# Holding on to High Cotton:
# How Narrow Economic Interests Resist Policy Retrenchment

Jake Alton Jares*

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**Abstract**

Scholars of policy feedback have emphasized the propensity of government programs to foster their own durability by creating constituencies that are motivated and empowered to defend their benefits. However, the vested interests in many longstanding policies are both electorally and economically marginal, and thus it is unclear what they might offer in exchange for continued patronage from legislators who are motivated by reelection or ideological concerns. I investigate these dynamics by unpacking a puzzle along these lines regarding the US farm safety net. Born out of the Great Depression, US farm programs have remained robustly intact throughout 18 successive reauthorization hurdles, despite consistent conservative opposition and an order-of-magnitude collapse in the relative economic stature of the farming sector. Drawing on population-scale administrative data and a natural experiment in farm program retrenchment, I argue that this resilience owes little to the votes and resources that program beneficiaries provide to legislators. Between the fundamental dispersion of crop production and the urban-rural partisan rift at the center of US geographic polarization, modern farmers are (a) electorally marginal in almost every congressional district, and (b) represented by conservative legislators who generally favor cuts to the broader social safety net. I hypothesize that the broad support farm programs nonetheless receive stems in large part from legislators' desire to support distinctly local enterprises—an objective that runs much deeper than expectations of electoral reciprocity from program beneficiaries. I corroborate this hypothesis through a quantitative case study of the disqualification—and eventual reinstatement—of cotton from the 2014 farm bill safety net due to a surprise World Trade Organization ruling. Altogether, the nature of farm programs' political resilience suggests that political scientists may be too quick to assume that legislators deliver particularistic benefits to narrow economic interests because they are electorally significant, and I highlight the role that economic geography might play in directly shaping lawmakers' policymaking objectives.

*Jake Alton Jares is a PhD candidate, Stanford Graduate School of Business, 655 Knight Way, Stanford, CA 94305-7298 (jjares@stanford.edu)

Compared to Social Security, the vaunted "third rail" of US politics, farm subsidies do not appear to be the linchpin of a formidable constituency. Nonetheless, President Dwight Eisenhower foresaw resilience in both of these components of the nascent social safety net. He argued in 1954 that conservative calls for retrenchment, from spending cuts to wholesale program dismemberment, had already been relegated to the quixotic province of ideologues:

> Should any political party attempt to abolish social security, unemployment insurance, and eliminate labor laws and farm programs, you would not hear of that party again in our political history. There is a tiny splinter group, of course, that believes you can do these things. ... Their number is negligible and they are stupid.

Eisenhower was prescient; farm programs have survived through the present day. They still provide a safety net for the same coalition of crop interests that achieved passage of the first "farm bill" amid the depths of the Great Depression (Coppess, 2018). Moreover, their share of federal expenditures over the past decade (0.5%) has barely changed from their share in the 1950s (0.6%).

While it is easy to pin the durability of other social programs—such as Social Security—on the growth of their core constituencies, the diminished stature of the modern farm sector makes it hard to imagine why farm programs continue to endure. Indeed, scholarly explanations of policy persistence have generally centered on the electoral and economic power of a policy's beneficiaries. Consistent with Eisenhower's narrative, scholars of "policy feedback" processes describe how programs benefiting mass constituencies ensure their own political durability by activating electoral coalitions that then mobilize and protect them (Campbell, 2012). In complementary work, a diverse array of research on money in politics, lobbying, and the political

economy of regulation has emphasized the role of market power and wealth in maintaining policies—and a broader political terrain—that favor US economic elites and large businesses (Salamon and Siegfried, 1977; Richter, Samphantharak, and Timmons, 2009; Hacker and Pierson, 2010; Kelly and Morgan, 2021; Callander, Foarta, and Sugaya, 2023). However, neither of these perspectives appears capable of explaining the enduring influence of a decentralized industry that lacks both voters and economic clout.

Given the prominence of these perspectives in folk wisdom about farm policy—pundits *are* quick to tout the "powerful agribusiness lobby"[1]—it is worth emphasizing that they did historically provide plausible explanations of farm country politics. When Eisenhower warned conservatives in 1954 not to mess with farm programs, agriculture still held a formidable position within the US economy and electorate. Just six years earlier, many commentators had attributed Democratic President Harry Truman's shocking reelection victory to an uprising against congressional Republicans' plans for liberalizing crop price supports (Hansen, 1991). In a year in which 17% of the US population lived on the farm, and farming accounted for 8% of GDP and 11% of the workforce, it was not far-fetched to link Republicans' collapse across the Midwest to Truman's vocal campaign against the proposed conservative reform.

However, farm program beneficiaries now account for less than 1% of GDP and the electorate, and it is difficult to imagine that they retain the capacity to impose retribution on such a meaningful scale. This dearth of electoral strength is especially notable in light of the need to reauthorize funding for farmers' distinctive safety net in farm bill negotiations that take

[1]In an archetypal example of the tone of farm policy coverage, Boudreau and Evich (2017) documented conservative groups' plans in 2017 to cut benefits for wealthy farmers, noting concerns that reform efforts would have to contend with the "spending power and organization" of "the entrenched and powerful agribusiness lobby." After the reform proposals failed, Boudreau's (2018) post-mortem cites a reform advocate's admission that they "aren't yet a match for the ag lobby."

place every five years. For contrast, funding for Social Security and the fiscal components of the Affordable Care Act does not need to be renewed; this status quo bias makes it inherently more difficult for political entrepreneurs to dislodge such programs. Farm program beneficiaries thus seem politically vulnerable in two key regards: they must routinely secure the patronage of a broad congressional coalition, and they seem to lack the electoral stature to demand this patronage. How then does the farm safety net seem to be nearly as strong as ever?

In this paper, I present and unpack this puzzle of modern US farm policy. I draw on a variety of novel data sources to illustrate the precise nature of farm programs' political predicament, rule out popular folk wisdom explanations, and propose an answer that is consistent with the incentives and observed behavior of the major political actors in farm policy. In particular, my analyses draw on linked administrative data on the political behavior of the universe of farm program recipients and the broader electorate, as well as data on voter, legislator, and interest group responses to a natural experiment in farm program retrenchment.

I first explain how farm programs' modern predicament has been shaped by critical interactions between US political geography, the decline of the farm sector, and continued opposition from free market conservatives. I link US Department of Agriculture (USDA) records on the universe of 2004-2020 farm program payments to several snapshots of a national voter file and Bonica's DIME database of federal, state, and local campaign contributions. After geocoding these records, I am able to calculate farm program households' share of turnout and contributions in all recent primary and general elections for Congress. The distributions of these shares demonstrate that the challenge of farm program reauthorization runs deeper than farmers' national electoral irrelevance. Due to the fundamental dispersion of crop production, farmers are now electorally marginal in almost every congressional district. And given the urban-rural

partisan rift at the center of US geographic polarization, these scattered remnants of the farm sector are represented by conservative legislators who generally favor cuts to the broader social safety net. Farm program recipients thus lack the electoral and economic clout to force the hand of any meaningful subset of lawmakers, and entreaties based on constituent status generally run counter to their legislators' economic ideology.

I hypothesize that the key to resolving the puzzle lies in legislators' intrinsic desire to support distinctly local enterprise. I ground this hypothesis in political behavior research that finds that local identity is a strong driver of US political attitudes and policy preferences—especially in rural areas, and in a manner that cuts across partisan divides. If legislators' concern for local enterprise is strong enough to overcome conservatives' aversion to government safety nets, it could convert the political geography of farming from a major liability into a major asset. That is, the same fundamental dispersion of agriculture that ensures farmers' votes are marginal everywhere would also ensure that farmers can find a sympathetic ear anywhere.

I corroborate my "local enterprise affinity" explanation through a case study of a natural experiment in farm program retrenchment. While highly visible, routine farm bill negotiations on the floor of Congress provide an unsatisfactory setting for examining the importance of legislators' affinity for local farmers, as proposals to phase out farm programs generally fail earlier in the legislative pipeline. To surmount this difficulty, I exploit a surprise 2007 World Trade Organization ruling disqualifying cotton—and only cotton—from the 2014 farm bill safety net. As the WTO is an international body whose motives are external to US domestic politics, the surprise ruling had the distinct ability to push farm policy far from its normal equilibrium. By examining the responses of various political actors to this external shock, I am able to shed light on the forces that normally hold farm policy in place.

In particular, I leverage the crop-specific incidence of this shock to gauge farmer, interest group, and legislator responses to the increased threat of permanent farm program retrenchment. I argue that these dynamics were consequential and reveal the collaborative nature of farm program recipients' relationship with a surprisingly broad group of legislators. Notably, despite the US government's assertions in 2013 that conventional cotton payments were permanently ending, a campaign by cotton growers and organizations eventually succeeded in convincing Congress to reinstate support in the 2018 farm bill.

I first estimate the effect of the 2007 WTO ruling on cotton grower and cotton lobbying group behavior using synthetic control estimators paired with linked administrative data on the political engagement of all farm program households and crop organizations. I uncover large effects on political behavior—including a 150% increase in cotton group lobbying expenditures—that are consistent with increased outreach to sympathetic legislators. However, I find no indication of mobilization that would exert meaningful electoral pressure on incumbents or influence election outcomes.

I then examine variation in legislators' decisions to sign congressional petitions in 2015 and 2017 calling for reinstatement of cotton program funding through extraordinary political means. I estimate a member's conditional probability of signing a petition given cotton growers' share of turnout in their district in the prior election. Representing at least a handful of cotton growers was typically both necessary and sufficient for a representative to lend their support. I find that the conditional probability of signing increases from roughly 0% to over 90% before cotton growers' share of the electorate reaches 0.2%. Moreover, analogous estimates concerning the broader agrarian share of district electorates demonstrate that these legislators' efforts were much more specific than a stand for rural voters or the farm sector at large. Altogether, my

results point to a politically active coalition of cotton growers that makes ample use of the freely given patronage of local members of Congress—a voluntary collaboration that is not principally founded on any political quid-pro-quo.

These findings have implications that extend well beyond agricultural policy. At a most basic level, they point directly to a plausible role for economic geography in explaining the enduring political influence of many parochial US industries, such as coal mining, logging, domestic maritime shipping, commercial fishing, and horse racing.[2] However, more broadly, my findings contribute to the literatures on interest groups and policy feedback by unpacking the mechanisms by which even electorally marginal interests can manage to sustain particularistic policies in a majoritarian democracy. And finally, as I discuss further in the conclusion, the case of US farm policy proves uniquely valuable for tracing out the ways in which economic ideology and economic interest give rise to each other and drive the American political economy.

# 1 The Puzzle of Farm Program Resilience

## 1.1 Farm Program Persistence Amidst a Century of Conservative Opposition

The core reason that farm program *persistence*—rather than *decline*—is surprising lies in these programs' fundamental incongruence with the objectives of conservative economic reformers, the prototypical architects of large-scale retrenchment efforts. Whereas Pierson's (1994) classic study of welfare state retrenchment frames conservatives as ideologically motivated to crusade against social policies, it must be pointed out that the agricultural welfare state is even more anathema to free market doctrine. This is because crop production is about as close as

[2]I discuss each of these examples in the conclusion.

one can get to the platonic ideal of a competitive market in neoclassical economic theory. There are no first-order market failures in corn, cotton, or wheat production as one might observe in, say, banking or technology or oil and gas extraction. Major crop markets are perfectly competitive, externalities are comparatively modest, and policymakers are not concerned with issues of asymmetric information or network effects. US farm programs have usually been designed to suppress supply and raise prices for growers; as such, they also do not serve to feed the population or aid in national security. Free market advocates thus oppose farm programs on two counts: not only do they redistribute income to a particular subset of the population (as other social programs do), they also entail government "picking winners and losers" to distort market signals in a naturally competitive market.

Indeed, laissez-faire farm policy is intertwined with the very DNA of free market economics, inspiring famous treatises from Boisguillebert—arguably "the first systematic free-market economic theorist" (Soll, 2022, pp. 135-136)—to Adam Smith (1776, Book IV, Ch. V).[3] Continuing this tradition, free market orthodoxy proved a major impediment to the emergence of interventionist farm policy in the US in the early twentieth century. Burgeoning supply in the 1920s yielded a collapse in crop prices that devastated farm income, but forceful calls by farmers for dirigiste supply restrictions were largely resisted by Republican Presidents Coolidge and Hoover, who remained "shackled to [their] traditional, conservative ideology" in developing policy responses (Coppess, 2018, p. 19). However, the Great Depression and election of Franklin Roosevelt proved large enough shocks to completely rewrite the US government's relationship with the agricultural sector. As Coppess (2018) documents, producers of corn, wheat,

[3]See Appendix A for a discussion of this history. This is not to say that the *rationale* for free market farm policy has been consistent across history. Indeed, Soll (2022) argues that agrarianism itself was itself a foundation for early laissez-faire economic thought, a point to which I return in the conclusion.

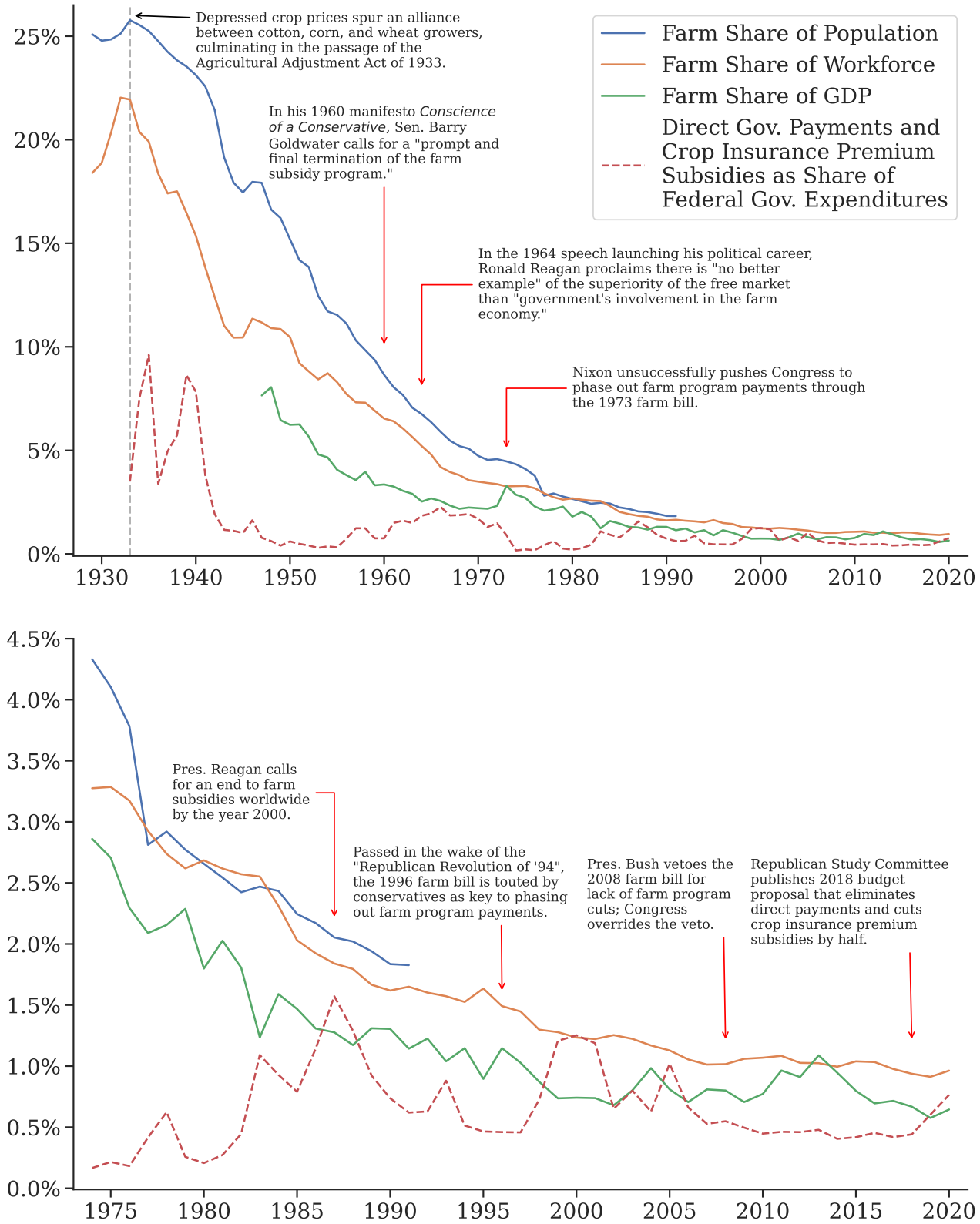
and cotton—the three predominant field crops that defined contemporary American farming—banded together to pass the Agricultural Adjustment Act (AAA) of 1933, which instituted an unprecedented system of supply controls to directly maintain elevated commodity prices.

Remarkably, this 1933 legislation marks the origin of the same "farm safety net"—albeit in a completely revised form—that has supported US commodity crop farmers' incomes through the present day. At the time of this writing, Congress has passed 18 such "farm bills" renewing programs implemented by the US Department of Agriculture, and these programs continue to overwhelmingly center on supporting producers of the three field crops at the center of the AAA of 1933 (corn, wheat, and cotton) in addition to soybeans (corn's chief partner in crop rotation).

Figure 1 depicts the evolution of the farm sector's share of the nation's economy, population, federal expenditures through nearly a century of continued conservative opposition. As noted in the introduction, US economic development appears to have delivered an order-of-magnitude collapse in the economic stature of farming without a concomitant collapse in its political stature. Farm programs' post-war share of national expenditures have been roughly flat, despite resolutions by Presidents Nixon, Reagan, and Bush to scale them back. Indeed, in the same book in which Rose and Milton Friedman famously quip that "nothing is so permanent as a temporary government program" (1984, p. 115), they pointedly express their surprise and frustration that—beset by interest group opposition—the Reagan administration failed to cut farm program spending. Echoing the incongruence depicted in Figure 1, they muse that "[a]pparently, the fewer the number of farmers, the greater their political clout" (p. 25).

Modern conservative thought leaders have been just as opposed to maintaining farm pro-

**Figure 1:** Farming and Farm Program (Non-)Retrenchment Across 18 Farm Bills




Notes: Employment and GDP figures are from the Bureau of Economic Analysis. Farm population estimates are obtained from the USDA Economic Research service and the Economic Report to the President. Note that the latter measure was discontinued in 1992.

grams, and they have been just as unsuccessful as their predecessors in phasing them out.[4] Each of the 16 conservative and libertarian members on the Think Tanks and Civil Societies Program's list of top US think tanks has published commentaries in recent years opposing the renewal of major farm programs.[5] In particular, the Heritage Foundation waged a campaign ahead of the 2018 farm bill to remind legislators that anything less than major cuts constituted ideological heresy, a point made explicitly in a commentary titled "It Is Not Conservative to Support Farm Subsidies" (Bakst and Cosby, 2018). Likewise, the archconservative "Republican Study Committee" House caucus has called for the farm safety net to be almost completely eliminated in 2018 and 2022 budget proposals. However, none of this pushing and cajoling from these groups has ever placed a major retrenchment proposal close to the floor of Congress.

## 1.2 Unpacking Extant Theories of Vested Interests and Policy Retrenchment: How might farmers matter to policymakers?

Extant theories of electoral accountability, policy durability, and policy feedback provide a compelling starting point in the search for explanations for the persistence of farm programs. A diverse literature within political science and economics discusses the propensity and ability of small groups to obtain disproportionate political influence.[6] However, I argue that the persistence of farm policy sheds light on a glaring hole within canonical theories of political economy, political representation, and policy retrenchment.

[4]In one of the most comprehensive historical studies of the US agricultural welfare state to date, Sheingate (2001) argues that the 1996 farm bill—passed in the wake of the "Republican Revolution of '94"—constitutes a significant instance of safety net retrenchment. However, as Patashnik (2008) chronicles, the reforms of the 1996 farm bill were temporary and unwound almost immediately. Had Sheingate written his book after the 2002 farm bill had passed, he may well have framed this historical episode differently.

[5]See Appendix A for a list of these 16 think tanks, as well as citations to their pronouncements on farm policy.

[6]See Schnakenberg and Turner (2023) for a review of the formal theoretical literature on special interest influence.

When narrow economic interests manage to secure policy benefits at the expense of the broader public, scholars and pundits alike are often quick to summarily conclude their analysis by alluding to Olson's (1965) theory that beneficiaries of programs inducing "concentrated benefits and diffuse costs" hold the greatest incentives to lobby. However, in a liberal democracy, elected officials—in the case of farm programs, members of Congress—ultimately must be convinced by such lobbying to appropriate the requested funds. Assuming that politicians are primarily motivated by their own policy objectives and future electoral success, it is far from obvious what narrow economic interests can provide in exchange for their political patronage.

When it comes to farm policy, this basic question has often been neglected by political scientists and economists, who have instead emphasized the legislative institutions that underpin farm programs. Reflecting its ability to pass every five years with large bipartisan majorities of Congress, the farm bill has been recognized as a canonical example of congressional logrolling (Stratmann, 1992). Since 1973, the fate of nutrition assistance has been inextricably linked to that of the farm safety net, a deal that is widely viewed as sustaining an alliance between inner-city Democrats and non-urban Republicans.[7]

I contend, however, that the logroll at the center of the farm bill does not explain the persistence of farm programs, but merely refocuses the puzzle. It is not especially difficult to imagine why anti-government Republicans would need a legislative trade in order to support a particular safety net program (i.e., nutritional assistance). However, what makes the reauthorization of an *additional* safety net (i.e., farm programs) a desirable outcome for Republican legislators—let alone an outcome worth making a deal for?

[7]Previously, the primary federal nutrition assistance was known as the Food Stamp Program. Beginning with the 2008 farm bill, it became known as the Supplemental Nutrition Assistance Program ("SNAP").

Following congressional scholars' traditional focus on the "electoral connection" of policy-making (Mayhew, 2001), an obvious conjecture worth evaluating is that—despite their small share of the national population—farm program beneficiaries are electorally significant in many particular congressional districts, and legislators compete for this critical block of votes. Drawing on previous literature, I consider three simple manners in which farmers' personal political capital could prove pivotal to a congressional patron: (1) they provide a large share of general election votes, (2) they provide a large share of primary election votes, or (3) they provide a large share of campaign finance. Since a member of Congress must successfully fund a campaign, succeed in her party's primary, and then succeed in the general election, if farm safety net participants could prove close to pivotal in any of these manners, it could explain why an otherwise anti-government conservative might be willing to support funding for a market-distorting safety net.

Even if farm program recipients are relatively sparse at the local level, not all citizens are politically active, and the prospect of political mobilization can lower the threshold at which a group can be electorally influential. Indeed, in the case of most redistributive programs, beneficiaries are clearly a minority of the population, and so researchers examining how such constituencies ward off retrenchment have often focused on their ability to maintain high levels of political engagement. Pierson (1994) argues that welfare state retrenchment is fundamentally distinct from (and indeed, more difficult than) program enactment or expansion, principally because inherited social policy structures activate beneficiaries and allied interest groups that then mobilize in their defense. Such "policy feedback" effects of social policies empower their constituencies to "reward or punish policymakers for particular courses of action" (p. 30).

As a starting point, it is worth investigating whether such policy feedback effects might

induce enough of a turnout boost to make farmers a meaningfully influential block in general elections. While Hansen (1991) argues that waves of farm country electoral backlash were historically a force that shaped party platforms, it is implausible that farmers' current one-percent share of the electorate could be close to pivotal in the broader struggle for Congress. However, I examine whether farm program beneficiaries might be close to pivotal in a meaningful number of House districts, perhaps through some combination of generally high turnout rates, low midterm turnout among the broader electorate, and/or living in particularly competitive districts.

A more plausible hypothesis might be that farm program households' votes are meaningful in primary elections. Since farmers have become solid Republican partisans amidst recent trends in urban-rural polarization (Anzia, Jares, and Malhotra, 2022), and because primary turnout is so much lower than general election turnout, it seems considerably more likely that farmers could find leverage in Republican House nominating contests, and thereby control which candidates even make it to the general election. This would comport with the "UCLA school" argument that political parties are dominated by interest groups and activists (Bawn, Cohen, Karol, Masket, Noel, and Zaller, 2012) and thus less responsive to the preferences of the broader electorate.

Finally, in an even less majoritarian channel of policy feedback effects, I engage with popular narratives concerning the "powerful agribusiness lobby" and consider the possibility that farmers may find leverage by providing legislators with a key source of campaign finance. While the money in politics literature is far from a consensus in finding that there are consistent, large returns to political donations (Ansolabehere, de Figueiredo, and Snyder, 2003; Fowler, Garro, and Spenkuch, 2020), Kalla and Broockman (2016) find that contributions facilitate

access to congressional officials. Bonica (2017) specifically points to campaign finance networks of lawyers as a reason that members of the legal profession are extremely overrepresented in Congress — individuals from other industries often cannot afford to mount a viable campaign. I consider whether farmers might similarly compose a professional network in rural districts that makes a significant number of candidates viable.

## 1.3 Methodology for Estimating the Political Capital of Vested Interests in Farm Programs

I take a very simple methodological approach to gauging the plausibility of each of the three hypotheses described in the previous section. Using comprehensive administrative data, I calculate for each district (1) the share of general election turnout, (2) the share of primary election turnout, and (3) the share of each Congress member's campaign contribution haul attributable to crop grower safety net households. By examining the distributions of these shares across all districts, I can assess not only whether program beneficiaries are disproportionately politically active (as policy feedback theory would predict), but whether they are sufficiently active such that they are close to pivotal in a meaningful subset of congressional districts.

While my approach to *analyzing* such data is rather simple, *assembling* comprehensive data on the political engagement of the universe of farm program participants is an extremely difficult task. However, it is necessary for understanding the political capital that these vested interests bring to the table. Classic data sources such as the Current Population Survey and the Cooperative Election Survey are far from suited for this task for three principle reasons. First, farmers are a small share of the US population, and so survey-based estimates of shares of district-level turnout would be unacceptably noisy. Second, the occupation reported in such surveys will rarely be sufficiently useful for determining whether an individual holds a vested

interest in the crop grower safety net. The primary occupation of most US farmers today is something other than farming, and regardless only a select subset of agricultural commodities are covered by the crop grower safety net. Third and finally, such survey data sources are of little use in determining the importance of farm program participants' campaign contributions.

Given available data, my primary empirical objective in this endeavor is to place an upper bound on the share of turnout and contributions attributable to 2012 farm program beneficiaries in each district in the 2014 and 2016 elections. For a few reasons, the 2014 election represents a best possible opportunity for the modern farm safety net coalition to be electorally pivotal. It was a low-turnout, Republican-wave midterm and it directly followed the passage of a transformative farm bill. As such, it is as good a test case as any for whether policy feedback among farm program beneficiaries is still potent enough to make a difference in Congressional elections. Focusing on this election is likewise advantageous for this period's centrality to the case study that composes the second half of this paper; in particular, the results of these analyses provide directly relevant context for interpreting analyses in Section 3.4.

The challenging aspect of this analysis lies in assembling administrative data that is sufficiently close to encompassing (a) all ballots cast in a national general election, (b) all ballots cast in a national primary election, and (c) all contributions made to sitting members of Congress — while also successfully identifying which of these ballots and contributions are attributable to farm program beneficiaries or related interest group organizations. I rely on snapshots of voter files for all 50 states from the vendor L2 to track the general and primary election turnout of virtually the entire US electorate, and I use itemized campaign contributions from the Database on Ideology, Money in Politics, and Elections (DIME) (Bonica, 2014) to approximate the total funding hauls of sitting members of Congress. Likewise, I file multiple Freedom of Information

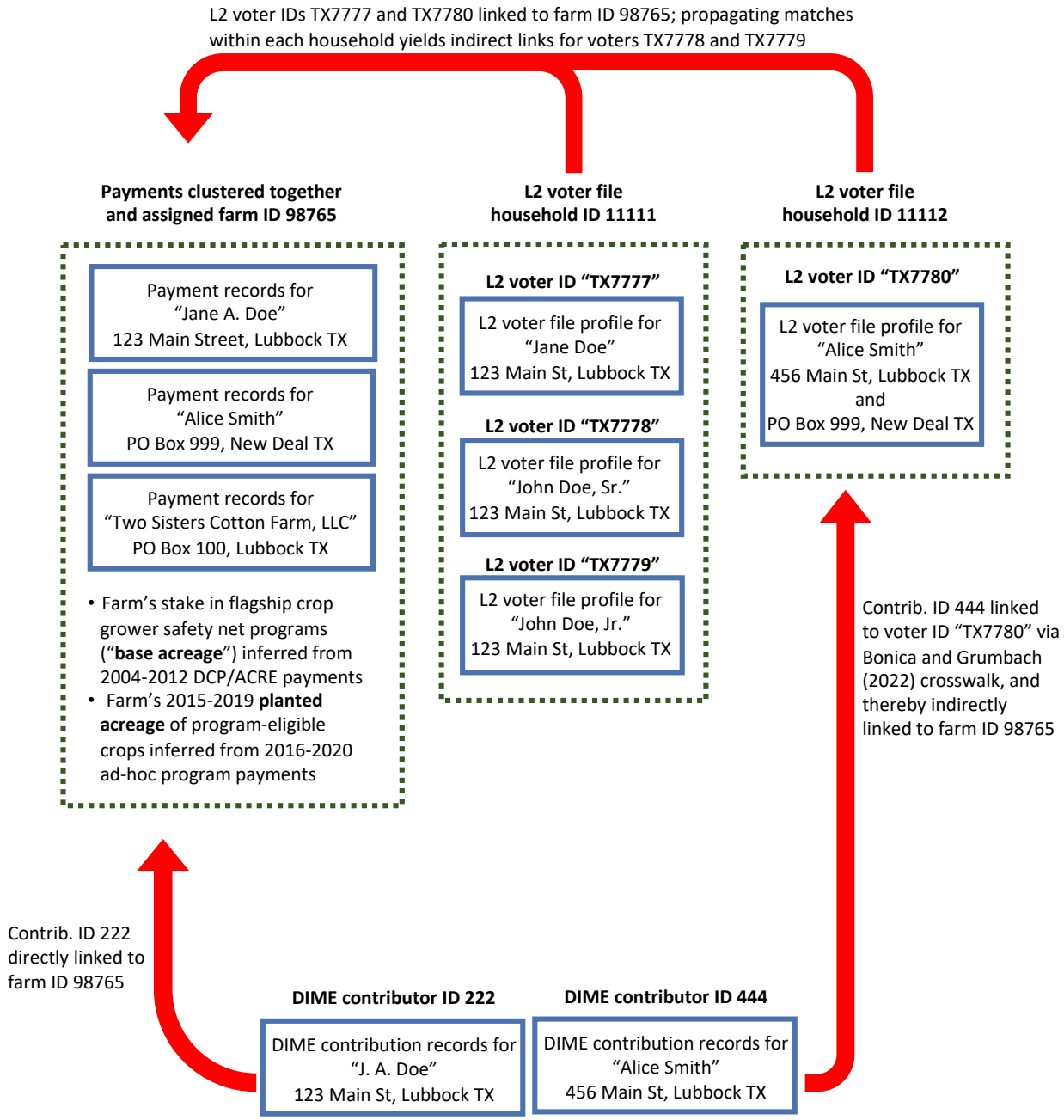
Act (FOIA) requests to obtain transaction-level records documenting the universe of 2004-2020 USDA farm program disbursements issued by the USDA's Farm Service Agency (FSA). This latter transaction-level dataset features the names and addresses of farm program payment recipients, as well as the dates, amounts, and program names associated with disbursements. For some years and programs—but not all—the data also contains recipient farm ownership relationships, recipient identifiers that the FSA would use to track individuals over time, and/or the particular agricultural commodities for which a payment may be attributed.

To gauge the shares of ballots and itemized contributions attributable to farms with a vested interest in the crop grower safety net, I link farm program recipients in these FSA administrative records to distinct identifiers in L2's voter files (2018, 2019, and 2021 snapshots) and Bonica's DIME database (version 4.0, covering 1979-2020). Figure 2 presents a stylized, hypothetical example depicting what this entails for each of the millions of farms, voters, and contributors featured in these administrative databases. This is a very involved record linkage process, and requires extensive pre-processing that I describe in detail in Appendix G. In particular, the FSA farm program records do not contain consistent identifiers that can be used to track distinct farms over time. Using the names, addresses, and ownership relationships of the several million individuals and businesses featured in this database, I employ a bespoke entity resolution algorithm to cluster recipients into groups that generally reflect distinct farming households or families.[8] I assign unique identifiers to each farming household cluster that is identified by this algorithm. For brevity, I refer to such clusters as "farms" in the rest of the paper, and I render all measures related to farm program payments at the farm level.

The L2 state voter files track distinct individuals across time using voter IDs, and Bonica's

[8]See Appendix G for details.

**Figure 2:** Stylized Hypothetical Example of Entity Resolution and Record Linkage for Farm Program, Voter File, and Campaign Contribution Administrative Records




**Entity resolution and record linkage outcomes**: total base acreage and planted acreage inferred for farm ID 98765, and then linked to general and primary election ballots for L2 voter IDs TX7777, TX7778, TX7779, and TX7780, and campaign contributions from DIME contributor IDs 222 and 444.

(2014) DIME database utilizes a bespoke entity resolution algorithm to assign IDs to distinct contributors. I develop my own highly customized probabilistic record linkage algorithms to assign each L2 voter file ID and DIME contributor ID to at most one farm ID. The algorithms each center on estimating the canonical record linkage model of Fellegi and Sunter (1969), and they attribute voters and contributors to farms according to individuals' names, addresses, occupations, and age. Each is described in detail in Appendix G. In particular, I note that each of the contributor-farm assignments is made according to one of two methods: (a) a direct match according to the bespoke probabilistic matching algorithm, or (b) by way of the previously established voter-farm matches using a crosswalk between recent DIME contributors and L2 voter profiles (Bonica and Grumbach, 2022). Between these two approaches, I identify the vast majority of true political engagement attributable to farm program households.

Given this paper's focus on understanding the lack of retrenchment in longstanding USDA farm programs, my focus in this exercise is on the traditional "crop grower safety net" programs that carry on the legacy of the first farm bill and are still central to modern farm bill debates. These programs send direct payments to hundreds of thousands of farms associated with a particular set of crops. As Coppess (2018) notes, the three crops at the center of the first farm bill (corn, wheat, and cotton) are still central to these programs. As this payment-eligible row crop acreage also accounts for the vast majority of subsidized crop insurance enrollment, participants in these programs constitute the core vested interests in the US farm safety net.

An important wrinkle in understanding these programs is that the terms "row crop growers" and "farm program participants" are not fully interchangeable. Ever since a reform in the 1996 farm bill, direct payments issued through these flagship farm programs are not made according to planted acreage or harvested production of covered commodities. Instead, farmers receive

payments according to their "base acreage" — the area that a farm historically planted to covered commodities.[9]

As discussed further in Online Appendix C, I classify farms as holding base acreage if they received payments in 2004-2012 from the flagship crop grower safety net programs under the 2002 and 2008 farm bills: the Direct and Counter-cyclical Programs or the ACRE option ("DCP/ACRE"). I classify farms as actually *growing* any of the program-eligible crops if they received payments in 2016-2020 from ad hoc payments made in proportion to 2015-2019 planted acreage.[10] Figure 3 shows that, while there is substantial overlap between these two groups, they differ in size. My entity resolution algorithm groups 2004-2012 DCP/ACRE recipients into 1,415,037 distinct "farms," which I successfully link to 2 million voters residing in 1 million households in the February 2018 L2 voter file snapshot. Likewise, ad hoc payments made on 2015-2019 planted acreage of program-eligible crops are associated with 603,676 distinct farms; this latter group of farms is linked to 1.1 million voter profiles and 555 thousand households.

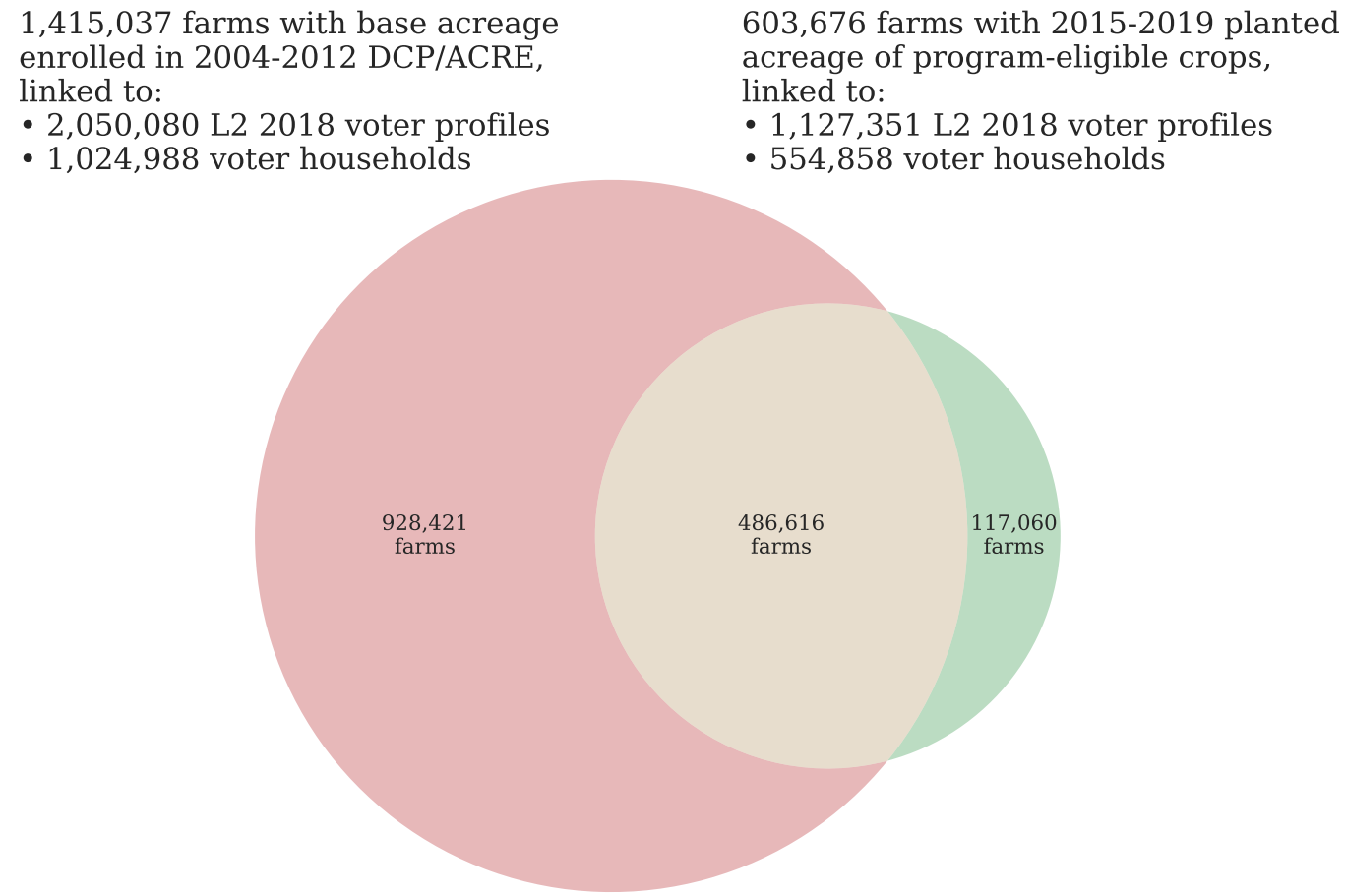
This substantial size discrepancy has several roots. First, by design, farmers do not actually have to plant any program-eligible crops to receive payments from DCP/ACRE (or from ARC/PLC, the successor to DCP/ACRE under the 2014 and 2018 farm bills). Farmers could even leave their fields fallow on a given year and still receive payments.[11] Second, the number of

[9]This "decoupling" of planting decisions and payments was supposed to achieve two aims. First, it would prevent farmers from planting particular crops for advantageous subsidies, and thereby mitigate positive supply effects that would put downward pressure on crop prices and thereby spur further calls for government support. Second, it was thought that decoupled payments would be immune to litigation under recent trade agreements that regulated state aid to the agricultural sector. Interestingly, the latter justification did not pan out exactly as intended, as made clear in my case study of the cotton program's dismemberment by the WTO.

[10]These ad hoc programs are the two iterations of the Cotton Ginning Cost Share Program (CGCS), and the two iterations of the Market Facilitation Program (MFP).

[11]In a highly revealing aspect of policy design, while farmers can leave base acreage unplanted and still obtain payments, planting fruit or vegetables on this land is strictly prohibited. This underscores a less-known point about US farm policy: these payments are very explicitly not subsidies for food but for farmers. The choice of

**Figure 3:** Farms with Program-Eligible "Base Acreage" and Actual Planted Acreage of Covered Crops, According to Administrative Payment Records




Notes: Counts of "farms" obtained via unique IDs created by applying bespoke entity resolution algorithm to FSA administrative payment data. "Base acreage" is historical acreage planted to program-eligible crops, and was the basis of the DCP/ACRE program payments (2002-2013) and ARC/PLC program payments (2014-2023). I infer whether a farm actually plants program-eligible crops using enrollment in the Market Facilitation Program (for crops planted 2018-2019) or the Cotton Ginning Cost Share Program (for crops planted 2015-2016).

farms continues to decline steadily across the country, and some farms operating in 2004-2012 have certainly ceased operations by 2015-2019.[12] Third and finally, programs' "actively engaged in farming" requirements have strengthened in recent years, and it has become more difficult to list miscellaneous relatives as part-time operators of a farm to circumvent per-capita limits on the payments a farm can receive.

As noted earlier in this section, my practical aim in this analysis is to place an upper bound on the electoral significance of 2012 farm program beneficiaries in each congressional district in the 2014 and 2016 elections. As such, my primary estimates of the political capital of vested interests in farm programs relies on the 1.4 million farms that received 2004-2012 DCP/ACRE payments, as most farms currently producing program-eligible commodities also fall into this category. The district-level shares of turnout and contributions attributable to these households provide a fairly generous estimate of these groups' electoral weight, as (a) I attribute the turnout and contributions of all members in a linked household—even if most members had no personal engagement in farming, and (b) my record linkage rates are quite high.

On the latter point, 847,279 farms received DCP/ACRE payments in 2012. Using my fairly conservative record linkage algorithm, I match roughly 80% of these farms to at least one household in the February 2018 snapshot of the L2 voter files. The matched farms account for 88% of DCP/ACRE direct payments issued in 2012. By inverting the DCP/ACRE direct payment formulas (see Appendix F), I calculate that these linked farms likewise account for 89% of 2012 base acreage. Since my entity resolution algorithm is not perfect at tracking farms from year-to-year, I note that some of the missing 20% of farms (and 11-12% of payments/acreage)

covered commodities and the structure of payments has made this clear from the first farm bill in 1933 through the present day.

[12]See Figure OA4 in Appendix E.

is very likely attributable to farms who enrolled in DCP/ACRE in 2003-2011 under a different name and address. As such, I consider the linked voters and households for all farms enrolling in DCP/ACRE at any point between 2004 and 2012, which leaves me with 933,017 farms linked to the 2018 L2 snapshot: 110 linked farms for every 100 farms enrolled in DCP/ACRE in 2012. As such, by aggregating the turnout and contributions of households linked to 2004-2012 DCP/ACRE farms, I am confident that I can place a reasonable upper bound on the district-by-district electoral significance of 2012 farm program participants in the 2014 and 2016 elections.

## 1.4 The Electoral (In-)Significance of the Modern Farm Coalition

The administrative data I've described in the previous section makes it clear that, even with high turnout rates, farm program households do not compose a meaningful share of the national electorate. Among the 179,529,332 distinct voters in the February 2018 snapshots of the L2 state voter files, 1.1% resided in a household in which some individual held a stake in 2004-2012 farm program-eligible base acreage. These 1.1% of voters constituted an impressive 1.9% of general election turnout in 2014, and 1.4% in 2016. Nonetheless, high turnout does not make these voters more than a sliver of the national electorate.

In searching for farm program participants' strongest claim to electoral significance, I examine their position on a district-by-district basis in the 2014 midterm House elections. As discussed in the analysis below, I find that these households are electorally significant in very few districts, whether evaluated according to their share of general election turnout, primary election turnout, or campaign contributions. In each case, I demonstrate that these findings are even stronger if I instead examine the 2016 general elections, or if I focus on households

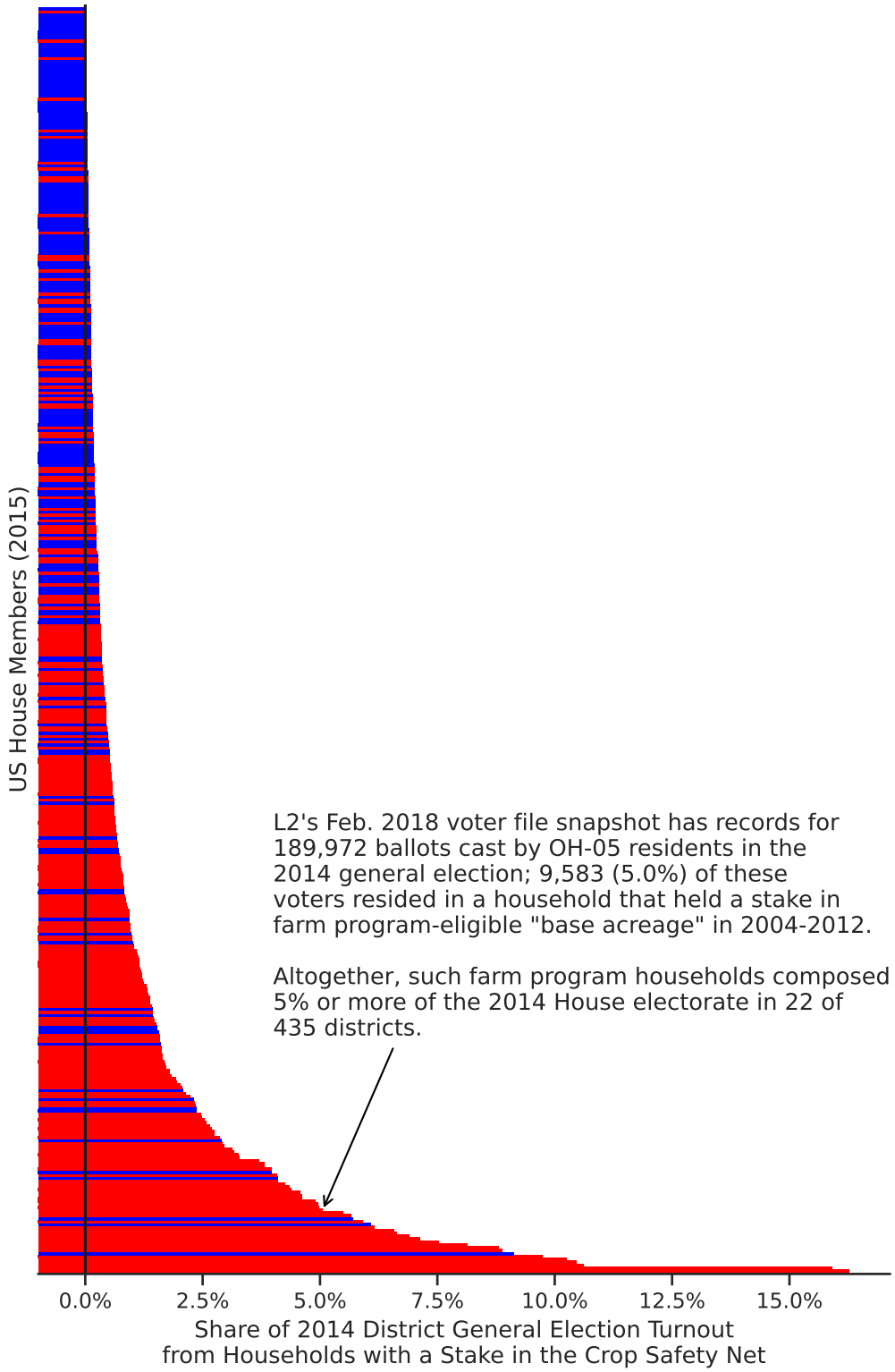
actually growing program-eligible crops instead of households who simply benefit from such programs.

Figure 4 depicts, for each sitting US House member in 2015, the share of 2014 general election turnout within her district attributable to 2004-2012 crop grower safety net households. The plotted distribution makes it immediately clear that Hansen's (1991) historical narrative of farmers policing farm policy through general election retribution cannot hold in the modern era. In Appendix B, I use data on House primary and general elections to argue that composing at least 5% of district turnout is a fairly low bar for determining whether a constituency is likely to be electorally pivotal with any frequency. However, Figure 4 makes clear that crop grower safety net households rarely clear this threshold even in a good year (i.e. the low-turnout Republican wave of the 2014 midterms). Only 5.1% of House members (22 out of 435) in 2015 served districts in which crop grower safety net households accounted for at least 5% of 2014 turnout. This number only dwindles if one instead looks at their share of 2016 general election turnout (3.4% of districts), or instead considers the share attributable to households that were actually involved in *growing* program-eligible commodities (2.3% of districts in 2014 and 1.6% of districts in 2016).[13]

These results are compounded by the fact that, from a general election candidate's perspective, farm program recipients are not a very competitive constituency. Farmers do not live in particularly competitive House districts; as depicted in Appendix Figure OA2, farm program households' general election turnout exceeded the 2014 margin of victory in only 5 districts. These voters are also not prone to switching partisan allegiances. According to Anzia, Jares,

[13]The distinction between households with a vested interest in the *production* of program-eligible crops, and those who simply receive benefits for holding a stake in historically planted "base acreage," is discussed in Section 1.3.

**Figure 4:** US House Members (2015) by Farm Program Households' Share of 2014 General Election Turnout within District



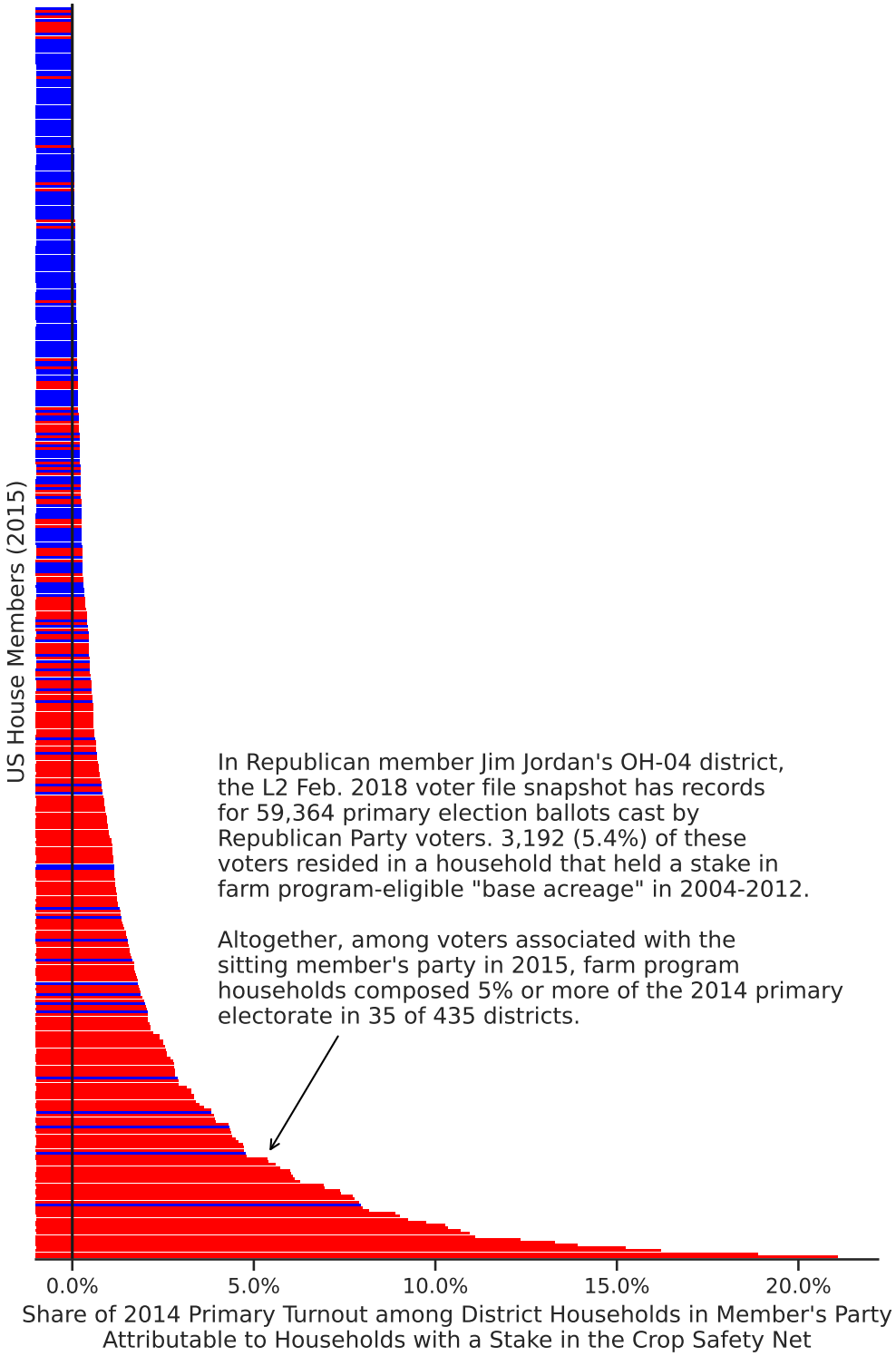

Notes: A "farm program household" features at least one individual in the February 2018 L2 voter file that has been linked directly or indirectly to a farm participating in 2004-2012 in DCP/ACRE, the flagship farm programs for row crop producers. The bars corresponding to Republican members are shaded red, and those corresponding to Democratic members are shaded blue.

and Malhotra's (2022) mid-2020 survey of 1,072 crop safety net beneficiaries, only 2% of 2016 Trump voters reported an intention to vote for Joe Biden in 2020, and only 2% of 2016 Clinton voters reported an intention to vote for Donald Trump in 2020. Furthermore, these voters' general election turnout does not appear to be very responsive to policy shocks, as Jares and Malhotra (2023) find that farmers are not easily mobilized or demobilized by large shifts in their personal agricultural policy fortunes. Altogether, the broad irrelevance of farm program households in general elections stands in stark contrast to the large bipartisan congressional majorities that pass nearly every farm bill. In particular, it seems highly unlikely that a significant number of Republican members of Congress exert effort on behalf of farm programs because they stand to lose farmers' support in the next general election.

Perhaps, however, farmers have greater prescience in primary elections. Farm program votes should be more important in Republican House primaries, given that such contests tend to have much lower turnout rates than general elections, and roughly two-thirds of farmers are Republicans (Anzia, Jares, and Malhotra, 2022).

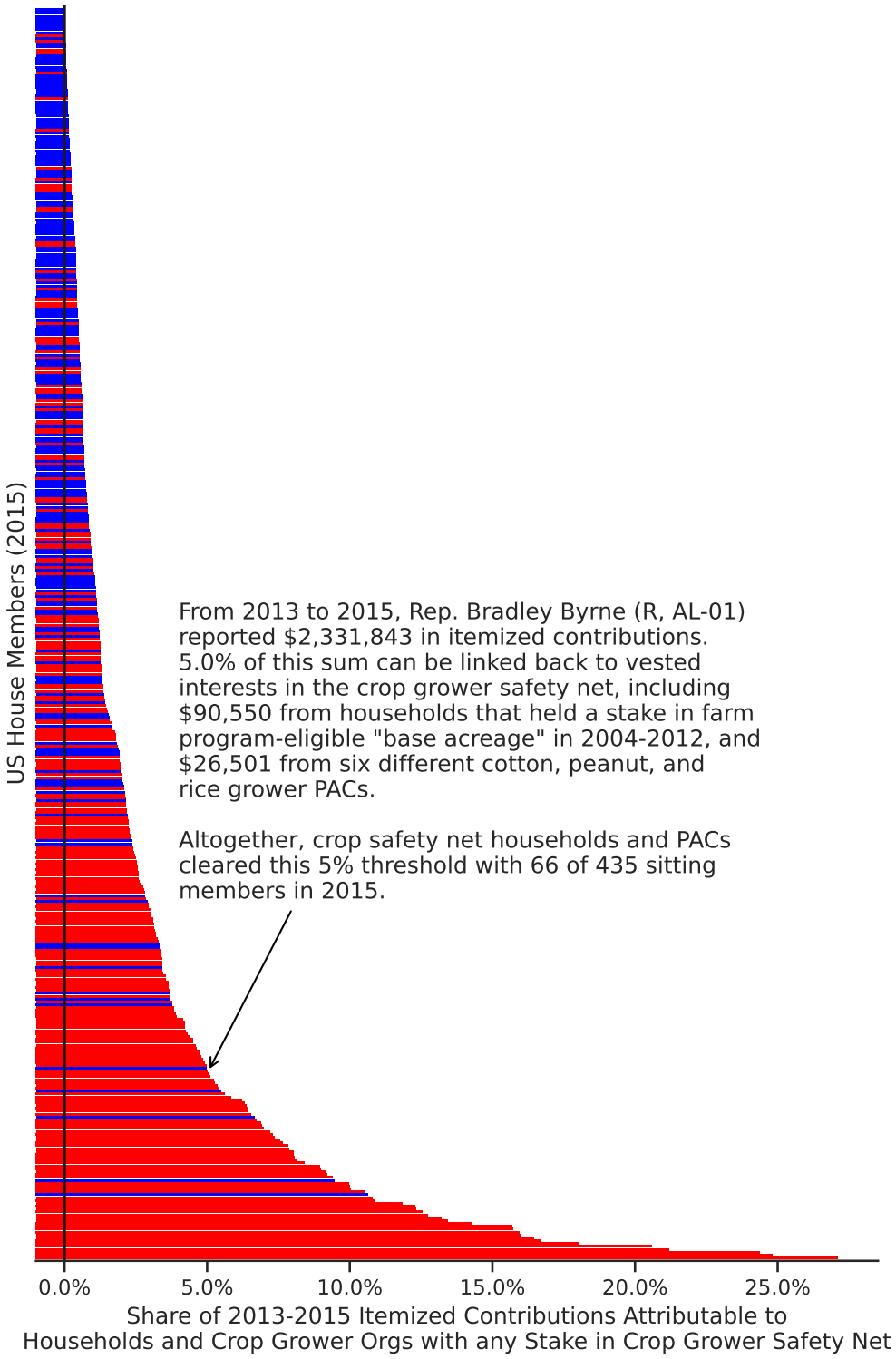
Figure 5 suggests that farmers are not much more relevant in primary elections. For each sitting House member in 2015, I plot the share of 2014 primary election turnout among district voters in the member's party that can be attributed to 2004-2012 crop safety net households. By this rather generous yardstick of the "crop grower safety net" share of the electorate, I find that 8.0% of House members (35 out of 435) in 2015 faced primary electorates in which crop grower safety net households accounted for at least 5% of turnout in the last cycle. As with my calculations for the general electorate, the share of members clearing this threshold declines if I instead examine 2016 primary election turnout (6.4%), or instead look at the share attributable to households that were actually involved in growing program-eligible commodities

**Figure 5:** US House Members in 2015 by Share of Party's 2014 Primary Election Turnout Accounted for by Farm Program Households




Notes: A "farm program household" features at least one individual in the February 2018 L2 voter file that has been linked directly or indirectly to a farm participating in 2004–2012 in DCP/ACRE, the flagship farm programs for row crop producers. Share of primary election turnout is calculated by counting the number of farmers affiliated with the member's party (according to L2) who voted in any primary election in 2014, and dividing by the total number of voters of that party who participated in any primary in 2014. In states where no traditional partisan primaries are held (CA, WA, LA), I substitute general election turnout for primary turnout.

**Figure 6:** US House Members in 2015 by Share of 2013-2015 Itemized Contributions Attributable to Crop Grower Safety Net Households and Interest Group PACs




Notes: Figure depicts share of itemized contribution amounts attributable to 2004-2012 DCP/ACRE households or grower PACs affiliated with program-eligible crops. Calculations are based on contributions in DIME database made either during the 2014 cycle, or during the 2016 cycle but dated before 12/14/2015. Note that this ending date is chosen to correspond to the 12/14/2015 congressional petition analyzed in Section 3.4.

(4.3% of districts in 2014 and 3.2% of districts in 2016). It thus seems unlikely that crop safety net beneficiaries hold sway with a large share of Congress because of the ballots they cast.

To the credit of commentators focusing on the agribusiness lobby, farm program beneficiaries do appear to be somewhat more significant in terms of campaign finance than in voting. As shown in Figure 6, 66 of 435 of sitting House members in 2015 (15%) can attribute at least 5% of their itemized contributions to either (a) crop grower safety net households or (b) the political action committees (PACs) that advocate for these growers during farm bill negotiations (such as the Nation Cotton Council and the National Corn Growers Association). Perhaps surprisingly, the 2013-2015 contributions from individual farm program participants far outweighed those made by the 215 active program-eligible commodity PACs in this time frame. Among the 430 members House members that received anything from either of these sources, 413 (96%) received more from individual program participants. And among the 199 members who received contributions from both sources, the median ratio of farm program household receipts to PAC receipts was 8.4 to 1.

Can we then attribute the success of farm program recipients to their broad campaign finance network within rural districts, perhaps analogously to Bonica's (2017) assessment of the critical role of lawyers' contributions? My data suggest this may be a limited part of the puzzle. Bonica (2017) shows that, on average, non-incumbent House candidates with a law degree obtain over a quarter of their first 90 days' fundraising from other attorneys. While Figure 6 demonstrates that farm program beneficiaries (and related PACs) virtually never attain such a share over the full course of the electoral cycle, they are occasionally more pivotal in terms of early fundraising. Examining Bonica's (2017) focal window of the first 90 days, 5 of the 116 new (non-incumbent) House members first serving in 2015 or 2017 collected at least

a quarter of their initial fundraising from crop grower safety net interests.

Nonetheless, such members are the exceptions that prove the rule: crop grower safety net beneficiaries are very rarely a pivotal constituency in US congressional races. The previous three analyses make it clear that broad, bipartisan support for renewing farm programs every five years cannot primarily be a product of legislators who (rationally) fear losing the electoral or financial support of such constituents.

As a final note, I argue that these analyses are *not* significantly understating the electoral significance of vested interests in the crop grower safety net by omitting spillover effects on other economic actors. While many crop grower organizations like to claim that their farms are the bedrock of their local economies, it is clear that—regardless of the veracity of such claims—members of Congress are designing farm programs to aid commodity producers themselves and not the broader rural economy. Indeed, if farm programs were intended to stimulate rural economic activity, one would expect that their design would encourage *increased* production of program-eligible commodities. However, Coppess (2018) notes that throughout the farm bill's history, the key aim of farm program designers has been to support farmers' incomes while inducing *negative* or *neutral* impacts on production (and thereby yielding upward or neutral pressure on covered commodity prices). The current use of historical "base acres" as the payment basis for crop grower safety net programs is explicitly justified as a way to support growers' incomes without creating an incentive to increase supply. And indeed, agricultural economists have found such "decoupled" payments to have minimal impacts on production (Goodwin and Mishra, 2005; Weber and Key, 2012).

For another way to see that direct program beneficiaries are the correct constituency to consider, one can look at who funds the PACs of the commodity groups that negotiate reforms

to the crop grower safety net in each farm bill. For each major program-eligible crop, I can trace the large majority of contributions to the crop's commodity PAC back to individual farm program beneficiaries.[14] I conclude that program beneficiaries are themselves the real vested interests in the crop grower safety net, and thus Figures 4, 5, and 6 meaningfully depict the limited capacity of such interests to affect congressional election outcomes.

## 1.5 Economic and Political Geography as the Heart of the Puzzle

From the perspectives of political and economic geography, this result should not be particularly surprising. The two million voters residing in households with a stake in 2004-2012 base acreage cast fewer than 2% of votes in a given national election. Given that most modern US House elections are not very competitive, these two million voters would need to be highly concentrated in a subset of districts to be regularly pivotal to particular incumbents. However, row crop farming is intrinsically a dispersed industry. Its main capital input is arable land—something that by its very nature cannot be concentrated geographically.

Indeed, despite popular depictions of the "cosmopolitan coasts" and "agrarian heartland," farming no longer constitutes a large share of economic activity in any particular region. The modern US economy is highly developed and service-oriented throughout the 50 states. Even though Iowa is famed for its agriculture, and remains the top corn-producing state, its entire farming sector averaged only 4% of employment, 5% of earnings, and 5% of state GDP in 2011-2020. Given that the specific array of row crops covered by the farm safety net are only one piece of this broader farm sector, it follows that the enterprises covered by the safety net

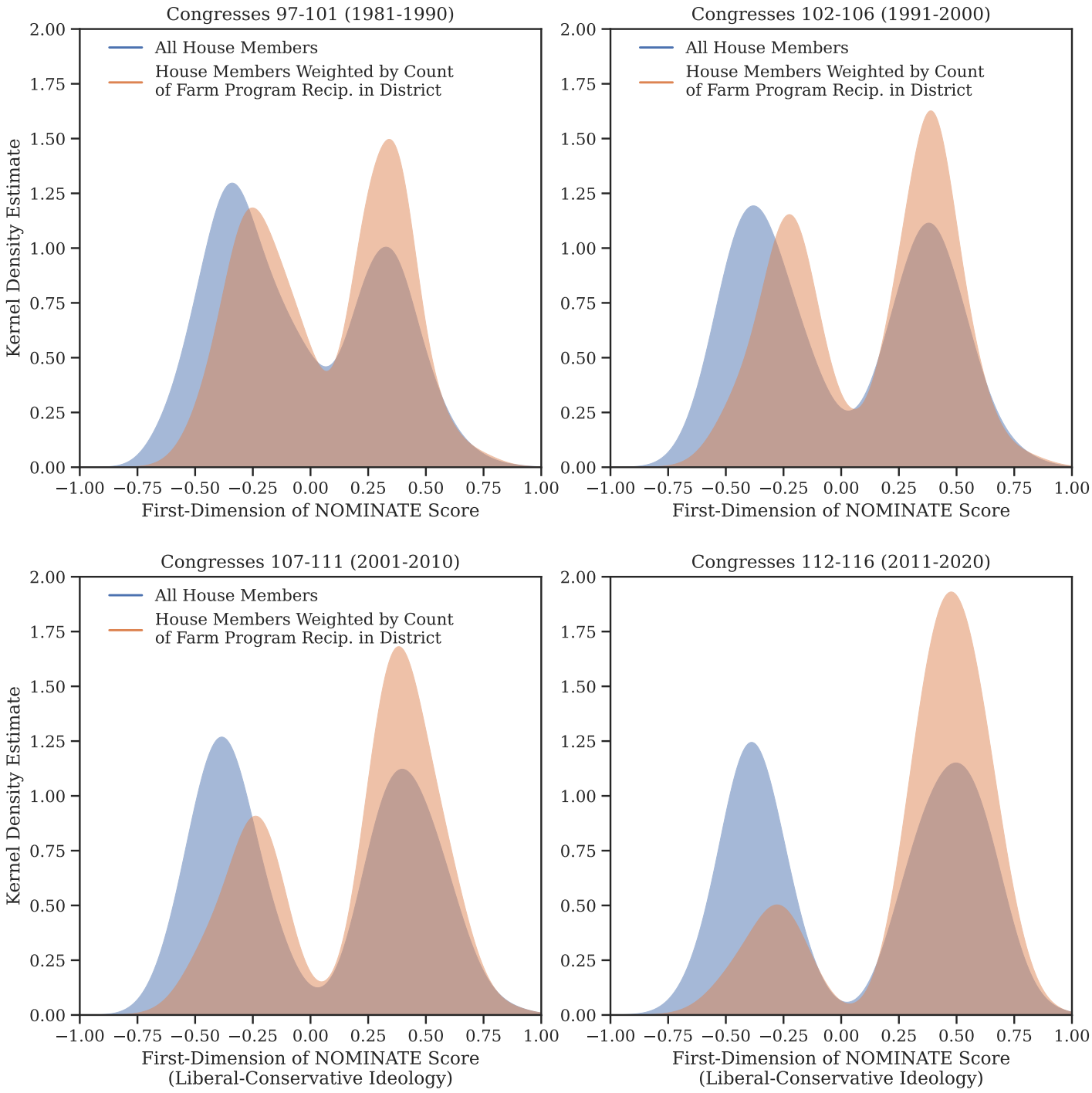
[14] I conduct this exercise for 2003-2020 contributions made to corn, soybean, wheat, cotton, sorghum, rice, barley, and peanut PACs. Even though my record linkage algorithm is relatively conservative, I link 2004-2020 farm program recipients to 79% of corn PAC contributions, 79% of soybean PAC contributions, 72% of wheat PAC contributions, 66% of cotton PAC contributions, 73% of sorghum PAC contributions, 57% of rice PAC contributions, 65% of barley PAC contributions, and 67% of peanut PAC contributions.

are not dominant economic players in any part of the country.

While geography provides a compelling explanation as to why farm program beneficiaries are so rarely electorally pivotal, it also points to a deep, complementary aspect of the puzzle of farm program persistence. As farmers have become increasingly economically and electorally marginal in recent decades, the political dynamics of the rural areas in which they reside have undergone a dramatic realignment. As Rodden (2019) and Gimpel, Lovin, Moy, and Reeves (2020) have documented, a massive urban-rural partisan gap has emerged, with urban areas largely shifting towards the Democratic Party and rural areas shifting towards the Republican Party.

Critically, this shift has yielded ideological realignment alongside partisan realignment. As shown in Figure 7, farm program beneficiaries are now considerably more likely to be represented by members of Congress with conservative voting records than they were a few decades ago. This point crystallizes the puzzle of farm policy resilience: farm program beneficiaries continue to convince large, bipartisan majorities of Congress to reauthorize their expensive safety net programs every five years, while being represented by Republican members with (otherwise) anti-government voting records, and while lacking the electoral heft to punish members who might deny them patronage.

**Figure 7:** The Areas in which Farm Program Beneficiaries Reside are Increasingly Represented by Conservative Members in Congress




Notes: Figure depicts historical trends in ideological alignment of House members representing areas in which recent farm program beneficiaries reside. Each panel of the figure corresponds to a particular decade of Congress, and compares the distributions of the first-dimension NOMINATE scores of (a) all House members within the decade and (b) House members weighted by the number of district-residing individuals in the 2018 L2 voter file whose household held a stake in 2004-2012 base acreage. Put otherwise, the weights for (b) are calculated by spatially merging L2 voter file addresses of farm program recipients with historic district boundaries, and weighting members by their districts' share of the nation's 2004-2012 crop grower safety net voters.

# 2 Distinctly Local Roots as an Enduring Source of Farmer Influence

The analyses thus far have made it clear that the continued survival of the crop grower safety net has had little to due with the electoral significance of its beneficiaries. What, then, do legislators get out of this affair? There can be no technocratic, national-welfare policy interest at stake. There is no serious national security justification for sending annual checks to an arbitrary subset of row-crop farmers. Despite lay theories arguing that farm subsidies are important for the national food supply, the design of the farm safety net makes it very clear that this is not an objective of legislators. From the beginning, farm programs have explicitly made crops sold for human consumption (e.g. fruits and vegetables) ineligible for support. Moreover, programs have always been designed to suppress supply (or at least, mitigate positive supply effects) and thereby raise prices for the benefit of growers.

What seems very likely, then, is that lawmakers are directly—and acutely—motivated by the objective of helping US crop growers weather economic difficulties. One mechanism by which this objective could come about is simply that legislators hold disproportionate interest in the fate of farmers. A reporter for *The Economist* labeled this phenomenon the "Richard Scarry" rule of politics upon observing the awkwardness of avowed small-government conservatives paying homage to the farm lobby during the 2015 Republican Presidential primaries.

> Most politicians hate to confront any profession or industry that routinely appears in children's books (such as those penned by the late Mr Scarry). This gives outsize power to such folk as farmers, fishermen, doctors, firemen or—to cite a fine work in the Scarry canon—to firms that build Cars and Trucks and Things That Go. (Lexington, 2015)

I venture in a related but distinct direction, and hypothesize that the key to the puzzle lies not so much in a national preoccupation with farmers, but in an array of individual legislators' concerns for protecting their *distinctly local* agricultural enterprises. The theoretical argument I craft draws on key substantive details of farm policy, as well as a burgeoning political behavior literature that emphasizes the salience of local identity in shaping policy attitudes, economic ideology, and political engagement.

The highly fractured nature of the US farm lobby is central to this theory. Farm safety net interests do not compose a single rural monolith; they form a complex array of regional and commodity-specific identities with varying policy priorities (Coppess, 2018). While the Farm Bureau mostly succeeded in organizing this coalition under a single umbrella in the 1930s and 1940s, Sheingate (2001) notes that an array of commodity-specific grower organizations soon thereafter came to dominate crop grower safety net negotiations. Hansen (1991) attributes this fracturing to legislators' high valuation on learning what their particular farmers wanted out of farm policy. Sheingate (2001) compares this development with the consolidated, "corporatist" arrangements maintained between the broader farm sector and the governments in France and Japan, and comes to the conclusion that fragmentation has severely limited the potential for largesse in US farm policy. However, I argue that if US legislators tend to care specifically about their *own* farmers, rather than the travails of national agriculture, then the localization of farm politics may have actually insulated the farm lobby from the massive urbanization and economic development of the 20th century.

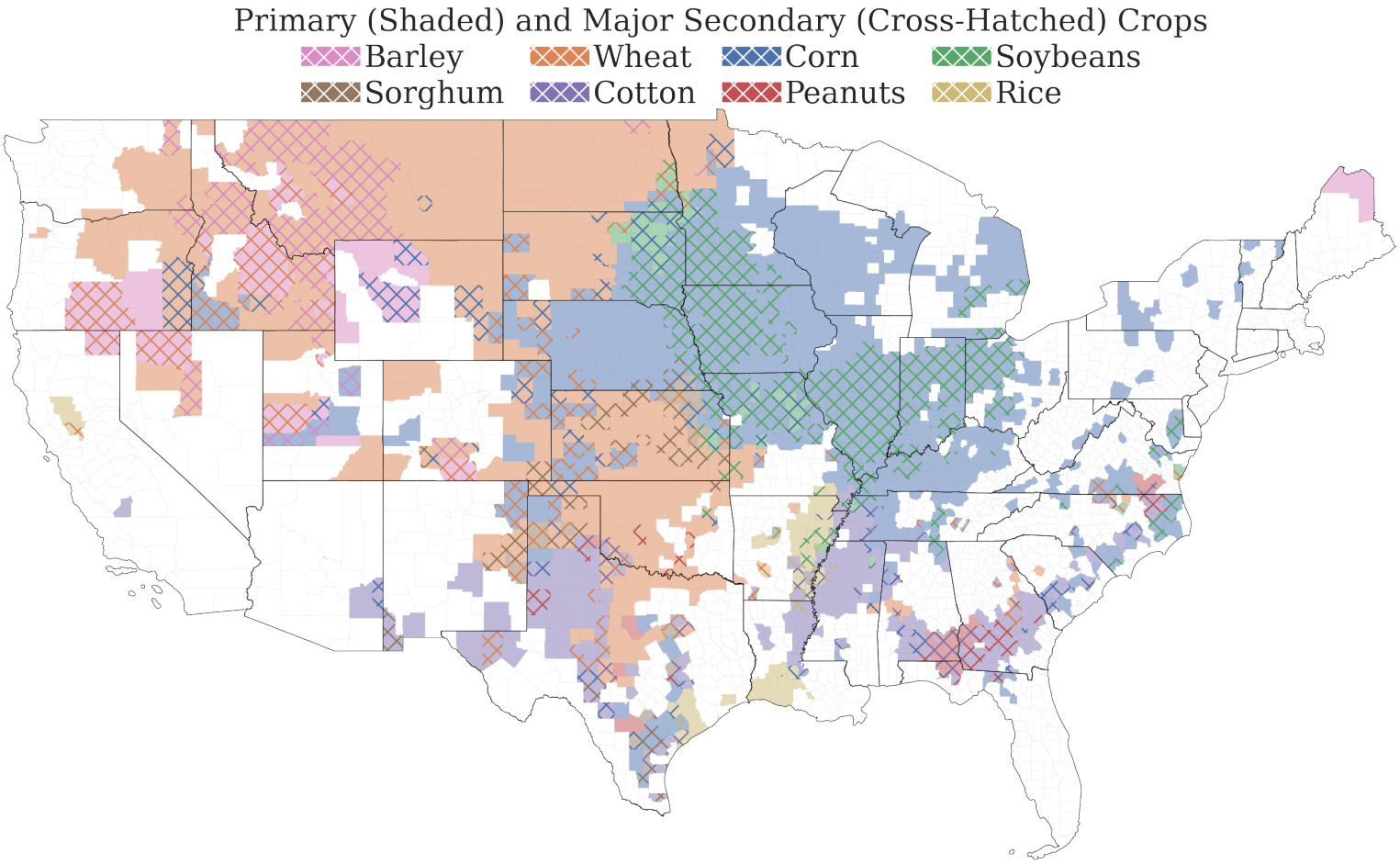
Indeed, Browne (1995) notes that in his three years shadowing and interviewing the House Agriculture Committee, he obtained the impression that members' desire to assist farmers was never a game of counting up constituents' votes. Rather, "congressional delegations are moved

by the logic that their state is a major producer of a specific 'crop or critter'" (p. 103). If legislators truly care about their special local "crop or critter" — regardless of the share of voters who tend to it — then this subtle motive may actually be a powerful driver of member behavior. Given the pronounced dispersion and geographic variability of US agriculture, hundreds of congressional districts feature *some* amount of farming, and most of these feature *some* commodity that is rare to the rest of the country. As Figure 8 demonstrates, the eight largest crops covered by the farm safety net are alone sufficient for covering the congressional map with a patchwork of distinct farming interests.

But why might distinctly local crop production carry such (putative) significance among a legislator's policy objectives? One possible reason is that this may be an effective way for a legislator to build an electorally beneficial "home style" (Fenno, 1978). A burgeoning literature on Congressional representation and political behavior argues that building such a local brand is valuable for candidates of many stripes and electoral challenges. Hunt (2021*b*) finds that local incumbents with deep local roots outperform their party's presidential nominees by roughly five percentage points on average; moreover, such incumbents are half as likely to face a primary challenge and on average perform five percentage points better in primary election when challenged (Hunt, 2021*a*). Munis and Burke (2023) find that candidates are able to leverage a "local" communication style to cultivate support among voters outside of their party. Likewise, in particular relevance to the subject at hand, Jacobs and Munis (2019) provide experimental evidence that rural imagery in campaign advertisements increases support for a hypothetical Senate candidate by 20 percentage points among highly rural voters.

Locally distinct crop production is likely an especially potent channel for tapping into local identity, both because geographic identity appears to be the most politically salient among rural

**Figure 8:** Variation in Local Agriculture across Farm Country: Main Farm Program Crops in Counties with at least One Crop Safety Net Beneficiary Per 100 Adults




Notes: Shaded counties feature at least one 2004-2012 DCP/ACRE recipient per 100 adults, according to 2004-2012 average county population estimates. For each county, base production (e.g. historical pounds of peanuts grown on program-eligible acreage) is inferred from commodity-specific DCP/ACRE payments by inverting the program formula. A measure of "base revenue" is then computed by multiplying these commodity-specific amounts by average 2009-2012 commodity prices. The shaded "primary crops" in this figure refer to the crop composing the highest share of county base revenue. A "secondary crop" is plotted with cross-hatches on top of this if it composes at least 25% of total county base revenue.

Americans (Jacobs and Munis, 2019, 2022; Munis, 2022; Lyons and Utych, 2023), and because farming is usually inseparable from its local environment. Farmland is the single largest capital asset or expenditure for any crop grower. As such, it is generally infeasible for a grower to pick up and move her operation overseas, or even out of her congressional district. Likewise, an upland cotton grower on the High Plains in Texas could not plant this crop if she instead lived in New York City, or even rural Iowa.

While the literature I have reviewed thus far has focused on the use of local branding to appeal to voters, there is good reason to assume that legislators share the same preoccupations of many of their constituents. Indeed, members of Congress may hold a degree of *intrinsic* concern for their locally distinct crop producers. This would be consistent with a number of recent findings that legislators with local roots are more likely to focus on local issues (as opposed to partisan or national issues) in their legislative duties. Not only are members with local roots less partisan and more locally-oriented in their official communications (Hunt, 2022), they are particularly likely to emphasize constituency work over policymaking and party-building (Crosson and Kaslovsky, 2023). In a further sign that legislators' own preferences could be a driver of such local orientation, electoral threat has been found to have little effect on the local orientation of congressional speech both on the House floor (Kaslovsky, Moskowitz, and Schneer, 2022) and in committee hearings (Ban and Kaslovsky, 2023).

As a coda to this discussion, I speculate that legislators' concerns for distinctly local enterprise may actually reconcile ostensible contradictions in the policy preferences of conservative rural members. Recent work has theorized that local identity among rural voters has been core to their burgeoning economic conservatism. In her influential theory of "rural consciousness," Cramer (2016) has argued that geographic identity concerns have become enmeshed with eco-

nomics, as rural voters increasingly proclaim their support for small government out of a belief that government largesse unfairly favors major urban population centers. In a distinct but related argument, Gimpel and Reeves (2023) theorize that the urban-rural political gulf arises in part due to variation place attachment. This conforms with their empirical findings that rural voters are significantly more attached to the particular places that they live, and place attachment is strongly associated with conservative economic views. Setting aside the specifics of these two arguments, it is worth noting that if distinctly local attachments are indeed the foundation of rural conservatives' anti-government economic ideology, then it might not be so surprising that this ideology contains a clear carve-out for government programs that support distinctly local enterprise.

# 3 Case Study of a Natural Experiment in Farm Program Retrenchment

## 3.1 Institutional Background: The WTO's Surprise Ruling against the US Cotton Program

While my prior rebuttals of resource-based explanations of farm policy persistence surmount a difficult data collection challenge, it is all the more challenging to provide empirical evidence *in support of* a theory of policy persistence. Doing so requires the same comprehensive evaluation of individual legislators' electorates, but also requires one to observe variation in legislators' choices to support farm programs in an instance where retrenchment was on the table.

If significant proposals for retrenchment regularly came up for a vote, one might simply examine variation in how particular legislators voted. However, in the process of theorizing that some factor sustains an incentive for politicians to maintain the status quo, one is inherently

claiming that major retrenchment efforts should be off the equilibrium path. Otherwise put, there exists a "puzzle of farm program persistence" to speak of because major retrenchment efforts are so rare. Some scholars have proceeded by studying roll call votes on passage of the farm bill (Bellemare and Carnes, 2015), but substantive institutional details within this setting make such analyses intractable. Retrenchment proposals that fail early in the legislative pipeline do not make it to the floor and thus are unobserved, and analyses of votes on final passage are confounded by the fact that the vast majority of farm bill spending is attributable to nutrition assistance programs.

Fortunately, recent farm policy history provides a test case that circumvents these difficulties. As part of the 2014 farm bill, cotton acreage—and only cotton acreage—became disqualified from flagship farm program support. Perhaps the deepest instance of farm program retrenchment since the creation of the farm safety net, cotton disqualification occurred not because of an ascendant anti-subsidy coalition within Congress, but because of a surprise World Trade Organization (WTO) ruling against the US cotton program in a case brought by Brazil.

The crop-specific incidence of this event is ideal for testing the theory that I've outlined for two reasons. First, the US cotton industry provides a particularly intense example of the narrative of farm industry decline that underpins the puzzle I raise. Cotton growers were the core of one of the three major regional coalitions that came together to pass the first farm bill in 1933, and Coppess (2018) argues that—alongside Midwestern corn growers—they have been one of the two most important forces dictating the evolution of the farm safety net throughout the 20th century. However, as shown in Appendix Figure OA4, the relative decline of agriculture has been much steeper in the South than in the Midwest, and so my conclusions about the

electoral irrelevance of farm program beneficiaries hold even more strictly in cotton-growing regions.

A second benefit to the cotton-specific nature of this retrenchment is that it allows me to compare cotton growers and cotton-district legislators to growers of other farm safety net crops and their congressional representatives. This allows me to develop and test theoretical expectations of my proposed theory (the "distinctly local enterprise affinity" hypothesis) alongside those of plausible alternative theories. It also aids in causal inference, as comparing one set of farmers to the rest of farmers allows me to mitigate concerns that my analyses of changes in political behavior are simply picking up on the burgeoning urban-rural political gulf.

A striking aspect of cotton program retrenchment was its (lack of) longevity: the ostensibly "permanent" farm program reform unraveled almost immediately after Brazil and the US agreed to resolve the WTO case, and in 2018 Congress passed a law reinstating the full extent of cotton growers' benefits under the auspices of supporting the production of "cottonseed" rather than cotton lint.[15] In conducting a case study of the cotton retrenchment episode, I am therefore able to examine an exogenous shock to the longstanding political equilibrium of farm policy, and identify the forces that bring policy back into equilibrium.

To leverage this shock to distinguish between alternative theories of farm program persistence, I examine the responses of a wide variety of political actors—cotton growers, cotton-area voters, cotton grower lobbying groups, and legislators—to the sudden threat of permanent farm program retrenchment. By examining changes in cotton interests' political behavior as

[15]Cottonseed is a byproduct of cotton lint production. In declaring cottonseed a covered commodity under ARC/PLC (the flagship safety net programs reauthorized in the 2018 farm bill), Congress was able to completely reverse course on its 2014 reform, while attempting to claim that it was not violating the letter of its agreement with Brazil.

the Sword of Damocles appears overhead, I can assess which strategies these groups might consider most central to their policy influence. Likewise, by examining which legislators became active in the four-year movement to reinstate cotton within the farm safety net, I can obtain a direct read on the factors that positively influence legislators to lend support to farm program beneficiaries.

My case study primarily focuses on events in 2007 and 2014-2018, but in some sense the broader saga was a three-decade affair. I provide fairly detailed timelines chronicling the developments of the retrenchment and reinstatement episodes in Figures 9 and 10, and note some key highlights here. To start, the crop grower safety net came to consist of three major components by the 1990s: (1) payments sent directly to farms producing covered commodities, (2) the federal marketing loan program, which often effectively served as an income-support program in periods of low commodity prices,[16] and (3) subsidies for federal crop insurance premiums. Cotton growers have long been disproportionately reliant on the first two of these pillars of the safety net. US cotton—in a marked contrast to US corn—is primarily grown for global export markets, and thus is far more exposed to risk from long-run price declines, which conventional (market-based) crop insurance cannot protect against.

It is this distinct risk profile that led growers to convince Congress to grant cotton a special export subsidy in the 1990 farm bill. These so-called "Step 2 Payments"—by far the most important plank in the bill's "three-step cotton competitiveness program"—were unique to cotton and thereby made the crop uniquely vulnerable to a challenge at the WTO. Brazil opened

[16]The marketing loan program offers farmers loans that they can repay at less than the original loan rate when market prices are lower. The degree of the implied subsidy has varied across different farm bills, but cotton program beneficiaries received substantial marketing loan benefits over the period leading up to the 2002 WTO case.

**Figure 9:** Timeline of US Cotton Program Retrenchment (2002–2014)

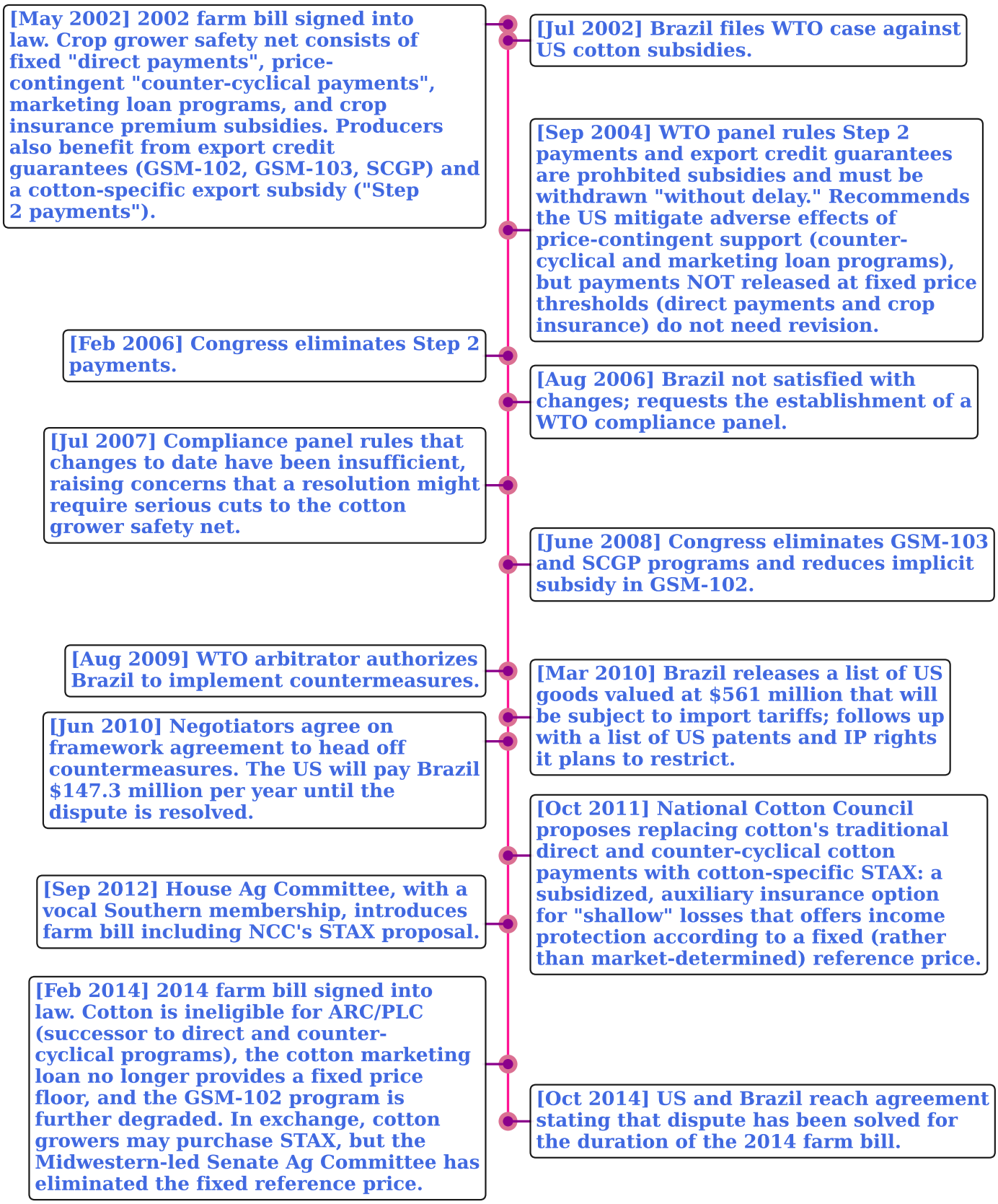
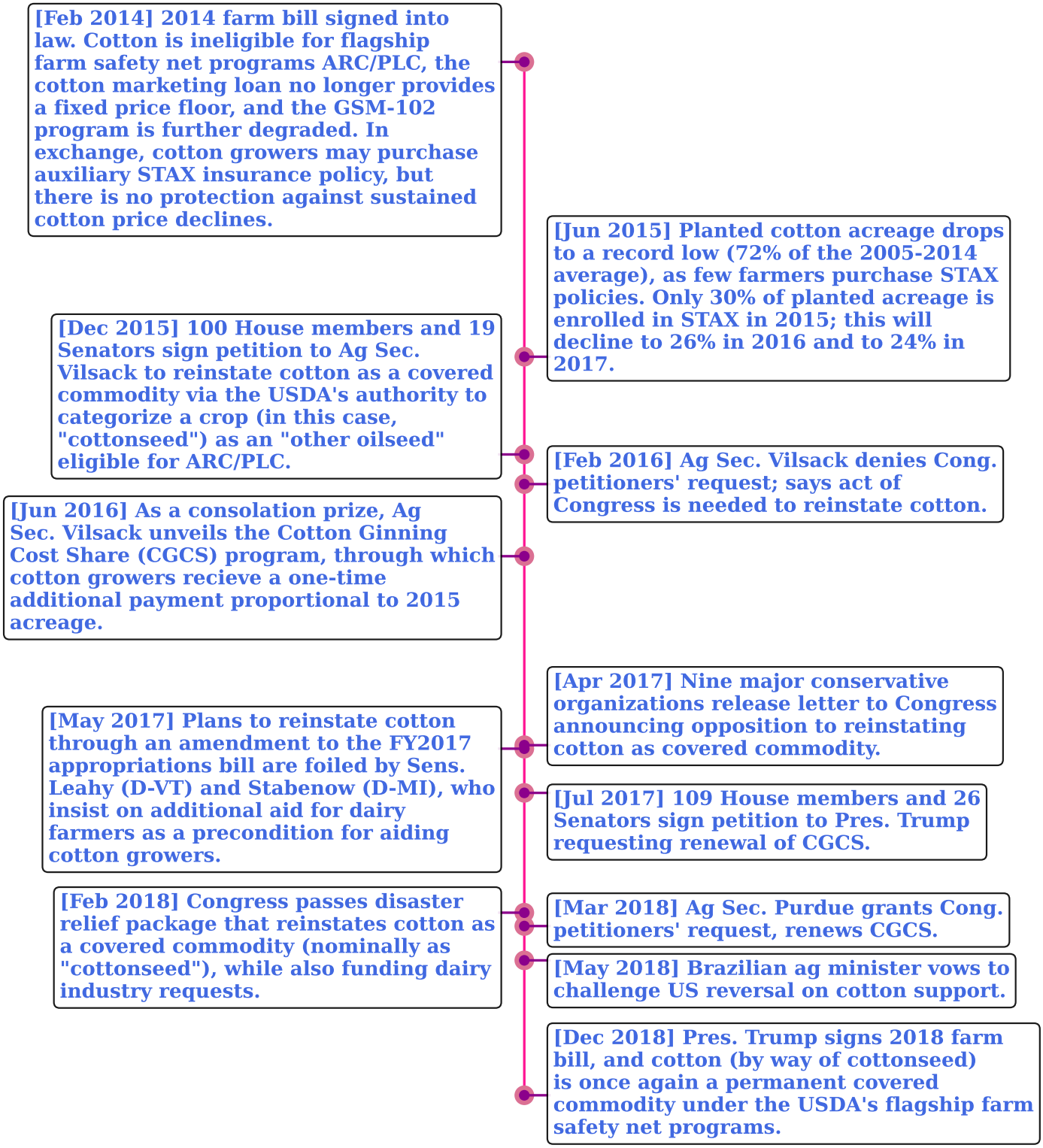


**Figure 10:** Timeline of US Cotton Program Reinstatement (2014-2018)



a case against US support for cotton growers in 2002 and won an initial ruling in 2004. The US agreed to scrap Step 2 payments and reformulate agricultural export credit programs over the following several years, and if the ruling's impact stopped here, this event would constitute a very minor episode in farm policy history. However, Brazil pressed its position, encouraged by the initial WTO panel's apparent skepticism towards price-contingent farm program payments. In July 2007, a WTO compliance panel ruled against the two central elements of US support for cotton producers: "counter-cyclical payments" sent directly to growers when prices fell below a statutorily-fixed benchmark, and the marketing loan program.

A push by the National Cotton Council attempted to settle this by moving the fixed-price protection of "counter-cyclical payments" into a novel supplemental subsidized insurance product called the Stacked Income Protection Plan ("STAX"). However, after convincing the sympathetic House Agriculture Committee to take up the plan for the upcoming 2014 farm bill, the Midwestern-dominated Senate Agriculture committee stripped out the critical fixed-price protection. Ultimately, the 2014 farm bill passed with cotton disqualified from the Price Loss Coverage Program (PLC) — the successor to their valued counter-cyclical program — and the cotton marketing loan program significantly diminished in its capacity to protect against sustained price declines. In exchange, cotton growers had the ability to enroll in the novel STAX program. However, as STAX lacked the National Cotton Council's proposed fixed-price protection, it ultimately enrolled less than a third of national cotton acreage. Cotton growers found themselves suddenly completely exposed to the full pressures of world markets. Just before the 2014 farm bill was signed, a prominent agricultural economist noted that cotton's abrupt reversal of fortunes was shocking and could not have occurred without the WTO case; indeed, the industry had likely flown too close to the sun with prior policy victories (Zulaf,

2014).

In some sense, the rapid unraveling of this farm program reform was equally striking. As it became clear in the first year of the post-retrenchment era that cotton growers were not signing up for STAX (their main consolation prize), a broad coalition of legislators mobilized in the aim of completely reversing cotton's exclusion from the crop grower safety net. In December 2015, 100 members of the House of Representatives sent Secretary of Agriculture Tom Vilsack a letter requesting that he use his authority to bring cotton back into the farm safety net by designating cottonseed a program-eligible "other oilseed."[17] Nineteen Senators sent Secretary Vilsack a similar petition two weeks later, but Vilsack declined the proposal, stating that he lacked the proper authority.

A campaign then began in earnest to pass a bill in Congress to push the measure through. Conservative advocacy groups fought this effort directly. An alliance of eight major conservative advocacy groups—including Americans for Prosperity, the central node in Charles and David Koch's formidable right-wing conservative network—sent a letter to Congress in April 2017 decrying the "surreptitious" redirection of "billions of additional dollars to select special interests" and the prospect of starting a trade war with Brazil by reneging on the WTO-brokered agreement. The conservative counter-offensive proved unsuccessful, however. Congress included "cottonseed" funding in a 2018 fiscal appropriations bill, with permanent cottonseed base acreage established months later in the 2018 farm bill.

[17]The term "other oilseed" here refers to oilseeds that are not soybeans. Soybeans are a central farm safety net crop and the second most widely planted row crop in the US. Since the 2002 farm bill, Congress has added minor secondary oilseeds such as canola and flaxseed to the list of program-eligible commodities. Cottonseed is a byproduct of cotton lint production that delivers cotton growers a secondary source of income from their cotton harvest. However, advocates of the proposal to declare cottonseed an "other oilseed" were explicitly attempting to use this as a loophole to reinstate the full scale of government benefits that cotton acreage would have earned but for the loss at the WTO.

## 3.2 Theoretical Expectations for Cotton Industry and Legislator Responses to Retrenchment

In considering how Congress ultimately sided with cotton growers over prominent conservative objections, one can see the central puzzle of this paper magnified several times over. While the entire array of crop grower safety net interests comprise 1-2% of the national electorate, cotton comprises less than 5% of this coalition in terms of value of production, acreage, and farms.[18] Nonetheless, as I shall discuss further in Section 3.4, the industry was able to rally a quarter of each chamber of Congress to its aid.

The stark incongruence of this response gives me room to adjudicate the plausibility of alternative theoretical mechanisms that could underpin the broader longstanding equilibrium of farm program persistence. As summarized in Table 1, I consider the empirical implications of four such alternative explanations. I start with a null hypothesis that reflects the emphasis that American politics scholarship places on theories of electoral accountability (Hacker and Pierson, 2014). Per what I label the "Direct Electoral Impact" hypothesis, I consider the claim that legislators' fear of electoral reprisal among cotton interests was key to the policy reversal. Both my earlier analyses in Section 1.4 and the sheer breadth of the coalition petitioning Secretary Vilsack suggest that the votes of cotton growers themselves could not have been the main impetus for the congressional about-turn. If legislators' actions were responses to credible electoral threats, then one would expect to observe some broader electorally significant mobilization resulting from cotton program retrenchment. This could entail voter mobilization among non-farmers living in cotton-heavy areas, or it could entail cotton growers and their

[18]Cotton subsidy proponents also cannot take advantage of the lay public belief that farm programs support abundant and cheap food. Moreover, cotton production has even fewer local economic spillovers than other program-eligible crops, as less than a fifth of US cotton production is sent to domestic mills.

associated industry organizations massively ramping up contributions to members to buy their support. In either case, if legislators are primarily acting out of fear of some electoral retribution, we should expect to see such mobilization occur on an electorally meaningful scale, and we should expect to see legislator responsiveness only where such efforts actually are electorally meaningful.

One would expect substantially different mobilization dynamics and responses if one instead conjectures that, consistent with the "Richard Scarry Rule," legislators are eager to assist farm program beneficiaries based on their status as farmers, rather than their contribution to some electoral calculus. I consider two particular mechanisms on which such a hypothesis could be founded: (a) legislators broadly harbor politically salient sympathies for farmers regardless of their personal electoral connection to the industry, or (b) legislators who face rural or agrarian electorates are eager to aid any effort to support farmers (perhaps because it makes for good branding in such districts). In either of these formulations, there is no reason to expect an electorally significant mobilization among cotton interests, as the legislators worth targeting are sympathetic to begin with. However, given findings that contributions can buy the attention of congressional officials (Hall and Wayman, 1990; Kalla and Broockman, 2016), one might expect cotton growers and industry PACs to increase the frequency or breadth of contributions to legislators, as even sympathetic legislators are not useful if one cannot manage to get onto their calendar.

These two explanations diverge in terms of which legislators we should expect to join the campaign to reinstate cotton. If there is a strong, universal affinity among legislators for the plight of all farmers, then participation in the cotton reinstatement campaign should be broadly high, and membership in this coalition should not be strongly related to the composition

of individual legislators' electorates. On the other hand, if an agrarian or rural camaraderie underpins the Richard Scarry Rule, we should expect membership in this coalition to be strongly associated with an agrarian or rural presence—but not necessarily a cotton grower presence—within legislators' constituencies.

Finally, my proposed mechanism—legislators' affinity for distinctly local enterprise—also yields no prediction of large-scale voter mobilization. As with the two "farmer affinity" hypotheses, there is no reason to expect that cotton interests will ramp up contributions enough to meaningfully "buy off" a group of legislators, but spreading around some modest donations could be a rational approach to helping cotton industry representatives and lobbyists schedule meetings with cotton district members. The critical prediction that distinguishes the "distinctly local enterprise" hypothesis from each of the prior three hypotheses concerns which legislators become active in the cotton reinstatement coalition. My proposed theory predicts that legislators representing even a few cotton growers will have a high probability to join the coalition, while members serving even the most agrarian or rural districts will be unlikely to support cotton reinstatement unless they have some degree of cotton production within their districts.

On a final note, while it is reasonable to theorize about the extent to which cotton groups' lobbying activity may respond to retrenchment, it is not clear that this is a factor that differentiates the four hypotheses I have described. Under any hypothesis, one would expect cotton group lobbying intensity to increase substantially, as groups must devise new policy proposals and work with allied legislators to modify them to a point that they can be pushed through Congress. To the extent groups' lobbying intensity can speak to the relative plausibility of each of these four hypotheses, it may be in the *timing* of such a lobbying increase. If groups are relying on voter mobilization or contributions to change the hearts and minds of legislators,

then one might expect those activities to occur relatively early in the lobbying ramp-up, as it would be important for lobbyists to be on the same page of the legislators they intend to collaborate with. On the other hand, if convincing legislators of the cause is not needed (or perhaps possible), then the new lobbying campaign can just as well begin right away.

**Table 1:** Theoretical Expectations for Cotton Interest and Legislator Responses to Retrenchment Under Alternative Explanations for Farm Program Persistence

| | Expectations for Voter and Interest Group Responses to Retrenchment | Expectations for Legislator Responses to Retrenchment |
|---|---|---|
| **Direct Electoral Impact** | Electorally significant mobilization occurs after retrenchment: either turnout in cotton-producing areas increases, or cotton grower and PAC contributions increase to an electorally significant level. | A legislator exerts effort on cotton industry request if and only if cotton votes or money are electorally significant. |
| **Universal Affinity for Farmers** | No need for voter mobilization, as legislators already sympathetic; growers and industry PACs may increase contributions to legislators, but contributions need not be large. | Probability of legislator engagement in cotton campaign broadly high and not strongly associated with agrarian or cotton share of constituents. |
| **Agrarian Affinity for Farmers** | No need for voter mobilization, as legislators already sympathetic; growers and industry PACs may increase contributions to legislators, but contributions need not be large. | Probability of legislator engagement in cotton campaign strongly related to agrarian/rural share of district electorate, but not specifically the cotton share. |
| **Affinity for Distinctly Local Enterprise** | No need for voter mobilization, as legislators already sympathetic; growers and industry PACs may increase contributions to legislators, but contributions need not be large. | Legislators join cotton campaign if and only if they represent at least a handful of cotton growers; it does not matter whether either cotton growers or the farming industry more broadly is electorally pivotal in the legislators' district. |

## 3.3 Cotton Interest Responses to the Increased Threat of Permanent Retrenchment

I commence my quantitative analysis of the cotton retrenchment case with an examination of cotton grower organizations' lobbying activities. I identify eight cotton grower organizations in LobbyView's database of lobbying disclosure reports. Paramount among these is the industry-leading National Cotton Council, which developed the supplemental subsidized insurance product STAX that replaced cotton growers' farm program payments under the 2014 farm bill. These eight organizations' lobbying expenditures give us some hint of the timing of the industry response to retrenchment, as the elites running these organizations likely saw the writing on the wall before regular cotton growers and the mass public became aware.

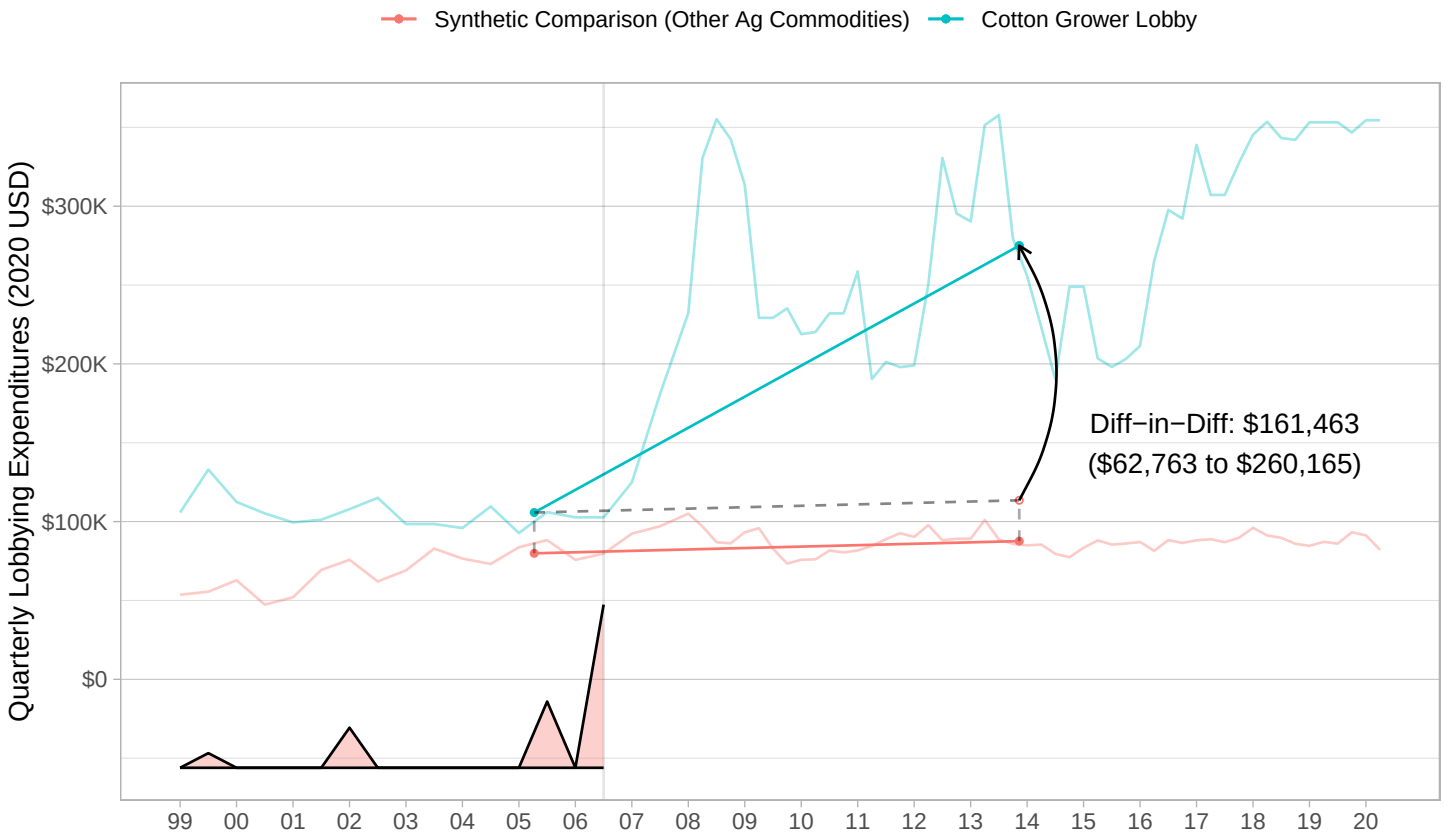
I aggregate quarterly federal lobbying expenditures across these eight organizations, and plot the resulting 1999-2020 cotton-industry total in Figure 11.[19] Cotton grower lobbying immediately spiked after the July 2007 WTO compliance panel ruling revealed that the fallout from the case might extend much broader than the cotton industry's special export subsidy. Cotton industry lobbying then hit peaks around 2008 (when Congress tried to placate Brazil with adjustments to export credit programs), 2012-2014 (when Congress developed a plan to formally resolve the WTO dispute), and 2017 (when a coalition of legislators began their major push to reinstate cotton).

To examine whether these sizeable spikes in lobbying were indeed attributable to the spectre of major farm program retrenchment—rather than broader trends in agriculture—I collect a comparison group of other organizations that lobby on behalf of distinct agricultural commodities. Within LobbyView, I identify 103 commodity-specific lobbying organizations representing 30 distinct agricultural commodities that disclosed lobbying expenditures prior to 2007.[20] I

[19]Lobbying expenditures were reported in half-year increments from 1999-2007, and in quarterly increments afterwards. For the sake of continuity, I divide 1999-2007 biannual lobbying totals by 2 to obtain the quarterly average in each of these periods. As such, Figure 11 depicts two periods per year in 1999-2007 and four periods per year afterwards, and the synthetic difference-in-differences estimate is produced accordingly.

[20]These 30 commodities are, in descending order of 1999-2006 lobbying expenditures, milk, citrus, pork, tobacco, corn, peanuts, rice, beef, horticulture, cotton, soybeans, honey, chicken, potatoes, wheat, avocados, grapes, eggs, sunflower, canola, sorghum, figs, walnuts, dates, peaches, dry peas and lentils, garlic, sesame,

**Figure 11:** Synthetic Difference-in-Difference Estimate of Effect of WTO Compliance Panel Ruling against Cotton Price Supports on Cotton Group Lobbying Expenditures




Notes: Treatment commencement reflects July 27, 2007 WTO compliance panel's confidential interim ruling in dispute between Brazil and US over US support for domestic cotton production. Ruling indicated that the the United States had not fully complied with the March 2005 WTO ruling against certain U.S. cotton support programs; in particular, this was the first point at which countercyclical price support payments and marketing loans were deemed prohibited subsidies. Shaded triangles depict time-period weights selected by Arkhangelsky, Athey, Hirshberg, Imbens, and Wager's (2021) synthetic diff-in-diff estimator.

aggregate quarterly lobbying expenditures at the commodity level, and then use Arkhangelsky et al.'s (2021) synthetic difference-in-differences approach to construct a weighted "synthetic" comparison group for which average quarterly lobbying expenditures run approximately parallel to cotton expenditures prior to 2007. Per the synthetic difference-in-differences estimate, I find that the WTO compliance panel's 2007 ruling—which raised the spectre of wholesale safety net retrenchment—increased quarterly cotton industry lobbying by over $160,000 (95% confidence interval $62,763 to $260,165), a roughly 150% increase over the pre-2007 baseline.

As such, cotton lobbying exploded well before retrenchment actually occurred in 2014. There is some qualitative evidence that these new lobbyists were quickly received with open arms. Congress swatted down attempts at significant cuts to cotton program benefits in the 2008 farm bill, and the House Agriculture Committee initially put forward a farm bill that included the National Cotton Council's STAX plan with the requested statutorily fixed reference price (the key element that, if passed, could have made expulsion from the main safety net palatable).

Was legislators' apparent openness to this lobbying a response to a visible electoral mobilization, as might be predicted by the "Direct Electoral Impact" hypothesis posed in the prior section? For my first test in this regard, I examine whether legislators could have reasonably perceived a spike in turnout in cotton-growing communities, either starting in 2007 (when elite lobbying efforts first took off) or in 2014 (when retrenchment actually occurred). For this purpose, I analyze a harmonized panel of Texas precinct-level election returns spanning 1994-2020. As the largest cotton-producing state in the nation, Texas comprised 40-50% of national harvested cotton acreage in the period of study, and is thus ideal for such an analysis. I spatially allocate Texas precincts in each election to 2010 census blocks in proportion to block population, and then aggregate the allocated precincts' turnout up to the level of Texas' 9,082 2018 voting tabulation districts (VTDs).[21] As a result, my analyses of changes in cotton-area

barley, and watermelon. Note that row crops covering the vast majority of farm program eligible acreage are included in this list. As such, the observed spikes in cotton grower lobbying are unlikely to be a product of a common shock to crop grower groups during farm bill negotiations.

[21]Texas' voting tabulation districts (VTDs) are constructed from precinct boundaries that have been consolidated to align with census geographies. My job of mapping precinct-level results to 2018 VTDs is substantially

mobilization depends on a panel of turnout rates, vote totals, and census demographics for small, geographically consistent units.

I calculate turnout rates by dividing total ballots cast by a VTD's voting age population in the year of the election.[22] As some Texas VTDs are very sparsely populated (or even unpopulated) over periods within my panel, I limit my sample to the 7,724 VTDs which consistently feature a voting age population greater than 100. To determine which of these VTDs qualify as "cotton communities," I spatially assign VTDs to geocoded addresses from both (a) my administrative database of farm program recipient profiles and (b) the 2018 L2 Texas voter file snapshot. Using these two data sources, I declare a VTD to be a "heavy cotton VTD" if it meets two criteria: (a) at least 5% of the L2 voter profiles mapped to the VTD reside in households with a stake in 2004-2012 cotton base acreage, and (b) historical levels of annual cotton production, as implied by DCP/ACRE payments, amount to at least $2,500 per adult within the VTD. To obtain a set of comparison VTDs that should *not* be affected by cotton program retrenchment, I select VTDs such that (a) fewer than 1% of the L2 voter profiles mapped to the VTD reside in households with a stake in 2004-2012 cotton base acreage, and (b) historical levels of annual cotton production amount to less than $500 per adult.

A naive difference-in-differences estimate in turnout rates between the resulting 235 cotton-heavy "treated" VTDs and 6,366 candidate "control" VTDs would almost almost certainly be confounded by the massive urban-rural realignment that transformed political behavior over the sample period (Gimpel et al., 2020). As such, I reweight the 6,366 candidate non-cotton VTDs so that—on average—they perfectly match the pool of cotton VTDs on 2000 census demographics,[23] 1994-2006 turnout rates, and 1994-2006 GOP two-party vote shares averaged across all statewide races. I conduct this reweighting using the disaggregated synthetic control

eased by the fact that the Texas Legislative Council has already conducted this allocation for the 2002-2018 cycles.

[22]I obtain estimates of voting age population in each year by applying a straight-line interpolation of census block decennial census population estimates. Since census blocks are nested within VTDs, I then simply aggregate population across constituent blocks.

[23]These VTD-level 2000 census demographic measures include: share white and non-Hispanic, share Hispanic, share Black, and logged number of persons per square mile.

method of Robbins, Saunders, and Kilmer (2017).[24] The approach ultimately selects for sparse control weights, with only 312 non-cotton VTDs obtaining positive weights. However, the candidate donor pool is large enough that these 312 units deliver a perfect match on all pre-2007 outcomes and covariates, with no particular handful of VTDs constituting a large share of the total weight.

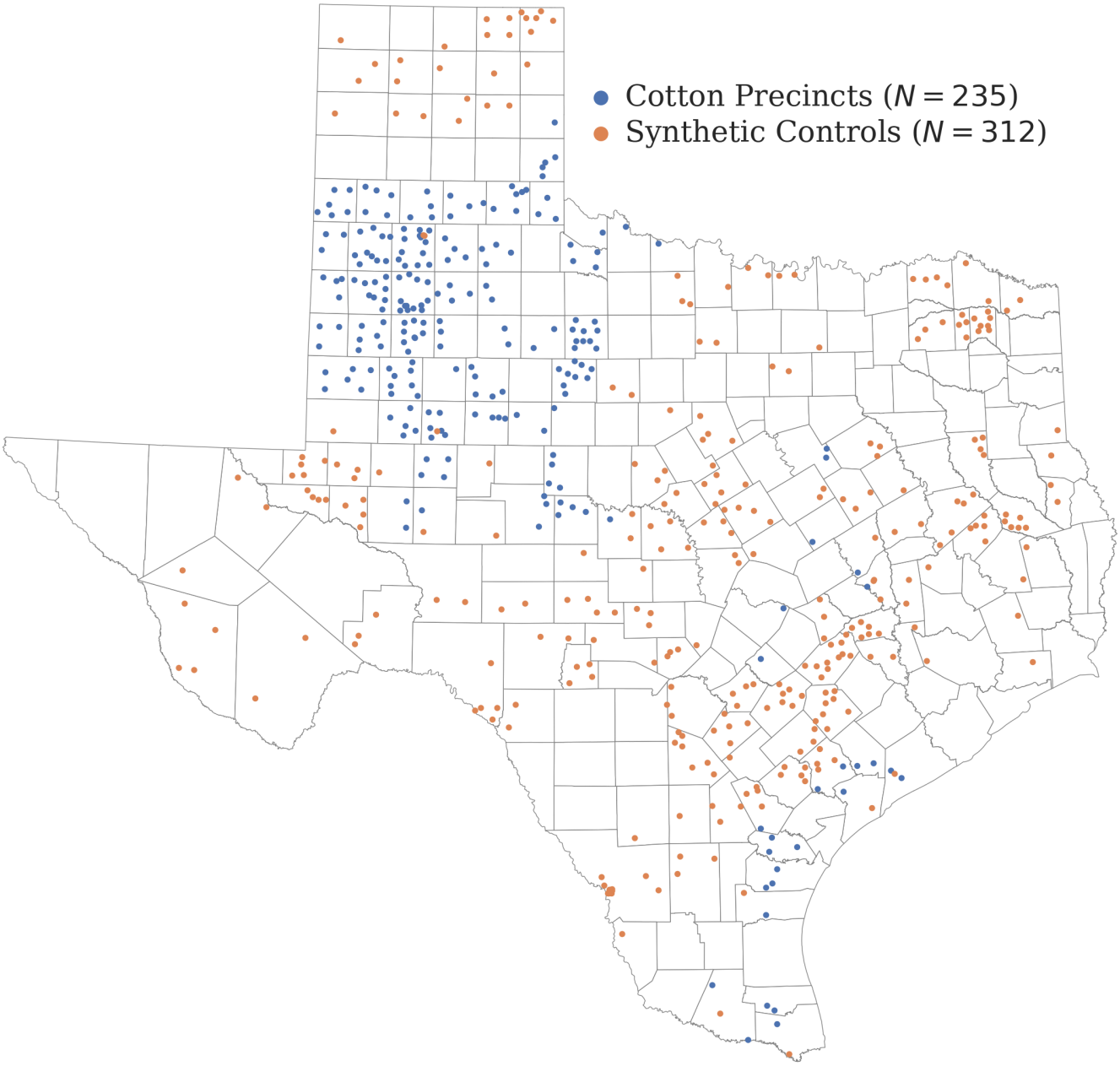
Figure 12 presents the spatial distribution of the 235 cotton VTDs and 312 non-cotton VTDs that I ultimately use to estimate the effect of cotton program retrenchment on cotton-community turnout. With these 547 VTDs and their respective synthetic control weights, I estimate a weighted dynamic two-way fixed effects (TWFE) regression of VTD-level turnout rate on exposure to the cotton program retrenchment. Mirroring the prior analysis of lobbying expenditures, the treatment indicator takes a value of 1 for each of the 235 cotton VTDs in cycles 2008-2020, reflecting a treatment commencement corresponding to the July 2007 WTO compliance panel ruling. Figure 13 depicts the resulting dynamic treatment effect estimates for cycles 2008-2020.

Figure 13 provides no evidence of major voter mobilization efforts in cotton communities, neither when the threat of major retrenchment first emerged in 2007, nor when retrenchment actually occurred in 2014. The average difference in turnout rates between cotton-heavy VTDs and comparable areas never exceeded one percentage point in the cycles following the 2007 compliance panel ruling, may have actually turned negative in later cycles. As such, it seems very unlikely that cotton interest groups orchestrated a mass voter mobilization to aid their cause, and it seems unlikely that legislators' (apparent) eagerness to work with cotton lobbyists stemmed from electoral upheaval in cotton-growing areas of their districts.

If cotton growers did not rally supporters at the ballot box, could they have instead conducted an impactful mobilization through campaign finance? To conduct an analogous analysis of contribution behavior, I construct a farm-level panel of yearly contributions to US House campaigns and cotton grower interest group PACs. For this analysis, I start with the same focal set

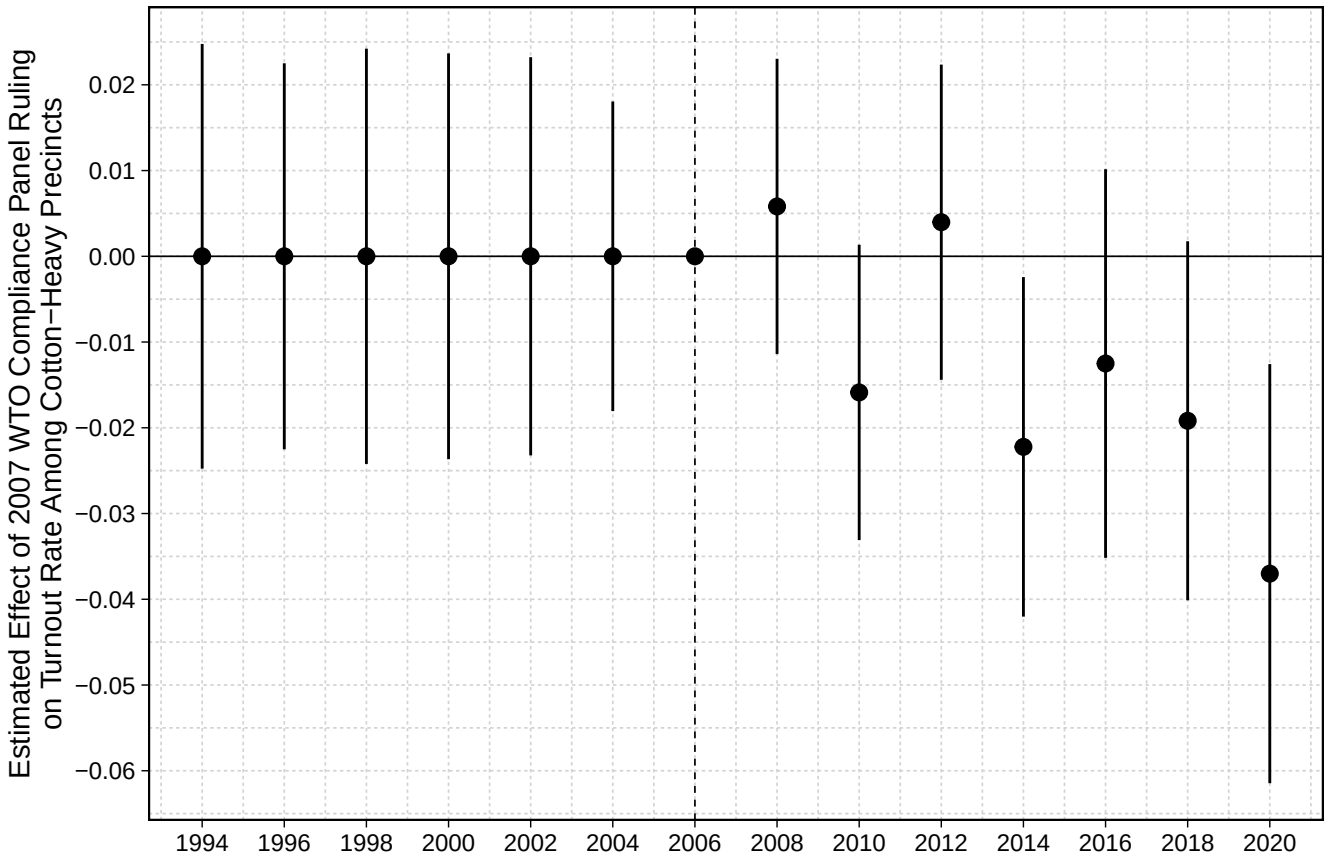
[24]Specifically, I use the `microsynth` software package created by Robbins and Davenport (2021).

**Figure 12:** Geographic Distribution of Cotton-Heavy ("Treated") and Non-Cotton ("Control") VTDs Compared in Turnout Analysis




Notes: Figure depicts Texas voting tabulation districts (VTDs) that were directly exposed to cotton program retrenchment, and a control set of VTDs that were not tangibly exposed. The 312 VTDs in the control set are the non-cotton VTDs to which Robbins, Saunders, and Kilmer's (2017) disaggregated synthetic control method ("microsynth") attributes nonzero weight.

**Figure 13:** Weighted Dynamic TWFE Estimates of Average Effect of Increased Threat of Permanent Cotton Program Retrenchment on Turnout Rate in Cotton Heavy Precincts




Notes: Point estimates are depicted alongside 95% confidence intervals. Standard errors are clustered at the precinct level. Estimates are based on a panel of 235 cotton-heavy ("treated") precincts and 312 non-cotton ("control") precincts, with the control group reweighted using Robbins, Saunders, and Kilmer's (2017) disaggregated synthetic control method to exactly match the treatment group on 1994-2006 turnout rates, 1994-2006 GOP two-party vote shares (averaged in each cycle across statewide races), and 2000 census demographics (share white and non-Hispanic, share Hispanic, share Black, and logged number of persons per square mile).

of farms as in Sections 1.3-1.5: the 1,415,037 farms with a stake in 2004-2012 program-eligible "base acreage." I subset to the 526,967 of these farms that exceed 50 base acres, primarily for computational tractability. However, this set of medium and large farms also contains most of the farmers who actually produce row crops as a primary occupation. And since farm size in the US is lognormally distributed, these farms also constitute over 95% of national base acreage, and thus reflect the main vested interests in US farm programs.

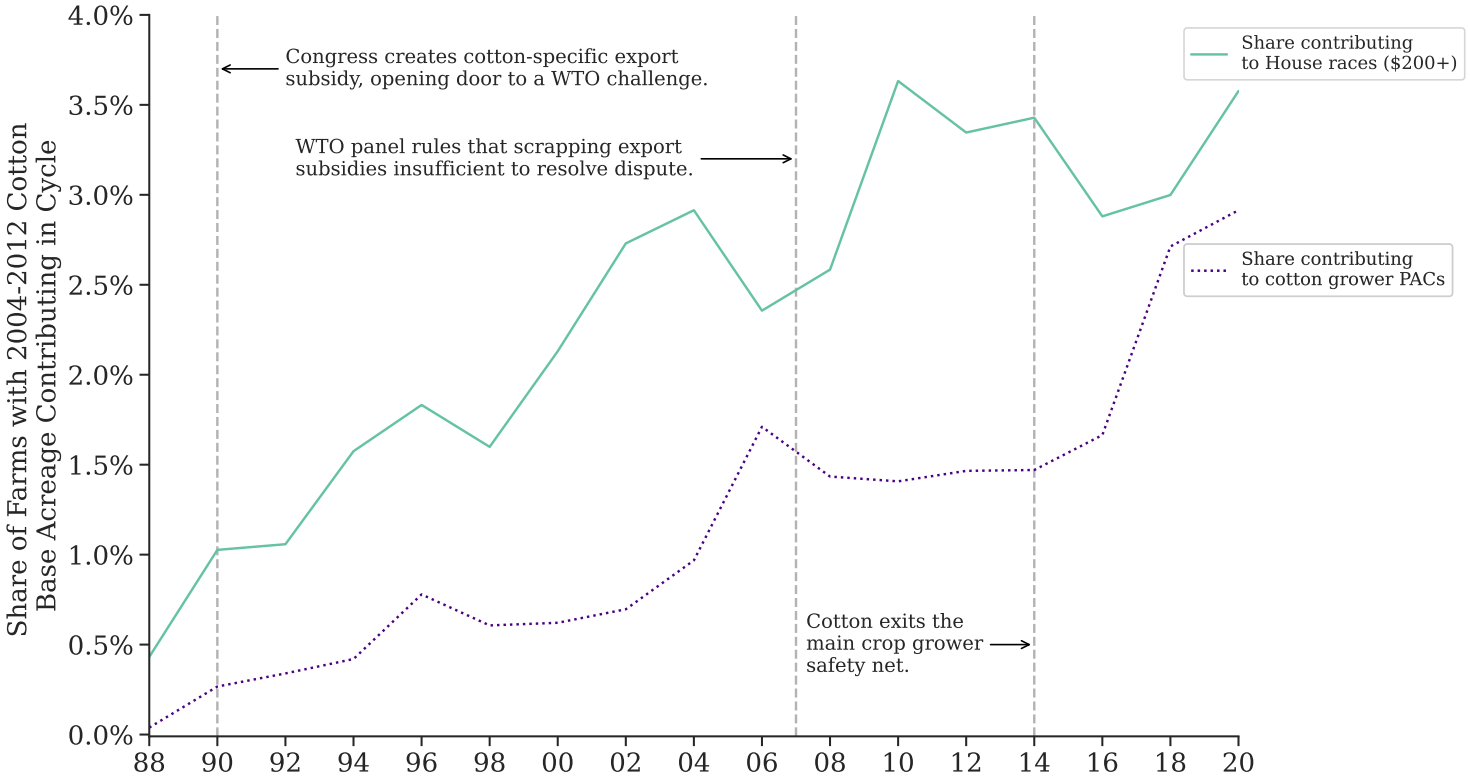
Similar to my approach in the voter turnout analysis, I label a farm as "exposed" to cotton program retrenchment if at least 30% of its base acreage is cotton base, I label it as "not exposed" if less than 1% of its base acreage is cotton base, and I discard the farms between these two thresholds from my analysis. This leaves me with 41,212 cotton farms and a pool of 464,910 non-cotton farms from which I can construct a comparison group. Using this sample, my primary objective is to estimate the (dynamic) effects of the 2007 WTO compliance panel ruling on (a) cotton growers' propensity to contribute at least $200 to a single US House campaign,[25] and (b) cotton growers' propensity to make any contribution to a PAC associated with a crop grower association advocating for a particular program-eligible crop.

Figure 14 depicts trends in these two outcomes across cycles 1988-2020: from before the cotton saga began to its full resolution. As one would expect, large House contributions and PAC contributions are the province of elite (as opposed to mass) political behavior, as at no point do contribution rates among the 41,212 cotton farms exceed 4%. However, Figure 14 does suggest that contribution activity among cotton growers has followed a secular increasing trend that may have began prior to the cotton retrenchment saga. As such, just as with my analysis of voter turnout, it appears to be critical to my assessment of the effect of retrenchment on contribution behavior that I construct a control group that similarly mirrors such trends.

I therefore apply Robbins, Saunders, and Kilmer's (2017) disaggregated synthetic control method to reweight the 464,910 non-cotton farms in my sample to match the 41,212 cotton farms exactly on (a) yearly indicators for whether the farm contributed $200+ to a congressional

[25]I focus on a $200 per candidate threshold here because this has been the Federal Election Commission's threshold since 1979 for requiring that campaign include a donation in their itemized contribution records.

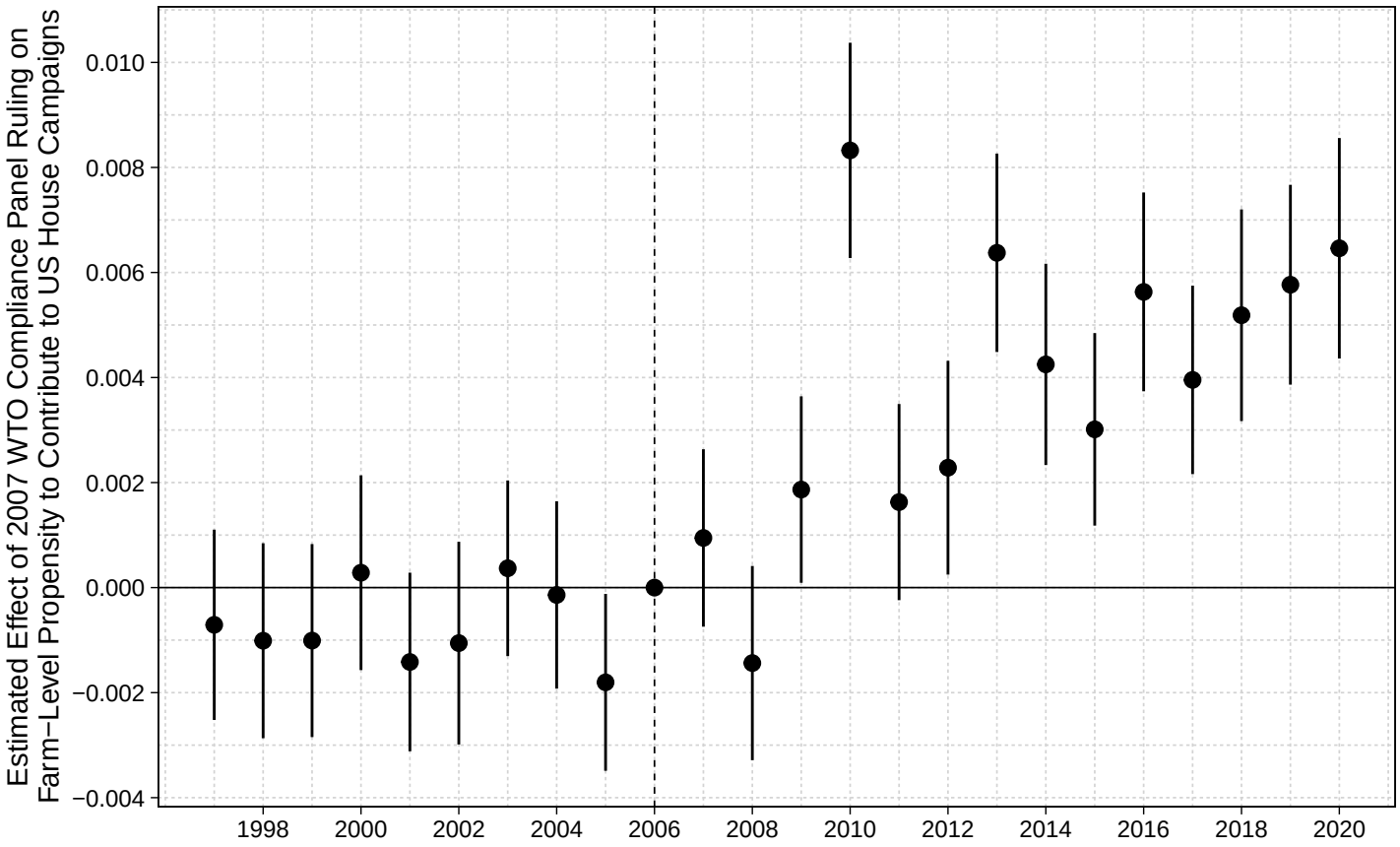
**Figure 14:** Share of Cotton Farms Contributing to House Races and Grower PACs by Cycle




Notes: Figure depicts the contribution behavior of the 41,212 sample farms that held a stake in at least 50 base acres, and attributed at least 30% of base acreage to cotton (as inferred by 2004-2012 DCP/ACRE records). The $200 threshold for counting a farm as contributing to a House race entails checking whether a DIME contributor ID linked to a farm is associated with at least $200 in contributions to a particular House candidate within a single cycle. I choose this threshold because it corresponds to the mandatory itemization threshold for federal campaigns, and thus makes it easier to observe trends in donor behavior (as opposed to trends in campaigns' disclosure behavior).

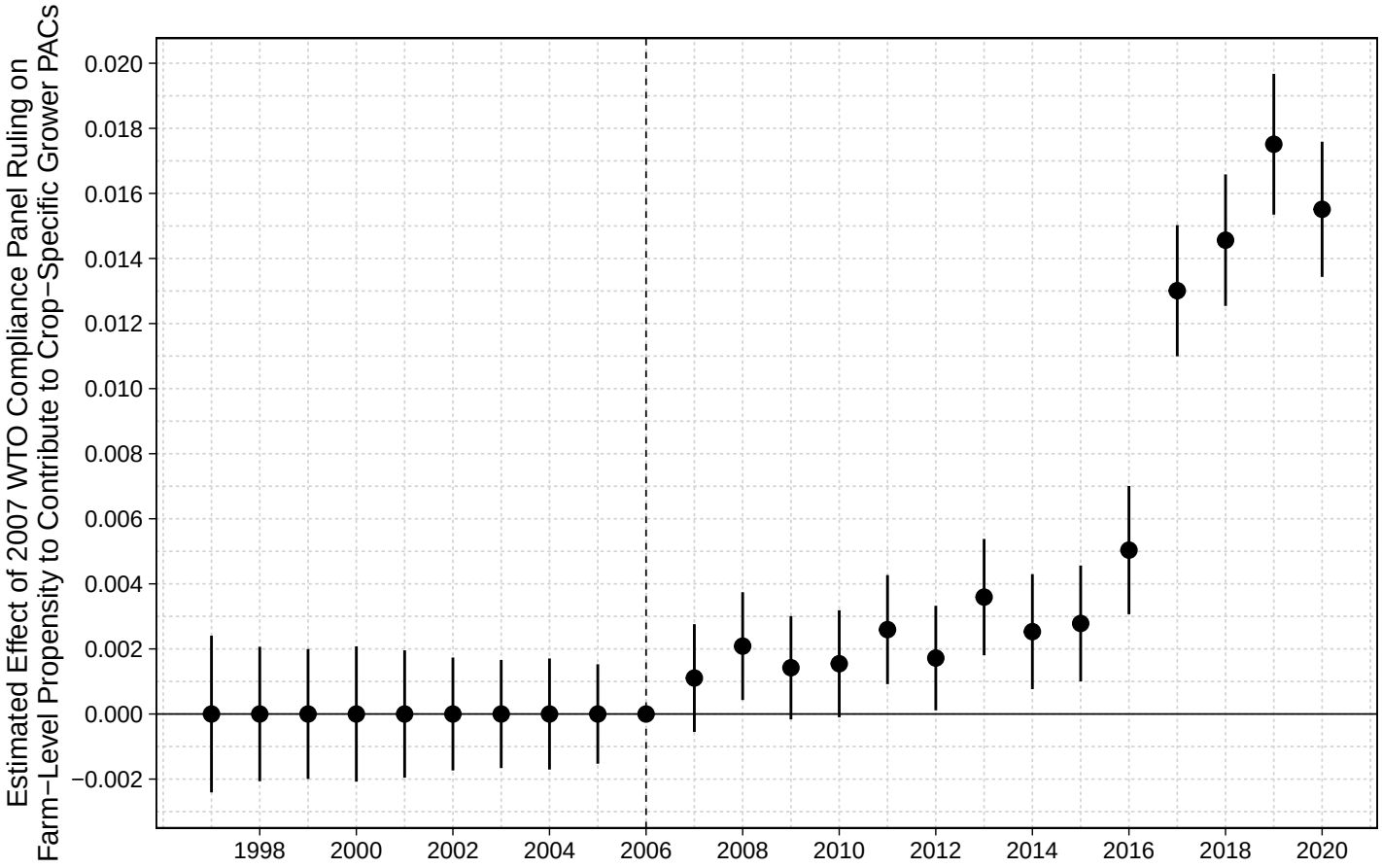
campaign in 1997-2006, and (b) yearly indicators for whether the farm contributed to a crop-specific PAC. In contrast to the turnout analysis, the reweighting method does not select for sparse weights, and over 99% of non-cotton farms receive positive weight. Mirroring the prior analysis, I estimate weighted dynamic two-way fixed effects (TWFE) regressions of whether a farm contributed within a particular year on a treatment indicator that takes a value of 1 for cotton farms starting in 2007.

**Figure 15:** Weighted Dynamic TWFE Estimates of Average Effect of Increased Threat of Permanent Cotton Program Retrenchment on Cotton Farms' Propensity to Contribute to US House Campaigns




Notes: Point estimates are depicted alongside 95% confidence intervals. Standard errors are clustered at the farm level. Outcome is an indicator for whether a farm contributed at least $200 to a particular House campaign within the specified year. Estimates are based on comparing 41,212 cotton ("treated") farms and 464,910 non-cotton ("control") farms, with the control group reweighted using Robbins, Saunders, and Kilmer's (2017) disaggregated synthetic control method to exactly match the treatment group on (a) rates of contributing $200+ to a congressional campaign (House or Senate) and (b) rates of contributing to crop-specifics PACs in each year 1997-1996.

**Figure 16:** Weighted Dynamic TWFE Estimates of Average Effect of Increased Threat of Permanent Cotton Program Retrenchment on Cotton Farms' Propensity to Contribute to Crop Grower PACs




Notes: Point estimates are depicted alongside 95% confidence intervals. Standard errors are clustered at the farm level. Outcome is an indicator for whether a farm made any contribution to a crop-specific grower PAC over the specified year. Estimates are based on comparing 41,212 cotton ("treated") farms and 464,910 non-cotton ("control") farms, with the control group reweighted using Robbins, Saunders, and Kilmer's (2017) disaggregated synthetic control method to exactly match the treatment group on (a) rates of contributing $200+ to a congressional campaign (House or Senate) and (b) rates of contributing to crop-specifics PACs in each year 1997-1996.

Figures 15 and 16 depict the resulting estimates of dynamic effects on farms' yearly propensity to contribute to House campaigns and crop-specific grower PACs, respectively. While I find some degree of a positive effect on each outcome, these two sets of estimates provide a stark contrast. As shown in Figure 15, relative to the synthetic control counterfactual, farms exposed to cotton-program retrenchment gradually increased their propensity to contribute to House campaigns after the 2007 compliance panel ruling. With the exception of the 2010 election, in which three candidates with farming backgrounds ran in cotton-district House races for the first time, there is little evidence of an industry-coordinated mobilization of donors. On average, 2007-2018 contribution rates exceeded counterfactual rates by 27%—a nontrivial increase, but not nearly on the same scale as the 150% increase in cotton-group lobbying expenditures depicted in Figure 11. On the other hand, the estimated effects on cotton growers' likelihood to contribute to grower PACs (Figure 16) appear to uncover a highly organized mobilization commencing during the congressional reinstatement campaign in 2017-2018. While initial effects on contributions to grower PACs appeared to be minimal, cotton farms nearly doubled their propensity to contribute to such PACs beginning in 2017.

Taken together, what do these estimated effects on lobbying, turnout, House campaign contributions, and grower PAC contributions tell us regarding the hypotheses outlined in Table 1? Though these analyses are not completely dispositive on their own, the scale and timing of effects casts doubt on the idea that cotton growers, interest groups, and communities felt the need to force or buy the votes of their patron legislators. For one, as Figure 13 shows, there is no evidence of voter mobilization to speak of. While Figures 15 and 16 suggest that cotton grower elites increased campaign contributions after the 2007 WTO compliance panel ruling raised the spectre of major retrenchment, this increase was fairly modest over the first several subsequent cycles. By contrast, cotton group lobbying expenditures spiked immediately, which may suggest that the cotton industry did not think it needed to introduce carrots or sticks before its lobbyists could find willing collaborators on Capitol Hill.

When cotton grower contributions did finally pick up, the increase appeared to be on an

order of magnitude that may have purchased lobbyists a meeting on legislators' calendars (per Kalla and Broockman (2016)), but hardly seemed large enough to merit changing a strongly held conviction. I replicate the synthetic control analyses depicted in Figures 15 and 16 using contribution amounts rather than binary propensities, and I estimate that the *total* increase in House and PAC contributions across 2007-2018 amounted to about $1.2 million. Given that the average cost of a victorious House campaign has exceeded $1 million since 2004,[26] these additional funds—spread across hundreds of races in this 12-year period—were likely far from critical to recipients.

As such, the behavioral responses of vested interests in cotton programs are not very consistent with the "Direct Electoral Impact" hypothesis. Such interests did not act as if they needed to (or perhaps, were *able* to) become electorally significant to collaborate with members of Congress. Instead, their behavior suggests that a sufficient number of legislators were automatically open to the cause, as would be consistent with the other three hypotheses I formulate ("Universal Affinity for Farmers," "Agrarian Affinity for Farmers," and "Affinity for Distinctly Local Enterprise"). The results I've presented here are not helpful for distinguishing between these latter three hypotheses, but as I argue in the next section, legislator behavior provides evidence that the "Distinctly Local Enterprise" is by far the most compelling.

## 3.4 Legislator Responses to Increased Threat of Permanent Retrenchment

In my final set of analyses, I directly examine variation in legislators' patronage of cotton growers to argue that my proposed "distinctly local enterprise" hypothesis yields the most compelling explanation of farm program resilience. Before jumping into a quantitative empirical assessment, I first note that stark regional divides in the cotton retrenchment saga provide some informative qualitative evidence in this regard. As alluded to in Section 3.1, the Southern-dominated House Agriculture Committee was quick to copy the National Cotton Council's STAX proposal directly into their 2012 farm bill draft. The Midwestern-led Senate

[26] See https://www.brookings.edu/wp-content/uploads/2017/01/vitalstats_ch3_tbl1.pdf.

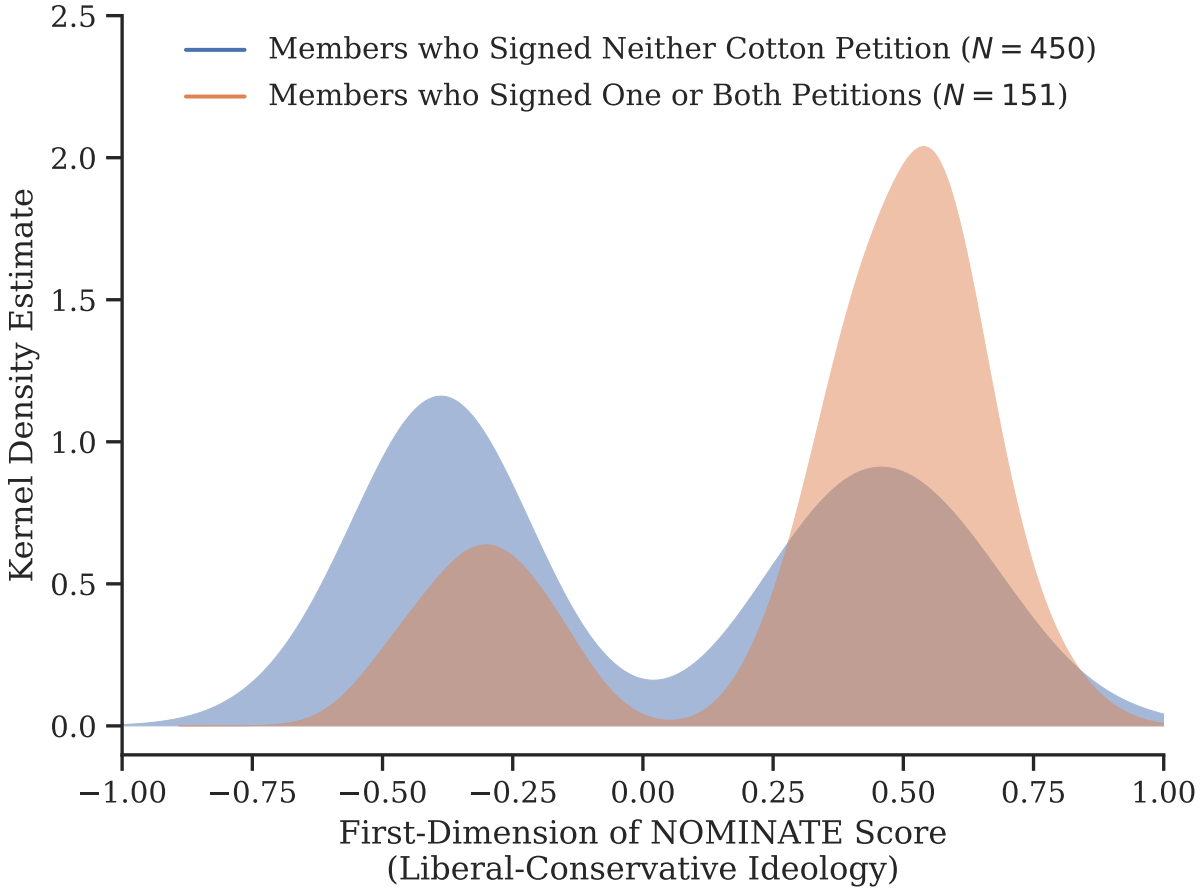
Agriculture Committee insisted that the statutorily fixed reference price be stripped from the plan, producing a replacement program that very few cotton farmers found worth enrolling in. Similar patterns emerged in the subsequent negotiations to reinstate cotton. As noted in Figure 10, one of the first legislative pushes to reinstate cotton failed in 2017 when Senators Leahy (D-VT) and Stabenow (D-MI) blocked funding for the proposal in a move to obtain leverage for their own local farm constituency: dairy farmers.

To demonstrate that these are not cherry-picked anecdotes, I assemble data on legislator-level participation in the campaign to reinstate cotton. In an unfortunate turn for causal identification, cotton returned to the safety net through a broad and multifaceted omnibus appropriation bill in 2018, so roll call voting data is of little help. However, legislators' support for reinstatement is observable by way of two sets of petitions that House members and senators sent the executive branch in 2015-2017. In December 2015 and January 2016, 100 House members and 19 senators signed a petition to Secretary of Agriculture Vilsack requesting that he reinstate cotton as a covered commodity by executive fiat. Sec. Vilsack replied that he did not have the authority to do so, but months later he gave the coalition a consolation prize by creating the Cotton Ginning Cost Share (CGCS) program, which issued one-time direct payments to cotton growers nationwide in proportion to their planted acreage. In 2017, the cotton coalition sent a new petition to President Trump signed by 109 House members and 26 senators. This latter petition requested that the Trump administration operate the CGCS program on an ongoing basis, and the administration granted the request for one year before cotton was permanently returned to covered commodity status under the 2018 farm bill.

Of the 601 distinct members serving in Congress at the time either of these petitions was released, 151 signed one or both petitions. Rallying a quarter of each chamber of Congress to support expensive subsidies was not a trivial accomplishment. In particular, as shown Figure 17, the large majority of these members had highly conservative voting records on economic issues. And as previously noted, an array of influential conservative advocacy groups vocally opposed cotton reinstatement and directly lobbied legislators to choose free markets over expensive

safety net programs.

**Figure 17:** Distributions of House and Senate Member Ideology by whether Member Signed 2015 or 2017 Cotton Program Petitions




The composition of this group of 151 lawmakers makes it clear that the failure of these conservative advocacy groups was *not* attributable to some universal affinity for protecting farmers, or even a shared rural/agrarian concern for the nation's farming industry. In Figure 18, I plot the 2015 petition signing disposition of every sitting House member alongside their districts' shares of 2014 general election turnout attributable to (a) households with a stake in 2015-2016 cotton production and (b) households with *any* stake in the crop grower safety net (proxied, as usual, by holding a stake in 2004-2012 base acreage). The former measure is made possible by the Cotton Ginning Cost Share (CGCS) program, which sent payments to nearly all cotton growers nationwide in proportion to actual planted cotton acreage. Figure 18 plots these district-by-district turnout shares with solid bars for members who signed the 2015

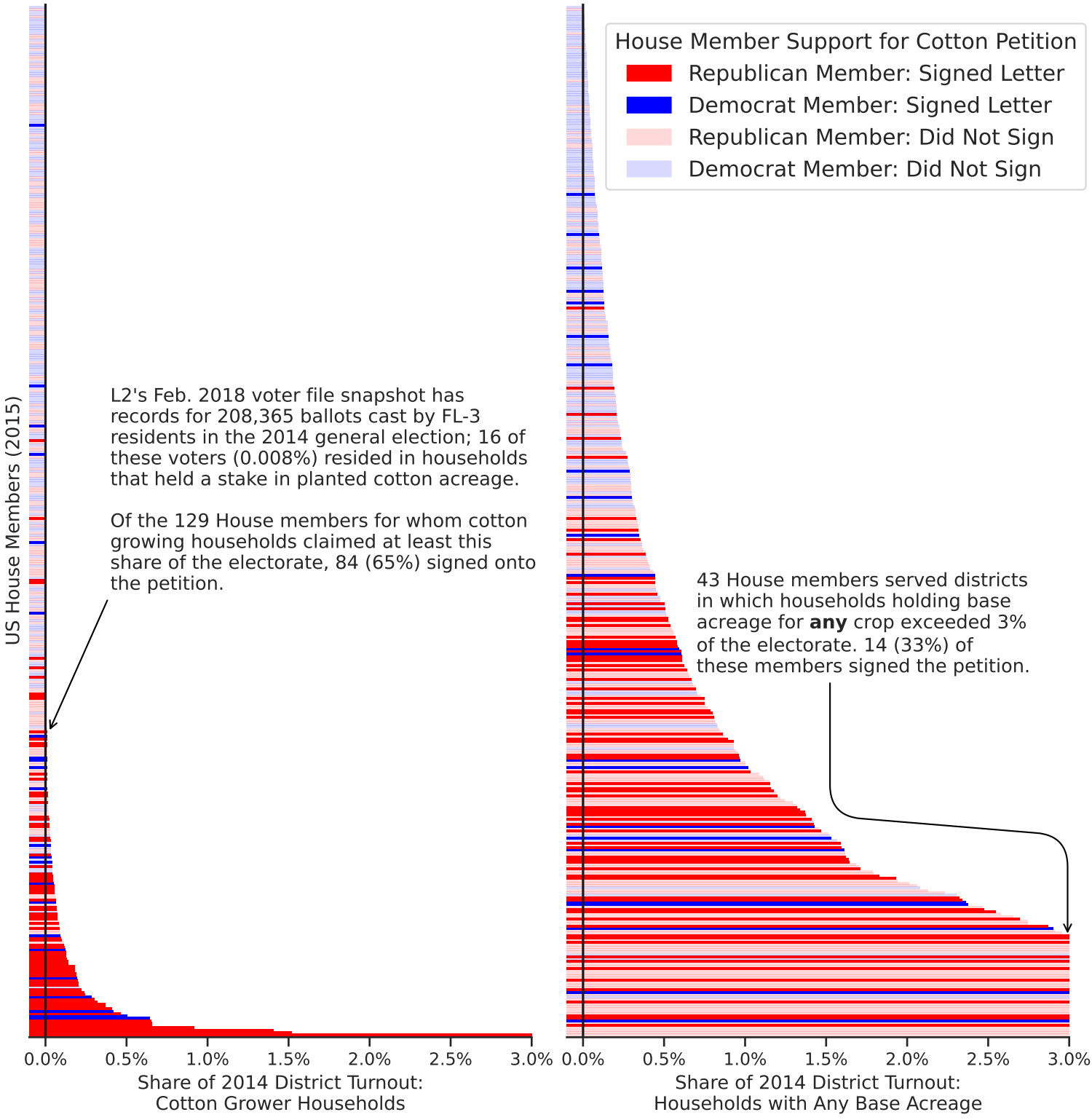
petition, and faded bars for members who did not sign the petition.

The left panel of Figure 18 demonstrates that the cotton reinstatement coalition was highly concentrated among House members at the upper end of the cotton-growing spectrum. Only a handful of members signed the petition without representing any cotton growers. In contrast, the right panel makes it clear that these signatures are not driven by some ecumenical pro-farmer camaraderie among the broader farm safety net coalition, as the large majority of members in the most agriculture-heavy districts declined to sign.

However, this does not mean that most of the legislators who advocated for cotton reinstatement did so because cotton production was electorally or economically important to their districts. Ted Yoho (R, FL-03) signed the petition even though only 16 of the voters who cast a 2014 ballot in his district (0.008%) lived in a household with a stake in cotton production. Of the 129 House members for whom cotton growing households passed this *de minimis* 0.008% threshold, 84 (65%) signed the cotton reinstatement petition. It is thus clear that representing at least a handful of cotton growers was nearly both necessary and sufficient for House members to support cotton reinstatement.

To bring this point further into focus, I examine the participation of the full set of 535 House and Senate members serving on the dates in which the 2015 and 2017 cotton program petitions were sent to the executive branch. Given the resulting $535 \times 2 = 1{,}070$ opportunities for a member to lend their support, I estimate the probability of signing a petition conditional on farming constituencies' share of the electorate in the prior election. Specifically, I use a gradient boosted random forest algorithm to separately estimate the probability that a member signs the petition conditional on (a) cotton grower households' share of turnout in the prior election, (b) crop safety net households' share of turnout in the prior election, and (c) the broader agrarian electorate's share of turnout in the prior election. As with Figure 18, I determine a household's stake in planted cotton acreage according to whether any voter in the household is linked to any farm that obtained CGCS payments, and I determine a stake in the crop grower safety net (i.e. base acreage) by way of 2004-2012 DCP/ACRE payments. I consider a household

**Figure 18:** House Member Participation in Petition to Reinstate Cotton in the Farm Safety Net Depends Mostly on Extensive (but not Intensive) Margin of Cotton Constituents




Notes: The plots depict signatures on Rep. Conaway's 12/14/2015 petition calling for Ag Sec. Vilsack to use extraordinary means to reinstate cotton as a covered commodity. "Base acreage" refers to historical acreage planted to a crop, and is the basis for payments through USDA's flagship farm programs (e.g. DCP/ACRE in 2002-2013, ARC/PLC in 2014-2023). The left panel pertains to 2015-2016 planted cotton acreage, a status that is inferred from CGCS program disbursements.

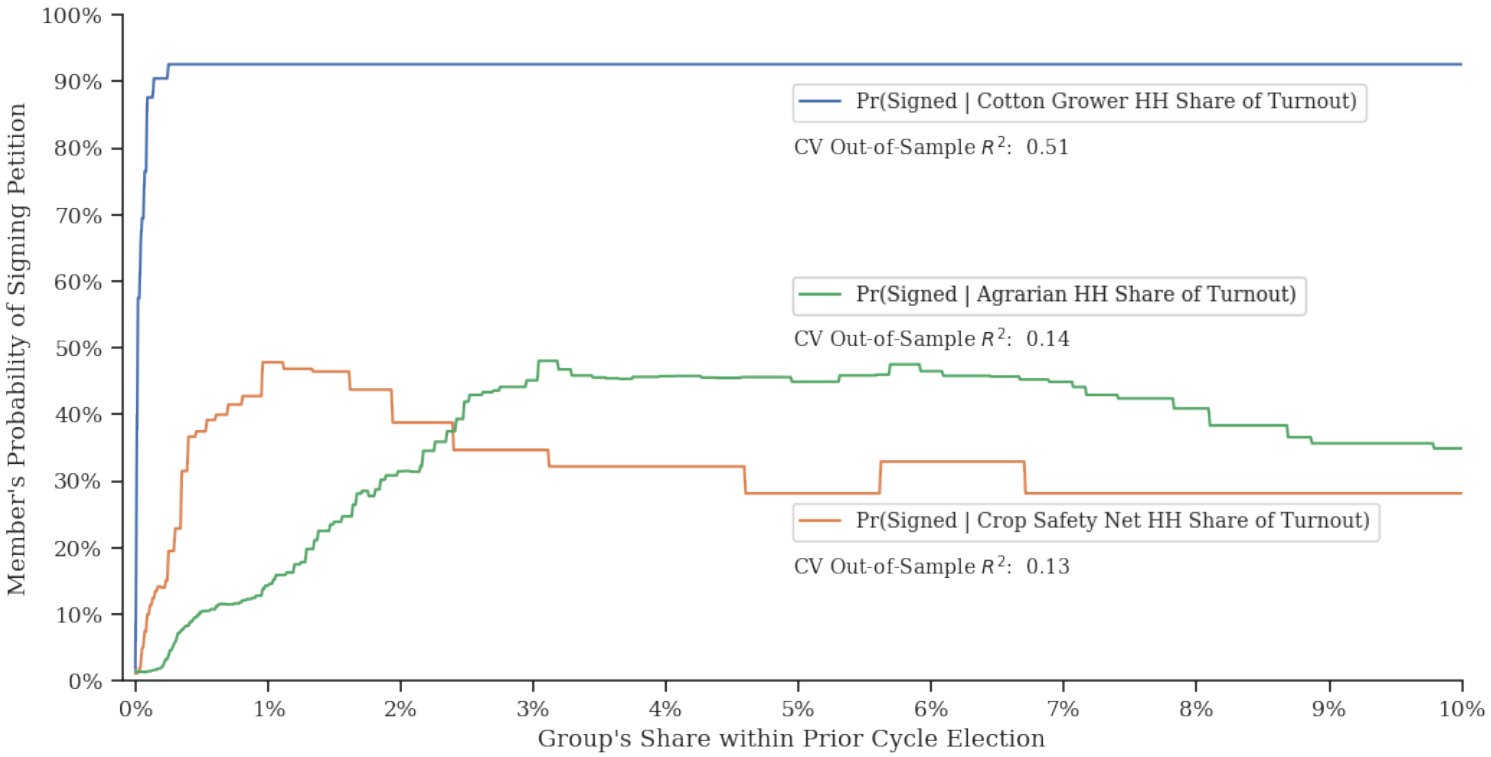
to belong to the "broader agrarian electorate" if it benefits from *any* 2004-2020 USDA farm program—including flagship farm safety net programs in addition to conservation, disaster relief, and miscellaneous ad hoc programs—or if L2's voter or commercial files label any of the household's voters as working in the farming, ranching, or dairy industries. For comparison, of the nearly 180 million voters with records in the February 2018 snapshot of the L2 voter file, I classify 65,911 as residing in cotton grower households, 2.1 million in crop grower safety net (i.e. "base acreage") households, and 3.9 million in agrarian households.

I separately tune the hyperparameters of a CatBoost classifier for each of these three predictors using five-fold cross validation to ensure the model does not overfit.[27] I then fit the tuned model to the full $N = 1{,}070$ dataset of legislator-petition participation decisions, and plot the resulting estimated conditional expectation functions in Figure 19. As depicted by the blue curve, a member's probability of publicly supporting a cotton-industry initiative jumps from roughly 0% to over 90% before the cotton growers' share of the electorate reaches 0.2%. However, no matter how large (a) the crop grower safety net share of the electorate or (b) the broader agrarian share of the electorate grows, at no point does a legislator's conditional probability of signing the petition exceed 50%.

To demonstrate that responsiveness to local cotton producers really was the main determinant of legislators' decisions, I calculate a measure of out-of-sample model fit associated with each of the three conditional probability curves presented in Figure 19. As before, I randomly split the 601 distinct legislators serving during the two periods (and associated petition signing observations) into five cross validation folds. Then, I iteratively generate "test fold" predictions for each of the three models by fitting a model on the remaining four "training" folds. Stacking the five sets of out-of-sample test fold predictions together, I compute out-of-sample $R^2$ metrics by comparing (a) predicted probabilities of signing the petition for observations in this stacked test set and (b) the actual signing decisions. I obtain an out-of-sample $R^2$ of 0.51 for the model

[27] I set up the cross validation folds randomly but in a manner such that the observations for each member of Congress are assigned to the same test fold, even if she served during both congresses. This ensures that within-legislator correlations over time do not cause the model to overfit.

**Figure 19:** Gradient Boosted Random Forest Estimates of Conditional Probability of Signing 2015/2017 Cotton Program Petition Given Local Electorate Composition




Notes: Plot depicts estimated likelihood that a member of Congress signs a 2015/2017 cotton program petition conditional on the specified constituency's share of district general election turnout in the prior election (2014/2016). Conditional expectations are estimated using CatBoost, a gradient boosted random forest algorithm, and rely on a dataset of $N$ = 1,070 member-year observations: 535 sitting House and Senate members at the time of the 2015 petition, and 535 at the time of the 2017 petition. Cross validated out-of-sample $R^2$ values are calculated using five-fold cross validation, where observations corresponding to the same legislator are grouped into the same CV fold so that "test fold" predictions are generated only from models trained on legislators not included in that fold.

based on cotton grower household share of turnout, and much smaller values for crop safety net household share of turnout (0.13) and agrarian household share of turnout (0.14). I conclude that representing at least a handful of cotton producers really was the primary determinant of legislators' cotton program advocacy.

Between Figures 18 and 19, it seems quite clear that members did not support cotton growers' policy objectives because such members commanded a key block of votes. It also seems unlikely that members signed the petition out of a universal support for the nation's farmers, or because the petition struck a chord with every member representing a rural or agrarian electorate. Rather, my analyses suggest that legislators were very responsive to the smallest positive quantity of cotton growers, but they needed to be *their* cotton growers. Notably, this conclusion corresponds directly to the predictions of the "distinctly local enterprise" hypothesis I propose, while contradicting hypotheses that emphasize the electoral significance of program beneficiaries or a putative general affinity for the plight of farmers.

# 4 Discussion and Conclusion

Having unpacked the marginal electoral stature of crop growers, as well as the swift reversal of the most significant farm program retrenchment in recent history, I conclude that the political economy of US farm policy is far from a simple electoral calculus. In particular, the resilience of the farm safety net reflects an incongruence that, upon first glance, raises a puzzle of political geography, and on second glance, owes its explanation to political geography. The votes and contributions of vested interests in the modern crop grower safety net are pivotal in very few districts, even as these interests enjoy the patronage of a large share of Congress in each farm bill. The extreme dispersion of the farming industry leads this small share of the national electorate to be spread thin across a number of partly-rural districts represented by increasingly conservative legislators. Farm program beneficiaries therefore have been left represented by members who typically vote to cut government safety nets, while lacking the electoral heft to punish such representatives if they were to turn on *their* safety net.

Without knowing otherwise, one might expect this combination to sound the death knell of farm programs. And yet, the case of the short-lived retrenchment in the cotton grower safety net suggests that—given the sustained decline in the US farm sector—the current arrangement may be close to politically optimal. While conservative advocacy groups and technocrats continue to push Congress to end the federal government's involvement in agriculture, conservative legislators appear to be quick to set aside free market doctrine as soon as it clashes with the interests of local businesses—regardless of their electoral significance. On this steep gradient upon which representatives come to champion local enterprise, the puzzle of farm program persistence is flipped on its head. Since it took only a few local cotton growers to convert a legislator into a staunch cotton program advocate in 2015-2018, the relatively thin sprinkling of cotton farms across the districts of anti-government conservatives was likely crucial to marshalling a quarter of Congress in support of cotton reinstatement, while also nullifying ideologically-based opposition. If these dynamics displayed in the cotton retrenchment saga apply in any meaningful degree to other farm policy events, then legislators' favoritism towards local business could, in the aggregate, amount to a powerful force underpinning the crop grower safety net. US farming is sufficiently dispersed and diverse such that most districts are home to at least a handful of farmers and some regionally distinct "crop or critter" (Browne, 1995).

I must acknowledge that there are some limitations in how far I can draw conclusions from these analyses. In particular, the "local enterprise affinity" hypothesis that I have raised here is—to my knowledge—somewhat novel within the literature on US political behavior and legislative representation, and further research is needed to unpack the factors that drive such an affinity, and the degree to which it characterizes the behavior of various political actors. To be clear, in claiming that legislators' support for the farm safety net can primarily be described as an affinity for distinctly local enterprise, I am not denying that other biases or motivations are not playing a critical moderating role. Farmers are overwhelmingly white, upper-middle-class, native-born, business owners, and thus may benefit (relative to beneficiaries of other safety net programs) from a perceived sense of "deservingness," or perhaps even more direct

forms of racial or socioeconomic prejudice. However, my case study of the cotton reinstatement campaign suggests that such factors are far from *sufficient* to explain the puzzle I've raised, as legislators representing highly agricultural but non-cotton districts were very unlikely to lend their support.

Likewise, my analyses here do not distinguish between whether the conjectured affinity for local enterprise ultimately rests with legislators' voters, the legislators themselves, or both. US members may exert disproportionate effort advocating for local agricultural interests because farmers hold symbolic importance and therefore are useful for building an electorally potent brand. However, if civically-minded individuals are more likely to run for office in the first place, the behavior I document in these analyses may reflect the preferences and/or biases of the legislators themselves. Further research disentangling these two possibilities would be helpful in understanding the implications of this research for democratic accountability and representation.

The value of these results extends beyond an understanding of the politics of US farm policy. Most simply, as noted in the introduction, the "distinctly local enterprise affinity" hypothesis I propose seems to speak to the enduring disproportionate influence of a number of other parochial industries. Van Nostrand (2022) argues that the coal industry *should* have faced a political decline in West Virginia as mechanization caused mining employment to plunge and natural gas production became far more economical; however, "it is almost unpatriotic among West Virginians to turn away from coal" (p. 53). Even though the economic importance of logging in Maine has dramatically diminished in recent decades, the state's Republican politicians continue to place a massive emphasis on keeping its paper mills open at nearly all costs (Hillard, 2021).[28] Grennes (2017) notes that domestic maritime shipping continues to be severely inhibited by the Jones Act, in part because of determined advocacy by legislators representing states with notable shipbuilding legacies. There is likewise a surprising level of regional political salience

[28]This has surprisingly had national policy impacts. Maine's congressional delegation succeeded for years in preventing retail investors from receiving their annual mutual fund reports electronically by default, which would have prevented up to two million trees being cut down annually (Ackerman and O'Connor, 2016).

to the commercial fishing (Federman, 2023) and horse racing (McConnell, 2021) industries.

This is admittedly a nonrandom collection of cases that stick out, and there are likely many more such instances of industries that retain significant political attention despite a deep decline in economic significance. Nonetheless, I note two apparent themes running through these examples: these industries all are intrinsically linked to the local environment or geography, and they seem to generally hold significant economic or cultural legacies within their particular regions. This suggests that future work on this topic may well benefit from an explicit focus on the political ramifications of local industrial legacies, and whether inextricable connections to local geography may help preserve such legacies.

My findings also have broader implications for the study of policy retrenchment, interest groups, and policy feedback. Pierson's (1994) claim that policy feedback effects make retrenchment a distinctly difficult task was developed with large-scale social policies in mind, but it almost certainly holds true for narrower policies. However, additional theorizing on this matter must sort through the multifaceted—and sometimes conflicting—objectives of both program supporters and retrenchment advocates to understand which elements are actually core to determining legislative effort. In particular, as studies of policy retrenchment and persistence expand beyond their central focus on social policies (Campbell, 2012), further research is needed to understand how policy feedback effects may be potent even when they do not activate mass electorates. Indeed, my case study of the cotton retrenchment saga suggests that interest group mobilization can be valuable even if it does not directly make an electorally significant impact.

On a final and highly speculative note, I posit that my findings might merit a reevaluation of the relationship between free market ideology and the economic policy preferences of US conservatives. It is easy to view Republican legislators' support for farm subsidies as a minor aberration in a broadly anti-government movement. However, in light of the centrality of the burgeoning urban-rural political gulf to developments in modern conservative politics (Rodden, 2019; Gimpel et al., 2020), conservatives' eagerness to support farm programs might actually speak to the core of what it means to be a modern US conservative. Indeed, given theories

by Cramer (2016) and Gimpel and Reeves (2023) that posit rural identity as a core cause of conservative economic political views, one could possibly interpret Republican legislators' dirigiste farm policies as more than a sign of practical conflict among political priorities. Instead, it may shine a light on the distinct political foundations of support for *free enterprise* and support for *private enterprise*, the former being a political ideal cherished by conservative think tanks and activist groups whose ideology forbids government intervention in competitive markets, and the latter being a rallying cry of voters and politicians motivated by local identity and an aversion to globalization.

This distinction yields a critical connection to the historical conflict between free market economic ideology and government intervention in agriculture, as discussed in Section 1.1 and Appendix A. While it certainly has been the case that free market thinkers have forcefully advocated for laissez-faire farm policy for centuries, Soll (2022) argues that such calls were predicated on very different motives prior to the 20th century. Whereas the 20th century voices of Friedman, Hayek, and Nozick broadly viewed government direction of the economy as an unnatural or immoral disturbance of a market equilibrium, Soll claims that pre-1900 proponents of free markets in agriculture were simply concerned that burdens placed on farming were holding back a productive and moral industry. In particular, Soll claims that Adam Smith's aversion to mercantilism was not an endorsement of laissez faire, but an endorsement of farmers of the ascendant merchant class:

> For Smith, only if the farming sector got richer would commerce expand, industry grow, and the salaries of even the "industrious poor" and their families provide a "wholesome" diet, good clothing, and comfortable lodging. For these reasons, Smith proposed that if one freed agricultural production and let landowners dominate society, it would create a benevolent, virtuous society with an "invisible hand" that would bring commerce into the moral fold of farming. (p. 209)

If Soll's interpretation is correct, a historical lens might suggest that conservative support for the agricultural safety net marks not a new development in conservative economic ideology,

but a return to a centuries-old tradition of supporting domestic private enterprise in the face of global economic upheaval.

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# Online Appendix for Holding on to High Cotton: How Narrow Economic Interests Resist Policy Retrenchment

## Contents

# A Opposition to Interventionist Farm Policy in Historical and Modern Free Market Doctrine

As I note in Section 1.1, non-intervention in agricultural markets has been an important and explicit plank within free market doctrine for centuries. In 1695, the French lawmaker Boisguillebert—arguably "the first systematic free-market economic theorist" (Soll, 2022)—proposed lifting taxes on poor farmers to mitigate "artificial disturbances" in the natural market order (Soll, 2022, pp. 135-136). Adam Smith argued in *The Wealth of Nations* that prevailing export subsidies and regulations for agricultural trade were "altogether unmerited" (1776, Book IV, Ch. V); inspired by such arguments, James Wilson founded the (free market) liberal publication *The Economist* in 1843 to advance the repeal of the Corn Laws in Britain (The Economist, 2013). Alfred Marshall, the father of neoclassical economics, demonstrated that this intellectual stance would endure into the modern era of global markets, writing in 1903 that agricultural protection—even in retaliation to "dumping" by foreign competitors—remained unjustifiable and "insidious" (McCready, 1955, p. 262).

And indeed, laissez-faire prescriptions for farm policy are still doctrine within free market intellectual circles, especially in the United States. To formally document modern conservative thought leaders' virtually unanimous opposition to interventionist farm policy, I examine research and advocacy related to farm programs from all major US conservative, libertarian, or otherwise "free market" think tanks. To do this, I first take the union of US-based think tanks listed in the 2012 and 2020 editions of the Global Go To Think Tank Index Report (McGann, 2012, 2021). I then subset to the 16 institutions that I identify as (a) predominantly advocating for conservative, libertarian, or free market viewpoints and (b) holding a nontrivial focus on US domestic economic policy. I find that each of these 16 institutions has either published research or commentary calling for significant retrenchment in the farm safety net, or has employed senior scholars who have explicitly made such calls in other outlets. Strikingly, this is the case even in those institutions with no formal focus on agricultural policy.

While it is easy to find examples for each institution, the Heritage Foundation—a relative

hegemon in conservative policy circles—has invested significant effort and staff its its anti-farm subsidy campaign. As of the time of writing, agriculture is one of the 11 major policy areas in which Heritage advocates on behalf of "economic freedom."[1] Heritage takes a formal institutional stance against the perpetuation of the farm safety net in particular:

> One of the primary issues in agricultural policy is federal farm subsidies. There is a misconception that these subsidies primarily exist to help farmers when they experience crop losses—a "safety net" for major losses connected to natural disasters. Yet, the subsidies are instead an out-of-control corporate welfare system that primarily insulates a small number of large agricultural producers from competing in the marketplace. It is easy to see that agricultural producers can flourish without such harmful government intervention: Most U.S. agricultural producers, just like other businesses, do not receive special taxpayer handouts to help them compete.

Notably, the Heritage Foundation's policy recommendations for agriculture include a call to eliminate flagship farm program payments (at least for farmers also enrolled in crop insurance) and a substantial cut in the federal government's subsidy for crop insurance premiums.

However, conservative policy wonks' opposition to farm programs extends far beyond the Heritage Foundation. The American Enterprise Institute (AEI) has published research positing that farm safety net programs "generally distort productive incentives and lead to the inefficient and wasteful use of scarce farmland and other resources" (Belasco and Smith, 2022). A 2017 AEI report looking ahead to the 2018 farm bill notes that "[i]deally, Congress would terminate many farm subsidy programs such as the ARC, PLC, federal crop insurance, the sugar programs, and marketing orders" (Smith, Glauber, Goodwin, and Sumner, 2017). AEI scholar Glauber (2018) specifically criticizes the cotton reinstatement that takes center focus in this article, not only opposing the "unraveling" of the 2014 reform but arguing that Congress should instead make further cuts: "[m]arket orientation should be the driving focus of federal farm subsidy and other programs for all crops, cotton included" (p. 14).

[1] See https://www.heritage.org/solutions/#EconomicFreedom.

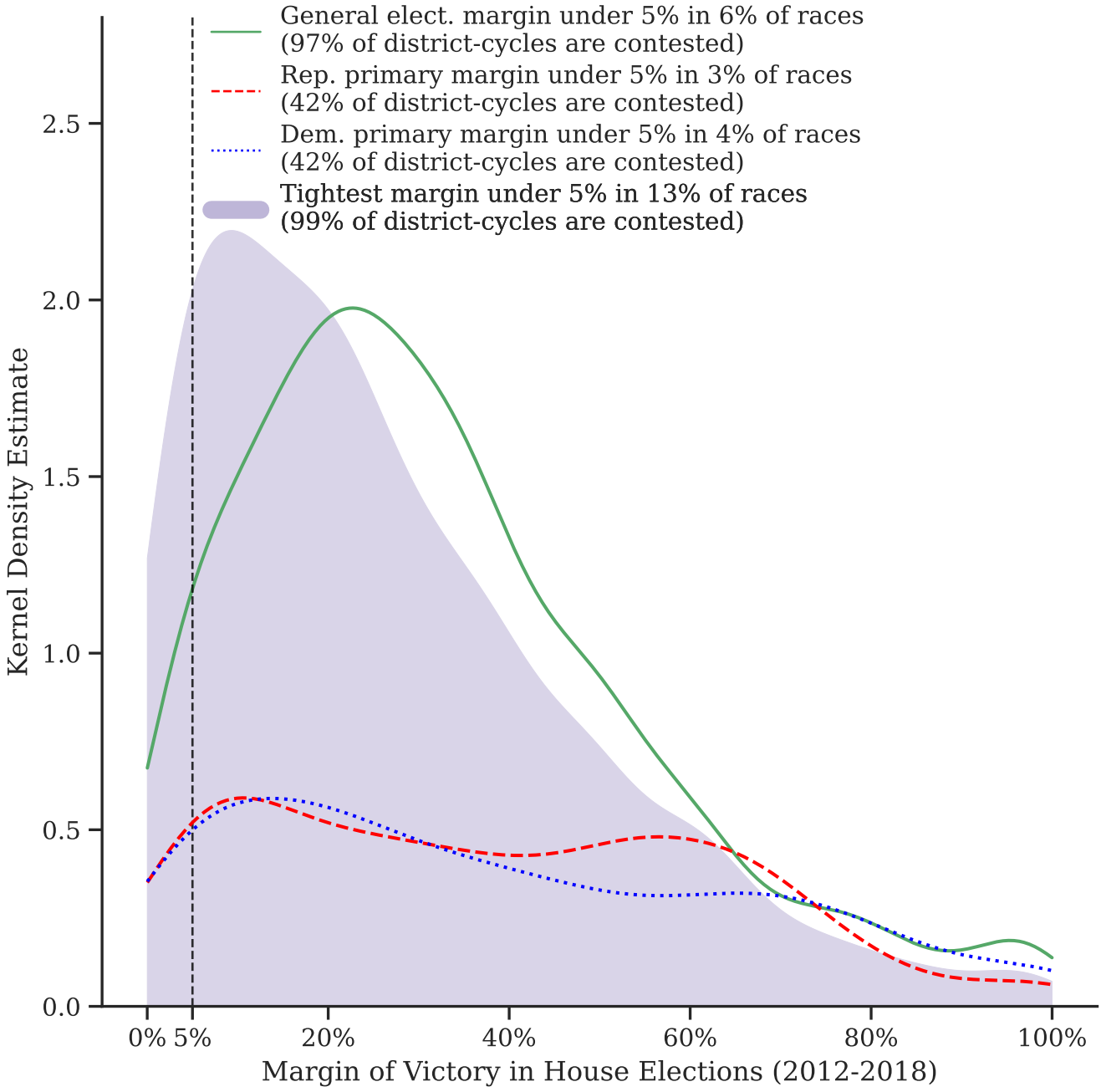
Similar calls can easily be found coming from scholars at the Cato Institute (Lincicome, 2020), the Manhattan Institute (Riedl, 2007), the Mercatus Center (De Rugy, 2013), the Hoover Institution (Hurst, 2020), the Hudson Institute (Avery, 2004), the Acton Institute (Amyx, 2011), the Reason Foundation (Linnekin, 2022), the Foundation for Economic Education (Mason, 2017), the Competitive Enterprise Institute (Bier, 2012), the Independent Institute (Powell, 2005), the R Street Institute (Kitchens, 2021), the Mackinac Center for Public Policy (Folsom, 1995; Douglas, 2014), the Goldwater Institute (Griswold, Silvinski, and Preble, 2005), and the Texas Public Policy Foundation (Loyola, 2014; Peacock, 2016). Indeed, it is very difficult to find even neutral opinions on farm subsidies within conservative policy shops; there appears to be an overwhelming consensus that such programs run counter to free market principles and technocratic ojectives. Given recent research finding important links between partisan think tanks and congressional polarization (Fagan, 2022), it is striking how minimal of an impact this consensus appears to have had among Republican members of Congress.

# B What Share of the Electorate must Farmers Compose to be "Electorally Significant"?

To facilitate interpretation of the analyses of farm program households' electoral significance (Figures 4, 5, and 6 in Section 1.4), I examine data on the actual distributions of US House election outcomes. In doing so I come up with a vote share threshold which farmers must exceed if they are to have any hope of regularly being pivotal.

I argue that 5% is a reasonable—though admittedly ad hoc—threshold for whether a group is likely to hold influence by way of (potential) electoral punishment or reward. Figure OA1 plots the distributions of margins of victory in US House races between 2012 and 2018. Notably, while most general elections have at least two candidates show up on the ballot, this is not the case in primary elections, and most House races regardless are not seriously competitive affairs. Indeed, there was a primary or general election decided by a margin of less than 5% in only 13% of 2012-2018 House races. Otherwise put, a 50 percentage-point swing among a group

**Figure OA1:** Distributions of Margin of Victory in 2012–2018 US House Races: General Elections, Primary Elections, and Tightest Race within District-Cycle




Notes: A race is "contested" in the sense of the shares presented in this figure if at least two candidates appear on the ballot. The mass of each probability density function in this figure integrates to less than one on the (0,1) open interval, because uncontested elections leave nonzero probability mass at $x = 1.0$. Note that California, Washington, and Louisiana did not hold traditional partisan House primaries in this time period, and thus primary races in these states are coded as "uncontested" in this figure.

constituting 5% of the electorate would only be pivotal in the most competitive stage of a House race in roughly 1 in 10 races.

# C Substantive Distinctions Between Base Acreage and Planted Acreage

An important issue concerning the classification of voter households as having an interest in the crop grower safety net is that the terms "row crop growers" and "farm program participants" are not fully interchangeable. Ever since a reform in the 1996 farm bill, direct payments issued through flagship farm programs are not made according to planted acreage or harvested production of covered commodities. Instead, farmers receive payments according to their "base acreage" — the area that a farm historically planted to covered commodities.

This payment basis has continued through the present day. Under the 2002 farm bill, payments were issued through the Direct and Counter-cyclical Programs (DCP). A farmer would receive an unconditional fixed payment each year (the "direct payment") according to the covered crop yields and acreage she planted in the historical reference period (generally in the 1980's or 1990's), and she might also receive an additional payment (the "counter-cyclical payment") proportional to this basis if the price of a particular commodity in her base acreage portfolio fell below a threshold that Congress had fixed for the duration of the farm bill. The 2008 farm bill continued the emphasis on base acreage by renewing the DCP programs and introducing the ACRE option, allowing farmers to elect to receive counter-cyclical payments based on a farm-level revenue trigger instead of the traditional price-based threshold. More recently, the 2014 farm bill maintained this system of decoupled payments and planting while scrapping direct payments altogether. Farmers since have chosen between two programs that make payments only when market conditions are challenging: the Agricultural Risk Coverage (ARC) program, which issues payments when county-level revenue falls below a benchmark that follows a moving average of realized market conditions, and the Price Loss Coverage (PLC) program, a successor to the Counter-cyclical Program that makes payments when a commodity price falls below its statutorily fixed reference price.

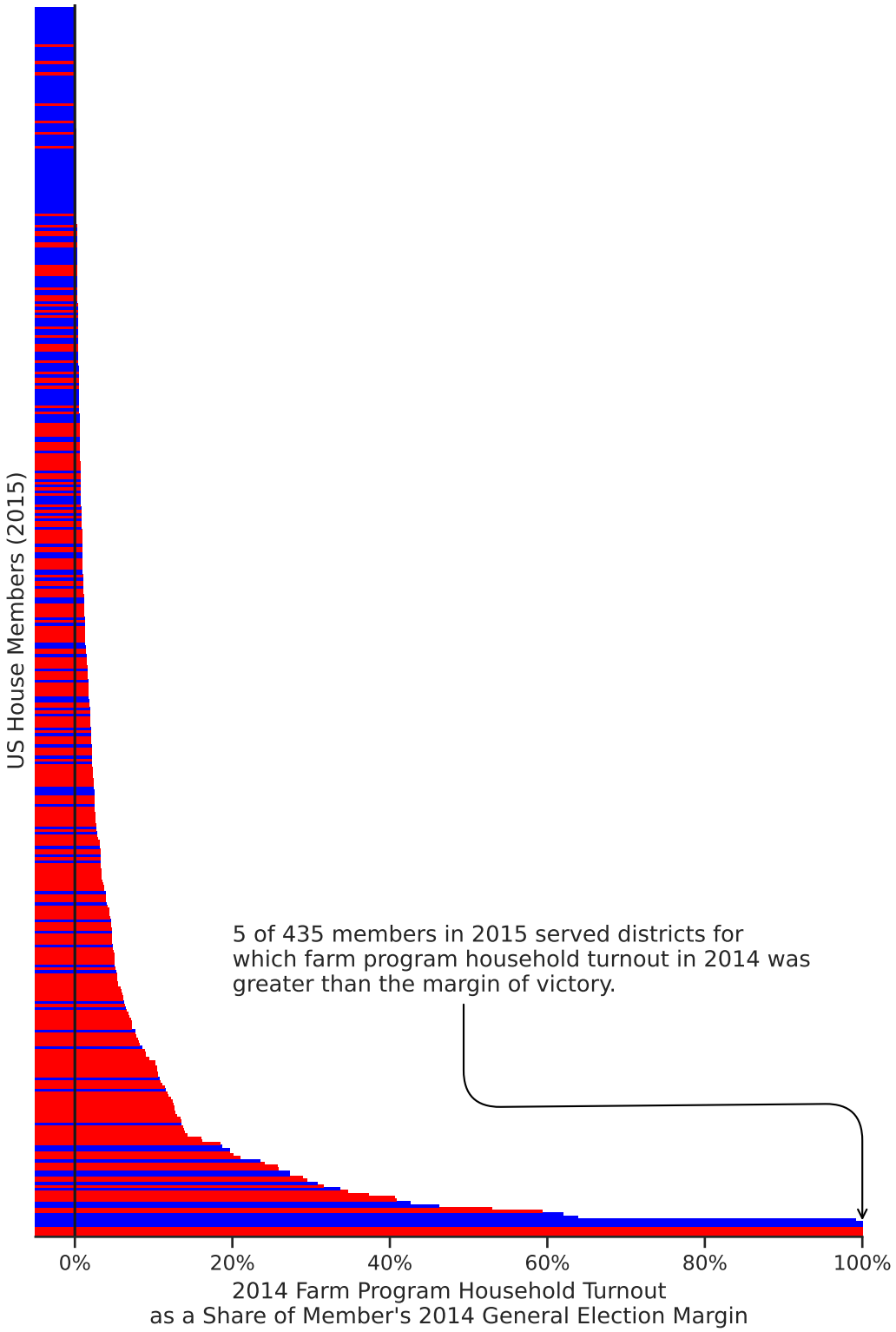
Having documented the ongoing use of historical "base acreage" as the basis for modern farm program payments, I consider two reasonable ways to measure the political capital of crop grower safety net households using administrative data. One can either examine the turnout and contributions of individuals associated with (a) farms that hold such base acreage or (b) farms that actually plant the crops covered by the programs. I obtain measures in the first manner by aggregating turnout and contribution records attributable to households linked to DCP/ACRE payments. Since every farm with base acreage received an annual direct payment from DCP/ACRE, the resulting measure can be justified by the fact that these are the families that actually held a vested interest in the crop grower safety net while the 2008, 2014, and 2018 farm bills were negotiated. One the other hand, I can examine participation in idiosyncratic, one-off programs between 2016 and 2020 that benefited households that held a stake in the actual current production of these covered commodities. A measure based on this latter group of households could be justified on the basis that these are the individuals that the farm programs aim to assist.

# D Additional Descriptive Statistics on Farm Program Households' Electoral (In)Significance in House Districts

I complement Figure 4 by calculating the share of House members' electorates composed by farm program households. Figure OA2 depicts, for each of the 435 members serving at the end of 2015, the share of 2014 general election turnout attributable to voters living in farm safety net households. Similarly, Figure OA3 depicts farm program households' share of 2016 district turnout for the 435 House members serving in July 2017.

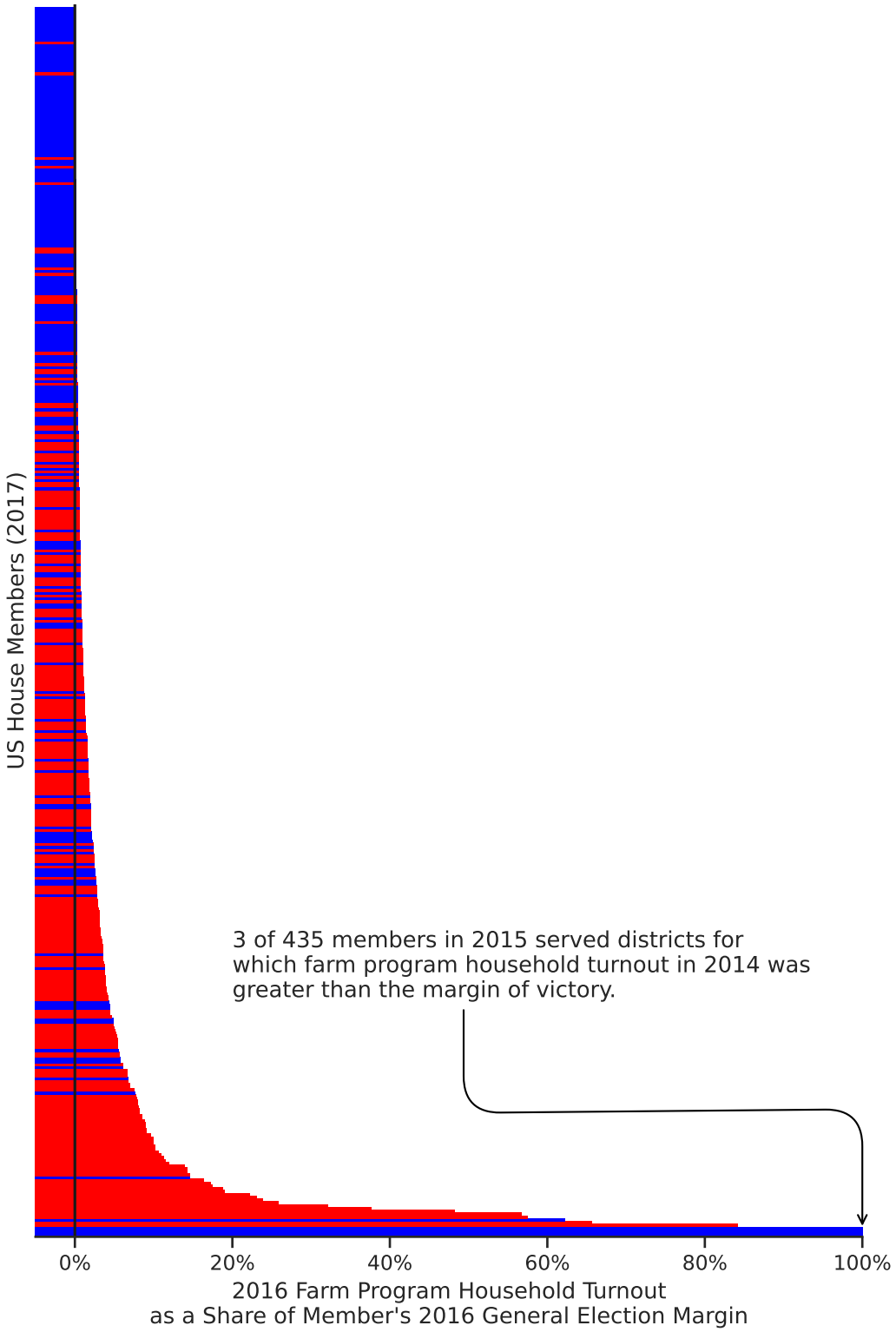
Both figures make it clear that farm program households are almost never pivotal in House general elections. Even if 50% of farm program households flipped their vote from the winning party to the losing party, this would only change the outcome of 5 House races in 2014 and 3 House races in 2016.

**Figure OA2:** US House Members (2015) by Farm Program Households' Turnout as a Fraction of 2014 General Election Margin




Notes: The x-axis is truncated at 100% for readability. A "farm program household" features at least one individual in the February 2018 L2 voter file that has been linked directly or indirectly to a farm participating in 2004-2012 in DCP/ACRE, the flagship farm programs for row crop producers prior to the 2014 farm bill.

**Figure OA3:** US House Members (2017) by Farm Program Households' Turnout as a Fraction of 2016 General Election Margin




Notes: The x-axis is truncated at 100% for readability. A "farm program household" features at least one individual in the February 2018 L2 voter file that has been linked directly or indirectly to a farm participating in 2004-2012 in DCP/ACRE, the flagship farm programs for row crop producers prior to the 2014 farm bill.

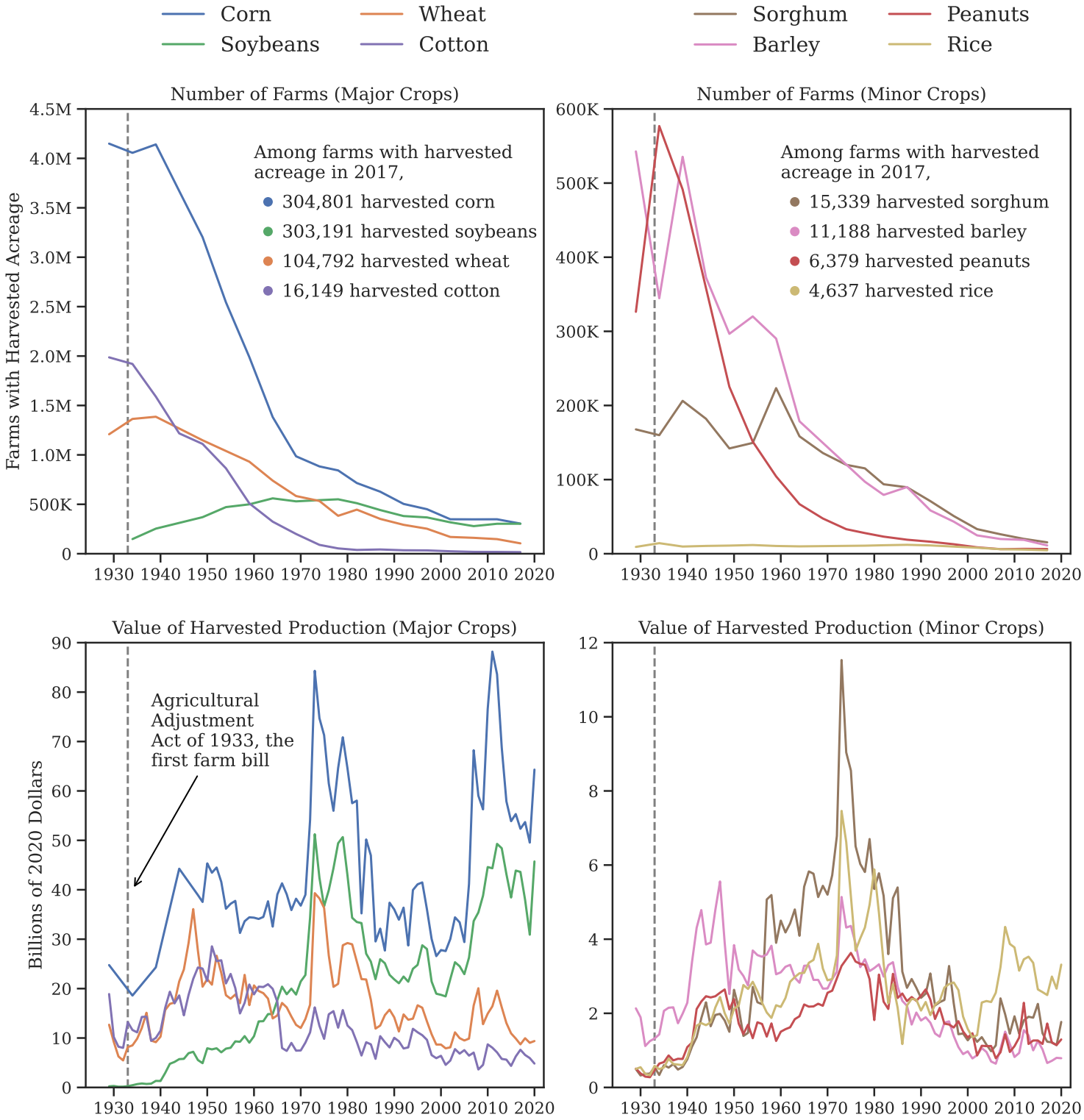
# E Additional Information on the Economics of Farm Safety Net Crops

Figure OA4 presents long-run trends for the eight most economically significant crops covered by the modern crop grower safety net. The top two panels depict the number farms growing each specified crop in a given year, according to the Census of Agriculture. The bottom two panels depict annual real revenue attributed to each crop in each year, per annual USDA production estimates. Note that one major reason the revenue time series are far more volatile than the farm count time series because commodity prices have yielded massive swings during certain historical periods.

An important takeaway from Figure OA4 is that there have been major regional differences in the broader national decline in agriculture. This is particularly clear from comparing trends in corn, cotton, and wheat, the three crops at the center of the first farm bill and the most economically important crops historically grown in the Midwest, South, and Great Plains (Coppess, 2018). As real US GDP in 2023 is roughly 10 times larger than it was in 1947, it is clear that growth revenue attributable to each of these three core commodities has not kept up with overall US economic growth. As such, the *share* of economic output attributable to each of these three commodities has fallen over the last century. However, this shared *relative* decline should not obscure the fact that corn (and soybeans, corn's chief partner in crop rotation) has become more economically important in an absolute sense, while cotton and wheat have fallen even in terms of absolute revenue.

This suggests that the case study of cotton retrenchment may be especially ideal for understanding how crop growers' have forestalled political decline amidst their industry's economic decline. Cotton production is the pinnacle of a once dominant economic industry that has been left behind by national economic development and global market pressures. As I argue in the main text, the fact that *cotton*—of all crops—is able to maintain its political influence in the 21st century suggests that the persistence of the crop grower safety net lies not in the electoral or economic clout of an imposing agribusiness lobby, but in the preferential treatment that

**Figure OA4:** Cotton Farming has Suffered a Steeper Decline than Other Major Program Crops




Notes: Data comes from US Census of Agriculture and USDA NASS yearly survey-based estimates.

legislators' afford their local crop growers.

# F Construction of Farm-Level "Base Acreage" and "Base Revenue" Measures

Several analyses in this article require measures of farm production that are comparable across program crops. In the following discussion, I describe my methodology for constructing measures of historical farm acreage and revenue by inferring the farm-level production figures that form the basis of farm program payments.

I take advantage of the relatively simple connection between payments issued through flagship USDA farm programs in 2004-2012 and each recipient farm's historical acreage and yields. Since the passage of the 1996 farm bill, the USDA's predominant farm programs have made payments on historical planted acreage rather than current planting decisions. The 2002 farm bill maintained this program design principle in authorizing the Direct and Counter-Cyclical Program (DCP), which made payments on a farm's "base acres," which generally reflected the farm's plantings of covered commodities between 1998 and 2001 or earlier. Farms enrolled in the DCP received a "direct payment" each year, a constant annual sum paid out at commodity-specific rates according to base acreage and yields. Farms also received a conditional "counter-cyclical" payment when prices of particular commodities fell below statutorily-fixed thresholds. In the 2008 farm bill (in effect between 2009 and 2013), farms had the option to enroll in the Average Crop Revenue Election (ACRE) program instead of the DCP, which traded a 20% reduction in the direct payment rate for a counter-cyclical payment that would be made on current plantings instead of base acres.

By construction of my cotton farm sample analyzed in the Section 3.3, all farms I study enrolled in either DCP or ACRE between 2004 and 2012.[2] Since I observe commodity-specific DCP/ACRE payment amounts for each farm in each year, I divide payment amounts by payment rates to infer each farm's "base production." Specifically, for each covered crop $c \in \mathcal{C}$, the

[2]While the DCP/ACRE programs were in effect between 2002 and 2013, my commodity-level transaction data for DCP/ACRE only spans 2004-2012.

DCP/ACRE formula specifies farm $i$'s fixed annual direct payment in year $t \in \{2009, 2010, 2011, 2012\}$ as:

$$\text{Payment}_{itc} = \text{Base\_Acres}_{ic} \cdot \text{Acreage\_Prop}_t \cdot \text{Base\_Yield}_{ic} \cdot \text{Payment\_Rate}_c \cdot \text{ACRE\_adj}_i,$$

where $\text{Base\_Acres}_{ic}$ denotes the farm $i$'s base acres associated with commodity $c$, $\text{Acreage\_Prop}_t$ reflects the fact that the 2008 farm bill specified payments to be made on 83.3% of base acres in 2009-2011 and 85% of base acres in 2012, $\text{Base\_Yield}_{ic}$ denotes the farm's historical yields for commodity $c$, $\text{Payment\_Rate}_c$ denotes the direct payment rate per harvested unit of commodity $c$ (fixed for the duration of the farm bill), and $\text{ACRE\_adj}_i$ denotes the fact that farmers electing the ACRE option incurred a 20% reduction in direct payments. Since I observe each farm's county of operation,[3] I proxy each farm's base yield for each commodity with their county's historical yields, and then estimate farm $i$'s total enrolled base acreage in year $t$ as

$$\widehat{\text{Base\_Acres}}_{it} = \sum_{c \in \mathcal{C}} \frac{\text{Payment}_{itc}}{\text{Acreage\_Prop}_t \cdot \text{County\_Avg\_Yield}_{ic} \cdot \text{Payment\_Rate}_c \cdot \text{ACRE\_adj}_i}.$$

I average the resulting measure across 2009-2012 to obtain a measure of longstanding farm size that predates the cotton program retrenchment that is the focus of the latter half of this paper.

My historical revenue measure is derived through a similar approach; I estimate base production and then multiply by an array of prevailing prices. To estimate each farm's base production, I took each farm's DCP records and backed out "base production" of each crop $c \in \mathcal{C}$ (in bushels or pounds) as

$$\widehat{\text{Base\_Production}}_{itc} = \frac{\text{Payment}_{itc}}{\text{Acreage\_Prop}_t \cdot \text{Payment\_Rate}_c \cdot \text{ACRE\_adj}_i}.$$

I then multiplied these base production measures by average 2009-2012 commodity prices to obtain a measure of "base revenue" that is comparable across crops.

[3] I observe the FSA county office through which each transaction is processed. According to a FSA employee I spoke with, this is generally a very good indication of where the actual farm in question is located.

Using the "base revenue" measure (as opposed to a measure based on farm program payments or farm acreage) is likely ideal for gauging the economic significance of a farm. Farm program generosity can improve or decline towards a particular crop from one farm bill to the next, and a highly productive farm on a smaller plot of land can be more important for the local economy than a less productive farm on a larger plot of land. It is also more natural to interpret the economic significance of a dollar-denominated measure than, say, an acreage-denominated measure. For these reasons, I use per capita base revenue in the precinct-level turnout analysis in Section 3.3 to decide which precincts could qualify as (treated) "cotton precincts" and which could qualify as (candidate control) "non-cotton precincts."

However, there are also limitations to using revenue as a measure of farm size. Farm yields have increased substantially since the yields associated with DCP/ACRE payments were established, soybean planted acreage has taken over a significant swathe of acreage previous planted to other crops, and the choice of applying 2009-2012 commodity prices to my inferred crop-level measures of "base production" is fairly arbitrary. As such, when I subset cotton farms to those exceeding a certain farm size, I set a threshold according to total inferred farm acreage, which should be less susceptible to all of these issues.

# G Record Linkage and Entity Resolution for Administrative Data

As noted in Section 1.3, I have collected nearly the universe of USDA farm program direct payment transactions for the period 2004–2020. Through multiple FOIA requests, I obtained variously overlapping Farm Service Agency transaction database snapshots in different formats that together provide detailed information on the beneficiaries of US farm programs. While not all farmers receive direct payments from the USDA, the vast majority of row crop acreage (e.g. corn, soybeans, wheat, sorghum, cotton, rice, peanuts) is covered by such by such programs. As such, I consider these payment records to constitute a near-complete directory of row crop producers in the US.

As I discuss below, my data building pipeline for this project was extensive and centered on

the objective of linking the largest number of voters and contributors possible to farms while minimizing measurement error. I first address a conceptual problem for analysing farm activity over time: my various transaction-level USDA databases are at the recipient level, and lack consistent and unique identifiers for recipients (and their farms) across the full 2004-2020 span. To overcome this, I develop an entity resolution algorithm to cluster transactions (and thereby recipients) into distinct "farming households," which I refer to as "farms" for brevity.

Critically, the commercial vendor L2 maintains state voter files with essential data preprocessing (e.g., purging duplicates and linking voter profiles over time) and a number of useful added fields. As noted in Section 1.3, farm-level measures of campaign contributions rely on itemized contribution records in the Database on Ideology, Money in Politics, and Elections (DIME) (Bonica, 2014). I develop a highly customized record linkage algorithm to link USDA farm program recipients to distinct voter profiles for L2's February 2018, June 2019, and May 2021 voter file snapshots, and then to distinct contributor profiles in DIME. In doing to, I link voters and consumers in L2's nationwide databases—and contributors in DIME—to distinct farms in the USDA administrative payment data. In my main analyses, this allows me to estimate changes in individual-level voter behavior stemming from farm-level policy outcomes.

## G.1 Data and Pre-Processing

All transaction-level records in my patchwork of USDA Farm Service Agency database snapshots contain at least a few key fields: names and addresses of payment recipients, key payment details (i.e. date of payment, transaction amount, and program name), and the Farm Service Agency office through which the payment was processed (generally indicative of the physical location of the farm in question). In particular, a nearly comprehensive 2004-2020 dataset I have obtained is limited to these fields. Certain older datasets feature additional useful fields. Prior to calendar year 2019, the USDA employed a (nearly) distinct identifier (the "customer number") for farm program recipients that is useful for identifying individuals over time. Certain pre-2019 database snapshots I've obtained also attribute transactions to particular crops (e.g. corn or soybeans). Critically, the 2004-2012 DCP/ACRE payment data—

on which I base all of my main analyses—features these "customer number" identifiers and attributes transactions to specific crops.

Linking farm payment records to L2 consolidated voter/consumer profiles is inherently difficult due to the lack of standardized and highly informative fields in the USDA payment files. In particular, recipient names are not broken into constituent parts (i.e., first name, middle name, last name, suffix) and in many cases refer to a business entity rather than an individual (e.g., "[FIRST] [LAST] FARMS LLC", "[CITY] DAIRY FARM INC"). Additionally, the current FSA record system does not provide unique recipient identifiers, and records lack useful identifying characteristics—such as age and gender—that would help narrow down potential comparisons.

To surmount these difficulties and obtain a merge with both high precision and recall, I created a highly customized record-linkage algorithm that leverages extensive pre-processing and auxiliary data to squeeze as much matching-relevant information as possible from the USDA program data. I start by using text analysis to parse each recipient name into constituent components: first name, first middle name, second middle name (rarely populated), last name, and suffix.[4] I standardize the resulting name fields by uppercasing all letters and stripping out whitespace and punctuation. I standardize suffixes by converting generations to integers, so that (for instance) "SR" and "I" map to the same value. I then merge in nicknames (and formal versions of nicknames) using the proprietary pdNicknames database. I also assign each farm recipient profile a gender based on first name if the SSA name popularity rank for a given gender is 20 times greater than that of the other gender.

Address pre-processing similarly centered on extensive text analysis to extract street and PO Box numbers. In addition, I geocoded addresses in the USDA payment data.[5] As L2 provides

[4]I do this by categorizing each recipient name into one of 92 distinct regular expressions based on the structure and organization of its name components. When a recipient name indicates a couple (e.g., "[FIRST] AND [FIRST] [LAST] FAMILY CORPORATION") I split the profile in two and separately consider comparisons with L2. Additionally, in cases in which I cannot extract a likely human name from the recipient name box, I am usually able to extract a name from the first or second address boxes (e.g., a business entity has second address field "% [FIRST] [LAST]").

[5]In the case of PO Box mailing addresses or addresses that otherwise are not amenable to geocoding, I use

geographic coordinates for each address in the voter and commercial files, I am therefore able to calculate straight-line distances for every pair of potential matches I evaluate.

For the purposes of record linkage, I define a distinct farm program recipient "profile" as a unique combination of name and address. In the following section, I describe my method for linking distinct individuals in the L2 databases to such profiles. Afterwards, I discuss how I cluster these profiles into distinct "farms" and ensure that each L2 voter/consumer is matched with at most one distinct farm.

## G.2 Probabilistic Record Linkage Model Specification

After the pre-processing stage, my record-linkage procedure centers around estimating the canonical record-linkage model of Fellegi and Sunter (1969). I direct readers to Enamorado, Fifield, and Imai (2019) for a full theoretical treatment of this model, and instead provide a brief summary of the model's structure within the paper's setting. In the notation of Enamorado, Fifield, and Imai (2019), consider datasets $\mathcal{F}$ (farm subsidy recipients) and $\mathcal{V}$ (voters). Each recipient $i \in \mathcal{F}$ can be compared to a voter $j \in \mathcal{V}$ along seven dimensions:

$$K = \{\texttt{first}, \texttt{middle}, \texttt{last}, \texttt{suffix}, \texttt{location}, \texttt{occupation}, \texttt{age}\}.$$

For a comparison between profiles $i \in \mathcal{F}$ and $j \in \mathcal{V}$, I define an agreement vector $\gamma_{ij} \equiv (\gamma_{\texttt{first}}, \gamma_{\texttt{middle}}, \gamma_{\texttt{last}}, \gamma_{\texttt{suffix}}, \gamma_{\texttt{location}}, \gamma_{\texttt{occupation}}, \gamma_{\texttt{age}})$ such that each coordinate $k \in K$ reflects a discrete-valued similarity along the specified dimension. For example, $\gamma_{\texttt{last}}(i, j)$ takes on one of three values (0, 1, or 2) to indicate the string-distance similarity between the last names of $i$ and $j$. In particular, $\gamma_{\texttt{last}}(i, j) = 2$ if there is an exact match on last name, whereas $\gamma_{\texttt{last}}(i, j) = 0$ indicates that the two surnames are quite dissimilar. The full definitions of the agreement measures $\gamma_k(\cdot, \cdot)$ are given in Table OA1; note in particular that $\gamma_{\texttt{occupation}}$ and $\gamma_{\texttt{age}}$ rely only on the characteristics of the given L2 profile.

Having defined the agreement vector, I can write down my record linkage model as follows.

representative latitude/longitude coordinates for the provided ZIP code.

**Table OA1: Match Agreement Measures for USDA-L2 Record Linkage**

| Dimension | Level | Description |
|---|---|---|
| `first` | 5 | Exact match on first name (and names are more than initials) |
| | 4 | First name of $i$ is a nickname for first name of $j$ |
| | 3 | First name of $i$ starts with / ends with first name of $j$, OR there is a Jaro-Winkler string similarity of at least 0.9 |
| | 2 | Profile $i$ provides only a first initial, and it matches first initial of $j$ |
| | 1 | Gender inferred from recipient first name does not conflict with L2 gender field |
| | 0 | None of the above criteria are satisfied |
| `middle` | 3 | Exact match on both middle names (and names are more than initials) |
| | 2 | Either middle name of profile $i$ is an exact match with either middle name of profile $j$, OR there is a Jaro-Winkler string similarity between first middle names of at least 0.9 |
| | 1 | Profile $i$ provides only a middle init, and it matches either middle init of $j$ |
| | 0 | None of the above criteria are satisfied |
| `last` | 2 | Exact match on last name |
| | 1 | Jaro-Winkler string similarity between last names of at least 0.94, or one last name is a shortened version of the other (e.g. "Jones" and "Jones-Smith") |
| | 0 | None of the above criteria are satisfied |
| `suffix` | 1 | Profiles $i$ and $j$ both have suffix field populated, and there's a match |
| | 0 | Profile $i$ has suffix field populated, and it conflicts with $j$ |
| `location` | 5 | Street number or PO box match, and ZIP code matches (L2 mailing address, voter file residence, or commercial file residence) |
| | 4 | Recipient ZIP matches any L2 address ZIP |
| | 3 | Recipient city matches any L2 address city, OR haversine distance between profiles less than 10 miles |
| | 2 | Haversine distance between profiles less than 50 miles |
| | 1 | Haversine distance between profiles less than 100 miles |
| | 0 | None of the above criteria are satisfied |
| `occupation` | 1 | Voter file occupation is "Skilled Trades-Farmer" OR commercial file occupation is "Farmer/Dairyman" OR commercial file occupation group is "Farmer" |
| | 0 | None of the above criteria are satisfied |
| `age` | 5 | L2 profile age $> 70$ |
| | 4 | L2 profile age $\in$ (60,70] |
| | 3 | L2 profile age $\in$ (50,60] |
| | 2 | L2 profile age $\in$ (40,50] |
| | 1 | L2 profile age $\in$ (30,40] |
| | 0 | L2 profile age $\leq 30$ |

Note: The Fellegi and Sunter (1969) model employs a missing at random (MAR) assumption, and by construction a missing value in one dimension has no bearing on the inferred match probability for a given comparison.

Let $M_{ij}$ be a latent mixing variable that indicates whether $i \in \mathcal{F}$ and $j \in \mathcal{V}$ are actually a match. I assume that

$$M_{ij} \overset{\text{i.i.d.}}{\sim} \text{Bernoulli}\,(\lambda)\,,$$

where $\lambda \in (0, 1)$ denotes the (unknown) probability of a match across all comparisons under consideration. Additionally, for $m \in \{0, 1\}$ and $k \in K$,

$$\gamma_k\,(i, j) \mid M_{ij} = m \overset{\text{indep}}{\sim} \text{Discrete}\,(\pi_{k,m})\,,$$

where $\pi_{k,m}$ is a vector containing the probabilities of realizing each agreement level in dimension $k$ given that the comparison is actually a match ($m = 1$) or not ($m = 0$). In words, $\pi_{\texttt{last},1}$ is a triple containing the conditional probabilities that a comparison of records yields a match on last name of similarity level 0, 1, or 2 given that the two records in question are actually a match. Likewise, $\pi_{\texttt{last},0}$ is the triple of probabilities that a surname match level is obtained conditional on a pair of records actually *not* being a match.

Given there are a total of $6 + 4 + 3 + 2 + 6 + 2 + 6 = 29$ distinct agreement levels across the seven match dimensions, I have 59 parameters to estimate: the overall match probability ($\lambda$), 29 conditional-on-match agreement level probabilities ($\pi_{k,1}$), and 29 conditional-on-nonmatch agreement level probabilities ($\pi_{k,0}$). As noted in Enamorado, Fifield, and Imai (2019), with a couple of technical assumptions,[6] I can write down a likelihood function for this data-generating process and readily estimate these 59 parameters using the Expectation-Maximization (EM) algorithm.

[6]These assumptions are not innocuous. In particular, I must assume conditional independence among linkage variables given the match status. In practice, problems associated with violations of this assumption are similar to multicollinearity issues in linear regression modeling. If two match categories measure essentially the same information, parameter estimates can become highly unstable. To mitigate this issue in my setting, I chose my set of seven match dimensions to be maximally disconnected. For example, instead of separately evaluating similarity of street name and ZIP code, I bundled all information relating to location into a single match dimension.

## G.3 Record Linkage Implementation

Linking USDA recipient profiles to L2 voter and consumer file IDs entails evaluating pairwise comparisons for each profile I am interested in matching. Given the data standardization described in the first subsection, I am left with 4,953,072 USDA profiles to match to L2 IDs. Profiles in L2's 2021 commercial files are uniquely identified by an L2 "consumer ID"; L2 provides a crosswalk that matches most consumer IDs to distinct "voter IDs" within the voter files. After consolidating information between each snapshot of the voter file and the 2021 commercial file, I arrive at the task of comparing each USDA recipient profile with 285,494,364 profiles from the February 2018 L2 snapshot (179,925,726 voter IDs consolidated with 220,652,455 consumer IDs), 290,767,966 profiles from the June 2019 snapshot (185,199,328 voter IDs consolidated with 225,996,623 consumer IDs), and 313,631,026 profiles from the May 2021 snapshot (208,062,388 voter IDs consolidated with 239,816,591 consumer IDs).[7] Even considering each of these snapshots separately, it is not computationally feasible for us to compare each USDA recipient profile with each L2 profile. For example, the Cartesian product of the USDA recipient profiles and 2018 L2 profiles would entail over 1.4 quadrillion comparisons.

It is thus critical to place strict limits on the comparisons made when estimating the Fellegi-Sunter record linkage model. First, I group states into 30 regions, and estimate separate models for each region. However, I still require further refinement to obtain a computationally feasible number of comparisons within each region. Indeed, such large-scale record linkage nearly always necessitates the use of an explicit "blocking" technique, in which the researcher places restrictions on which comparisons are to be evaluated. I devise blocking rules based on the match fields to further winnow down the set of comparisons. I use the PySpark package `splink` to implement a blocking strategy, estimate model parameters via the EM algorithm,

[7] As noted previously, L2 tracks voters across time. I have found voter IDs to be very consistent across snapshots. The one systematic exception is that L2 voter IDs are state-specific, and when a voter moves across state lines between election snapshots, L2 creates a new voter ID and assigns the voter's turnout history to the new ID. Given that farming is tied to a particular plot of land, out-of-state moves are extremely rare in my main analysis sample. Nonetheless, in further data processing, I attempt to track the small handful of voters in my sample who appear to have changed voter IDs across snapshot.

adjust for surname frequency, and compute match probabilities. Documentation is available at https://github.com/moj-analytical-services/splink.

As noted in the `splink` documentation, it is important that blocking rules limiting comparisons are not based on the same fields that are used for estimating model parameters. However, it is typically critical to block on match fields to reduce the number of comparisons to a manageable level. As such, `splink` allows users to implement a typical workaround from record linkage practice: estimating and combining multiple "smaller" models. Specifically, I estimate six models, each with different tight blocking rules based on a subset of match fields that allow estimation of parameters corresponding to the remaining fields. Table OA2 lists the six record linkage models I estimate and combine for each of the 30 regions. To make this exposition clear, I note that the first row indicates that I estimate a model with the match dimensions `last`, `suffix`, `location`, `occupation`, and `age` from Table OA1. In doing so, I limit profile comparisons to those featuring an exact match on first name and middle name. Of course, requiring comparisons to match on first name and middle name will throw out many true matches, such as cases in which a recipient doesn't report their middle name or only reports a first initial. However, the final set of match evaluations is made using a model aggregated from the six sets of estimates here, applied to all comparisons satisfying *any* of the six blocking rules listed in the right column of Table OA1. Indeed, it should be extremely uncommon for a true match (or at least, a match that could be identified by a human coder) to not satisfy any of my six blocking rules. In summary, this procedure enables computationally tractable estimation of all parameters of my record linkage model, while allowing us to still vet nearly 100% of remotely plausible match comparisons.

Estimating the model parameters allowed me to compute a match probability for each comparison, which I further adjusted for the relative frequency of each profile's surname (see the `splink` documentation or Enamorado, Fifield, and Imai (2019) for details). After manually reviewing several hundred comparisons, I find the match probability to be a very strong indicator of relative match plausibility, with comparisons rated above 90% almost always corresponding

**Table OA2: Record Linkage Blocking Rules**

| Parameters Estimated | Blocking Rule |
|---|---|
| `last`, `suffix`, `location`, `occupation`, `age` | Exact match on first name AND exact match on middle name |
| `first`, `suffix`, `location`, `occupation`, `age` | Exact match on last name AND exact match on middle initial |
| `first`, `middle`, `last`, `suffix`, `occupation`, `age` | Exact match on ZIP AND exact match on street number / PO box number |
| `first`, `middle`, `suffix`, `occupation`, `age` | Exact match on ZIP code and last name |
| `middle`, `last`, `suffix`, `occupation`, `age` | Exact match on ZIP code and first name |
| `middle`, `suffix`, `location`, `occupation`, `age` | Exact match on first name AND exact match on last name |

Notes: Each row specifies a separate record linkage model estimated. The left column lists the match dimension from the Fellegi-Sunter model for which parameters are being estimated (see Table OA1). The right column lists restrictions on the set of comparisons considered. The six models are combined to produce a single set of global parameter estimates; see the `splink` package documentation and Enamorado, Fifield, and Imai (2019) for details on. combining models.

to what a human coder would consider a match. Nonetheless, I find that I can most closely implement my preferred concept of a match by utilizing the estimated match probabilities in an ensemble of rules.[8]

To present the final "match rule" I settled on, I define:

- a "weakly consistent match on name" as when there is no definitive clash on first name, last name, or suffix,[9]
- a "strictly consistent match on name" as a weakly consistent match on name that also features no clash in middle name as well as exact matches on first and last name,[10] and
- an "affirmative match on name" as a strictly consistent match on name that also obtain some positive indication of a match from the middle name fields (e.g. middle initials match)[11].

I then accept matches that satisfy any of the following four conditions:

1. weakly consistent name and match probability above 80%,
2. weakly consistent name and perfect match on address (i.e. $\gamma_{\texttt{location}=5}$),
3. strictly consistent match on name, addresses quite close ($\gamma_{\texttt{location}>2}$), and the L2 ID is the only L2 ID in the set of comparisons constituting a strictly consistent match on name for that USDA profile,

[8]It is worth noting that just because I do not solely rely on the Fellegi-Sunter match probability for determining matches does not mean that the model performs "poorly" or has a high error rate. At its core, my method is an *unsupervised* machine learning algorithm – rather than supply the algorithm with ground truth matches, I simply supply a series of profiles and ask the model to identify clusters within the data. In my setting, there's not a single objective underlying truth as to what a "true" match is, since farm recipient profiles sometimes indicate family names or LLCs rather than individuals.

[9]Formally, using the agreement levels defined in Table OA1, a weakly consistent match on name satisfies $\gamma_{\texttt{first}} \notin \{0, 1\}$, $\gamma_{\texttt{last}} > 0$, and $\gamma_{\texttt{suffix}} \neq 0$, where comparisons with missing values on either sided are coded $\gamma_k = -1$.

[10]Formally, using the agreement levels defined in Table OA1, a strictly consistent match on name satisfies $\gamma_{\texttt{first}} = 5$, $\gamma_{\texttt{middle}} \neq 0$, $\gamma_{\texttt{last}} = 2$, and $\gamma_{\texttt{suffix}} \neq 0$.

[11]Formally, using the agreement levels defined in Table OA1, an affirmative match on name satisfies $\gamma_{\texttt{first}} = 5$, $\gamma_{\texttt{middle}} > 0$, $\gamma_{\texttt{last}} = 2$, and $\gamma_{\texttt{suffix}} \neq 0$.

4. affirmative match on name, addresses quite close ($\gamma_{\texttt{location}>2}$), and the L2 ID is the only L2 ID in the set of comparisons constituting an affirmative match on name for that USDA profile.

In actuality, the vast majority of accepted matches satisfied both of the first two conditions on this list. However, the latter two conditions allowed me to scrape a few more highly credible matches and thereby maximize the accuracy of my record linkage.

## G.4 Entity Resolution for Farm Program Recipients

Were I to stop my record linkage at this point and assign USDA program recipients to the voter(s) matched to each profile, the resulting links would be highly accurate, but would present certain conceptual difficulties for measuring exposure to policy shocks. Some farms have joint ownership, and some individuals use different names over time or in different Farm Service Agency transaction databases (e.g. "John A Smith" vs "Smith Family Farm LLC"). As such, I find it most appropriate to cluster USDA recipient profiles together at the "farming household" level and define all farm attributes at this level.

I design an entity resolution algorithm that implements this clustering using recipient profiles' names and locations. I also make maximal use of the Farm Service Agency's internal system of linking and tracking profiles over time. In particular, as noted in the first subsection, the Farm Service Agency used "customer numbers" to identify and track distinct recipients in operations prior to calendar year 2019. While my most comprehensive 2004-2020 database of FSA transactions lacks this identifier, earlier database releases I have obtained for 2004-2012, 2014-2017, and (a subset of) 2018 transactions feature this field. I merge in these customer numbers to my most comprehensive 2004–2020 transaction-level database using an exact match on name and either address or ZIP code. While this criteria for assignment is quite strict, this nonetheless allows me to assign an official USDA identifier to the vast majority of transactions between 2004 and 2020. I generate stand-in "customer numbers" for the remaining transactions in the 2004-2020 database using distinct combinations of name and address. I then define my entity resolution problem as how to appropriately cluster customer numbers together into units

**Table OA3: Match Agreement Measures for Farm Entity Resolution**

| Dimension | Level | Description |
|---|---|---|
| first | 5 | Exact match on first name (and names are more than initials) |
| | 4 | First name of $i$ is a nickname for first name of $j$ |
| | 3 | First name of $i$ starts with / ends with first name of $j$, OR there is a Jaro-Winkler string similarity of at least 0.9 |
| | 2 | Profile $i$ provides only a first initial, and it matches first initial of $j$ |
| | 1 | Gender inferred from first name $i$ does not conflict with that of $j$ |
| | 0 | None of the above criteria are satisfied |
| middle | 3 | Exact match on both middle names (and names are more than initials) |
| | 2 | Either middle name of profile $i$ is an exact match with either middle name of profile $j$, OR there is a Jaro-Winkler string similarity between first middle names of at least 0.9 |
| | 1 | Profile $i$ provides only a middle init, and it matches either middle init of $j$ |
| | 0 | None of the above criteria are satisfied |
| last | 2 | Exact match on last name |
| | 1 | Jaro-Winkler string similarity between last names of at least 0.94, or one last name is a shortened version of the other (e.g. "Jones" and "Jones-Smith") |
| | 0 | None of the above criteria are satisfied |
| suffix | 1 | Profiles $i$ and $j$ both have suffix field populated, and there's a match |
| | 0 | Profile $i$ has suffix field populated, and it conflicts with $j$ |
| entity | 3 | Names for $i$ and $j$ both have entity text, and there's an exact match |
| | 2 | Jaro-Winkler string similarity between entity text of at least 0.94 |
| | 1 | Jaro-Winkler string similarity between entity text of at least 0.85 OR one is a shortened version of the other (e.g. "FARMS" and "FARMS LLC") |
| | 0 | Profile $i$ has suffix field populated, and it conflicts with $j$ |
| recipient_type | 1 | Names for $i$ and $j$ indicate the same recipient type |
| | 0 | Names for $i$ and $j$ indicate different recipient types |
| customer_number | 4 | Profiles share a customer number |
| | 3 | Customer numbers for $i$ and $j$ belong to the same connected component in the business party share graph AND in the payment attribution graph |
| | 2 | Customer numbers for $i$ and $j$ belong to the same connected component in the business party share graph |
| | 1 | Customer numbers for $i$ and $j$ belong to the same connected component in the payment attribution graph |
| | 0 | None of the above criteria are satisfied |
| location | 5 | Street number or PO box match, and ZIP code matches |
| | 4 | Match on ZIP or ZCTA |
| | 3 | Match on city + state OR haversine distance less than 10 miles |
| | 2 | Haversine distance between profiles less than 50 miles |
| | 1 | Haversine distance between profiles less than 100 miles |
| | 0 | None of the above criteria are satisfied |

Note: The Fellegi and Sunter (1969) model employs a missing at random (MAR) assumption, and by construction a missing value in one dimension has no bearing on the inferred match probability for a given comparison. The "entity text" for a profile (if any) refers to the text not indicating a person's name (e.g. "FARMS INC" for "JONES FARMS INC").

that most resemble a single business or family operation.

Similar to my approach to the record linkage problem, I identify a number of distinct dimensions on which the similarity of two USDA recipient profiles can be compared. From parsing recipient names, I obtain all of the name fields considered by the USDA-L2 record linkage algorithm (e.g. first, middle, last, suffix). Additionally, I capture the residual part of the name not captured by these fields (e.g. "REVOCABLE TRUST" for "JANE DOE REVOCABLE TRUST" or "GREEN PASTURES FARMS" for "GREEN PASTURES FARMS"), which I term the "entity" associated with a profile name. Likewise, I assign each profile a "recipient type" based on the structure of the recipient name field, with the most frequent designations being the name of an individual (81% of profiles), a trust in an individual's name (4% of profiles), and a farm in the name of an individual (3% of profiles).

I also use additional auxiliary information on links between customer numbers to further inform my clustering. Specifically, I leveraged FSA datasets from 2004-2012 and 2014–2017 that link individual FSA IDs to the FSA IDs of businesses that are partly or wholly owned by the individual in question. These links come in two forms. In the 2014–2017 "business party share" files, the FSA records whether certain customer numbers have ownership stakes in other customer numbers. In a separate set of databases, payments are attributed to a customer number indicating a joint operation as well as customer numbers indicating the individuals receiving shares of this payment. I construct directed graphs from these two sets of links and identify connected components within these graphs. I use membership in the same connected components of these graphs as an indication of similarity in my entity resolution algorithm. This is especially useful for the minority of profiles in which the recipient name indicates an entity but not an individual ("GREEN PASTURES FARMS"), and ensures that in the large majority of such cases I am able to link the business name to an individual's name.

Having described these new fields, my entity resolution algorithm is easy to describe, since it very closely mirrors the structure of my record linkage algorithm described in the previous sections. Specifically, I estimate a Fellegi-Sunter record linkage model in which I compare each

of the 4,953,072 recipient profiles to the remaining profiles. Figure OA3 presents the agreement vectors that define the model. For the sake of brevity, I omit a detailed discussion of my implementation (including my blocking strategy). After estimating match probabilities among profiles, I construct a directed graph between customer numbers by drawing an edge between two customer numbers if I am able to identify a link between any two of their constituent recipient profiles. I then label the connected components of this graph as distinct "farming households" or "farms."

**Table OA4: Farm Groups Among USDA Customer Numbers**

| | # of Customer Numbers | # of Farms (Clusters) |
|---|---|---|
| All Farm Program Recipients (Full 2004-2020 Database) | 3,909,482 | 2,792,985 |
| Recent Recipients (All Programs, 2013-2020) | 1,999,763 | 1,610,089 |

Table OA4 presents the results of this clustering algorithm. The full set of 4,953,072 distinct profiles fed into the Fellegi-Sunter model (which together reflect the universe of 2004-2020 Farm Service Agency transactions) are associated with just under four million customer numbers, which I cluster into 2.8 million farm groups. I identify 1.6 million farm groups among the last eight years of payments. Notably, I find that 858,369 groups received payments in 2017, which is roughly comparable to the 643,145 farms recorded as receiving government payments in the 2017 Census of Agriculture. This suggests that the clusters identified by the entity resolution algorithm are comparable to the USDA's definition of a distinct farm (if, perhaps, a little more narrow on average).

## G.5 USDA-L2 Record Linkage Results

After linking USDA recipient profiles to individuals in the L2 voter file, and clustering USDA profiles into farm groups, I allocated each linked L2 ID to a unique farm group. In the very rare occasion in which an L2 voter/consumer profile was linked to multiple distinct farm

groups, I allocate the profile to the farm that obtained the higher match probability. Table OA5 presents record linkage results at the farm level, separately for (a) the set of all farms holding base acreage between 2004 and 2012, (b) the subset of farms holding base acreage in 2004-2012 for whom I estimate total base acreage exceeded 50 acres, and (c) the full set of farms for whom I have records of 2015-2019 planted acreage of program-eligible commodities. As noted in Section 1.3 of the main text, I infer whether farms hold base acreage by their receipt of 2004-2012 payments from DCP/ACRE (the flagship farm programs under the 2002 and 2008 farm bills), and I infer whether farms planted program-eligible crops by their participation in the Cotton Ginning Cost Share Program and the Market Facilitation Program (two sets of idiosyncratic programs that made payments on actual harvested production or planted acreage, rather than base acreage).

**Table OA5: Farm-Level L2 Match Rates Among All Farms Receiving Payments for Program-Eligible Crops**

| | Any Base Acreage (2004-2012) $N = 1{,}415{,}037$ | 50+ Base Acres (2004-2012) $N = 526{,}967$ | Planted Field Crops (2015-2019) $N = 603{,}676$ |
|---|---|---|---|
| % of Farms Linked to... | | | |
| Any L2 Profile | 76% | 85% | 89% |
| Any L2 Voter Profile | 68% | 78% | 83% |
| Any L2 Consumer Profile | 68% | 78% | 81% |
| A Voter in the Feb. 2018 Snapshot | 66% | 76% | 80% |
| A Voter in the June 2019 Snapshot | 65% | 75% | 80% |
| A Voter in the May 2021 Snapshot | 63% | 74% | 80% |
| Among Farms Linked to any L2 Profile... | | | |
| % Linked Directly to 1 L2 Profile | 75% | 63% | 68% |
| % Linked Directlyto 2 L2 Profiles | 17% | 24% | 21% |
| % Linked Directly to 3 L2 Profiles | 4% | 7% | 6% |
| % Linked Directly to 4 L2 Profiles | 2% | 3% | 3% |
| % Linked Directly to 5+ L2 Profiles | 2% | 3% | 3% |
| Among Farms Linked to an L2 Voter Profile... | | | |
| % Linked Directly to 1 Voter | 78% | 67% | 72% |
| % Linked Directly to 2 Voters | 16% | 23% | 19% |
| % Linked Directly to 3 Voters | 3% | 6% | 5% |
| % Linked Directly to 4 Voters | 1% | 3% | 2% |
| % Linked Directly to 5+ Voters | 1% | 2% | 2% |

Notes: Matching to an L2 voter profile is not exclusive of matching to an L2 consumer profile, since L2 has already linked many individuals between these two datasets. An "L2 profile" refers to a distinct individual, and has been assigned either an L2 voter ID, an L2 consumer ID, or both. The leftmost column refers to farms that held any base acreage between 2004 and 2012 (i.e. they received a DCP/ACRE payment). The middle column reflects match rates for farms associated with at least 50 base acres. The last column presents match rates for farms that I have determined actually planted program-eligible field crops; this includes farms receiving either Cotton Ginning Cost Share Program payment (paid out on 2015 and 2016 planted cotton acreage), as well as farms that received a Market Facilitation Program payment in 2018-2020 (which applied to acreage planted in 2018 and 2019).

**Table OA6: Farm-Level L2 Match Rates Among All Farms Receiving Payments on Cotton Acreage**

| | Any Cotton Base (2004-2012) $N = 173{,}738$ | 50+ Base Acres (2004-2012) $N = 41{,}265$ | Planted Cotton (2015-2018) $N = 36{,}975$ |
|---|---|---|---|
| % of Farms Linked to... | | | |
| Any L2 Profile | 73% | 79% | 85% |
| Any L2 Voter Profile | 65% | 72% | 78% |
| Any L2 Consumer Profile | 64% | 72% | 76% |
| A Voter in the Feb. 2018 Snapshot | 62% | 70% | 76% |
| A Voter in the June 2019 Snapshot | 61% | 69% | 75% |
| A Voter in the May 2021 Snapshot | 60% | 69% | 74% |
| Among Farms Linked to any L2 Profile... | | | |
| % Linked Directly to 1 L2 Profile | 72% | 49% | 60% |
| % Linked Directly to 2 L2 Profiles | 19% | 29% | 24% |
| % Linked Directly to 3 L2 Profiles | 5% | 11% | 8% |
| % Linked Directly to 4 L2 Profiles | 2% | 5% | 4% |
| % Linked Directly to 5+ L2 Profiles | 2% | 6% | 4% |
| Among Farms Linked to an L2 Voter Profile... | | | |
| % Linked Directly to 1 Voter | 75% | 54% | 65% |
| % Linked Directly to 2 Voters | 18% | 29% | 23% |
| % Linked Directly to 3 Voters | 4% | 9% | 7% |
| % Linked Directly to 4 Voters | 2% | 4% | 3% |
| % Linked Directly to 5+ Voters | 1% | 3% | 2% |

Notes: Matching to an L2 voter profile is not exclusive of matching to an L2 consumer profile, since L2 has already linked many individuals between these two datasets. An "L2 profile" refers to a distinct individual, and has been assigned either an L2 voter ID, an L2 consumer ID, or both. The leftmost column refers to farms that held cotton base acreage between 2004 and 2012 (i.e. they received a DCP/ACRE payment attributable to cotton). The middle column reflects match rates for farms associated with at least 50 cotton base acres. The last column presents match rates for farms that I have determined actually planted cotton; this includes farms receiving either Cotton Ginning Cost Share Program payment (paid out on 2015 and 2016 planted cotton acreage), as well as farms who received a calendar year 2018 Market Facilitation Program payment for harvested cotton production.

The top part of Table OA5 presents the share of each subset of farms that were linked to any individuals featured in one of L2's databases (the February 2018 release of L2's voter files, the June 2019 voter files, the May 2021 voter files, or L2's 2021 commercial files). Among farms holding base acreage in 2004-2012, 76% are matched to at least one L2 profile. However, 85% of farms receiving payments on over 50 base acres are linked to at least one L2 profile, and 89% of farms that I can connect to planted acreage in 2015-2019 are linked to at least one profile.

These rates cover more of the farm sector than might appear at first glance, as farm size is lognormally distributed and so the farms that *are* matched cover the vast majority of US row crop production (as noted in Section 1.3). However, as the non-trivial share of unmatched farms in the first, broadest group is still not ideal given my objective of placing an upper bound on the share of the electorate with a stake in these programs. The issue appears to stem in no small part from entity resolution: despite my best efforts, it is not always feasible to bundle together the farm program records of a single real-life farm from 2004 to 2012. When my entity resolution algorithm fails in this regard, one of the two "pieces" of the real farm ends up unmatched, as I insist in my record linkage that an L2 profile is assigned to at most one farm ID. As noted in Section 1.3, a simple solution to this issue appears to be simply counting anyone linked to any 2004-2012 base acreage as a "vested interest in farm programs." Whereas one would ex-ante only want to use farms with a stake in 2012 for the analyses of electoral significance are based on turnout in the 2014 and 2016 elections, using all voters assigned to 2004-2012 base acreage should mitigate concerns that one "real life" farm is split into 2012 and pre-2012 components, and then only the pre-2012 component is linked to voters. Indeed, this seems sufficient for placing an upper bound on the political significance of 2012 farm program participants, as I link 110 farms to the 2018 voter files for every 100 farms that specifically received DCP/ACRE payments in 2012.

The second and third parts of Table OA5 present the distributions of the number of individuals (voters) matched to a farm, given that the farm finds a match in the database. A majority of linked farms are linked to only one individual within the L2 databases. This is consistent with my observation that USDA program recipients usually only list the name of one individual, as well as the fact that most farms in the US are operated by a single family. Since my goal is to place an upper bound on the electoral significance of voters with a stake in the farm safety net, I therefore propagate all of these matches to individuals that L2 flags as living in the same household.

Table OA6 depicts analogous match rates for farms with cotton base acreage and cotton

planted acreage, respectively. I find that cotton growers are matched to L2 databases at very similar rates to growers of other field crops.

## G.6 USDA-DIME Record Linkage

To study campaign contribution behavior, I link farm groups identified within the USDA recipient data to the DIME database of 1979-2020 itemized campaign contributions. Contributors within DIME are identified uniquely by contributor IDs using a bespoke entity resolution algorithm. I link DIME contributor IDs to distinct farm IDs within my database using two distinct approaches, and then assign each farm the union of these two sets of matched IDs.

First, as with my L2-USDA merge, I design a bespoke probabilistic record linkage algorithm to match USDA recipient profiles to DIME profiles. This closely mirrors the approach of my L2-USDA record linkage. Table OA7 presents the analogous agreement measures I define to estimate the Fellegi-Sunter record linkage model. Second, I use a crosswalk between recent DIME contributors and L2 voter profiles (Bonica and Grumbach, 2022). This crosswalk matches DIME contributor IDs for contributors active between 2011 and 2020 to at most one distinct L2 voter ID in the 2021 L2 voter file snapshot. Using my previously obtained USDA-L2 matches, I take voters matched to a particular farm group, and then assign the farm those contributor IDs which are associated with the respective L2 voter IDs in Bonica and Grumbach's (2022) crosswalk. Together, these two approaches match 35,401 of the 122,157 farms (29%) to one or more contributor profiles in DIME.

**Table OA7: Match Agreement Measures for USDA-DIME Record Linkage**

| Dimension | Level | Description |
|---|---|---|
| `first` | 5 | Exact match on first name (and names are more than initials) |
| | 4 | First name of $i$ is a nickname for first name of $j$ |
| | 3 | First name of $i$ starts with / ends with first name of $j$, OR there is a Jaro-Winkler string similarity of at least 0.9 |
| | 2 | Profile $i$ provides only a first initial, and it matches first initial of $j$ |
| | 1 | Gender inferred from recipient first name does not conflict with L2 gender field |
| | 0 | None of the above criteria are satisfied |
| `middle` | 3 | Exact match on both middle names (and names are more than initials) |
| | 2 | Either middle name of profile $i$ is an exact match with either middle name of profile $j$, OR there is a Jaro-Winkler string similarity between first middle names of at least 0.9 |
| | 1 | Profile $i$ provides only a middle init, and it matches either middle init of $j$ |
| | 0 | None of the above criteria are satisfied |
| `last` | 2 | Exact match on last name |
| | 1 | Jaro-Winkler string similarity between last names of at least 0.94, or one last name is a shortened version of the other (e.g. "Jones" and "Jones-Smith") |
| | 0 | None of the above criteria are satisfied |
| `suffix` | 1 | Profiles $i$ and $j$ both have suffix field populated, and there's a match |
| | 0 | Profile $i$ has suffix field populated, and it conflicts with $j$ |
| `location` | 5 | Street number matches and (ZIP or city matches), OR PO box match and ZIP code matches |
| | 4 | ZIP is nonmissing and matches |
| | 3 | City matches, OR haversine distance between profiles less than 10 miles |
| | 2 | Haversine distance between profiles less than 50 miles |
| | 1 | Haversine distance between profiles less than 100 miles |
| | 0 | None of the above criteria are satisfied |
| `occupation` | 4 | DIME profile indicates contributor has a "farmer" occupation |
| | 3 | DIME profile indicates contributor has a "rancher" occupation |
| | 2 | DIME profile indicates contributor is self-employed or retired |
| | 1 | DIME profile indicates contributor has misc other occupation |
| | 0 | DIME profile indicates occupation distinctly not related to agriculture (e.g. attorney, accountant, banker, librarian, artist, judge, pharmacist) |

Note: The Fellegi and Sunter (1969) model employs a missing at random (MAR) assumption, and by construction a missing value in one dimension has no bearing on the inferred match probability for a given comparison.

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