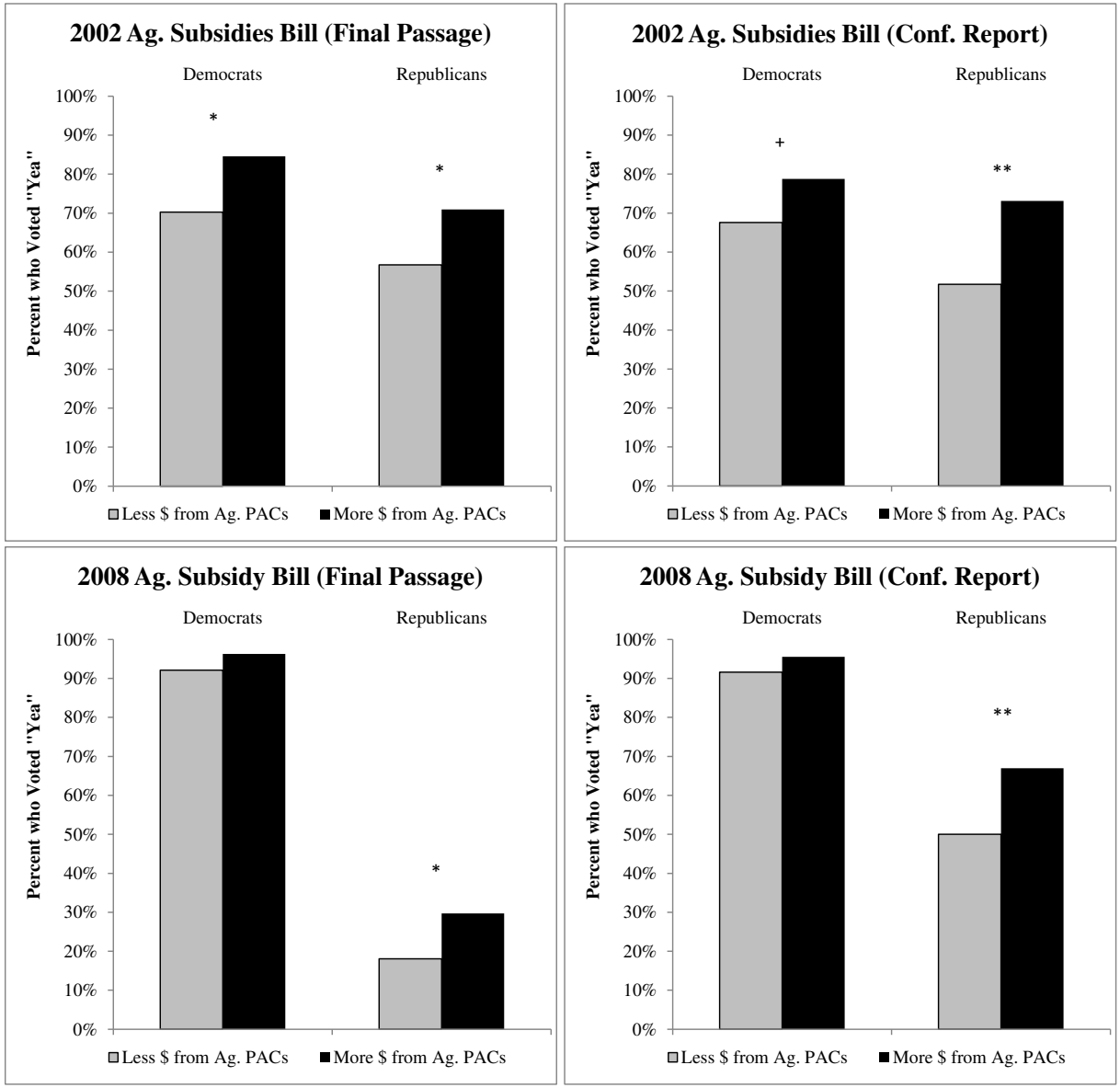
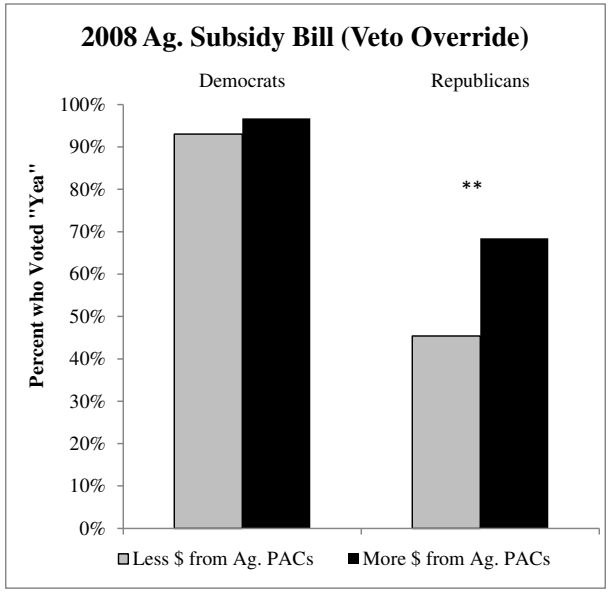
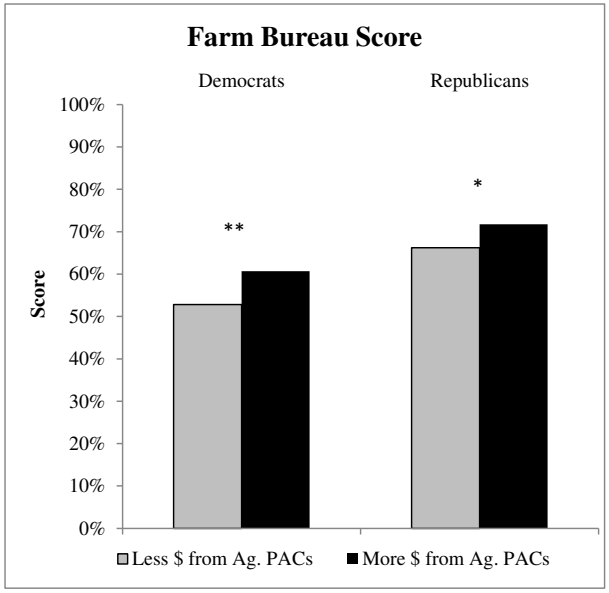


Figure 3. Do Legislators who Receive Substantial Amounts of Agricultural PAC Money Vote Differently? (Continued)





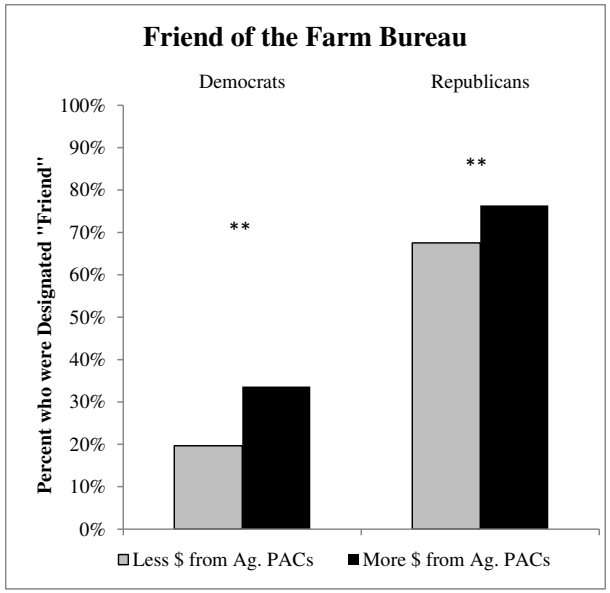


Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	N
Dependent Variables			
Farm Bill 2002 Passage Vote (Indicator)	0.689	(0.463)	511
Farm Bill 2002 Conference Committee Vote (Indicator)	0.662	(0.473)	518
Farm Bill 2008 Passage Vote (Indicator)	0.602	(0.490)	515
Farm Bill 2008 Conference Committee Vote (Indicator)	0.767	(0.423)	520
Farm Bill 2008 Veto Override Vote (Indicator)	0.765	(0.424)	520
Farm Bureau Score (in [0,1] Interval)	0.612	(0.269)	906
Friend of the Farm Bureau (Indicator)	0.483	(0.500)	2699
Variables of Interest			
Proportion of Career Spent in Agriculture	0.022	(0.091)	2715
Proportion of Farm Constituents	0.008	(0.011)	2715
Contributions from Agricultural PACs ($1,000)	22.942	(33.590)	2715
Controls			
Republican (Indicator)	0.511	(0.500)	2714
Proportion of Republican Constituents	0.522	(0.079)	2680
Female (Indicator)	0.142	(0.349)	2715
Age (Years)	56.069	(10.050)	2715
Senator (Indicator)	0.187	(0.390)	2715
106th Congress (Indicator)	0.200	(0.400)	2715
107th Congress (Indicator)	0.200	(0.400)	2715
108th Congress (Indicator)	0.199	(0.399)	2715
109th Congress (Indicator)	0.199	(0.399)	2715
110th Congress (Indicator)	0.202	(0.402)	2715

Table 2. OLS Estimation Results for Friends of the Farm Bureau

Variables	(1)	(2)	(3)	(4)
Dependent Variable: = 1 if Friend of the Farm Bureau; = 0 Otherwise.				
Proportion of Career in Agriculture	0.384***			0.191**
	(0.087)			(0.089)
Proportion of Farm Constituents		4.488***		3.279***
		(0.768)		(0.786)
Log of Agricultural PAC Contributions			0.020***	0.017***
			(0.003)	(0.003)
Republican	0.370***	0.378***	0.359***	0.364***
	(0.026)	(0.026)	(0.026)	(0.025)
Proportion of Republican Constituents	-0.413***	-0.323**	-0.368**	-0.289*
	(0.158)	(0.159)	(0.156)	(0.157)
Female	-0.022	-0.017	-0.027	-0.014
	(0.024)	(0.023)	(0.022)	(0.022)
Age	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Senator	0.044*	0.039*	0.053**	0.053**
	(0.023)	(0.023)	(0.022)	(0.022)
Constant	0.148	0.054	0.129	0.057
	(0.150)	(0.153)	(0.165)	(0.164)
Observations	2,665	2,665	2,665	2,665
State Fixed Effects	Yes	Yes	Yes	Yes
Congress Fixed Effects	Yes	Yes	Yes	Yes
R-squared	0.382	0.380	0.385	0.391

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. OLS Estimation Results for the 2002 and 2008 Farm Bills and for Farm Bureau Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Farm Bill 2002		Farm Bill 2008			Farm Bureau	
Variables	**Pass.**	**Conf.**	**Pass.**	**Conf.**	**Veto**	**Score**	**Friend**
Proportion of Career in Agriculture	0.032	-0.165	0.133	0.270	0.432**	0.149*	0.191**
	(0.190)	(0.276)	(0.161)	(0.186)	(0.189)	(0.085)	(0.089)
Proportion of Farm Constituents	5.690**	5.707	3.183***	5.940**	7.113**	2.480***	3.279***
	(2.705)	(4.140)	(1.201)	(2.571)	(2.940)	(0.590)	(0.786)
Log of Agricultural PAC Contributions	0.005	0.009	-0.004	0.003	-0.001	0.008**	0.017***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.003)	(0.003)
Republican	-0.197***	-0.136***	-0.696***	-0.390***	-0.382***	0.091***	0.364***
	(0.050)	(0.049)	(0.037)	(0.043)	(0.041)	(0.021)	(0.025)
Proportion of Republican Constituents	-0.536	-0.234	0.570**	0.118	0.436*	0.143	-0.289*
	(0.392)	(0.376)	(0.227)	(0.269)	(0.263)	(0.128)	(0.157)
Female	-0.047	0.080	0.043	0.067	0.076*	0.021	-0.014
	(0.068)	(0.064)	(0.040)	(0.048)	(0.045)	(0.017)	(0.022)
Age	-0.004*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Senator	-0.097*	-0.057	0.329***	0.115***	0.137***	0.045***	0.053**
	(0.058)	(0.054)	(0.050)	(0.042)	(0.040)	(0.017)	(0.022)
Constant	1.215***	1.061***	0.408***	0.820***	0.560**	0.551***	0.057
	(0.356)	(0.242)	(0.155)	(0.242)	(0.248)	(0.087)	(0.164)
Observations	504	511	508	513	513	894	2,665
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Congress Fixed Effects	-	-	-	-	-	Yes	Yes
R-squared	0.221	0.275	0.656	0.338	0.395	0.200	0.391

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. OLS Estimation Results for the 2002 and 2008 Farm Bills and for Farm Bureau Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Farm Bill 2002		Farm Bill 2008			Farm Bureau	
Variables	**Pass.**	**Conf.**	**Pass.**	**Conf.**	**Veto**	**Score**	**Friend**
Proportion of Career in Agriculture	1.189***	0.430	0.163	1.516***	1.638***	0.076	0.278
	(0.420)	(0.570)	(0.687)	(0.473)	(0.429)	(0.176)	(0.275)
Proportion of Farm Constituents	12.326***	17.240***	8.472**	16.884***	18.661***	3.009*	5.122***
	(3.562)	(4.879)	(3.501)	(3.873)	(4.001)	(1.762)	(1.676)
Log of Agricultural PAC Contributions	0.008	0.015	0.002	0.015*	0.009	0.007**	0.018***
	(0.010)	(0.009)	(0.008)	(0.008)	(0.008)	(0.004)	(0.004)
Proportion of Career in Agriculture	-0.223**	-0.031	0.084	-0.147	-0.076	0.099*	-0.001
× Log of Agricultural PAC Contributions	(0.104)	(0.139)	(0.163)	(0.124)	(0.117)	(0.058)	(0.068)
Proportion of Career in Agriculture	-9.809***	-15.274**	-22.670*	-39.246**	-55.059***	-16.805***	-2.929
× Proportion of Farm Constituents	(3.579)	(6.264)	(12.490)	(19.769)	(19.139)	(5.262)	(1.810)
Log of Agricultural PAC Contributions	-0.427	-1.224	-0.929	-1.969**	-1.888**	0.080	-0.272
× Proportion of Farm Constituents	(0.846)	(0.963)	(0.753)	(0.838)	(0.908)	(0.402)	(0.392)
Republican	-0.208***	-0.150***	-0.693***	-0.385***	-0.377***	0.089***	0.363***
	(0.050)	(0.049)	(0.037)	(0.043)	(0.041)	(0.021)	(0.025)
Proportion of Republican Constituents	-0.404	-0.070	0.639***	0.289	0.618**	0.132	-0.265*
	(0.395)	(0.374)	(0.228)	(0.271)	(0.262)	(0.131)	(0.159)
Female	-0.040	0.087	0.042	0.068	0.075*	0.020	-0.013
	(0.067)	(0.062)	(0.039)	(0.048)	(0.044)	(0.017)	(0.022)
Age	-0.005**	-0.001	-0.001	-0.002	-0.002	-0.001*	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Senator	-0.099*	-0.060	0.327***	0.104**	0.128***	0.046***	0.053**
	(0.058)	(0.054)	(0.051)	(0.043)	(0.042)	(0.016)	(0.022)
Constant	1.087***	0.873***	0.373**	0.669***	0.465*	0.567***	0.042
	(0.343)	(0.251)	(0.154)	(0.257)	(0.245)	(0.090)	(0.165)
Observations	504	511	508	513	513	894	2,665
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Congress Fixed Effects	-	-	-	-	-	Yes	Yes

R-squared	0.239	0.305	0.660	0.359	0.422	0.203	0.392

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1