

THREE ESSAYS IN PUBLIC CHOICE

by

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DEDICATION

I dedicate this dissertation to my wife, Jaclyn, who is awesome.

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I would like to thank my wife for keeping our family together as I pursued my studies. Her sacrifices cannot be repaid, and I am eternally blessed to call her my wife. Thank you, Thomas Stratmann, for your guidance and direction in completing my research. Finally, I am grateful for my father-in-law, Mike, who moved across the country to care for my daughter, allowing me to finish my research.

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ABSTRACT

THREE ESSAYS IN PUBLIC CHOICE

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This dissertation consists of three papers on public choice. The first chapter examines the relationship between money and roll call votes using 1990s dairy legislation data. Dairy farmers have competed with processors and grocers to maintain government protection since the Great Depression. If money affects roll call votes, then evidence will be found for votes affecting low salient, concentrated interests. Using a legislator fixed effect logit model, the results show that farmers and the competing processors and processors' contributions increase the probability of voting for their respective interests.

The second chapter explores relationships between pork-barrel spending and incumbent re-election. In 2011, Congress banned earmarks and eliminated one avenue to claim credit for pork-barrel spending. After the ban, the desire to bring additional federal spending back to home districts did not dissipate, but the process of gaining additional spending became more opaque. The opaque nature of the process makes it more difficult for legislators to obtain and receive credit from voters. One available channel to gain

additional spending is to use informal relationships with the executive branch to obtain additional spending. Agency leadership with more political appointees allows more opportunities for legislators to engage leaders. The results find positive correlations between bringing additional spending from politically responsive agencies and increased vote share.

The third chapter uses a synthetic control model to analyze Maine's voting system change from first-past-the-post to rank choice voting in 2018. Instrumental voting predicts lower voter turnout, and expressive voting predicts higher voter turnout when the voting system switches to ranked choice voting. Research and economic theories of voting indicate that rank choice voting would increase third-party voter turnout. However, this paper does not find evidence that rank choice voting increases voter turnout or third-party voter turnout in the House of Representatives. Furthermore, the synthetic control estimator demonstrates that rank choice voting does not have a causal effect on voter turnout or third party voter turnout.

1. EFFECT OF CAMPAIGN CONTRIBUTIONS ON LEGISLATOR BEHAVIOR: INTRA DAIRY INDUSTRY INTEREST GROUP COMPETITION

I. Introduction

United States dairy farmers have maintained government support for dairy farmers dating to the Great Depression. This government support increased dairy prices (Sumner and Balagtas 2002). Since the mid-20th century, dairy farmers have received government benefits from minimum dairy prices. The 1996 farm bill significantly reduced dairy price supports and minimum fluid milk price guarantees.¹ A roll call vote passed this reduction in the US House of Representatives on an amendment to that farm bill. The implementation of this amendment was scheduled for implementation within three years. However, before the 1996 reforms were due to be applied, in 1999, the House passed a bill repealing the 1996 farm bill dairy reforms.

One explanation for the dairy interest group's success in securing government price supports and minimum prices is that dairy interests are concentrated, and the interests of consumers are diffuse, providing a situation that favors the organization of dairy lobbies instead of milk consumer lobbies (Olson 1965). However, one interesting aspect of this topic is that there are other concentrated interests in the milk industry, such

¹ Farm bill is an omnibus, multi-year law that governs a variety of agricultural and food programs. Not all agricultural legislation is in the farm bill, but it provides for comprehensive and periodic opportunities to address agricultural issues. The farm bill is typically renewed every five to six years (Congressional Research Service 2019).

as milk processors and grocery stores, favoring lower milk prices. Thus, the question arises whether competing lobbies might have offsetting effects, which might mitigate any welfare-reducing impact of lobbying efforts and campaign contributions on policy outcomes.

Analyzing roll call votes and campaign finance is a challenge because variables that are unobserved or hard to measure, such as ideological constituency leanings or those of legislators, can affect representatives' roll call voting decisions and the campaign contributions they receive from interest groups. These challenges are captured at length by Hall and Wayman (1990), Kalla and Brockman (2015), Powell and Grimmer (2016), and Wright (1985). One solution to this challenge is to analyze repeated votes on the same subject using a legislator fixed effect logit model. Effectively, this approach implies using that variation in the empirical model from legislators who switched their votes (Stratmann 2002, Grier, Grier and Mkrtchian 2021). In this study, I study whether campaign contributions from competing dairy interests can explain changes in Representatives' voting behavior between the 1996 and 1999 dairy votes.

The campaign contribution literature has mixed results concerning campaign contributions' effects on roll call voting. One view posits that campaign contributions are consumption goods, not intended to influence policy outcomes (Ansolabehere, de Figueiredo and Snyder 2003). Another theory posits an exchange of campaign contributions for legislative votes. One piece of evidence supporting the latter view comes from Stratmann (2005), who finds that campaign contributions affect roll call votes conditioned upon studies controlling for potential simultaneous determination of

contributions.² Additionally, Roscoe (2005) finds that campaign contributions affect one-third of roll call votes.^{3,4} Specific to agriculture, Stratmann (1995) found campaign contributions timing affected whether farm interests successfully impacted legislators' voting decisions. Grier (2022) found "Big Sugar" significantly increased campaign contributions to House districts between 2013 and 2018 Farm Bill votes, and these high contributions raised the probability that targeted representatives voted with "Big Sugar" and not reform sugar subsidies. Stratmann (2002) found changes in contribution level determine changes in roll-call voting for financial services legislation, competing groups are partially offsetting, and junior legislators are more responsive to changes in contribution levels than senior legislators.

First, I document how the dairy farmers competed against processors and grocers' interests for legislators' votes with campaign contributions. Farmer groups contributed to about the same number of legislators in the 1995/96 election cycle as processor and grocer groups, but farmer groups contributed to more legislators in the 1999/2000 cycle. Using a legislator fixed effects logit model, I show that the increased contributions by farmers raised the likelihood of recipients to vote in favor of the farmers' interests, thus switching their 1996 votes which supported the phaseout of the dairy support program, to

² Matter (2019) finds a link between House narrowly passed bills and well times campaign contributions.

³ In the Great Financial crisis, politicians' voting behavior were sensitive to campaign contributions if they were seeking re-election, whereas incumbents who were set to retire were not sensitive to campaign contributions (Mian, Sufi and Trebbi 2010).

⁴ Anzia and Berry (2011) used district fixed effects to show that women who replace men as legislators in the same district secure more federal discretionary spending than congressmen. Berry, Burden, and Howell (2010) used district and county fixed effects to study the relationship between the president and federal spending distribution. Kriner and Reeves (2012) used county fixed effects to show voters rewarded the president for increasing federal spending in co-partisan congressional districts. Rubenzer (2011) used district effects to study how the Cuban diasporic community affected U.S foreign policy towards Cuba.

a vote in 1999, that reinstated the dairy program. On the other side of the concentrated interests, that is, processor and grocer interests, I find that in some instances, a larger proportion of processor-grocers' contributions made a legislator switch from the 1996 vote favoring the interests of farmers to a 1999 vote favoring the interest of processor and grocers.

II. Hypotheses

Legislators' behaviors are motivated by the possibility of being re-elected, and campaign expenditures may increase re-election probabilities. If campaign expenditures contribute to re-election, incumbents face an incentive to exchange their services for campaign contributions from interest groups. Services legislators provide to their constituencies and donors are the positions taking on roll call votes. Thus I hypothesize those campaign contributions positively affect legislators' probability of voting for contributors' interests. That is, as interest groups donate more campaign contributions to legislators, the chance that they vote for the contributors' interests increases.

Kroszner and Stratmann (1998) assume legislators maximize contributions and develop a reputation to favor particular interest groups. Legislators will carve out and build their reputations by altering their behavior over time, maximizing contributions from favored interests. This model implies that junior legislators still developing a reputation are more responsive to changes in campaign contributions received when compared with the voting behavior of more senior members of Congress.

Reputation development applies most to issues where the legislator has not staked out a position. The federal dairy program is not an issue for which most legislators have staked out a position before entering office because it has low salience.

The federal dairy program benefits dairy farmers because it increases the prices of dairy products. The low salience of the dairy program provides farmers an advantage in seeking government subsidies leading to higher prices of dairy products, as consumers and taxpayers, who have dispersed interests, tend to be less organized and thus less well funded. While farmers do not tend to face strong opposition from consumers and taxpayers, the dairy industry has another set of concentrated interests: processors and grocers. Processors and grocers can potentially offset farmers' interests and, at the same time, benefit consumers. However, the processors and grocers have broader interests than dairy prices, such as other commodity prices, labor issues, processing, labeling, and food safety regulation. Therefore, dispersed interests across multiple issues predict that their contributions are less potent for Representatives' voting decisions on the dairy program. However, farmer, grocery, and processor contributions affect legislative voting behavior.

III. Institutional Background

The Roosevelt administration in 1933 established the Federal Milk Marketing Order (FMMOs) system during the Great Depression through the Agricultural

Adjustment Act (AAA) with the stated goal of assisting farmers facing low milk prices (Congressional Research Service 2017). Proponents of FMMOs justified this program because farmers were in a challenging market position that could lead to instability in the supply and price of milk. Dairy price support programs, another government tool to assist farmers, originated by Congress by amending the AAA in 1935. Subsequently, the federal government purchased processed dairy products to lower the milk price. Since the Agricultural Act of 1949, the USDA has purchased butter, nonfat dry milk, and cheese from processors at administratively set prices to keep farm prices of manufacturing milk above legislated support prices (Sumner and Balagtas 2002).

Before the introduction of FMMOs, milk handlers transported and distributed milk for farmers and determined the price they would pay to farmers.⁵ The introduction of FMMOs provided farmers with negotiating power with milk handlers and required milk handlers to pay farmers uniform prices.⁶ As part of establishing milk prices, the United States Department of Agriculture's Agricultural Marketing Service administered a formal public hearing process. The USDA FMMO authorizes the minimum prices.⁷ The changes to an FMMO price became effective only after approval by farmers via a referendum (Agricultural Marketing Service, 2022).

⁵ A report from the Congressional Research Service (2017), suggests that dairy farmers are in a difficult market position because fluid milk is highly perishable, milk production has no distinct planting and harvesting season, liquid milk is more inelastic than other dairy products, and the dairy industry has high fixed costs.

⁶ At the time, the impact on the dairy product industry was minimal because dairy product purchases amounted to less than 1% of milk production (Erba and Novakovic 1995).

⁷ The Agricultural Marketing Agreement Act authorizes both the FMMOs and amendments to the Federal Order overseen by USDA.

Since the enactment of dairy price supports, farmers and processors have frequently been at odds in the semi-decennial farm bills (Coppess 2018). Between the 1990 farm bill and the 1996 farm bill, party control changed in the United States Congress and the executive branch. The executive branch went from Republican to Democrat with Clinton's win over Bush in 1992. The Republican party took over Senate and House Congress in 1994, and Republicans won in districts that had traditionally elected Southern Democrats who had favored traditional farm policy. In contrast, the newly elected Republicans emphasized market-oriented policies.

In 1996, the House of Representatives Agricultural Committee Chairman, Pat Roberts, proposed the Freedom to Farm Act, eliminating acreage reduction policies. This Freedom to Farm Act also replaced price-based assistance with fixed, annual payments on a declining basis that were decoupled from prices and production. There was an understanding among members of Congress that the dairy program was a contentious issue that risked de-railing the broader reforms. Therefore the dairy program would be one of the last roll call votes taken during the farm bill debate.⁸

The house had roll call votes on several amendments to the 1996 Freedom to Farm Act, all of which entailed the removal of price controls and other government programs supporting commodity prices. On February 28, 1996, Congressional Magazine reported an amendment proposing the phase-out of the peanut price support program that boosted peanut prices through government loans and production limits. That amendment

⁸ The dairy provisions were pulled from deficit reducing budget reconciliation bill four months prior to amendment votes (Hosansky 1996).

was defeated 209-212. On the same day, the peanut vote was followed by voting on a phase-out of the sugar program, with sugar cane planters opposing the passage and a coalition of manufacturers, consumer groups, and environmentalists favoring it (Hosansky 1996). This sugar amendment was defeated 208-217 vote. Both of these votes followed cotton producers defeating an amendment eliminating marketing loans 167-253.

In the months leading up to the amendment votes, negotiations about the dairy program were constantly changing. In January 1996, the AP reported a deal backed by Steve Gunderson, the agricultural livestock and dairy subcommittee chair. This deal would raise the minimum price farmers received for milk, maintaining the same price for consumers while saving taxpayers at least \$500 million over seven years. The National Milk Producers backed the proposal, but the deal was met by objections from the industry group for bottlers, ice cream makers, and other dairy manufacturers concerned its members' production costs would increase (Associated Press 1996).

In February 1996, the Rules Committee Chairman Gerald Solomon, R-NY, proposed a dairy amendment to the 1996 farm bill to end butter, cheese, and dairy price supports after a five-year phase-down. In addition, the amendment consolidated the 33 federal milk marketing orders (FMMO) into no more than 10 to 14 by the end of 2000, requiring the United States Department of Agriculture to create new federal milk marketing orders regions. The Solomon amendment further guaranteed California continued to set its standards for pricing and milk solids.⁹ Milk solids are the non-water

⁹ HR 1402 did not include any provision about California setting its own milk standards. The California provision in the Solomon Amendment is the one difference between the two votes. A specification dropping California legislators is included in the robustness section.

portion of fluid milk, including fat, protein, carbohydrates, and minerals (International Dairy Foods Association 2022). This dairy amendment passed on a 258-164 vote.

In the 1996 farm bill, the farmers defeated cotton, peanut, and sugar price support reduction amendments (Lewis, et al. 2022). The only amendment to go against farming interests was dairy. Gunderson tried to remove the language associated with the amendment in conference with the Senate. Still, Senate Agriculture Committee Chairman Lugar backed the House language, and it became part of the final legislation (Hosansky 1996). Following the passage of the House dairy amendment, Section 143 of the 1996 farm bill introduced a sunset date, requiring the USDA to reduce milk marketing orders within three years using informal rulemaking procedures and reduced dairy price supports.¹⁰ This 1999 sunset date was critical for the farmers' and processor-grocers' interests to win or lose the fight over dairy provisions.¹¹ This was because dairy price supports ended on December 31, 1999, and the new FMMO took effect on October 1, 1999, unless blocked by Congress (Pope 1999).

In March 1999, the Clinton Administration USDA proposed 11 FMMO regions under the 1996 farm bill. For most states, this proposal would have cut the prices processors and grocers pay for fresh milk (Congressional Quarterly 1999). At the same time, the semi-decennial Farm bill following the 1996 bill was not scheduled for another few years. Between 1996 and 1998, the National Milk Producers claimed an 11% decline

¹⁰ The price support plan for 1996 was \$10.35 per hundredweight, \$10.20 in 1997, \$10.05 in 1998, \$9.90 in 1999 and eliminated in 2000 (Congressional Research Service 1996).

¹¹ The explicit nature of the timing was evident by pro-reformer Paul Ryan after losing the HR 1402 285-140 (Eleventh Hour Dealing Clears Way for Passage of New Dairy Pricing Plan 1999): "We accomplished two things," Ryan said. "We delayed the vote until today and we educated our colleagues ... about an antiquated, Soviet style pricing scheme."

in the number of dairy farms due to low milk prices, pressures on land values, and farm consolidation (National Dairy Producers Federation 1999). The opponents of the USDA plan claimed it would put constituent farmers out of business. Rep Roy Blount of Missouri introduced bill HR1402 with 138 co-sponsors to override the USDA decision and maintain the FMMO status quo prices before the 1996 bill for many states. The status quo FMMO system would keep fluid milk prices elevated for consumers. The bill passed 285-140 in favor of dairy farm interests (Lewis, et al. 2022). The provisions in HR1402 were ultimately included in the catch-all appropriations legislation for the fiscal year 2000 (Congressional Quarterly 1999). Keeping the price supports in place would keep dairy product prices higher for consumers and taxpayers financing dairy price supports.

IV. Model and Data

I estimate a legislator fixed effect logit model to examine the effect of campaign contributions and roll call votes. This model is

$$prob(y_{it} = 1 | \beta, X, a) = F(\beta' X_{it} + a_i) \quad t=1,2 \quad (1)$$

where y_{it} equals at 1 if the vote cast is pro-dairy farmer and 0 otherwise.¹² For this model, t indexes either 1996 or 1999, and the matrix X_{it} includes variables for farmers' and processor-grocers' contributions and control variables.

Legislator fixed effects a_i control for legislator-specific characteristics that are constant over time for each legislator. Due to these fixed effects, this analysis uses only

¹² In 1996 a "nay" vote was designated as a pro-farmer vote, and in the 1999 vote, an "aye" was designated a pro-farmer vote.

legislators who changed their vote. This is because legislators voting in favor or opposed to dairy farmer interests do not generate any variation in the dependent variable of this legislator fixed-effects model. Additionally, as this legislator fixed effects model is estimated using legislator and legislator district characteristics, I cannot include legislator time-invariant characteristics such as party affiliation or nonchanging district characteristics such as the district size. However, my model allows for the inclusion of variables that change over time. Thus, in addition to campaign contributions, X_{it} includes the number of milk cows as a control. The National Agricultural Statistical Service collected the number of milk farms by congressional district in the 1992 and 1997 Agricultural Census (National Agricultural Statistic Service 2019). Other control variables include ideology as measured by American Conservative Union (ACU) adjusted scores and seniority (Groseclose, Levitt, & Snyder, 1999).^{13, 14}

In a separate specification, I also account for junior legislators establishing their reputation that will allow them to attract contributions. I define junior legislators as those who have been US Representatives for less than four terms before the 1996 vote.

While the dairy roll call votes occurred in 1996 and 1999, contributions occurred before, during, and after this interval. Therefore, my main estimates consider campaign contributions from the 1995-96 election cycle and the 1999-2000 election cycle.

¹³ I also explored other time varying control variables such as Median Income and Poverty Rate, but their inclusion or exclusion did not affect the results.

¹⁴ Adjusted American for Democratic Action and DW-Nominate (Lewis, et al. 2022) scores were used as crosscheck in the analysis. Adjusted ADA scores were positive and statistically significant meaning the more liberal lawmakers voted for farmers and required imputation for a few legislators. DW-Nominate was also statistically significant but more conservative lawmakers were voting for farmers. Adjusted ACU had negative coefficient which was consistent with the Adjusted ADA scores but was not statistically significant and did not require imputation.

I obtained roll call votes from Voteview and the Political Action Committee (PAC) campaign finance data from the Federal Election Commission (Lewis, et al. 2022). The individual contributions by the employer come from the Database on Ideology, Money in Politics, and Election (DIME) (Bonica 2016). I obtained the names of dairy farmers, processors, and grocery PACs for each election cycle from the Open Secrets website (Center for Responsive Politics 2019). I added PACs to this list based on searches of newspaper archives, farm, processor, grocery organization websites, and FEC data listing the universe of registered PACs. Table 1-12 lists the pro-farmer, pro grocer, and pro- processor PACs.

V. Results

Table 1-1 provides descriptive statistics for the 301 Representatives who participated in the 1996 and 1999 dairy roll call votes. Table 1-1 shows that farmers' contributions decreased from the 1995-6 to the 1999-2000 election cycle in both the average donation and the standard deviation of campaign contributions, the latter indicating a more even distribution of contributions among these legislators. Conversely, the pro-processor-grocer average contributions remained constant, and the standard deviation rose.

The left panel of Table 1-2 shows the descriptive statistics for those 163 legislators who switched their position from the first to the second vote. The right panel shows the descriptive statistics for the 138 legislators who did not switch their positions. When comparing legislators who switched their position with legislators who did not

switch their position in both election cycles considered, there is no statistically significant difference in means for farmer contributions. However, non-switchers received statistically significantly more processor-grocers' contributions in both election cycles.¹⁵ With respect to the observable characteristic used in the regression analysis as controls, seniority, ideology, and dairy constituency interests as measured by the number of milk cows is not statistically significant between switchers and non-switchers.

Table 1-3 shows a cross-tabulation of the voting behavior for the 301 legislators participating in both votes. This table reflects that in 1996 farm interests lost on a 116-185 vote, and in 1999 won on a 199-102 vote. Further, this cross-tabulation shows that 123 legislators switched their vote in 1999 to a pro-farmer position, and 40 legislators switched their vote to a pro- processor-grocer position.

Neither the 1996 votes nor the 1999 votes break down along partisan lines. Of the 123 legislators who voted pro-processor-grocers in 1996, 53 Democrats and 70 Republicans changed to a pro-farmer vote in 1999. Of the 40 legislators who voted for pro-farmer interests in 1996, 17 Democrats and 23 Republicans voted for pro-processor-grocer interests in 1999.¹⁶

¹⁵ Pro farmer non-switchers received on average \$4,901 from farmers and \$2016 from processors and grocers in 1995/1996 election cycle. In 1999/2000 election cycle they received on average \$2016 from farmers and \$3176 from processors and grocers. Pro-Processor-grocers non-switchers received on average \$791 from farmers and \$2473 from processors and grocers in 1995/1996 election cycle. In 1999/2000 election cycle they received on average \$294 from farmers and \$3124 from processors and grocers.

¹⁶ A similar pattern emerged among legislators who consistently voted for and against dairy farmer interests. 36 Democrats voted pro-farmer interests in 1996 and 1999 while 40 Republicans voted for farmer favored position in these two years. Among Democrats, 29 legislators voted against farmer interests in 1996 and 1999 and 33 Republicans voted against farmer interests in these two years.

For the switchers, Table 1-4 shows a cross tabulation for the number of legislators who received positive or zero contributions in 1995-96 from farmer PACs and processor-grocer PACs, while Table 1-5 shows the same information for 1999-2000 contributions. Comparing both tables shows that processor-grocers PACs reduced the number of legislators who received their contributions from the first to the second vote from 125 to 96. In comparison, farmer PAC increased the number of legislators to whom they contributed from 115 to 130.¹⁷

Table 1-4 shows processor-grocers contributed to more legislators who switched their vote in 1995/1996, but Table 1-5 farmers contributed to more legislators who switched their vote in 1999/2000. In 1996, 13 legislators and in 1999, 20 legislators who switched their vote did not receive any campaign contributions from farmers or processors-grocers. Still, they are not always the same legislators receiving no contributions. For example, the legislators who switched their votes from processors-grocers to farmers received an additional \$685 from farmers, receiving \$759 less from processors-grocers.¹⁸ In summary, the data shows farmers contributed to more legislators in 1999 and reduced contributions to other legislators.

Table 1-6 presents the correlations between 1995-1996 campaign contributions and the 1996 vote. Farmer contributions are correlated with voting for farmer interests in the 1996 amendment vote at a statistically significant level. Interestingly, in 1995-1996,

¹⁷ This is consistent with (Groseclose and Snyder 1996) , who find that if a supermajority coalition may be cheaper than minimum winning coalitions because if vote buying move sequentially, the losing vote buyer is granted a chance to attack the winner's coalition, making the minimal winning coalition more expensive than supermajority coalition.

¹⁸ Table 1-13 includes a breakdown of farmers' and processor-grocers' contributions to legislators by how the legislator voted in 1996 and 1999 votes.

processor contributions are also positive and statistically significantly correlated with the 1996 vote favoring farmer interests. However, for the 1999-2000 contribution and the 1999 vote, the correlations coefficient between processor and grocer contributions and the pro-farmer vote switches signs (Table 1-7). The correlations coefficient for grocer contributions is not statistically significant in either Table 1-6 or Table 1-7, but the processor and grocer correlation coefficient switches signs. The positive contribution correlation coefficient between the opposing interests reflects that both groups compete for the same legislators.¹⁹

Table 1-8 presents the odds ratios and the corresponding p-values for the conditional fixed-effect model without time-varying control variables.²⁰ Consistent with my prediction, the regression specification reported in Table 1-8, Column 1 shows that the odds ratios for farmer PAC contributions are above one and statistically significant at the 1 percent level, using a two-tailed test. Processor-grocer contributions have an odds ratio of less than one and are also statistically significant at the 1 percent level. The specification in Table 1-8, Column 2 uses the difference between farmers' and processor-grocers' contributions. These results are consistent with the results in Column 1 in that the contributions from the competing interests are partially offsetting with respect to their impact on legislators' voting behavior. This is because the odds ratio, while above one, indicates a legislator is 1.35 times more likely to vote for farmers when he received

¹⁹ Farmers and Processors contributions have a .54 and .44 correlation coefficient in 1995/1996 and 1999/2000 election cycle. Farmers and Grocers contributions have a .17 and .25 correlation coefficient in 1995/1996 and 1999/2000 election cycle. All correlations coefficients are statistically significant.

²⁰ 138 legislators are excluded who did not change their votes in the regression analysis because their voting behavior does not generate within legislator variation.

\$1000 more contributions from farmer PACs than from processor-grocer PACs. The estimates in Column 1 indicated a 2.29 more likely to vote for farmers for a \$1000 increase in farmer contributions and 1.21 times more likely to vote for pro-processor-grocer interests for an additional \$1000 contribution.

Table 1-8, Column 3 presents the results for junior legislators, and the estimates indicate that dairy PAC campaign contributions have a major impact on influencing the voting behavior of junior legislators compared to the overall sample of switchers (Table 1-8, Column 1 and Columns 2). However, the impact of processor-grocers is similar between the full sample of legislators and that of the subset of junior legislators. Similarly, the difference in contributions between both opposing interests has a similar effect in both samples. However, while the sample of junior legislators is only about two-thirds of the size of the overall sample, the estimates remain statistically significant at similar levels as when the regressions are based on the entire sample.

Table 1-9 shows the estimation results corresponding to the specification reported in Table 8 when including time-varying control variables. While the odds ratios for farmer PAC contributions increase by about .5, the other odds ratios for contributions variables are similar as in Table 1-8. Among the control variables, seniority has a statistically significant positive effect on voting for farm interests, while the estimates for ideology and the milk cow variables are not statistically significant. Processor-grocers' contributions to the total sample are negative and statistically significant.

Figure 1-1 plots the marginal effects of farmer money on the probability of voting in favor of farmer interests. The solid line represents the estimated effects, the dotted

lines describe the 95% confidence interval, and the gray shading portrays the histogram of farmers' contributions. For example, at zero contributions, the probability of voting for farmers is below .25 but rises above .5 with \$2000 contributions.

In contrast to the farmers, Figure 1-2 shows with no processor-grocers' contributions, the likelihood of voting for farmers is above .5, and \$2000 brings the probability of voting for farmers below .5. The confidence interval for the processors also widens with the increase in contributions because of fewer observations. As a result, the estimates with wider confidence intervals are less reliable than the narrower confidence intervals.

Figure 1-3 evaluates the offsetting nature of intra-industry contributions. There is a higher than a .5 probability of legislators voting for farmers' interests with equal contributions from farmers and processor-grocers. However, once processor-grocers' contribution exceeds farmers' contributions by \$1,000, the probability of voting for farmers' interests drops below .5 and is below .25, with a \$4,000 advantage in contributions.

VI. Robustness

One reason of concern regarding the comparability of the 1996 and 1999 amendments is that in 1996 Congress added California's separate marketing order. To address this concern, I dropped the California representatives from my sample. Table 1-10, Column 1, does not include the CA legislators. The results show a larger magnitude for farmers and remain statistically significant, and processor-grocers' magnitude

increases slightly and is still statistically significant. The removal of the legislators did not alter the conclusions from the relationship between the interest group campaign contributions and voting for farmers' interests. Table 1-10, Column 2 removes the Agriculture Committee members from the sample to see if the results remain without Agriculture Committee members. The odds ratios did not drastically change for any variable when excluding Agricultural Committee members. Column 3 looks at the 1995/96 election cycle and 1997/98 election to evaluate whether the contributions were a quid pro quo as pre-payment before the roll call votes or reward for voting the donors' interests. Table 1-10, Column 3 farmers' coefficient indicates farmers' relationship could be a pre-payment for roll call voting as the 1997/98 contribution occurred before HR 1402 vote. The processor-grocers' contributions are now not statistically significant, which supports the theory that the processor-grocers' contributions are rewards for voting processor-grocers' interests versus pre-payment. Column 4 looks at a narrower time frame for contributions occurring in the same election as the roll call votes but before the votes occurred. The farmers' contributions remain statistically significant and above one, whereas the processor-grocers' contributions odds ratio is above one and not statistically significant. The pre-vote contribution regression reinforces the point that farmers' contributions could be pre-payment for roll call votes, and processor-grocers' contributions are more like rewards for voting in the donors' interests.

VII. Alternative Processor Definition

The processor-grocers' PAC competing against the farmers throughout the paper includes diverse interests ranging from dairy processor Dean Foods to grocery store chain Kroger. An alternative definition for processor-grocers' PAC focuses exclusively on dairy processors or exclusively on grocers. The processors' definition has more concentrated interests than the broader grocer category and would predict a greater effect per dollar contribution. For comparison, the average processors' contribution amount in the base grocer and processor definition is \$2605 compared to \$903 for processors in 1996. Table 1-11 presents the results for the alternative interests opposing farmers. As predicted, the processors' contributions have a larger effect than the grocer', illustrated by the lower odds ratio in Column 1 vs. grocers' odds ratios in Column 2. This result holds when adding controls. The specification in Column 6 has odds ratios that are not statistically significant; however, they are jointly significant.

VIII. Conclusion

Determining whether campaign contributions buy roll call votes for interest groups is difficult because unobserved variables can affect votes and campaign finance. So instead, I look at two votes on dairy legislation on the same subject at different periods and find some support for increasing campaign contributions increases the probability of voting for interest group priorities. The paper also finds some support for campaign contributions being rewards from contributors for voting for their interests.

Table 1-1. Summary Statistics for State and District Level Spending Data (N= 301)

Variable	Mean	S.D	Minimum	Maximum
Vote 1996 1= vote for farmer interest	0.385	0.487	0	1
Vote 1999 1= vote for farmer interest	0.661	0.474	0	1
Farmers' Contributions, 1995-96, Inflation Adjusted	2,702	3,745	0	21,664
Farmers' Contributions, 1999-2000, Inflation Adjusted	1,858	2,533	0	16,974
Processor/Grocers' Contributions, 1995-96, Inflation Adjusted	2,605	3,321	0	18,192
Processors/Grocers' Contributions, 1999-2000, Inflation Adjusted	2,594	4,354	0	27,584
Seniority, as of 1995	4.3	3.5	0.5	20.5
ACU Adjusted, 1995	52	33	7	88
ACU-Adjusted, 1999	52	34	8	98
LN(Milk Cows) Census of Agriculture, 1992	3.86	2.36	0.00	8.55
LN(Milk Cows) Census of Agriculture, 1997	3.68	2.29	0.00	8.35

Notes: N=301 includes all Representatives of the US House who voted on the dairy amendments in 1996 and 1999. Dollars are inflation adjusted to real 1999 dollars.

Table 1-2. Summary Statistics District Level Spending Data: Switchers and Non- Switchers

Variable	Non-Switchers (N= 138)				Switchers (N= 163)				<u>Difference in Means</u>
	Mean	S.D	Min	Max	Mean	S.D	Min	Max	p-Value
Vote 1996 1= vote for farmer interest	0.551	0.499	0	1	0.245	0.431	0	1	
Vote 1999 1= vote for farmer interest	0.551	0.499	0	1	.754	0.431	0	1	
Farmers' Contributions, 1995-96, Inflation Adjusted	3,055	4,180	0	21,664	2,403	3,319	0	17,377	0.133
Farmers' Contributions, 1999-2000, Inflation Adjusted	1,639	2,599	0	16,974	2,044	2,468	0	12,839	0.167
Processors/Grocers' Contributions, 1995-96, Inflation Adjusted	2,221	3,162	0	18,192	2,936	3,425	0	15,537	0.062
Processors/Grocers' Contributions, 1999-2000, Inflation Adjusted	3,153	5,251	0	27,584	2,121	3,360	0	20,740	0.040
Seniority, as of 1995	4.5	3.85	0.5	20.5	4.2	3.2	0.5	13.5	0.471
ACU Adjusted, 1995	51	34	7	88	53	33	7	88	0.544
ACU Adjusted, 1999	51	34	8	98	52	34	8	98	0.613
LN(Milk Cows) Census of Agriculture, 1992	3.70	2.48	0.00	7.77	4.00	2.25	0.00	8.55	0.265
LN(Milk Cows) Census of Agriculture, 1997	3.53	2.37	0.00	7.57	3.81	2.21	0.00	8.36	0.313

Notes: N=163 includes all Representatives of the US House who switched sides on their votes on the dairy amendments in 1996 and 1999. N=138 includes all Representatives of the US House who did not switch sides on their votes on the dairy amendments in 1996 and 1999. Dollars are inflation-adjusted to 1999 real dollars.

Table 1-3. Cross Tabulations of the 1996 and 1999 Votes

	Vote in 1999 = 0	Vote in 1999 = 1	1996 Vote Sum
Vote in 1996 = 0	62	123	185
Vote in 1996 = 1	40	76	116
1999 Vote Sum	102	199	301

The observation unit is a Representative who voted on the 1996 and 1999 amendments. The vote is coded as one if it is pro-farmer interests and zero if it is pro-grocer and pro-processor interests.

Table 1-4. Cross Tabulations of Vote Switchers Receiving Competing Contributions in 1995-1996

	Farmers Contributions = 0	Farmer Contributions >0	Processor/Grocer Sum
Processor/Grocer Contributions = 0	13	25	38
Processor/Grocer Contributions > 0	35	90	125
Farmer Sum	48	115	163

The unit of observation is a Representative who voted on the 1996 and the 1999 amendment and switched their positions.

Table 1-5. Cross Tabulations of Vote Switchers Receiving Competing Contributions in 1999-2000

	Farmers Contributions = 0	Farmer Contributions >0	Processor/Grocer Sum
Processor/Grocer Contributions = 0	20	47	67
Processor/Grocer Contributions > 0	13	83	96
Farmer Sum	33	130	163

The unit of observation is a Representative who voted on the 1996 and the 1999 amendment and switched their positions.

Table 1-6. Pairwise Correlations for 1996 Vote Switchers and 1995-1996 Contributions

	1996 Vote	Farmer Contributions	Processor Contributions	Grocer Contributions
Farmer Contributions	0.498***			
Processor Contributions	0.229***	0.538***		
Grocer Contributions	0.004	0.253***	0.345***	
Farmer minus Processor/Grocer Contributions	0.347***	0.495***	-0.253***	-0.600***

Note: Number of Observations = 163 and *** p<0.01, ** p<0.05, * p<0.1

Table 1-7. Pairwise Correlations for 1999 Vote Switchers and 1999-2000 Contributions

	1996 Vote	Farmer Contributions	Processor Contributions	Grocer Contributions
Farmer Contributions	0.073			
Processor Contributions	-0.191**	0.443***		
Grocer Contributions	-0.008	0.168**	0.338***	
Farmer minus Processor/Grocer Contributions	0.156**	0.382***	-0.423***	-0.738***

Note: Number of Observations = 163 and *** p<0.01, ** p<0.05, * p<0.1

Table 1-8. The Effects of Campaign Contribution Changes on Roll Call Votes: No Controls

VARIABLES	Full Sample		Junior Legislators	
	(1)	(2)	(3)	(4)
Farmers	2.295 (0.009)		3.007 (0.004)	
Processors/Grocers	0.827 (0.010)		0.832 (0.082)	
Farmers minus Processors/Grocers		1.348 (0.000)		1.355 (0.006)
Pseudo R-Squared	0.28	0.15	0.40	0.19
Observations	326	326	184	184

Note: The numbers above the parentheses are odds ratios. In parentheses are p- values using a two-tailed test with clustered standard errors by the legislator. Contributions are expressed in thousands of dollars. Contributions are from the 1995/1996 and 1999/2000 election cycles. The dependent variable equals 1 for farmer interests and 0 otherwise. All specifications include legislator-fixed effects. Columns 1 and 2 are based on the 163 Representatives who changed their voting behavior. The specifications in Columns 3 and 4 are based on 92 junior Representatives who changed their voting behavior. A junior Representative is a legislator who served less than four terms in Congress.

**Table 1-9. The Effects of Campaign Contribution Changes on Roll Call Votes:
Including Controls**

VARIABLES	Full Sample		Junior Legislators	
	(1)	(2)	(3)	(4)
Farmers	2.887 (0.020)		4.297 (0.020)	
Processors/Grocers	0.879 (0.028)		0.912 (0.265)	
Farmers minus Processors/Grocers		1.344 (0.000)		1.357 (0.001)
ACU (Adjusted)	0.978 (0.552)	0.995 (0.855)	0.938 (0.237)	0.998 (0.952)
Seniority	2.522 (0.000)	1.988 (0.000)	5.418 (0.000)	2.831 (0.000)
LN(Milk Cows)	0.927 (0.820)	1.680 (0.048)	13.04 (0.111)	9.225 (0.027)
Pseudo R-Squared	0.56	0.36	0.74	0.47
Observations	326	326	184	184

Note: The numbers above the parentheses are odds ratios. In parentheses are p- values using a two-tailed test with clustered standard errors by the legislator. Contributions are expressed in thousands of dollars. Contributions are from the 1995/1996 and 1999/2000 election cycles. The dependent variable equals 1 for farmer interests and 0 otherwise. All specifications include legislator-fixed effects. Columns 1 and 2 are based on the 163 Representatives who changed their voting behavior between the two election cycles. The specifications in Columns 3 and 4 are based on 92 junior Representatives who changed their voting behavior. A junior Representative is defined as a legislator who served less than four terms in Congress.

**Table 1-10. The Effects of Campaign Contribution Changes on Roll Call Votes:
Robustness Tests**

VARIABLES	(1)	(2)	(3)	(4)
Farmers	11.82 (0.000)	2.665 (0.050)		
Processors/Grocers	0.782 (0.004)	0.890 (0.047)		
Farmers' Contributions 95/96 & 97/98			1.920 (0.001)	
Processors/Grocers' Contributions 95/96 & 97/98			0.956 (0.519)	
Pre-Vote Farmers' Contributions in 95/96 & 99/2000 Cycles				1.768 (0.034)
Pre-Vote Processors/Grocers' Contributions in 95/96 & 99/2000 Cycles				1.049 (0.561)
ACU (Adjusted)	1.028 (0.577)	0.981 (0.590)	0.984 (0.545)	0.985 (0.523)
Seniority	3.968 (0.000)	2.407 (0.000)	2.394 (0.000)	2.373 (0.000)
LN(Milk Cows)	0.748 (0.651)	0.938 (0.838)	2.096 (0.063)	1.776 (0.058)
Pseudo R-Squared	0.74	0.49	0.38	0.31
Observations	298	276	326	326

Note: The numbers above the parentheses are odds ratios. In parentheses are p- values using a two-tailed test with clustered standard errors by the legislator. Contributions are expressed in thousands of dollars. Contributions are from the 1995/1996 and 1999/2000 election cycles. The dependent variable equals 1 for farmer interests and 0 otherwise. All specifications include legislator-fixed effects. The specification in Column 1 includes 298 observations because it excludes California legislators from the regression. The specification in Column 2 only has 276 observations because it excludes Agricultural Committee members. The specification in Column 3 looks at contributions in the 1995/96 and 1997/98 cycles, and the specification in Column 4 looks at contributions received before the roll votes occurred.

**Table 1-11. The Effects of Campaign Contribution Changes on Roll Call Votes:
Including Controls Considering Processor and Grocers as the Only Opposition to
Dairy Interests**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Farmers	2.136 (0.005)	2.234 (0.008)	2.293 (0.008)	2.820 (0.013)	2.864 (0.022)	2.873 (0.019)
Processors	0.784 (0.149)		0.825 (0.220)	0.759 (0.062)		0.779 (0.149)
Grocers		0.817 (0.030)	0.830 (0.049)		0.893 (0.247)	0.927 (0.471)
ACU (Adjusted)				0.977 (0.545)	0.979 (0.573)	0.978 (0.556)
Seniority				2.613 (0.000)	2.538 (0.000)	2.555 (0.000)
LN(Milk Cows)				0.926 (0.816)	0.950 (0.876)	0.920 (0.804)
Pseudo R-Squared	0.25	0.27	0.28	0.56	0.55	0.56
Observations	326	326	326	326	326	326

Note: The numbers above the parentheses are odds ratios. In parentheses are p- values using a two-tailed test with clustered standard errors by the legislator. Contributions are expressed in thousands of dollars. Contributions are from the 1995/1996 and 1999/2000 election cycles. The dependent variable equals 1 for farmer interests and 0 otherwise. All specifications include legislator-fixed effects. The specification in Column 1 includes processors only, the specification in Column 2 includes only grocers, and the specification in Column 3 includes processors and grocers as separate variables. Specifications in Columns 4,5, and 6 include control variables.

**Table 1-12. Dairy Farmer, Processor, and Grocer Political Action Committees
Contributing to US Representatives**

Dairy Farmer PACs	Processor PACs	Pro Grocer PACs
Agri-Mark, Inc Legislative and Educational Committee	Dean Foods Company Good Government Committee	Dairy Mart PAC Dairy Mart Convenience Stores Inc
Arizona Dairymen Political Action Committee	Ice Cream, Milk&Cheese Pac-Intl Ice Cream Assn, Milk Industry Fdtn &Natl Cheese Institute	Dominick's Finer Foods Inc PAC
Associated Milk Producers Inc PAC FKA North Central AMPI Inc PAC	Kraft Food Inc Political Action Committee	Food Distributor's Voice In Politics Cmte-Nat'l-Amer Whls Grocers' & Int'l Foodservice Dist
California Cooperative Creamery Federal Pac Of Dairy Farmers Of America Inc	Milk Marketing Inc Political Action Committee	Food Lion Inc Political Action Committee
California Cooperative Creamery Federal Political Action Committee	Suiza Foods Corporation Political Action Committee	Food Marketing Institute Political Action Committee
Committee For Thorough Agricultural Pol Ed Of Dairy Farmers Of America Inc	Blue Bell Creameries USA Inc PAC	Grocery Manufacturers Of America Inc Political Action Committee
Committee For Thorough Agricultural Political Education Of Associated Milk Producers, Inc	Pillsbury Company Political Action Committee	Hy-Vee Food Stores Inc Employees' Political Action Committee
Dairy Farmers Of America Inc Depac	Conagra, Inc. Good Government Association	Kroger Political Action Committee
Dairy Farmers Of America Inc MMI-PAC	Hershey Foods Corporation Citizenship Fund	National Association Of Chain Drug Stores, Inc. Political Action Committee
Dairy Farmers Of America Inc Political Action Trust	National Frozen Food Association Political Action Committee	National Association Of Convenience Stores Political Action Committee
Dairylea Cooperative Political Action Committee	Nestle USA Inc Political Action Committee	National Nutritional Foods Association Political Action Committee
Dairyman's Cooperative Creamery Association Political Action Committee		Ohio Grocers Association Ohio Food PAC

Danish Creamery
Association Federal
Political Action Committee
Darigold Political Action
Committee
Land O'lake Inc Political
Action Committee
Michigan Milk Political
Action Committee
Mid-America Dairymen,
Inc -Dairy Educational
Political Action Committee
National Milk Producers
Federation PAC
North Central AMPI Inc
Political Action Committee
Political Action Trust
Political Action Committee
Southeast Milk Inc
Political Action Committee
Western United Dairymen's
Association Federal
Political Action Committee
Dairymen Inc-Kentucky
Dairymen Inc-NC
Dairymen Inc- VA
Dairymen Inc-MS
Dairymen Inc-LA
Dairymen Inc-PA
Dairymen Inc MD

Note: List of Farmer, Processor, and Grocer PACs contributing to legislators.

Table 1-13. Legislators' Contribution Summary: Switchers vs. Non-Switchers

	1995/96	1999/2000
<i>Switch from Farmer to Processor/Grocer</i> (N=40)		
Farmer' Contributions	5,297 (1)	1,727 (14)
Processors/Grocers' Contributions	3,708 (10)	2,735 (13)
<i>Switch from Processor/Grocer to Farmer</i> (N=123)		
Farmer' Contributions	1,462 (47)	2,147 (19)
Processors/Grocers' Contributions	2,685 (28)	1,921 (54)
<i>Stayed with Farmers (N=76)</i>		
Farmer' Contributions	4,901 (9)	2,736 (13)
Processors/Grocers' Contributions	2,016 (25)	3,176 (27)
<i>Stayed with Processor/Grocer (N=62)</i>		
Farmer' Contributions	791 (35)	294 (45)
Processor/Grocers' Contributions	2,473 (28)	3,124 (28)

Note: Contributions are expressed in dollars. The number in parenthesis is the number of legislators who received zero contributions.

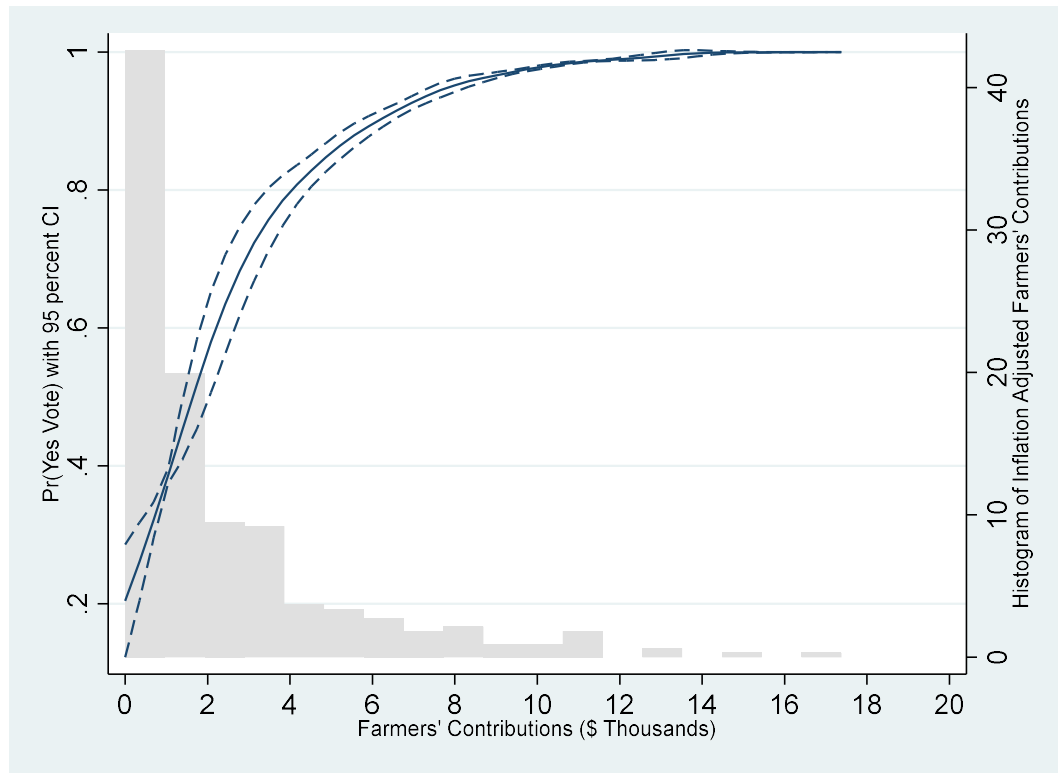


Figure 1-1. Dairy Farmers' Contributions Marginal Effect on Voting for Farmers
 Note: The X-Axis is farmers' PACs' contributions to legislators, and Y-Axis is the probability legislators vote in farmers' interests. The dash lines represent the 95% confidence interval.

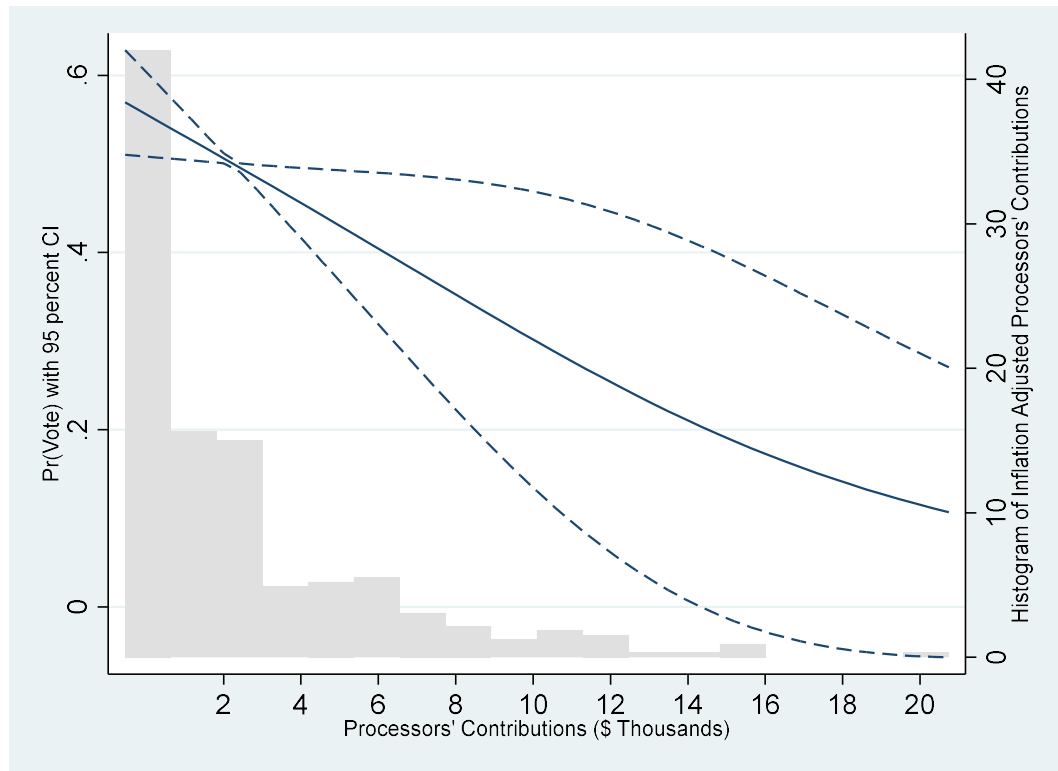


Figure 1-2. Processors/ Grocers' Contributions Marginal Effect on Voting for Farmers

Note: The X-Axis is the processor/grocers' PACs' contributions to legislators, and Y-Axis is the probability legislators vote in farmers' interests. The dash lines represent the 95% confidence interval.

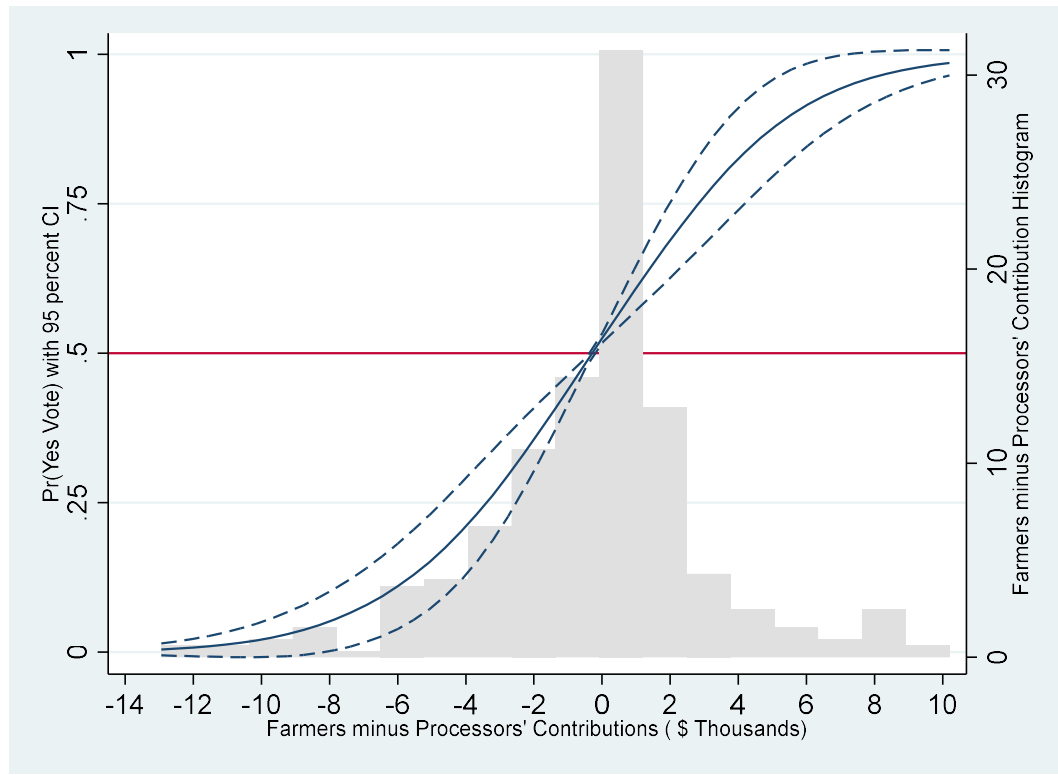


Figure 1-3. Farmers minus Processors/Grocers Contributions Marginal Effect on Voting for Farmers

Note: The X-Axis is farmers minus processor/grocers' PACs' contributions to legislators, and Y-Axis is the probability legislators vote in farmers' interests. Therefore, a negative value on X-Axis indicates processors and grocers contributed more than farmers to a legislator, and a positive value indicates farmers contributed more than processors and grocers. The dash lines represent the 95% confidence interval.

2. SOME REWARDS FOR PORK

I. Introduction

The popular theory in politics is legislature's primary job is to get re-elected. To get re-elected, congressional representatives must devote their time to constituent interests. An application of this theory to federal spending yields the prediction that representatives focus on obtaining more federal spending to distribute pork-barrel projects to constituents and get re-elected. Multiple theoretical models predict incumbents increase their chance of re-election through acquiring pork-barrel spending (Weingast, 1979; Weingast, Shepsle, & Johnson, 1981; Ferejohn & Krehbiel, 1987). For this to happen, legislators need to claim credit for pork, and voters need to recognize the claim to reward legislators. The empirical literature provides mixed evidence on the power of federal spending and electability (Balla, Lawrence, Maltzman, & Sigelman, 2002; Bickers & Stein, 1996; Lee, 2003). Some papers find evidence additional federal spending help incumbents (Levitt & Snyder, 1997; Stratmann, 2013).

Before 2011, congressmen could use earmarks to identify projects and claim credit for bringing pork-barrel spending back to their districts. After 2011, Congress banned earmarks, but the desire to bring additional federal spending back to one's district did not dissipate. The potential for incumbents to increase their chance of re-election through additional spending does beg the question, will additional spending affect different House members' electability more than others? Intuitively, vulnerable members of Congress should benefit most from additional federal spending. Anecdotally,

Congressmen have acted as if vulnerable members benefited more than safe members. Republican House leadership in the 1990s and 2000s kept lists of projects for vulnerable members and provided larger earmarks to vulnerable members than rank and file members (Frisch & Kelly, 2016).²¹ Furthermore, evidence shows House majority control leads to modest spending increases for majority members, and the House majority leadership protects vulnerable incumbents with additional federal spending (Dynes & Huber, 2015; Lazarus, 2009). While House majority leadership will look to protect its members, individual Congressmen may use bipartisanship to obtain additional federal funding for their districts. The most recent example of this bipartisan notion is the Army Chinook Helicopter Program. In the President's Budget for Fiscal Year 2019, the Army proposed canceling the Chinook Program to open funding for other Army priorities. The potential cancellation of the program directly impacted the Boeing plant in Delaware County, Pennsylvania, which employs over 4,600 area residents. Knowing the potential impact of the cancellation, local members of Congress and Senators jumped into action and worked to refund the program.²² The Army Chinook Helicopter Program highlights the bi-partisan coalition-building needed to restore federal funding for district programs.

²¹ In former House Appropriations Committee member, Ralph Regula (R-OH), papers a spreadsheet broke down earmark allocation based on institutional position such as Committee Chairs or leadership for FY 2006 Labor, Health, and Human Services Subcommittee. Rank and file members were allocated \$400,000 while vulnerable members were allocated \$1,200,000. For perspective, subcommittee members were allocated \$2,400,000 Appropriation members \$1,600,000, and rules committee members \$600,000.

²² Legislators' effort to refund programs is highlighted in Philadelphia Inquirer (DiStefano, 2019): "Not all other canceled programs have been re-funded. Those who joined to pressure leaders of the Armed Service and Appropriations Committees to restore Chinook funding included New Jersey U.S. Rep. Donald Norcross (D.), who heads the House Armed Services Committee's Tactical Air and Land Forces Subcommittee, and Pennsylvania U.S. Reps. Scanlon, Brian Fitzpatrick (R.), Brendan Boyle (D.), Dwight Evans (D.), Madeleine Dean (D.), Guy Reschenthaler (R.), and Mike Kelly (R.), among others. U.S. Sens. Pat Toomey (R., Pa.) and Chris Coons (D., Del.) were among the area senators who pushed for Chinook upgrades in the other chamber."

Although the additional funding obtained for the program signals the significance of the federal spending, it did not directly cause the reelection of the local members of Congress. I argue that voters reward incumbents for bringing federal spending back to their districts when they are vulnerable to losing re-election.

In addition to the effects of federal spending on incumbent elections, I explore the effects of federal spending through specific executive agencies on House members' vote share. Political appointees lead several executive agencies, while career civilians lead other agencies (Lewis, 2008). Agencies led by political appointees are more politically responsive. Politically responsive agencies give more non-competitive contracts in battleground states (Dahlstrom, Fazekas, & Lewis, 2020). Politically responsive agencies give the president's party an advantage in bringing federal spending back to their district and allowing the opposing party to claim credit for their ability to bring funds back to their district regardless of administration.

II. Pork Barrel Spending

There are two types of federal spending: mandatory and discretionary spending. Previous laws govern mandatory spending and do not require annual appropriations (Office, 2020). Discretionary spending requires an annual appropriations bill passed by Congress and signed by the president. Annual appropriation bills, budget formulas designed by federal agencies, and the composition of the population benefiting from mandatory spending programs affect spending distribution. Congressmen cannot claim credit for mandatory spending because it exists absent their tenure; for example, districts

with older populations have higher mandatory spending because Social Security and Medicare benefit individuals over 65.

Before 2011, House members had another mechanism to signal to constituents they were bringing home the bacon. Earmarks are provisions in discretionary spending appropriations that allow Congress to direct funds to districts. Common areas for earmarks historically were military and transportation spending. In the 2006 budget, earmarks accounted for 13% of the Department of Transportation budget (Kirk, Mallett, & Peterman, 2016). Since earmarks were specific to a district, legislators could curry votes for specific spending projects in their districts. In 2011, the Republican-led House of Representatives banned earmarks, which did not re-emerge before the 2020 election. After 2011, House members used alternative methods to acquire additional federal funds. Although earmarks are banned, legislators can use appropriation bill report language to identify preferred projects, fund specific programs, and call or write departments supporting projects. The opaque federal spending process makes it difficult for voters to credit incumbents and predicts smaller rewards from voters compared to previous research.

Incumbents can attempt to claim credit for federal spending through press releases and campaign advertising.²³ The literature on pork-barrel politics finds results ranging

²³ An example of claiming credit is Virginia Congressional delegation claim credit for FASTLANE Grant from U.S. Department of Transportation in 2016: “We are very pleased to announce that the Department of Transportation has selected Arlington Memorial Bridge to receive a \$90 million FASTLANE grant. While additional federal resources will be needed to complete this \$250 million project, this funding will allow NPS to move forward with planning and contracting immediately so that construction can begin early next year. This significant federal investment will go a long way towards ensuring that Memorial Bridge remains open, which is welcome news for the region’s commuters.” (Beyer, 2016).

from support for additional federal spending per capita benefited incumbents to results indicating recipients of public spending did not reward the incumbents for public transfers (Orriols, 2009; Levitt & Snyder, 1997; Griffith, 1976; Ray, 1980). Alternatively, Democrats and Republicans reward different types of federal spending. Lazarus and Reilly (2010) found Democrats benefited from spending projects, and Republicans benefited from delivering contingent liabilities. Sidman (2019) found Democrats benefited from spending projects by deterring experienced challengers; however, Republicans only benefited from contingent liabilities during periods of low polarization. Under high polarization, Republicans with increased spending had a higher probability of contested primary with no electoral effects in the general election.

House leadership, as previously stated, attempts to protect vulnerable incumbents with additional federal funds. The attempt to protect vulnerable incumbents implies additional federal spending in competitive races will affect the vote share received by the incumbent. In short, I argue vulnerable incumbents benefit from securing increased spending in their districts. The first part of the paper looks at how additional spending affects incumbent vote share under competitive conditions.

III. Politically Responsive Agencies

Politically responsive agencies have appointees selected by the president, and the appointments do not require further confirmation or oversight. Politically responsive agencies are agencies where most appointees are neither civilian nor Senate-confirmed appointees. The United States Government Policy and Supporting Positions (Plum Book)

is published by the Senate Committee on Homeland Security and Governmental Affairs and House Committee on Government Reform alternately after each presidential election. The Plum Book lists over 7,000 federal civil service leadership jobs not subject to non-competitive appointments (Office U. G., 2021). Agency structure determines the composition of appointments; however, the executive branch is responsible for filling the appointments or keeping the positions vacant. In addition, the Plum Book details the type of appointment. Appointment types include Presidential Appointment with Senate Confirmation, Presidential Appointment without Senate Confirmation, Career Appointment, Noncareer Appointment, Limited Emergency Appointment, Limited Term Appointment, Schedule C Excepted Appointment, and Appointed Excepted by Statute (Committee on Oversight and Reform, 2020). The agencies with non-Senate confirmed appointees holding most appointments over the last four congressional elections are the Department of Education, General Services Administration, Department of Labor, Department of Agriculture, Small Business Administration, Department of Commerce, Department of Housing and Urban Development, and Office of Personnel Management. The only agency with a majority for one administration and not the other was the Department of Homeland Security.

The change in federal spending to increase incumbent vote share includes heterogeneous federal spending projects. The ability to shape spending is not limited to legislation; the executive branch can impact the allocation of federal funds. Institutional structure influences the president's ability to lead executive branches. An agency led by political appointees is easier for legislators to influence than an agency led by civilian

appointees or a board-approved by the Senate. Since a statute creates Senate-confirmed positions, presidents can create schedule C positions to control the federal bureaucracy (Lewis D. , 2008). The absence of earmarks makes alternative modes for acquiring federal spending for a legislator's district more important. Congressmen can still meet with and write officials concerning programs and grants. House committees oversee different federal agencies, and committee oversight allows Congressmen the opportunity to build relationships with political appointees to influence spending decisions. The non-legislative opportunities for legislators to influence spending decisions allow the president the opportunity to reward legislators or constituencies. At the same time, legislators in the party opposite the sitting president can use informal relationships to bring federal spending to their districts without explicitly having it written into law. Research shows that presidents target co-partisan districts with additional funds and counties in swing states and counties in core states that support the President (Kriner & Reeves, 2015). The more politically responsive the agency, the more credit a legislator can claim for federal spending from the agency. I hypothesize that voters reward incumbents for bringing home additional spending from politically responsive agencies but are not rewarded with a higher vote share for additional spending from less responsive executive agencies.

IV. Data

The timeline chosen to study is 2014-2020 to evaluate the relationship exclusively in the second decade of the 21st century after the House banned earmarks. I did not

include the 2012 election results because the election immediately follows redistricting. I collected the federal congressional district obligation data from USAspending.gov. USAspending.gov is the official source for spending data for the United States Government. Federal Funding Accountability and Transparency Act of 2006 authorized USAspending.gov, and the government created it by December 2007. Federal Assistance Award Data System (FAADS) data moved to USAspending.gov in 2011 (Bureau, 2008). The federal spending data is obligation data and not expenditure data. Obligations are a commitment of funds by the government for a specific use, and expenditures are disbursements of federal funds (Department of Defense, 2015). Obligations are legal commitments by the government; however, funds not disbursed can be de-obligated if not expended. Expenditures cannot be recouped by the government absent a breach of contract or fraud. As a result of using obligation data, there was potential for negative obligations. The data was truncated at zero because de-obligated funds may be from funds obligated under previous representation for the district.

Contracts definition is: "the principal purpose of the instrument is to acquire (by purchase, lease, or barter) property or services for the direct benefit or use of the United States Government." 31 USC 6303. Contracts do not include transfer payments or grant awards. Obligation data was aggregated for all contracts by the district and Chief Financial Officers (CFO) Council agencies. There are twenty-four CFO agencies, but this does not include all executive agencies. The CFO Act of 1990 established the CFO council to include the CFOs and deputy CFOs of the largest Federal agencies to improve

financial management in the U.S government (General Services Administration & Office of Management and Budget, 2021).

I collected election results from the MIT Election Data Science Lab (MEDSL). The MEDSL provided United States House of Representatives election results from 1978 to 2020; however, the analyses only use data from 2012, 2014, 2016, 2018, and 2020. The data collected includes the politicians who received votes in the general election, their vote total, and total votes in the general election (Lab, 2020). Additionally, whether the politician was an incumbent and how many terms they served is added to the MEDSL data. I acquired fundraising data from the Federal Election Commission website (Federal Election Commission, 2021). Finally, I retrieved state real Annual Gross Domestic Product (GDP) data from the Bureau of Economic Analysis (Bureau of Economic Analysis, 2021). Real GDP growth statistics were measured by the percentage increase or decrease in state GDP from the previous year.

Redistricting changes the composition of congressional districts; some voters have different representatives. The change in electorate negated the ability of the electorate to exchange votes for federal spending when the same Congressman does not represent the same constituents. Aside from the re-districting following the 2010 census, re-districting occurred in a few other instances. I removed elections affected by redistricting during the 2014-2020 election. The elections removed were Florida district elections in 2016, Pennsylvania district elections in 2018, and Virginia's 3rd and 4th district elections in 2018. Florida Supreme Court enforced a Florida law outlawing gerrymandering to favor parties or incumbents, forcing new Florida districts.

Pennsylvania Supreme Court determined gerrymandering violated the state constitution, and Pennsylvania redrew districts. Virginia's 3rd and 4th districts were redrawn because a federal court found the districts were drawn to pack African Americans into one district and dilute their representation. Incumbents without an opponent are removed because they received all the votes and would skew the results upward. Voters could not reward or punish an incumbent for changes in federal spending if no challenger existed. Whether federal spending affects incumbents' vote share, unopposed incumbents' vote share will not change. Although incumbents without an opponent may signal their reward for bringing federal spending to their district, the most likely explanation is they represented a heavily Democrat or Republican electorate.

An agency's political responsiveness is calculated using the 2016 and 2020 Plum Book. Since the agency only crossed the 50% for one administration, the politically responsive categorization did not include the Department of Homeland Security. Historically, when the office of the presidency switches parties, the political responsiveness of the agency increases through additional SES and Schedule C positions. As shown in Table 2-9, there is variation in the political responsiveness of an agency, but contrary to historical precedent, there is no clear increase or decrease across all agencies. For example, between 2016 and 2020, 14 of the 27 agencies increased the proportion of non-senate confirmed political appointees, while 13 agencies saw no increase or a decrease in the proportion of non-senate confirmed political appointees.

V. Research Design

To test the hypothesis that change in federal spending effect the percentage of vote incumbents receive in the general election, I estimate

$$VoteShare_{it} = a + \beta_1 dContract_{it} + \beta_2 X_{it} + a_i + \delta_t + e_{it} \quad (1)$$

The dependent variable is the percent of an incumbent's vote share in the general election when facing a challenger. $dContract$ is the dollar change from the first year of Congress to the second year of Congress. The change, $t_2 - t_1$, between years 1 and 2 determines additional federal spending. For freshman congressmen, the first year begins before their election and will not be able to influence year 1 spending.²⁴ The exception to this will be if Congress passes the budget after the new Congress begins. Even if the law passes after the new Congress begins, bill writing and markup occur in the spring before the election. Separately for all Congressmen, the effect of the spending change between 1st and 2nd year is consistent with literature showing voters are myopic and focus on the time immediately before the election (Healy & Lenz, 2014; Erikson, 1989; Fair, 1996; Guntermann, Lenz, & Myers, 2021). Since voters are myopic, voters do not reward the total amount over the election cycle but the change in spending between the first and second years. In addition, I use the log of the dollar amounts in the last year of the term to compare the results from the change between 1st and 2nd and the level of obligations for an incumbent. *Politically Responsive dContract* replaces $dContract$ in the second specification to measure whether a certain type of federal spending benefits incumbent

²⁴ A freshman legislator elected in year t does not serve until year $t+1$, and therefore does not formulate a budget until $t+2$.

legislators. The variable is the aggregate change in obligations for agencies with over half of their leadership appointed by the president without Senate approval.

X_i includes controls that have been shown to affect incumbent vote share. *State Growth* captures the effect of economic growth on the reelection of incumbents (Grier & McGarrity, 2002). *Seniority* is the number of terms the incumbent legislature has been in the House of Representatives. Seniority in Congress is linked to electoral gains, but there is no causal link between seniority and pork-barrel spending (Fowler & Hall, 2015). Born (1977) showed seniority positively related to prior terms in the 1950s, 60s, and 70s. As recently as 2004-2010, a two percentage points increase in incumbents' vote share was expected for ten-term incumbents (Duquette, Mixon, & Cebula, 2013). a_i is the fixed effect by each legislator, which measures the time invariant legislators characteristics and δ_t is the election fixed effects. There is almost no variation in the size of the House Districts as specified by Article 1 of the U.S. Constitution. Therefore, spending per population is not estimated.

Percent of Total Fundraising is the percentage of total fundraising the incumbent raised in their district for the election cycle. Total fundraising is the sum of fundraising raised by the incumbent and challengers in the election cycle. *Percent of Total Fundraising* is the measure used to identify incumbent vulnerability. A candidate's ability to raise funds is related to electability (Jacobson, 1980; Klingensmith, 2019). The race's competitiveness is defined as the percent of total fundraising the incumbent raised in the election cycle. A competitive election is where the incumbent secures less than 60% of the total fundraising. In theory, incumbents use fundraising to strategically ward off

quality challengers (Epstein & Zemsky, 1995). Challenger spending increases challenger vote share and reduces incumbent vote share (Gerber, 1998; Jacobson, 1990). A percentage is used instead of dollar amounts because percentage reduces the effect of market size and advertising price.²⁵

Table 2-1 reports the means and standard deviations of the data for 1229 congressional elections in which House members faced a challenger. Incumbents selected between elections are not included because they did not have the opportunity to secure additional funds.²⁶ On average, incumbents received a 63% vote share across the four election cycles, with a minimum of 39% and a maximum of 89%. The average spending is \$75 million, with a large variation around the mean. The change in additional spending ranged from a negative \$11.2 billion for Kay Granger of Texas to an increase of \$7.8 billion for Barbara Comstock of Virginia. The politically responsive agencies had a lower \$4.5 million mean with a standard deviation of \$55 million per House member. The average incumbent held five terms, and the average real GDP growth was 1%. The average state GDP growth is the weighted average from the sample and does not reflect the average for states.

²⁵ Stratmann (2009) shows the differences in advertising costs are one source apparent ineffectiveness of campaign spending. When the price of advertising is accounted, campaign spending is productive for both incumbents and challengers.

²⁶ Even though special election winners stand for re-election as an incumbent they do not have the same opportunity to sit on committees, work with executive branch during budget deliberations, and are at a fundraising disadvantage from raising money for two separate elections during one election cycle.

VI. Results

Table 2-3 shows results clustered by Congressmen for the baseline model under different levels of competition. The dependent variable in all columns is the vote share for the incumbent Congressmen. However, the specification in the first column differs from the second in that the first column includes all incumbents facing a challenger, and column two includes incumbents in a competitive election.

When looking at the first column, dContract is positive as predicted not but statistically significant. In the second column, dContract is positive and statistically significant when incumbents raise less than 60% of total fundraising. Column 3 drops legislators who only ran in one competitive election. Column 3 illustrates that the variation in the second column is derived from legislators who were in more than one competitive election. Beginning with the full sample, there is no impact or minimal correlation between bringing federal spending to one's district when the elections are not competitive.²⁷ Competitive elections account for about one-fifth of the total elections at 229 races in the second column. However, bringing federal spending back to one's district is rewarded with an increased vote share when the election is competitive. Considering the magnitudes, congressmen increasing \$100 million of contract spending for a district increases his vote share by about .23%.

The controls in Table 2-3 are consistent with the predictions. In the second column, state growth is positive although not statistically significant. Percent of total

²⁷ Table 2-10 fixed effects regression looks at observations with only positive or negative dContract. dContract is positive and statistically significant when looking only at positive changes but negative and statistically significant for negative changes. Politically Responsive Agency is positive and statistically significant for positive changes and but negative and not statistically significant for negative changes.

fundraising was positive and significant in Columns 1 and 2. The magnitudes for Columns 1 and 2 were about the same. Contrary to the predictions, seniority had negative coefficients in the second column but was not statistically significant. In Table 2-4, the specification is the same as in Table 2-3, except using the log of the spending levels in the election year. Using the log of the spending levels allows us to interpret a percentage change in spending levels. In the first column, the contract is negative but not statistically significant. The contract spending results point estimate in column two for competitive elections is positive but not statistically significant.

Table 2-5 looks at federal spending based on party affiliation. In Columns 1 and 2, dContract represents the coefficient for Republican legislatures, and Democrat is one for Democrat incumbents and zero for Republicans. Democrat* dContract is the interaction term between dContract and Democrat. In Column 1, Democrat is positive but not statistically significant, and both dContract and Democrat *dContract are positive but not statistically significant. In Column 2, dContract is positive and statistically significant, indicating that voters rewarded Republicans for bringing additional federal spending in competitive elections. An additional \$100 million for Republicans increases vote share by .19. Additionally, Democrat is large and significant, indicating Democratic incumbents had an advantage in competitive races compared to their Republican peers. Additionally, seniority is positive and statistically significant in competitive elections when controlling for the incumbent's political party.

Table 2-6 looks at federal spending on contracts from politically responsive and non-politically responsive agencies using a legislator fixed-effect model. In Column 1,

politically responsive agency spending is regressed without controls and is positive but not statistically significant. Column 2 adds election year dummies; additional pork is now positive and statistically significant. When controls are added in Column 3, the magnitude remains about the same as in the second column and is statistically significant. In Column 4, non-politically responsive agency spending has a negative sign and is not statistically significant. Consistent with regressions in Tables 2-3 and 2-4, the percent of total fundraising is positive and statistically significant. For reelection purposes, Congressmen need to bring back a lot of distributive spending from politically responsive agencies. \$100 million in additional spending will increase vote share by .76%.²⁸

Table 2-7 considers politically responsive agency spending based on party affiliation. In Column 1, politically responsive agency spending for Republicans is negative and not statistically significant. Democrat incumbency is positive and not statistically significant. Politically responsive agency spending for Democratic incumbents is positive and statistically significant. \$100 million in additional spending will increase vote share by 1.2%. In the second column, responsive agency spending for Democrats and Republicans is positive but not statistically significant. As shown in Table 2-5, Democrat incumbency and seniority are positive and statistically significant for competitive elections.

Table 2-8 shows whether voters rewarded House majority members and whether the President's Party benefited incumbents by bringing federal spending back from politically responsive agencies. When looking at Column 1, neither incumbents in the

²⁸ Table 2-10 fixed effects regression looks at observations with only increases or decreases. Politically responsive agency dContract is positive and statistically significant for increases and negative but not statistically significant for decreases.

majority nor the minority benefited from bringing additional federal spending back to their district. As indicated in Column 2, being a member of the president's party had a negative and statistically significant impact on an incumbent's vote share. Incumbents in the president's party lost a 2% vote share compared to incumbents not in the president's party. Additionally, bringing additional federal spending back from the president's party was negatively and statistically significant. Voters rewarded incumbent legislators not in the president's party for bringing additional federal spending back to their district.

Column 3 highlights members in the minority benefited from bringing federal spending from politically responsive agencies back to their district. In Column 4, incumbents not in the president's party benefit from spending from politically responsive agencies, and the president's party does not benefit from spending from politically responsive agencies.

The overall results support theory that politically responsive agency federal spending increases the incumbent's vote share but does not support voters rewarding the president's party incumbents through this channel.

VII. Conclusion

The ban on earmark's in 2011 did not stop Congressmen from trying to bring federal spending back to their districts. Alternative means employed by Congressmen are less transparent and difficult to measure. Regardless, a House member's ability to bring additional federal spending back to their district affects their vote share in competitive elections. The ability to bring additional funds back can be the difference between winning and losing an election in the House of Representatives. Moreover, voters reward

federal spending from politically responsive agencies. Still, the higher vote share is not attributable to either being in the House Majority nor being a member of the incumbent president's party but rather the ability to bring back federal spending despite the institutional disadvantages faced by being in the minority or the party opposite the president.

Table 2-1. Summary Statistics for State and District Level Spending Data (N= 1229)

Variable	Mean	S.D	Minimum	Maximum
Incumbent Share	62.99	8.76	39.47	89.07
dContract	.755	7.482	-112.247	78.290
Politically Responsive Agency dContract	.045	.555	-2.410	10.754
Non Politically Responsive Agency dContract	.504	6.598	-112.401	66.738
Fundraising Percent	0.797	0.206	0	1
State Growth	0.007	0.03	-0.08	0.079
Seniority	5	4.2	1	25

Table 2-2. Summary Statistics for Vulnerable Incumbents (N= 229)

Variable	Mean	S.D	Minimum	Maximum
Incumbent Share	54.81	7.52	39.84	80.53
dContract	1.029	5.76	-17.099	59.364
Politically Responsive Agency dContract	.011	.372	-1.579	1.862
Non Politically Responsive Agency dContract	.947	5.38	-13.961	56.549
Fundraising Percent	.442	.125	0	.5999
State Growth	.006	.032	-.069	.071
Seniority	4.4	4.5	1	24

Note: Spending is expressed in hundreds of millions of dollars.

Table 2-3. Pork- Barrel Spending Effects on Vote Share: Change in Annual Spending

VARIABLES	(1) Full Sample	(2) Competitive Elections	(3) Legislators with more than one Competitive Election
dContract	0.0197 (0.0170)	0.236** (0.0955)	0.236** (0.0994)
State Growth	0.244 (13.52)	38.05 (52.83)	38.05 (55.02)
Seniority	0.363** (0.178)	-0.0169 (0.195)	-0.0169 (0.203)
Fundraising Percent	14.72*** (0.986)	12.90*** (3.693)	12.90*** (3.846)
Constant	50.10*** (1.113)	50.10*** (2.774)	49.65*** (3.013)
Legislator Fixed Effects	Yes	Yes	Yes
Election Year	Yes	Yes	Yes
Observations	1,229	229	82
R-squared	0.368	0.613	0.613

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. dContract is expressed in hundreds of millions of dollars. Competitive elections are assumed to be where incumbents fundraised less than 60% for the total election.

Table 2-4. Pork- Barrel Spending Effects on Vote Share: Log Dollars

VARIABLES	(1) Full Sample	(2) Competitive Elections	(3) Legislators with more than one Competitive Election
Log \$ Contract Award	-0.275 (0.258)	1.555 (1.033)	1.555 (1.076)
State Growth	2.034 (13.56)	29.12 (47.45)	29.12 (49.41)
Seniority	0.359** (0.177)	0.0359 (0.170)	0.0359 (0.177)
Fundraising Percent	14.64*** (0.981)	15.84*** (4.315)	15.84*** (4.493)
Constant	55.57*** (5.323)	17.56 (21.17)	16.98 (21.92)
Legislator Fixed Effects	Yes	Yes	Yes
Election Year	Yes	Yes	Yes
Observations	1,229	229	82
R-squared	0.368	0.612	0.612

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. Contract log dollars. Competitive elections are assumed to be where incumbents fundraised less than 60% for the total election.

Table 2-5. Pork- Barrel Spending Effects on Vote Share: Change in Annual Spending by Party

VARIABLES	(1) Full Sample	(2) Competitive Elections
dContract	0.00197 (0.0244)	0.189** (0.0936)
Democrat	1.002 (2.413)	10.58*** (3.371)
Democrat * dContract	0.0350 (0.0337)	1.408 (1.618)
State Growth	0.284 (13.51)	44.42 (51.90)
Seniority	0.379** (0.187)	1.244** (0.582)
Fundraising Percent	14.75*** (0.990)	16.48*** (3.821)
Constant	49.54*** (1.833)	40.68*** (4.402)
Legislator Fixed Effects	Yes	Yes
Election Year	Yes	Yes
Observations	1,229	229
R-squared	0.370	0.707

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. dContract is expressed in hundreds of millions of dollars. Democrat is an indicator variable for incumbents in the Democratic party. Competitive elections are assumed to be where incumbents fundraised less than 60% for the total election.

Table 2-6. Politically Responsible Pork-Barrel Spending Effects on Vote Share

VARIABLES	(1)	(2)	(3)	(4)
Politically Responsive Agency dContract	0.653 (0.451)	0.781* (0.438)	0.767** (0.351)	
Non Politically Responsive Agency dContract				-0.000550 (0.0189)
State Growth			-2.440 (12.70)	1.219 (13.57)
Seniority			0.363** (0.178)	0.359** (0.177)
Fundraising Percent			14.65*** (0.970)	14.68*** (0.986)
Constant	62.97*** (0.0206)	63.74*** (0.316)	50.21*** (1.092)	50.12*** (1.113)
Legislator Fixed Effects	Yes	Yes	Yes	Yes
Election Year	No	Yes	Yes	Yes
Observations	1,229	1,229	1,229	1,229
R-squared	0.006	0.057	0.376	0.367

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. Politically Responsive dContract and Non Politically Responsive Agency dContract are expressed in hundreds of millions of dollars.

Table 2-7. Politically Responsible Pork- Barrel Spending Effects on Vote Share: By Party

VARIABLES	(1) Full Sample	(2) Competitive Elections
Politically Responsive Agency dContract	-0.0372 (0.561)	0.630 (1.170)
Democrat	0.938 (2.414)	8.342*** (3.048)
Democrat* Politically Responsive Agency dContract	1.200** (0.592)	1.978 (2.730)
State Growth	-3.427 (13.01)	42.60 (50.79)
Seniority	0.380** (0.187)	1.142*** (0.419)
Fundraising Percent	14.70*** (0.969)	17.34*** (3.343)
Constant	49.71*** (1.815)	41.78*** (3.321)
Legislator Fixed Effects	Yes	Yes
Election Year	Yes	Yes
Observations	1,229	229
R-squared	0.380	0.687

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. Politically Responsive dContract represents the Republican Party, Democrat is indicator for Democrat Incumbent and Democrat* Politically Responsive agency dContract represents Democratic spending. Spending is expressed in hundreds of millions of dollars. Competitive elections are assumed to be where incumbents fundraised less than 60% for the total election.

Table 2-8. Pork-Barrel Spending Effects on Vote Share: Change in Annual Spending by Legislative and Executive Branch Affiliation

VARIABLES	(1) Majority Party	(2) President's Party	(3) Majority Party	(4) President's Party
dContract	0.00146 (0.0273)	0.0397* (0.0204)		
Majority	-0.0821 (0.243)		-0.107 (0.246)	
Majority * dContract	0.0305 (0.0365)			
President's Party		-2.240*** (0.277)		-2.222*** (0.278)
President's Party * dContract		-0.0784** (0.0363)		
Politically Responsive Agency dContract			1.232* (0.675)	0.942*** (0.174)
Majority * Politically Responsive dContract			-0.516 (0.521)	
President's Party * Politically Responsive dContract				-1.330*** (0.269)
State Growth	-0.0944 (13.53)	8.746 (14.26)	-2.673 (12.78)	7.120 (13.63)
Seniority	0.369** (0.179)	0.427*** (0.162)	0.363** (0.180)	0.412** (0.162)
Fundraising Percent	14.65*** (0.991)	12.49*** (0.977)	14.63*** (0.972)	12.51*** (0.970)
Constant	50.20*** (1.132)	52.57*** (1.039)	50.28*** (1.110)	52.62*** (1.039)
Legislator Fixed Effects	Yes	Yes	Yes	Yes
Election Year	No	Yes	Yes	Yes
Observations	1,229	1,229	1,229	1,229
R-squared	0.369	0.458	0.377	0.464

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. Politically Responsive dContract represents the non Majority and Non-Presidential parties. Spending is expressed in hundreds of millions of dollars. Majority and President's Party are indicator variables for the President's Party and Member of the Majority Party in the House of Representatives. Competitive elections are assumed to be where incumbents fundraised less than 60% for the total election.

Table 2-9. Plum Book Political Appointments Proportions

Agency	2016	2020
DEPARTMENT OF EDUCATION	0.74	0.65
GENERAL SERVICES ADMINISTRATION	0.74	0.71
DEPARTMENT OF LABOR	0.65	0.74
DEPARTMENT OF AGRICULTURE	0.63	0.59
SMALL BUSINESS ADMINISTRATION	0.63	0.70
DEPARTMENT OF COMMERCE	0.59	0.56
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	0.57	0.66
DEPARTMENT OF HOMELAND SECURITY	0.55	0.35
OFFICE OF PERSONNEL MANAGEMENT	0.50	0.58
DEPARTMENT OF THE TREASURY	0.47	0.34
DEPARTMENT OF DEFENSE - OFFICE OF THE SECRETARY OF DEFENSE	0.39	0.39
DEPARTMENT OF ENERGY	0.37	0.49
ENVIRONMENTAL PROTECTION AGENCY	0.35	0.49
DEPARTMENT OF THE INTERIOR	0.34	0.30
DEPARTMENT OF JUSTICE	0.34	0.29
DEPARTMENT OF HEALTH AND HUMAN SERVICES	0.32	0.42
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	0.32	0.36
DEPARTMENT OF DEFENSE - DEPARTMENT OF THE ARMY	0.32	0.41
DEPARTMENT OF TRANSPORTATION	0.31	0.40
DEPARTMENT OF STATE	0.29	0.25
DEPARTMENT OF DEFENSE - DEPARTMENT OF THE AIR FORCE	0.27	0.25
DEPARTMENT OF DEFENSE - DEPARTMENT OF THE NAVY	0.23	0.22
NATIONAL SCIENCE FOUNDATION	0.12	0.04
SOCIAL SECURITY ADMINISTRATION	0.10	0.10
DEPARTMENT OF VETERANS AFFAIRS	0.07	0.08
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT	0.03	0.05
NUCLEAR REGULATORY COMMISSION	0.00	0.00

Table 2-10. Pork- Barrel Spending Effects on Vote Share: Asymmetrical Distributional Spending

VARIABLES	(1)	(2)
Positive*dContract	0.0620*** (0.0236)	
Negative * dContract	-0.0406* (0.0213)	
Positive Politically Responsive Agencies* dContract		0.917** (0.397)
Negative Politically Responsive Agencies* dContract		-0.272 (0.592)
State Growth	-2.054 (13.38)	-2.506 (12.87)
Seniority	0.358** (0.181)	0.364** (0.177)
Fundraising Percent	14.80*** (0.991)	14.71*** (0.966)
Constant	49.98*** (1.115)	50.14*** (1.090)
Legislator Fixed Effects	Yes	Yes
Election Year	Yes	Yes
Observations	1,229	1,229
R-squared	0.373	0.378

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. Positive*dContract and Positive Politically Responsive Agencies* dContract values truncated below 0. Negative * dContract and Negative Politically Responsive Agencies* dContract truncated at zero and above.

Table 2-11. Pork-Barrel Spending Effects on Vote Share: Freshman Legislator Effect

VARIABLES	(1) No Freshmen	(2) Freshmen Only	(3) No Freshmen	(4) Freshmen Only
dContract	0.00859 (0.0169)	0.0193 (0.0624)		
Politically Responsive Agency dContract			0.486 (0.396)	1.571 (1.157)
State Growth	16.20 (12.99)	22.94 (31.65)	13.07 (12.40)	28.12 (31.63)
Seniority	0.494** (0.212)		0.488** (0.213)	
Fundraising Percent	15.20*** (1.086)	25.08*** (2.012)	15.15*** (1.074)	24.92*** (1.996)
Constant	48.89*** (1.480)	40.56*** (1.902)	49.02*** (1.460)	40.48*** (1.893)
Legislator Fixed Effects	Yes	No	Yes	No
Election Year	Yes	Yes	Yes	Yes
Observations	994	235	994	235
R-squared	0.370	0.419	0.373	0.423

Note: Standard errors clustered by legislator in parentheses *** p<0.01, ** p<0.05, * p<0.1. dContract and Politically Responsive dContract are expressed in hundreds of millions of dollars. Freshmen are defined as having served one term.

3. CASE STUDY ON MAINE RANKED CHOICE VOTING IN UNITED STATES HOUSE OF REPRESENTATIVES

I. Introduction

Congressional voter turnout in the United States has followed a steady pattern of over 50% turnout for presidential elections and less than 50% voter turnout in midterm elections from 2012-2020. During this period, Maine changed their federal elections from First Past the Post (FPTP) to Rank Choice Voting (RCV) starting with the 2018 election. Whether RCV had a causal effect on voter turnout is an open question. To test this question, a synthetic control estimator is used to test whether RCV causally affected voter turnout in Maine congressional elections. The move from FPTP to RCV provides testable implications for economic voting models. Instrumental and expressive voting may provide insight into RCV's effect on voter turnout. Instrumental voting looks at the benefits and costs of the change to determine whether RCV increases voter turnout. Expressive voting will predict additional voters' turnout if voters get more consumption value from RCV than FPTP.

Maine's voters approved Rank Choice Voting (RCV) 388,273 to 356,621 on November 8th, 2016. Lawsuits were filed against the approved RCV law, and Justices of the Maine Supreme Judicial Court declared the law unconstitutional for state elections. However, the law was deemed constitutional for federal elections. During a special legislative session, the legislature passed a law delaying its implementation until December 1st, 2021, unless state voters ratified an amendment to the state constitution. A people's veto gained enough votes to put RCV on a statewide referendum scheduled for

June 12th, 2018. The referendum passed, and Maine implemented RCV for federal elections on November 6th, 2018, becoming the first state to implement RCV for federal elections (Maine Secretary of State, 2021).²⁹

Starting in 2018, Maine instituted RCV for federal elections. RCV referred to as "instant runoff voting," allows voters to choose candidates in order of preference by marking their first, second, third, and subsequent choices. Under Maine's RCV, votes are tallied in each round, eliminating the lowest-ranked candidates until one candidate achieves 50% of the vote. The system requires three or more candidates for implementation (Maine Department of the Secretary of State, 2020). Since RCV implementation in Maine, researchers have begun exploring the impact of RCV on various outcomes in Maine compared to the rest of the United States. A survey experiment on 3,471 voters throughout the United States found voters less satisfied with Maine's RCV than with plurality or runoff. In addition, outcomes with come from behind victory were least favored (Cerrone & McClintock, 2021). Voter satisfaction results are notable because Maine's 2nd Congressional District was decided by a come-from-behind victory in 2018 (Maine Secretary of State, 2021). In Maine, most municipal clerks were not enthusiastic about implementing RCV. They did not want to continue it in Maine and expressed low levels of support for RCV because they believed voters did not understand the new voting rules. In Maine, there are partisan splits, with Democrats having more positive assessments than Republicans (Anthony, Fried, Glover, & Kimball, 2021).

²⁹ In 2020, Alaska approved an initiative to establish a nonpartisan top four primary election system and rank choice voting general election. Alaska's primary will produce four candidates and use RCV for the general election starting 2022 elections (Alaska Division of Elections n.d.).

This paper focuses on applying instrumental and expressive voting theories to Maine's RCV implementation, particularly the effects on voter turnout in the United States House of Representatives using synthetic control comparative analysis. The results indicate that RCV had no causal impact on overall voter turnout or third-party candidate voter turnout.

II. Literature Review

Literature on Instrumental Theory and Expressive Voting

Voter turnout is an aggregation of individual decisions by voters. According to Downs (1957), individuals calculate the expected utility of voting and vote only if personal benefits exceed personal costs. For example, voting is instrumental when a citizen's vote only has value if it is decisive for their preferred candidate. A simple illustration of the model is in equation one, where the individual will only vote if the personal benefit of voting exceeds the cost.

$$R = PB - C > 0 \tag{1}$$

Where P is the probability of being the decisive vote, B is the benefit of being the decisive vote, the voter's preferred party wins, and C is the cost of voting. R is the utility gained from the decision. A voter will abstain from voting if personal benefits do not exceed the cost. The Downs voting model is susceptible to the paradox of voting, which states that the costs usually outweigh the benefits of voting. Downs added a variable representing the continuation of democracy. An extension of Downs voting model adds a consumption benefit to voting. The extension appears because the probability of being

the decisive vote is negligible in almost all elections with a significant voter population. Research finds turnout increases with increased competitiveness which supports the theory that as the probability the voter's vote decides the election increases, the probability a voter votes increases (Ashworth, Geys, & Heyndels, 2006; Geys, 2006; Gilliam, 1985; Cancela & Geys, 2016).

The consumption value of voting includes the utility derived from expressing one's votes in and of itself (Brennan & Buchanan, 1984; Riker & Ordeshook, 1968; Fiorina, 1976). The consumption value of expressive voting may be ethical or ideological rather than wealth maximizing, which would explain voters voting against their own perceived self-interest (Brennan & Lomasky, 1993). The voter may not be the decisive vote but receive utility from expressing their vote. The consumption value of voting is added in equation two and represented by V. The general class of models that add a form of V are expressive voting models.

$$R = PB - C + V > 0 \quad (2)$$

Experimental evidence shows the smaller chance of people being instrumental, the more likely they will vote expressively (Fisher A. , 1996). For example, Kan and Yang (2001) showed voters in the 1988 Presidential election showed up to vote to "cheer" or "boo" their favored or unfavored candidate, like a sporting event. The evidence did not support the instrumental view of voting but rather that "cheering" and "booing" affect voter turnout and voter choice. Additionally, a strong positive relationship was found between political expressiveness and the act of voting (Copeland & Laband, 2002). Voters who donate to Presidential Election Fund or display political signs have a higher

propensity to vote, albeit the effect is smaller in presidential election years. Both results support the consumption value of voting.

Literature on Rank Choice Voting

Most elections in the United States use a First Past the Post system to elect officeholders. In First Past the Post electoral system, the candidate with the most votes wins (Burnett & Kogan, 2015). Rank Choice Voting, also known as instant runoff voting (IRV), preferential voting, or alternative voting, works by listing preferences for candidates 1 through N. The votes are tallied based on the first-place votes on the ballot for each race. If one candidate receives the majority of the votes, he is declared the winner. If no candidate gets the plurality of first-place votes, then the last-place candidate is eliminated, and second-choice votes of that candidate are allocated among the remaining candidates. Suppose there is no majority calculated after the second round. In that case, the last-place candidate is eliminated, and the following non-eliminated choice votes of that candidate are allocated among the remaining candidates. The process continues until one candidate has over 50% of eligible ballots. Eligible ballots are not exhausted. A ballot can be exhausted if all the ranked candidates are eliminated before a majority winner is calculated (Lewyn, 2012). When using RCV, if no candidate achieves 50% of the vote in a round, the plurality winner is not the winner, whereas, in FPTP, the plurality winner is the winner. Once one candidate in RCV receives 50% of the vote, the election is finalized (Cuff, 2016). If any candidate gets the majority of the votes in both systems, he is declared the winner.

Both FPTP and Rank Choice Voting are susceptible to tactical voting, where a voter votes for a candidate other than their first choice. Under the rational choice theory, a voter's utility is only affected by who wins the election. Therefore, a tactical voter votes for a party they believe is more likely to win, rather than vote for their party to influence the election outcome (Fisher S. D., 2004). In the case of FPTP in the United States, tactical voting would be voting for the Democrat or Republican candidate even though the voter's sincerely held preference would be the Libertarian candidate. Tactical voting occurs because voters do not think the Libertarian candidate will win the election. In Rank Choice Voting, tactical voting is possible, although more challenging to implement. A simple example would be letting the ballot exhaust rather than rank sincerely held preferences.

According to Rank Choice Voting advocacy group FairVote, over twenty municipalities are using some form of Rank Choice Voting. Before 2000, Arden, Delaware, and Cambridge, Massachusetts, were the only municipalities using RCV in the United States. Since 2000, San Francisco, Minneapolis, and Oakland have implemented Rank Choice Voting (Fair Vote, n.d.). In addition, New York City used RCV in the 2021 municipal elections (Board of Elections in the City of New York, n.d.). Proponents argue, and research supports that RCV is perceived as less negative by voters and candidates (Donovan T. , 2014; Donovan, Tolbert, & Gracey, 2016; McGinn, 2020). Based on the perceived benefits of expanded choice and reduced negativity, proponents argue that RCV will positively affect voter participation and engagement in municipal elections (Fair Vote 2018). Nielson((2017) found using a survey experiment that RCV would not

affect electoral outcomes for the 2016 U.S. presidential election. The same study found that most voters do not prefer to vote in RCV elections and do not think they result in fair elections. Furthermore, survey experiment data found significant support for the claim that RCV increases support for third-party candidates (Simmons, Gutierrez, & Transue, 2022). However, empirical research on third-party candidates' vote share under RCV does not exist.

In recent research, generation has become a significant predictor for favorability towards Rank Choice Voting, accounting for demographic factors and partisanship. Dissatisfaction with "the way that democracy works in America" is a potential link between younger generations and support for RCV reforms (McCarthy & Santucci, 2021). Using matched voter turnout data for seven RCV and fourteen non-RCV local elections in 2013 and 2014, RCV caused no statistically significant increase in voter turnout. However, younger voters in RCV cities had an increased turnout compared to non-RCV cities (Coll & Juelich, 2021). The increased youth voter turnout in RCV cities supports younger generational support for RCV.

At the local level, recent scholarship used difference in difference regressions to show RCV employed from the 1990s through 2018 saw a decrease in voter turnout ranging from 3-5% in RCV cities. Conversely, a study on Minneapolis measured a 9.6% percent increase in turnout for Mayoral elections (McGinn, 2020; McDaniel, 2019). Noted in McDaniel's paper is a visual inspection of the data for municipalities that suggests the comparison group election data may present a violation of the parallel trends assumption used in difference in difference regressions. Violation of the parallel trends

assumption in difference in difference regressions would question previous research using the difference in difference regressions with the same data. Using synthetic control comparative case study is one alternative to relying on the parallel trends assumption used in difference in difference regressions.

III. Theory

Instrumental and expressive voting can produce predictions in the same direction or offset effects on voter turnout. As shown in Table 3-1, instrumental voting would predict voter turnout would decrease under rank choice voting because the information cost associated with voting has increased. The cost has increased because voters have to acquire more information to list a slate under RCV compared to FPTP. For third-party votes, instrumental voting would predict an increase in third-party voting. Third-party votes would increase because the probability of affecting the election's outcome is raised compared to voting for third-party candidates under first past the post. The third-party voter turnout increase is predicated on $PB > C$ when switching from FPTP to RCV. In both cases, expressive voting would positively affect voter turnout. Expressive voters gain additional expressive value from “cheering” or “booing” for a team by listing several candidates. The more candidates on the ballot, the more voters consume expression. The following analysis can only identify the net effects of the instrumental and expressive theories.

IV. Data and Methods

I collected voting data for congressional elections conducted in 2012-2020 and state-level results from the United States Census Current Population Survey(CPS) Voter and Registration Supplement (MIT Election Data and Science Lab, 2017; Office of the Clerk U.S. House of Representatives , 2021; United States Census Bureau, 2020). The percent of registered voters or percent of eligible voters voting are two different methods for measuring voting turnout. First, the voting age population(VAP) was used to evaluate voter turnout (Franklin, 2000). VAP overestimates the eligible electorate because of different state voting restrictions and non-citizens present in the American Community Survey estimate; however, VAP provides similar results to the voting-eligible population (VEP) denominator (Holbrook & Weinschenk, 2014).³⁰

Federal elections were chosen from 2012 to 2020 because congressional districts are re-apportioned and districts redrawn after each decennial census. Re-districting changes that affect partisan composition decrease voter turnout (Hunt, 2018; Hayes & McKee, 2009). The timing of Maine's law change allows for multiple congressional elections before the law change and multiple elections following the law change. I compiled demographic data by congressional district for 2012, 2014,2016, 2018, and 2019 from the American Community Survey Table DP05 Demographic and Housing Estimates (U.S. Census Bureau, 2012,2014,2016,2018,2019). Additionally, I collected

³⁰In a purely instrumental voting account, turnout ought to be specific in absolute number of votes because Nash Independent Equilibrium will find an equilibrium number of voters for any policy options and adding extra potential voters ought not affect the equilibrium (Brennan & Lomasky, 1993). Analysis looking at absolute voting did not change the results because there is almost no variation in the size of the House Districts as specified by Article 1 of the U.S. Constitution.

the economic indicators by congressional districts for the years 2012,2014, 2016, 2018, and 2019 using the American Community Survey (ACS) Table DP03 Selected Economic Characteristics (U.S. Census Bureau, 2012,2014,2016,2018,2019).³¹

Looking at Maine's congressional districts' voter turnout compared to the rest of the United States, Maine's voter turnout advantage shrunk since enacting RCV in 2018. I used a synthetic control estimator to evaluate the impact of RCV on voter turnout. The synthetic control estimator compares the voter turnout in Maine against counterfactual Maine congressional districts. The counterfactual, called the synthetic unit, estimates what would have happened in Maine's congressional districts without RCV. Synthetic Maine uses a weighted average of units in the donor pool to model the counterfactual. The United States has 435 congressional districts; however, 418 districts were used in the analysis due to several districts' voting data issues.

Formally, let J be the number of available control districts (the 416 other Congressional Districts in the United States), and $W = (w_1, \dots, w_J)'$ a $(J \times 1)$ vector of nonnegative weights which summed to one. The scalar w_j ($j \times 1, \dots, J$) represented the weight of region j in the synthetic Maine congressional district. Each value for W produced a different synthetic Maine congressional district, and therefore the choice of a valid subset of control regions was embedded in the choice of the weights W . The weights were chosen to most resemble the Maine congressional district before moving to Rank Choice Voting. Let X_1 be a $(K \times 1)$ vector of pre-RCV of K demographic and

³¹ Due to the 2019 COVID pandemic, the Census Bureau did not release ACS 2020 results; experimental data were released in November 2021. Therefore, the Census Bureau recommends using ACS 2019 to replace ACS 2020.

economic characteristics. Let V be a diagonal matrix with nonnegative components. The values of the diagonal elements of V reflect the relative importance of the different voting percent predictors. The vector of weights W^* is chosen to minimize $(X_1 - X_0W)'V(X_1 - X_0W)$ subject to $w_j \geq 0$ ($j = 1, 2, \dots, J$) and $w_1 + \dots + w_J = 1$. The vector W^* defines the combination of the non-RCV congressional districts, which resembled Maine 1 and Maine 2 in demographic and economic characteristics at the change to RCV. The V minimized the mean squared prediction error:

$$\sum_{t=1}^{T_0} (Y_{1t} - \sum_{j=2}^{J+1} w_j^*(V) Y_{jt})^2 \quad (2)$$

Synthetic control is based on the observation that a combination of units provided a better counterfactual than one single unit alone (Cunningham, 2021). Therefore, the Stata Synth Package is used to estimate the model (Abadie and Gardeazabal 2003, Abadie, Diamond and Hainmueller 2010, Abadie, Diamond and Hainmueller 2015).

Economic factors controlled for include unemployment, labor force participation, median income, and health insurance. High unemployment increases voter turnout, healthcare coverage correlates with the increased turnout, and turnout increases with age (Baicker & Finkelstein, 2018; Cebula & Toma, 2006; Incantalupo, 2015; Cebula, Payne, & Saltz, 2017). Higher education individuals vote more than less educated individuals; however, the American Community Survey did not track education by the congressional district until 2014 and thus was not included in the analysis. Additionally, controls include race and election competitiveness. The proportion of Hispanic and black voters negatively correlates with voter turnout (Cebula, Payne, & Saltz, 2017). Specific to

individual elections, increased competition increases voter turnout (Gilliam, 1985; Geys, 2006).

Since Maine has two congressional districts, two synthetic control comparisons are created to consider the congressional districts' unique characteristics lost at the aggregate level. When estimating the counterfactual, Maine 1 donor pool removes Maine 2, and Maine 2 donor pool removes Maine 1. Aside from re-districting, districts were not ruled out before the match to avoid subjective research into the counterfactuals. Congressional districts redrawn after 2012 were removed because redistricting alters the composition of the district. For evaluating the RCV effect on third-party voter turnout, elections with victories larger than 80% were removed from the sample because uncompetitive elections with large third-party turnout would distort third-party voter turnout in a given election. New York was removed from the analysis because candidates can run on multiple party slates. The vote total was zero if no third parties' votes existed in an election.

V. Results

I controlled the pre-treatment outcome and voting percentage for 2014 and 2016 to account for heterogeneity in addition to economic, age, ethnic, and election characteristics (Abadie, Diamond, & Hainmueller, 2010). Due to presidential elections occurring every four years and Congressional elections occurring every two years, the 2012 election voter turnout is not included as a pre-treatment outcome to avoid biasing the synthetic donor units to presidential elections years.

Table 3-3 shows the donor units for the total sample and the third-party candidate analysis. For the voter turnout analysis, Maine 1 synthetic unit included Wisconsin 5th District and Minnesota 3rd District. Maine 2 synthetic units included Wisconsin 5th District and Minnesota 8th District. Maine 1 was the more urban of Maine's two congressional districts. Wisconsin's 5th district geographically covered the rural part of Wisconsin, Minnesota's 3rd district covers a suburban district surrounding Minneapolis, and Minnesota's 8th district covers a rural section in Minnesota. In contrast to voter turnout, the third-party candidates' donor pool for Maine 1 includes California 17, Hawaii 1, Minnesota 6 and 7, New Hampshire 2, and Ohio 6. Over ninety-five percent of the weights are from Minnesota and Ohio. Minnesota 6 is a suburban district surrounding Minneapolis and Saint Paul. Minnesota 7 is a rural district, and Ohio 6 is a rural district in southeast Ohio. Maine 2 also includes Minnesota 6,7,8, and Ohio 6.

As shown in Table 3-2, Maine 1 has a lower unemployment rate, higher median income, a higher proportion of Non-Hispanic White Population, higher proportion of the population in the 55-64 age group and 65+ age group. Maine 2 had a higher proportion of Non-Hispanic White Population, an older population; however, the unemployment rate is only .27% lower than in the United States. Maine 2's labor force participation and median income are also lower than the average for the United States.

Looking at Maine 1 first, Table 3-2 shows the synthetic estimator is a closer approximation for Maine 1 than the United States averages. The differences between Maine 1 and the synthetic control are most apparent in Median Income. Given the number of voter turnout determinants, some differences between the synthetic control are

expected. Results are shown in Figure 3-2 for Maine 1, a change from a constant positive gap between the synthetic unit and Maine 1 to a negative gap in 2018 following the change to rank choice voting before returning to a positive gap again in 2020.

The synthetic control for Maine 2 has similar differences to Maine 1's synthetic control but provides a close approximation across most voter turnout determinants; Maine 2 results shown in Figure 3-2 show a Maine 2 gap greater than and less than zero before the law implementation in 2018. In 2018, Maine's 2 voting percent dropped in absolute terms below the 2014 voting percentage, which was the last non Presidential election before the change of the law. Compared to the synthetic unit, Maine 2 gap was negative .08 in 2018 and negative .04 in 2020. Evaluating the two cases of Maine 1 and Maine 2 based on Figure 3-2 does support the instrumental case for the negative effect of RCV on voting turnout. In the case of Maine 2, where a come from behind winner in Maine 2 2018 election, the gap remained large in the 2020 election.

Both Maine 1 and 2 third-party voters decreased compared to their synthetic unit in 2018, and the gap was maintained in 2020. The negative gap between the Maine 1 and 2 and their synthetic controls counter the instrumental prediction for higher turnout among third-party voters. I show the comparisons for third-party voter turnout against their synthetic units in Figure 3-6.

The gap between treated districts and synthetic units is insufficient to determine whether there was a negative effect on voter turnout or third-party voter turnout. After comparing the Maine 1 and Maine 2 gaps against their synthetic control units, the next step was to conduct permutation testing (Abadie, Diamond, & Hainmueller, 2010). For

each potential control observation, the unit was considered a treatment unit and then tracked the difference between the potential control observation and its synthetic control unit. The gap between the potential control observation and their respective unit is plotted in Figure 3-3 to compare Maine 1 and Maine 2 against the placebos. If the Maine districts' effect were large compared to the placebos, RCV would be considered significant.³²

The large set of donor pools allows granular statistical significance estimates. If RCV voting had a significant effect on voting, the graph would show a major break between Maine 1 and 2 and the rest of the congressional district. As shown in Figure 3-3, Maine 1 and Maine 2 do not look drastically different from the United States congressional districts' voter turnout. Maine 1 is ranked 365/418 for Maine 1 with a p-value of .84, and Maine 2 is 144/418 with a p-value of .34. Figure 3-6 shows the histogram of the Post/Pre-Treatment RMSPE Ratios. Maine 1 and Maine 2 are in the first bin. Neither Maine 1 nor Maine 2 had significant p-values when measured against the rest of the United States House of Representatives congressional districts. The same analysis conducted for the third-party voter turnout ranked Maine 87/328 and Maine 2 90/328. Both districts are ranked lower than voter turnout but are not statistically significant.

³² I calculated the pre-treatment and post-treatment period root mean squared prediction error (RMSPE) values to measure a test statistic for inference. $RMSPE = \left(\frac{1}{T-T_0} \sum_{t=T_0+t}^T (Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt})^2 \right)^{\frac{1}{2}}$. I calculated the *p*-value by sorting the ratio of post-treatment RMSPE to pre-treatment RMSPE and then calculating the *p*-value. $p = \frac{RANK}{Total}$

VI. Robustness

The United States is vast and different regions of the country have different economic and voting characteristics. Due to the differences in regions in the country, testing Maine against the congressional districts in its region will contrast the RCV districts against districts with similar regional histories. For this analysis, I used the United States Census Bureau Division grouping. Maine is in Division 1, New England, including Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont (United States Census Bureau, 2020). The Bureau of Economic Analysis also groups the same six states to form the New England Region (Bureau of Economic Analysis, 2018).

Massachusetts and New Hampshire Districts make up the Maine 1 and Maine 2 synthetic units. Both Massachusetts districts are coastal areas surrounding Boston, and New Hampshire borders Maine to the west. Similar to the comparison against all of the United States, the more rural areas in New Hampshire represent the more rural Maine 2, whereas suburban districts comprise Maine 1 synthetic unit. Table 3-4 shows the weight for both Maine 1 and Maine 2.

To conduct the analysis, I compare Maine 1 and Maine2 against districts in the New England Region. I created placebo synthetic units for each district in the region using the same New England division donor pool. For the comparison against regional districts in Figure 3-4, the gap between the congressional district and their respective unit is plotted in Figure 3-4 to compare the results for Maine 1 and Maine 2. If RCV voting

significantly affected voting in the region, the graph would show a major break between Maine 1 and 2 and the rest of the congressional district.

To further refine the robustness, Maine 1 and Maine 2 gaps are compared only against the districts used in the synthetic controls for Maine 1 and 2. Figure 3-5 compares the gaps in Maine 1 and Maine 2 against the gaps produced by running placebo tests on Minnesota 3, Minnesota 8, and Wisconsin 5. Figure 3-4 and 3-5 demonstrates Maine 1, and Maine 2 did not see a major change in voter turnout after RCV implementation. Maine 1 voter turnout sustained the gap between the synthetic unit and before and following RCV, but the Maine 2 gap dissipated almost completely.

Since the difference in difference regression is an alternative to synthetic control to measure outcomes after treatment, I used the difference in difference regression as a robustness check. Figure 3-1 shows that the United States average moves parallel to Maine Congressional districts. Maine congressional districts and the United States moved parallel before Maine's law change, thus, difference in difference regression is appropriate. *Maine* is the dummy variable for whether the congressional districts are in the regression's treatment group or the non-treatment group. *Maine* is the treatment for this paper, and the non-treatment group is not Maine. *Post* is the post-treatment dummy. *Post* is one if the election is in 2018 or later and zero if the election is before 2018. An interaction term between *Maine* and *Post* is the coefficient for the difference in difference causal effect of interest. A statistically significant positive β_3 would have supported the hypothesis that Rank Choice Voting had a positive causal effect on voting turnout. z_c represents the various economic and population controls added to the model.

$$Voting\ Percent_{it} = a + \beta_1 Maine + \beta_2 Post + \beta_3 (Maine * Post) + \beta_4 z_c + e$$

The results in Table 3-5 from the difference in difference regressions indicate no causal impact of RCV on voting turnout. The base regression shows a negative sign on the difference in difference regression; however, it is not statistically significant. When I add economic variables such as unemployment, labor force participation, health insurance, and median income, the interaction coefficient remains not statistically significant. When adding ethnic makeup or age makeup to the base model, the coefficient remained negative and not statistically significant. The lack of statistical significance in the difference in difference regressions supports the hypothesis that RCV has no causal impact on voter turnout. The null results imply that RCV does not affect voter turnout in Maine.

VII. Conclusion

Contrary to research and economic theories of voting, Maine's legislative change to Rank Choice Voting in 2018 does not appear to affect voter turnout or third-party voter turnout compared to other congressional districts. The further refinement comparing Maine 2 to the New England Region shows no difference for Maine 2 compared to its synthetic unit after changing to Rank Choice Voting in 2018.

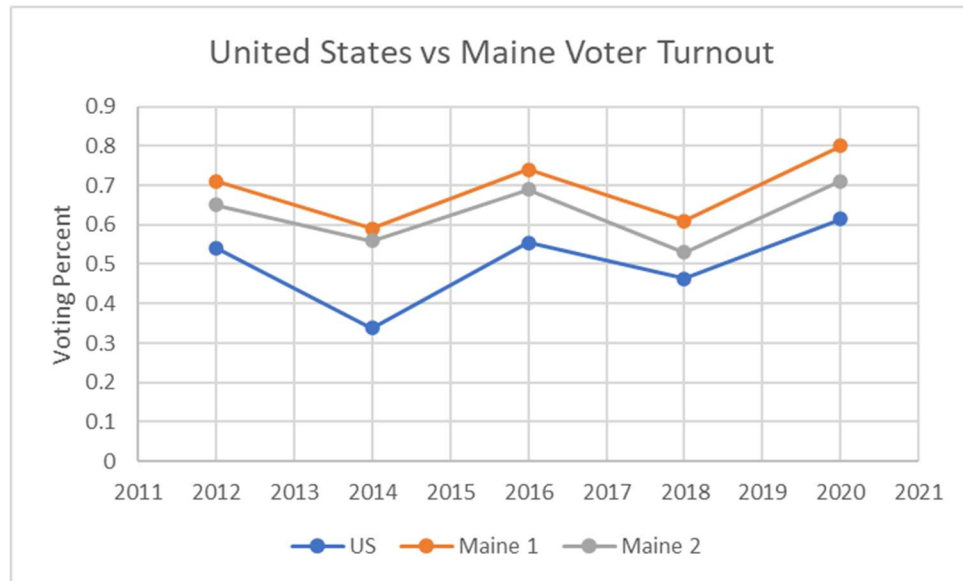


Figure 3-1. Maine Congressional Districts vs United States

Table 3-1. Instrumental and Expressive RCV Voter Turnout Predictions

Theory	Voter Turnout	Third Party Voter Turnout
<i>Instrumental</i>	Decrease	Increase
<i>Expressive</i>	Increase	Increase

Table 3-2. Pre Rank Choice Voting Characteristics 2012-2016

Variable	Maine 1	Maine 1 Synthetic	US	Maine 2	Maine 2 Synthetic
Unemployment Percent	4.86	4.19	7.47	7.20	5.26
Labor Force Participation	65.80	69.25	63.40	60.30	64.55
Median Income (\$)	61968.00	75415.00	54215.00	47625.00	61205.00
Health Insurance Percent	91.90	65.20	88.30	89.10	94.00
Hispanic	1.66	5.33	17.33	1.20	3.35
White (Non-Hispanic)	93.10	85.39	61.93	94.30	90.40
Black (Non-Hispanic)	1.56	3.30	12.30	0.80	1.29
Native (Non-Hispanic)	0.33	0.28	0.70	0.80	1.65
Asian (Non-Hispanic)	1.56	3.80	5.17	0.76	1.49
Pacific Islander (Non-Hispanic)	0.00	0.19	0.20	0.00	0.00
Other (Non-Hispanic)	0.06	0.09	0.20	0.06	0.03
2 or more Race (Non-Hispanic)	1.63	1.60	2.23	2.00	17.00
Percent of Pop 18-24	8.16	7.80	9.83	8.70	8.54
Percent of Pop 25-54	39.20	39.77	40.00	37.50	37.46
Percent of Pop 55-64	15.10	14.14	12.57	15.80	14.69
Percent of Pop 65 and Over	17.90	15.62	14.47	18.40	17.59
Incumbent	1.00	1.00	0.88	0.66	1.00
Competitiveness	0.24	0.31	0.36	0.09	0.18
Voter Turnout (2014)	0.59	0.57	0.34	0.56	0.56
Voter Turnout (2016)	0.74	0.70	0.54	0.69	0.69

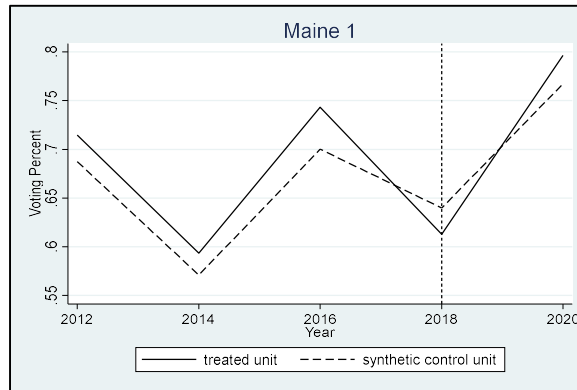
Note: The table reports the characteristics of the treated regions (Maine 1 and Maine 2), their synthetic controls, and all the regions in the United States in the three elections prior to RCV implementation. The weights used to build synthetic control are presented in Table 3-3.

Table 3-3. Donors

Donor Districts	Maine 1	Maine 2
<i>Total Sample</i>		
Minnesota 3	0.29	
Minnesota 8		0.56
Wisconsin 5	0.71	0.44
<i>3rd Party Voters</i>		
California 17	0.004	
Hawaii 1	0.001	
Minnesota 6	0.123	0.090
Minnesota 7	0.207	0.176
Minnesota 8		0.039
New Hampshire 2	0.005	
Ohio 6	0.660	0.695

Note: The weights of synthetic controls are chosen to minimize the distance with Maine 1 (Panel A)/ Maine 2 (Panel B) and their synthetic control unit in terms of voter turnout and demographics. See the Data and Methods section for details.

Panel A: Maine 1



Panel B: Maine 2

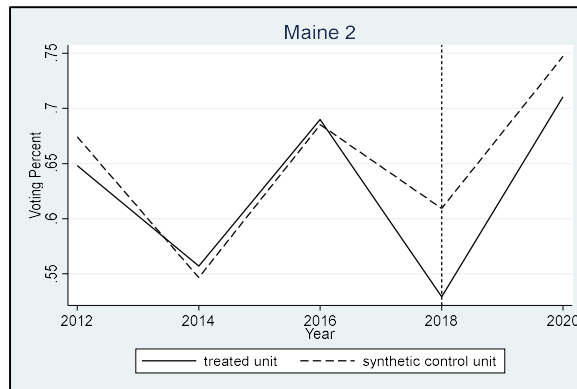


Figure 3-2. Baseline Results

Note: Voting Turnout 2012-2020. The graph reports the voter turnout for the treated regions and the respective synthetic control. In addition, the weights used to build synthetic controls are presented in Table 3-3.

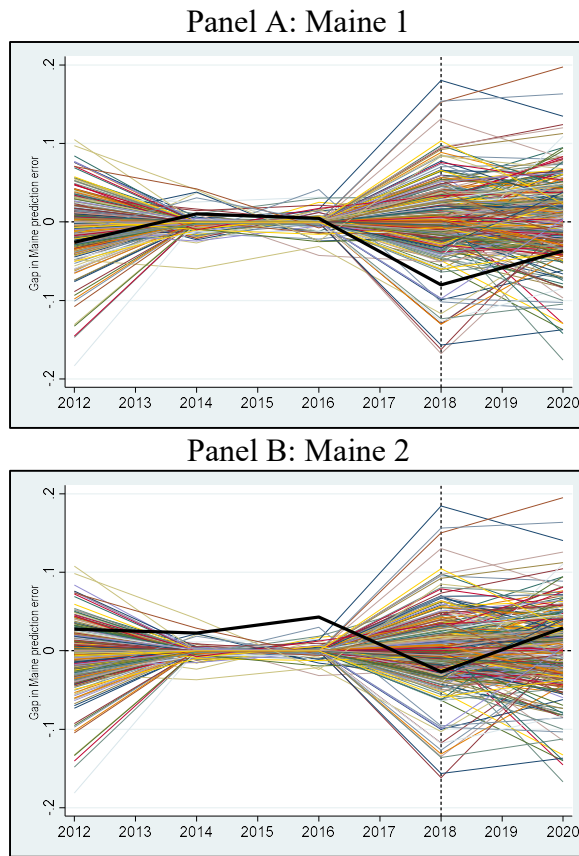


Figure 3-3. Placebo Test

Note: The graph reports the difference, in terms of voter turnout, between the treated regions and their synthetic controls, as well as the same differences for all other districts. Maine districts are in black.

Table 3-4. Regional Synthetic Control Weights

Donor Districts	Maine 1	Maine 2
Massachusetts 6	0.16	
Massachusetts 9	0.23	0.28
New Hampshire 1	0.61	0.15
New Hampshire 2		0.57

Note: The weights of synthetic controls are chosen to minimize the distance with Maine 1 (Panel A)/ Maine 2 (Panel B) and their synthetic control unit in terms of voter turnout and demographics for the New England Region. See the Data and Methods section for details.

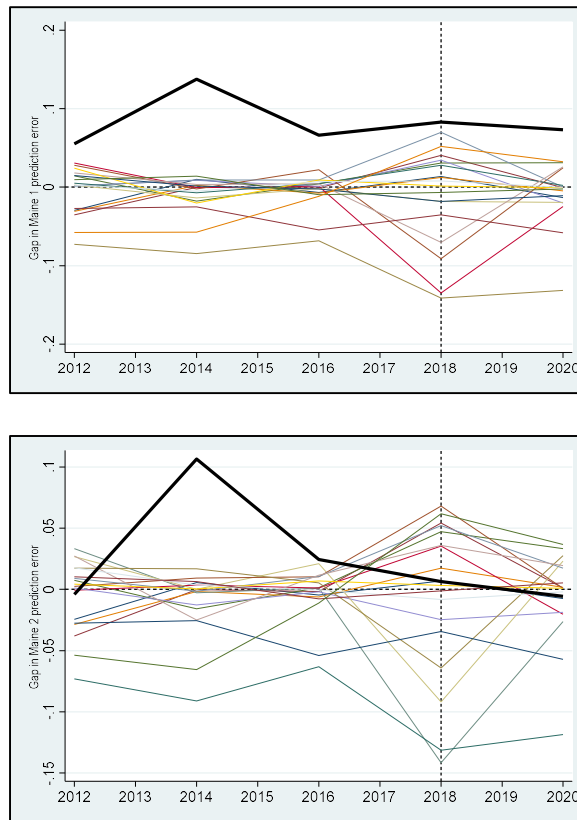


Figure 3-4. New England Region Robustness Check

Note: The graph reports the difference, in terms of voter turnout, between the treated regions and their synthetic controls, as well as the same differences for all New England districts. Maine districts in black.

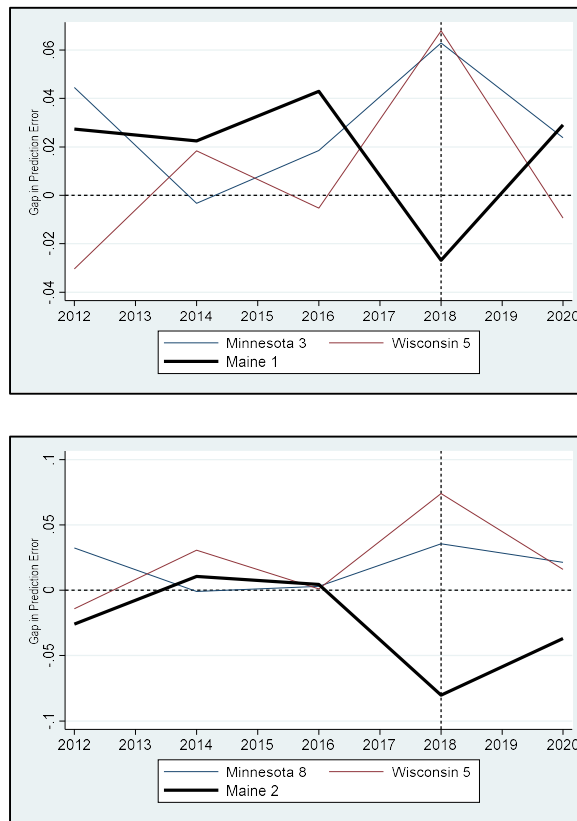


Figure 3-5. Donor Robustness Check

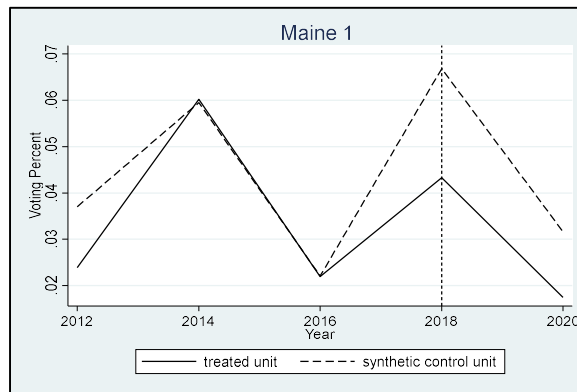
Note: The graph reports the difference, in terms of voter turnout, between the treated regions and their synthetic controls, as well as the same differences for Maine donor units. Maine districts in black.

Table 3-5. Difference in Difference Results

VARIABLES	(1) Base	(2) Base w/Econ	(3) Base w/Pop	(4) Base w/Age	(5) Base w/Election	(6) Base w/All
DiD	-0.0711 (0.0573)	-0.0591 (0.0503)	-0.0742 (0.0586)	-0.0676 (0.0620)	-0.0706 (0.0621)	-0.0781 (0.0486)
Post	0.0756*** (0.00547)	0.0387*** (0.00579)	0.0769*** (0.00473)	0.0621*** (0.00508)	0.0683*** (0.00516)	0.0402*** (0.00525)
Maine	0.206*** (0.0271)	0.198*** (0.0206)	0.130*** (0.0284)	0.0964*** (0.0290)	0.174*** (0.0278)	0.140*** (0.0212)
Observations	2,105	2,105	2,105	2,105	2,105	2,105
R-squared	0.088	0.284	0.340	0.261	0.188	0.523

Note: Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All Columns include Difference in Difference, Maine indicator variable, and post RCV indicator variables. Column 2 includes Unemployment, Labor Force Participation, Median Income, and Health Insurance. Column 3 includes the ethnic makeup of the population. Column 4 includes the age demographic. Column 5 includes election competitiveness. Column 6 includes all controls from Columns 2-5.

Panel A: Maine 1



Panel B: Maine 2

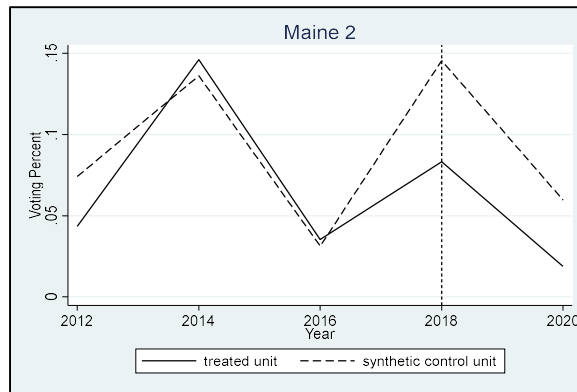
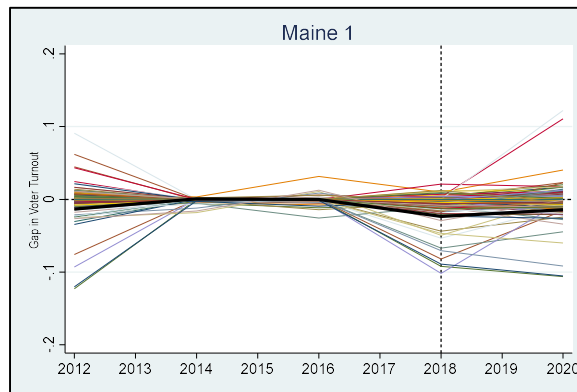


Figure 3-6. Third-Party Voting Results

Note: Voting Turnout 2012-2020. The graph reports the third-party voter turnout for the treated regions and the respective synthetic control. In addition, the weights used to build synthetic controls are presented in Table 3-6.

Panel A: Maine 1



Panel B: Maine 2

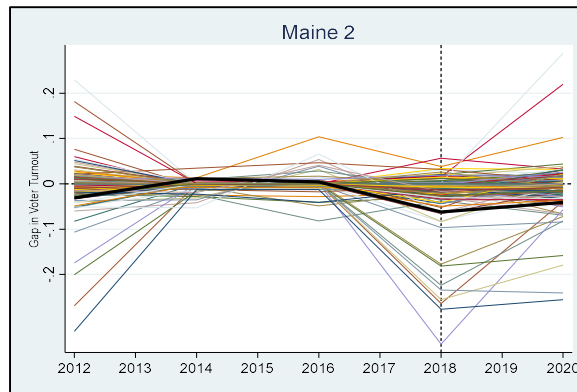


Figure 3-7. Third-Party Placebo Test.

Note: The graph reports the difference in voter turnout between the treated regions and their synthetic controls and the same differences for all other districts. Maine districts are in black.

Table 3-6. Pre Rank Choice Voting Characteristics Third Party 2012-2016

Variable	Maine 1	Maine 1 Synthetic	US	Maine 2	Maine 2 Synthetic
Unemployment Percent	4.86	6.56	7.47	7.20	6.72
Labor Force Participation	65.80	60.84	63.40	60.30	59.99
Median Income(\$)	61968.00	53601.81	54215.00	47625.00	52238.78
Health Insurance Percent	91.90	92.14	88.30	89.10	91.92
Hispanic	1.66	1.905967	17.33	1.20	1.69
White (Non Hispanic)	93.10	92.70	61.93	94.30	93.20
Black (Non Hispanic)	1.56	2.12	12.30	0.80	2.10
Native (Non Hispanic)	0.33	0.73	0.70	0.80	0.74
Asian (Non Hispanic)	1.56	0.99	5.17	0.76	0.65
Pacific Islander (Non Hispanic)	0.00	0.05	0.20	0.00	0.04
Other (Non Hispanic)	0.06	0.03	0.20	0.06	0.03
2 or more Race (Non Hispanic)	1.63	1.46	2.23	2.00	1.44
Percent of Pop 18-24	8.16	8.63	9.83	8.70	8.58
Percent of Pop 25-54	39.20	37.31	40.00	37.50	37.09
Percent of Pop 55-64	15.10	14.41	12.57	15.80	14.56
Percent of Pop 65 and Over	17.90	17.37	14.47	18.40	17.63
Incumbent	1.00	0.96	0.88	0.66	0.97
Competitiveness	0.24	0.20	0.36	0.09	0.20
Voter Turnout (2014)	0.06	0.06	0.34	0.15	0.14
Voter Turnout (2016)	0.02	0.02	0.54	0.04	0.03

Note: The table reports the characteristics of the treated regions (Maine 1 and Maine 2), their synthetic controls, and all the regions in the United States in the three elections before RCV implementation. The weights used to build synthetic control are presented in Table 3-3.

REFERENCES

- Abadie, A., & Gardeazabal, J. (2003). The Economic Costs of Conflict: A Case Study of Basque County. *American Economic Review*, 113-132.
- Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program. *Journal of American Statistical Association*.
- Abadie, A., Diamond, A., & Hainmueller, J. (2015). Comparative Politics and Synthetic Control Method. *American Journal of Political Science*, 495-510.
- Agricultural Marketing Service. (n.d.). *Federal Milk Marketing Orders*. Retrieved February 1 2022, 2022, from <https://www.ams.usda.gov/rules-regulations/moa/dairy>
- Alaska Division of Elections. (n.d.). *Alaska Better Elections Implementation*. Retrieved April 1, 2021, from <https://www.elections.alaska.gov/Core/RCV.php>
- Ansolabehere, S., de Figueiredo, J. M., & Snyder, J. M. (2003). Why is There so Little Money in U.S. Politics. *Journal of Economic Perspectives*, 105-130.
- Anthony, J., Fried, A., Glover, R., & Kimball, D. (2021). Ranked Choice Voting in Maine from Perspective of Local Election Officials. *Election Law Journal*.
- Ashworth, J., Geys, B., & Heyndels, B. (2006). Everyone likes a winner: An empirical test of the effect of electoral closeness on turnout in a context of expressive voting. *Public Choice*, 383-405.
- Associated Press. (1996, January 26). Dairy Farmers Agree on Pricing Changes. *New York Times*, p. 12.
- Baicker, K., & Finkelstein, A. (2018). The Impact of Medicaid Expansion on Voter Participation: Evidence from the Oregon Health Insurance Experiment. *NBER Working Paper Series*.
- Balla, S., Lawrence, E. D., Maltzman, F., & Sigelman, L. (2002). Partisanship, Blame Avoidance, and he. *American Journal of Political Science*, 515-525.
- Berry, C. R., & Anzia, S. F. (2011). The Jackie (and Jill) Robinson Effect: Why Do Congresswomen Outperform Congressmen. *American Journal of Political Science*, 479-493.
- Berry, C. R., Burden, B. C., & Howell, W. G. (2010). The President and the Distribution of Federal Spending. *American Political Science Review*, 783-799.
- Beyer, D. (2016). *Beyer, National Capital Delegation Announce Memorial Bridge Selected For \$90 Million FASTLANE Grant*. Arlington: United States Congress.

- Bickers, K., & Stein, R. (1996). The Electoral Dynamics of the Federal Pork Barrel. *American Journal of Political Science*, 1300-26.
- Board of Elections in the City of New York. (n.d.). *Learn About Ranked-Choice Voting for NYC Local Elections*. Retrieved April 1, 2021, from <https://vote.nyc/page/ranked-choice-voting>
- Bonica, A. (2016). Database on Ideology, Money in Politics, and Elections: Public version 2.0 [Computer file]. Stanford, CA: Stanford University Libraries. Retrieved from <<https://data.stanford.edu/dime>>
- Born, R. (1977). House Incumbents and Inter-Election Vote Change. *Journal of Politics*, 1008-1034.
- Brennan, G., & Buchanan, J. (1984). Voter Choice Evaluating Political Alternatives. *American Behavioral Scientist*, 185-201.
- Brennan, G., & Lomasky, L. (1993). *Democracy & Decision*. New York: Cambridge University Press.
- Bureau of Economic Analysis. (2018, February 28). *Regional Maps, GDP by State 2014*. Retrieved November 21, 2021, from <https://www.bea.gov/news/2015/gross-domestic-product-state-advance-2014-and-revised-1997-2013/region>
- Bureau of Economic Analysis. (2021, June 20). *SAGDP tables: Annual GDP by State*. Retrieved from <https://apps.bea.gov/regional/downloadzip.cfm>
- Bureau, U. S. (2008, March). *Federal, State, and Local Governments Federal Assistance Award Data System*. Retrieved from United States Census Bureau: <https://www.census.gov/govs/www/faads.html>
- Burnett, C. M., & Kogan, V. (2015). Ballot (and voter) “exhaustion” under Instant Runoff Voting: An examination of four ranked-choice elections. *Electoral Studies*, 41-49.
- Cancela, J., & Geys, B. (2016). Explaining Voter Turnout: a meta-analysis of national and subnational elections. *Electoral Studies*, 264-275.
- Cebula, R. J., & Toma, M. (2006). Determinants of Geographic Differentials in Voter Participation Rate. *Atlantic Economic Journal*, 33-40.
- Cebula, R. J., Payne, J. E., & Saltz, I. S. (2017). Determinants of Geographic Voter Participation Rate. *Atlantic Economic Journal*, 36-43.
- Center for Responsive Politics. (2019, June 10). *Dairy*. Retrieved January 20, 2022, from Open Secrets.
- Cerrone, J., & McClintock, C. (2021). Ranked-Choice Voting, Runoff, and Democracy: Insights from Maine and Other U.S. States.

- Coll, J., & Juelich, C. L. (2021). Ranked Choice Voting and Youth Voter Turnout: The Roles of Campaign Civility and Candidate Contact. *Politics and Governance*.
- Committee on Oversight and Reform. (2020). *United States Government Policy and Supporting Positions*. Washington, DC: U.S. Government Publishing Office.
- Congressional Research Service. (1996). *Dairy Provisions of the Enacted 1996 Farm Bill*. District of Columbia : Library of Congress.
- Congressional Research Service. (2005). *Agriculture: A Glossary of Term, Programs, and Laws, 2005 Edition*. District of Columbia: Library of Congress.
- Congressional Research Service. (2017). *Federal Milk Marketing Orders: An Overview*. District of Columbia: Library of Congress.
- Congressional Research Service. (2019). *What is the Farm Bill?* CRS Report. Retrieved from <https://sgp.fas.org/crs/misc/RS22131.pdf>
- Copeland, C., & Laband, D. N. (2002). Expressiveness and Voting. *Public Choice*, 351-363.
- Coppess, J. (2018). *The Fault Lines of Farm Policy*. University of Nebraska Press.
- Cuff, P. (2016). *Voting Research-Voting Theory*. Retrieved November 2021, from <http://www.princeton.edu/~cuff/voting/theory.html>
- Cunningham, S. (2021). *Causal Inference*. New Haven: Yale University Press.
- Dahlstrom, C., Fazekas, M., & Lewis, D. (2020). Partisan Procurement: Contracting with the United States Federal Government, 2003–2015. *American Journal of Political Science*, 652-669.
- Department of Defense. (2015, April). Financial Management Regulation 7000.14-R. Arlington, Virginia. Retrieved from DOD Comptroller.
- DiStefano, J. N. (2019, December 11). Congress restoring \$28 million for ArmyChinook work at Boeing Pa. plant where 4,600 employed. *Philadelphia Inquirer*.
- Donovan, T. (2014). Candidate perceptions of campaigns under preferential and plurality Voting Paper prepared for the workshop on electoral systems, electoral reform, and implications for democratic performance. *Stanford University*.
- Donovan, T., Tolbert, C., & Gracey, K. (2016). Campaign civility under preferential and plurality voting. *Electoral Studies*, 157-163.
- Downs, A. (1957). *An Economic Theory of Democracy*.
- Duquette, C. M., Mixon, F. G., & Cebula, R. (2013). The Impact of Legislative Tenure and Seniority on General Election Success: Econometric Evidence from U.S. House Races. *Atlantic Economic Journal*, 161-172.

- Dynes, A. M., & Huber, G. A. (2015). Partisanship and the Allocation of Federal Spending: Do Same-Party Legislators or Voters Benefit from Shared Party Affiliation with the President and House Majority? *American Political Science Review*, 172-186.
- Eleventh Hour Dealing Clears Way for Passage of New Dairy Pricing Plan. (1999). *CQ Almanac*, pp. 46-49. Retrieved from <http://library.cqpress.com.mutex.gmu.edu/cqalmanac/cqal99-0000201142>
- Epstein, D., & Zensky, P. (1995). Money Talks: Deterring Quality Challengers in Congressional Elections. *American Political Science Review*, 295-308.
- Erba, E. M., & Novakovic, A. M. (1995). *The Evolution of Milk Pricing and Government Intervention in Dairy Markets*. Ithaca: Cornell Program on Dairy Markets and Policy.
- Erikson, R. S. (1989). Economic Conditions and The Presidential Vote. *The American Political Science Review*, 567-573.
- Fair Vote. (n.d.). *Where is Rank Choice Voting Used*. Retrieved April 1, 2021, from https://www.fairvote.org/rcv#where_is_ranked_choice_voting_used
- Fair, R. C. (1996). The Effect of Economic Events on Votes for President: 1992 Update. *Political Behavior*, 119-139.
- Federal Election Commission. (2021, August 1). *House/Senate current campaigns*. Retrieved from Campaign Finance Data: <https://www.fec.gov/data/browse-data/?tab=bulk-data>
- Ferejohn, J., & Krehbiel, K. (1987). The Budget Process and the Size of the Budget. *American Journal of Political Science*, 296-320.
- Fiorina, M. P. (1976). The Voting Decision: Instrumental and Expressive Aspects. *Journal of Politics*, 390-415.
- Fisher, A. (1996). A further experimental study of expressive voting. *Public Choice*, 171-184.
- Fisher, S. D. (2004). Definition and Measurement of Tactical Voting: The Role of Rational Choice. *British Journal of Political Science*, 152-167.
- Fowler, A., & Hall, A. B. (2015). Congressional seniority and pork: A pig fat myth? *European Journal of Political Economy*, 42-56.
- Franklin, M. N. (2000). *Voter Turnout and Dynamics of Electoral Competition in Established Democracies since 1945*. Cambridge: Cambridge University.
- Frisch, S., & Kelly, S. (2016). *Cheese Factories on the moon: why earmarks are good for American Democracy*. New York: Routledge.
- Gelman, A., & King, G. (1990). Estimating Incumbency Advantage without Bias. *American Journal of Political Science*, 1142-64.

- General Services Administration & Office of Management and Budget. (2021). *About the Chief Financial Officers Council*. Retrieved from United States Chief Financial Officers Council: <https://www.cfo.gov/about-the-council/>
- Gerber, A. (1998). Estimating the Effects of Campaign Spending on Senate Election Outcomes Using Instrumental Variables. *American Political Science Review*, 401-411.
- Geys, B. (2006). Explaining voter turnout: A review of aggregate-level research . *Electoral Studies* , 637-663.
- Gilliam, F. D. (1985). Influences on Voter Turnout for U.S. House Elections in Non-Presidential Years. *Legislative Studies Quarterly*, 339-351.
- Grier, K., & McGarrity, J. P. (2002). Presidential Party, incumbency, and the effects of economic fluctuations on House Elections, 1916-1996. *Public Choice*, 143-162.
- Grier, K., Grier, R., & Mkrtchian, G. (2021). Interest Group Responses to Reform Efforts in U.S. House of Representatives: The Case of Big Sugar. *SSRN*.
- Griffith, B. S. (1976). An Interrupted Time-Series Test of the Distributive Theory of Military Policy-Making. *Western Political Quarterly*, 620-626.
- Groseclose, T., Levitt, S. D., & Snyder, J. M. (1999). Comparing Interest Group Scores across Time and Chambers: Adjusted ADA Scores for the U.S. Congress. *The American Political Science Review*, 33-50.
- Guntermann, E., Lenz, G. S., & Myers, J. R. (2021). The Impact of the Economy on Presidential Elections. *Political Behavior*, 837-857.
- Hayes, D., & McKee, S. C. (2009). The Participatory Effects of Redistricting. *American Journal of Political Science*, 1006-1023.
- Healy, A., & Lenz, G. S. (2014). Substituting the End for the Whole: Why Voters Respond Primarily to the Election-Year Economy. *American Journal of Political Science*, 31-47.
- Holbrook, T., & Weinschenk, A. C. (2014). Campaigns, Mobilization, and Turnout in Mayoral Elections. *Political Science Quarterly*, 42-55.
- Hosansky, D. (1996, March 16). *Agriculture: Snare of Competing Interests Entangles Dairy Debate*. Retrieved January 20, 2022, from CQ Weekly: <http://library.cqpress.com.mutex.gmu.edu/cqmagazine>
- Hosansky, D. (1996, March 2). *House, Senate Move Closer As Bills go to Conference*. Retrieved January 20, 2022, from CQ Weekly: <http://library.cqpress.com.mutex.gmu.edu/cqmagazine/wr401061>
- Hunt, C. R. (2018). When does redistricting matter? Changing conditions and their effects on voter turnout. *Electoral Studies*, 128-138.

- Incantalupo, M. B. (2015). The Effects of Unemployment on U.S. National Elections.
- International Dairy Foods Association. (2022). *Definitions*. Retrieved June 1, 2022, from <https://www.idfa.org/definition>
- Jacobson, G. C. (1980). *Money in Congressional Elections*. New York: Yale University.
- Jacobson, G. C. (1990). The Effects of Campaign Spending in House Elections: New Evidence for Old Arguments. *American Journal of Political Science*, 334-362.
- Justin Grimmer, S. M. (2012). How Words and Money Cultivate a Personal Vote: The Effect of Legislator Credit Claiming on Constituent Credit Allocation. *American Political Science Review*, 703-719.
- Kan, K., & Yang, C. C. (2001). On Expressive Voting: Evidence from the 1988 U.S. Presidential Election. *Public Choice*, 295-312.
- Kirk, R. S., Mallett, W. J., & Peterman, D. R. (2016). *Transportation Spending Under an Earmark Ban*. Congressional Research Service.
- Klingensmith, J. Z. (2019). Using tax dollars for re-election: the impact of pork-barrel spending on electoral success. *Constitutional Political Economy*, 31-49.
- Kriner, D. L., & Reeves, A. (2012). The Influence of Federal Spending on Presidential Elections. *American Political Science Review*, 348-366.
- Kriner, D., & Reeves, A. (2015). Presidential Particularism and Divide the Dollar Politics. *American Political Science Review*, 155-169.
- Kroszner, R. S., & Stratmann, T. (1998). Interest-Group Competition and the Organization of Congress: Theory and Evidence from Financial Services' Political Action Committees. *The American Economic Review*, 1163-1187.
- Lab, M. E. (2020, April 24). *U.S House Election*. Retrieved from Harvard Dataverse: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/IGOUN2>
- Lazarus, J. (2009). Party, Electoral Vulnerability, and Earmarks in the U.S. House of Representatives. *The Journal of Politics*, 1050-1061.
- Lazarus, J., & Reilly, S. (2010). The Electoral Benefits of Distributive Spending. *Political Research Quarterly*, 343-355.
- Lee, F. (2003). Geographic Politics in the U.S House of Representatives: Coalition Building and Distribution of Benefits. *American Journal of Political Science*, 714-28.
- Levitt, S. (1996). How Do Senators Vote? Disentangling the Role of Voter Preferences, Party Affiliation, and Senator Ideology. *The American Economic Review*, 425-441.

- Levitt, S. D., & Snyder, J. M. (1997). The Impact of Federal Spending on House Election Outcomes. *The Journal of Political Economy*, 30-53.
- Lewis, D. (2008). *The Politics of Presidential Appointments*. Princeton: Princeton University Press.
- Lewis, J. B., Poole, K., Rosenthal, H., Boche, A., Rudkin, A., & Sonnet, L. (2022). *Voteview: Congressional Roll-Call Votes Database*. Retrieved February 1, 2022, from <https://voteview.com/>
- Lewyn, M. (2012). Two Cheers for Instant Runoff Voting. *Phoenix Law Review*, 117-136.
- Maine Department of the Secretary of State. (2020, September). *Are you ready for ranked-choice voting?* Retrieved March 18, 2021, from <https://www.maine.gov/sos/cec/elec/upcoming/pdf/RCVFactSheet.NOV2020.pdf>
- Maine Secretary of State. (2021, January). *A Timeline of Ranked-choice Voting in Maine*. Retrieved April 1, 2021, from Bureau of Corporations, Elections, and Commissions: <https://www.maine.gov/sos/cec/elec/upcoming/pdf/RCVpowerpointtimeline.UpdateJAN2021.pdf>
- McCarthy, D., & Santucci, J. (2021). Ranked-Choice Voting as a Generational Issue in Modern American Politics. *Politics and Policy*, 33-60.
- McDaniel, J. (2019). Electoral Rules and Voter Turnout in Mayoral Elections. *Election Systems, Reform, and Administration*. Philadelphia.
- Mcdonald, M. P. (n.d.). *United States Election Project*. Retrieved April 10, 2021, from <http://www.electproject.org/home/voter-turnout/demographics>
- McGinn, E. (2020). Rating Rankings: Effect of Instant Run-off Voting on participation and civility.
- Mian, A., Sufi, A., & Trebbi, F. (2010). The Political Economy of the US Mortgage Default Crisis. *The American Economic Review*, 1967-1998.
- MIT Election Data and Science Lab. (2017). *U.S. House 1976–2018*. Retrieved March 2021, from <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/IGOUN2>
- National Agricultural Statistic Service. (2019). *The Census of Agriculture*. Ithaca.
- Nielson, L. (2017). Ranked Choice Voting and Attitudes toward Democracy in the United States: Results from a Survey Experiment. *Politics & Policy*, 535-570.
- Office of Sponsored Program, U. o. (2019, 9 17). *Grants vs Contracts*. Retrieved from https://www.osp.pitt.edu/sites/default/files/OSPDocs/Grants_vs_Contracts.pdf
- Office of the Clerk U.S. House of Representatives . (2021). *Statistics of Presidential and Congressional Election November 3, 2020*. Washington.

- Office, C. B. (2020, May 5). *What is the difference between mandatory and discretionary spending?* Retrieved from Congressional Budget Office:
<https://www.cbo.gov/content/what-difference-between-mandatory-and-discretionary-spending>
- Office, U. G. (2021, September 29). *United States Government Policy and Supporting Positions(Plum Book)*. Retrieved from govinfo:
[https://www.govinfo.gov/collection/plum-book?path=/gpo/United%20States%20Government%20Policy%20and%20Supporting%20Positions%20\(Plum%20Book\)/2020](https://www.govinfo.gov/collection/plum-book?path=/gpo/United%20States%20Government%20Policy%20and%20Supporting%20Positions%20(Plum%20Book)/2020)
- Olson, M. (1965). *The Logic of Collective Action*. Cambridge: Harvard University Press.
- Orriols, L. (2009). Social Spending, partisan bias and vote choice. Evidence from the US. *Electoral Studies*, 54-65.
- Ray, B. (1980). Congressional Promotion of District Interests: Does Power on the Hill Really Make a Difference? *Political Benefits: Empirical Studies of American Public Programs*.
- Riker, W. H., & Ordeshook, P. C. (1968). A Theory of the Calculus of Voting. *American Political Science Review*, 25-43.
- Roscoe, D. D., & Jenkins, S. (2005). A Meta-Analysis of Campaign Contributions Impact on Roll Call Voting. *Social Science Quarterly*, 52-68.
- Rubenzer, T. (2011). Campaign Contributions and U.S. Foreign Policy Outcomes: An Analysis of Cuban American Interests. *American Journal of Political Science*, 105-116.
- Sidman, A. (2019). *Pork Barrel Politics*. Columbia University Press.
- Simmons, A. J., Gutierrez, M., & Transue, J. E. (2022). Ranked-Choice Voting and the Potential for Improved Electoral Performance of Third-Party Candidates in America. *American Politics Research*, 1-13.
- Stratmann, T. (1995). Campaign Contributions and Congressional Voting: Does the Timing of Contributions Matter? *The Review of Economics and Statistics*, 127-136.
- Stratmann, T. (2002). Can Special Interests Buy Congressional Votes? Evidence from the Financial Service Legislation. *The Journal of Law and Economics*, 345-373.
- Stratmann, T. (2005). Some Talk: Money in Politics. A(partial) review of the literature. *Public Choice*, 135-156.
- Stratmann, T. (2009). How prices matter in politics: the returns to campaign advertising. *Public Choice*, 357-377.
- Stratmann, T. (2013). The effects of Earmarks on the likelihood of reelection. *European Journal of Political Economy*, 341-355.

- Sumner, D. A., & Balagtas, J. V. (2002). United States' Agricultural Systems: An Overview of U.S. Dairy Policy. In H. Roginski, J. Fuquay, & P. Fox, *Encyclopedia of Dairy Sciences*. Elsevier Science Ltd.
- Survey, A. C. (2018). *ACS Demographic And Housing Estimates*. Washington DC: United States Census Bureau.
- U.S. Census Bureau. (2012,2014,2016,2018,2019). *American Community Survey Demographic and Housing Estimates 1 Year Estimates*. Washington DC.
- U.S. Census Bureau. (2012,2014,2016,2018,2019). *American Community Survey Selected Economic Characteristics*. Washington.
- United States Census Bureau. (2020). *Census Regions and Divisions of the United States*. Retrieved November 21, 2021, from https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf
- United States Census Bureau. (2020). *Voting and Registration Tables*. Retrieved April 1, 2022, from <https://www.census.gov/topics/public-sector/voting/data/tables.html>
- Volden, C., & Wiseman, A. E. (2013). Legislative Effectiveness and Representation. In L. C. Dodd, & B. I. Oppenheimer, *Congress Reconsidered* (pp. 237-264). Los Angeles: Sage.
- Weingast, B. R. (1979). A Rational Choice Perspective on Congressional Norms. *American Journal of Political Science*, 245-62.
- Weingast, B. R., Shepsle, K. A., & Johnson, C. (1981). The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics. *Journal of Political Economy*, 642-666.

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