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Laboratories of Power: Federalism and Reform in the American Political Economy

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Federalism and Reform in the American Political Economy

By

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Abstract

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This dissertation studies how the institution of federalism structures policy reform in the American political economy. It amends and expands the classic logic of states as "laboratories of democracy," which suggests that successful state policy experiments diffuse across the federal system due primarily to mechanisms of learning and healthy competition. I argue that this perspective misses a crucial element of what state policy reforms do—which is to shape the political power of coalitions of organized interests active in the broader federal system.

In three policy areas, I demonstrate how policy feedbacks on interest group politics operating across the federal system have structured policy reform pathways. First, in the case of rooftop solar policy, I show how solar power installers built their industry by first locating in states with favorable policy terrain, and then leveraged resources they accumulated to influence policy in other states, allowing them to expand into new markets. Turning to marijuana policy, the marijuana industry initially followed a similar pattern, but because of the context of a federal prohibition, industry political efforts soon focused much more heavily on influencing national policy than on spreading legalization state-by-state. I leverage exogenous variation in likelihood of legalization from ballot initiative rules to show that state legalization had a causal effect on support for marijuana policy reforms in Congress. Finally, in the case of charter school policy, I argue that as state-level experiments drove charter growth, charter advocates were able to recruit certain foundations, which saw charter schools as a vehicle for achieving their own education policy goals, as allies. Crucially, foundations used their extensive resources to promote pro-charter policies more broadly than charter school networks and other advocates would have been able to on their own.

By highlighting the national-level political implications of state-level policy decisions, the dissertation supports the notion that state politics and policy is more consequential than traditional perspectives on federalism suggest, and in doing so, helps to explain why national groups have made such massive investments in state politics in recent years. Indeed, findings suggest that state policy reforms can be a crucial ingredient in building coalitions for (geographically) broader policy change.

I dedicate this dissertation, first, to Caitlin Ruppel, without whose steadfast love and support it likely would not have been completed.

I also want to acknowledge my parents and siblings, Lauren Richman, Joel Trachtman, Hannah Luk-Zilberman, and Aaron Trachtman, for their love and support.

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Introduction

The authority of subnational governments sets American federalism apart from other federal systems. State governments, in particular, play prominent roles governing critical sectors of the economy like energy, healthcare, and education. This, along with the dysfunction, polarization, and gridlock that has plagued federal politics in recent years, has made state governments attractive targets for reformers. Polarization and gridlock, of course, extend to the subnational level, but the sheer variety in the political landscapes across the states means there are more opportunities to shift public policy. Some states also have institutions like the ballot initiative that make it easier bypass legislatures and break the status quo. While federalism and "states' rights" has traditionally been a clarion call for conservatives (especially racial conservatives) seeking to preserve the status quo, there is now a movement on the Left to leverage the states to drive forward progressive reforms (Gerken 2012).

Yet, relying too heavily on the states presents its own pitfalls. State policy can be an impotent tool for addressing complex political economy issues of broad scope like climate change. For one, taking on these issues often requires coordination across the federal system to address spillovers—meaning federal action is critical. Second, states also tend to be budget-constrained, which restricts their ability to enact major policy change. They, unlike the federal government, do not control their own currencies, and are required to, for the most part, run balanced budgets. Attempts to raise more revenue through higher taxes risks chasing businesses and wealthier residents to lower-tax jurisdictions. Third, and finally, reduced legislative professionalism and a lower density of countervailing interests means that state politics can be a more favorable venue than national politics for incumbent economic interests—which often work to block reforms that challenge their position.

The potential for policy reform in the states, combined with the limitations of state policy for addressing major issues, motivates examining political and policy interdependencies across the federal system. A reform achieved in one state alone might make just a small dent in a problem of broad scope, but if it leads other states and the federal government to follow suit, the overall effects could be significant. Thus, this dissertation addresses the following general question: how does adoption of policy reforms in the states affect the political prospects for those reforms in the broader federal system?

It is, of course, not the first to examine questions of policy interdependence in American federalism. The innovation is in the theoretical and empirical approaches, and the particular focus on political economy—interactions between elements of the political and economic systems.

The conventional framework for studying policy interdependence in American federalism is policy diffusion, which refers generally to how adoption of a policy in one unit increases the likelihood of its subsequent adoption elsewhere (Crain 1966; Gray 1973; C. R. Shipan and Volden 2008; J. L. Walker 1969). This general idea can be traced at least as far back as Louis Brandeis, who famously, in a 1932 judicial opinion, suggested that states could function as "laboratories of democracy" (Brandeis 1932)—state experimentation could be leveraged to identify promising policy designs, which might then be propagated. As the policy diffusion literature has developed, scholars have productively moved from simply tracing the spread of policies to trying to identify the mechanisms driving that spread. Two mechanisms have emerged in the federalism literature as central to the diffusion process. The first, which Brandeis alluded to, is policy learning (Boehmke and Witmer 2004; Gilardi, Füglister, and Luyet 2009). Because lawmakers generally aim to pursue policies that work well for constituents, they might, in considering which policies to adopt, choose policies that have already been shown to work well in other units (and avoid ones that have performed poorly). The second core mechanism is competition (Volden 2005). Because federal units compete for mobile businesses and residents, subnational governments can be pressured to adopt attractive policies pursued in other units—or risk losing tax revenue and economic activity.[1]

The policy diffusion perspective has been highly fruitful. It has shed light on the degree to which policy decisions by governments are interdependent and explored several compelling mechanisms that drive this interdependence. But, I argue, this perspective is incomplete. It fails to fully account for the role of interest groups in the policy process—and how *prior* policy decisions across the federal system shape interest group politics.

Policy diffusion scholarship focuses primarily on re-election motivated lawmakers who learn and compete because they, broadly speaking, want to produce good policy outcomes for their constituents. Yet, we know that much more goes into policy decisions besides lawmakers seeking good policy. Significant policy reforms usually represent just the final outcomes at the tail end of hard-fought political battles—which generally continue post-enactment in the implementation phase. These battles can draw a diverse array of interest groups like businesses, unions, and citizens groups, as well as government bureaucrats. The outcomes of these battles also depend on public opinion and the mobilization of individuals. Painting a complete picture of policy interdependence in American federalism (and in other federal systems) therefore requires considering how prior policy decisions adopted *across the federal system* construct and empower political actors engaging *across the federal system.*

That is the approach taken in this dissertation. I focus primarily on organized economic interests, whose engagement is among the strongest drivers of policy decisions in American politics broadly (Gilens and Page 2014), and who are particularly important in considering policy reforms that affect sectors of the economy. Literature studying "policy feedback" has demonstrated the powerful ways in which the public policy landscape affects the representation of organized economic interests in the political system (Pierson 1993; Skocpol 1992). For instance, the public policy landscape shapes the types of firms that grow and prosper—and as a result, which have the capacity to influence politics (J. S. Hacker 2002a; Mettler 2014). Similarly, public policies like collective bargaining rules affect the ability of unions to grow and maintain membership, which in turn influences their political sway (Anzia and Moe 2016). Shifts

[1] In the international sphere, Elkins and Simmons (2005) similarly categorize diffusion as either "adaptation to altered conditions" (which includes competition) and learning.

in policy, therefore, can affect the power of different organized economic interests in the political system.

In a federal system of government in which states have significant authority and interest groups are active at multiple sites and levels of government, I argue that policy feedback effects on interest group politics can also generate powerful policy interdependencies—in some cases driving the spread of policies across jurisdictions. More specifically, state-level reforms can increase the political power of interest group coalitions supporting the geographic and jurisdictional expansion of those reforms.

These dynamics can play out, first, horizontally across the states. State-level reforms that benefit existing organized interests, or give rise to new ones, also tend to strengthen them politically. The groups that benefit from particular state-level reforms are likely to also benefit from the propagation of those reforms to other states. Thus, these groups might apply newfound strength to propagate reforms horizontally through lobbying and other political activities.

The political implications of state-level reforms are not restricted to other states. The groups that benefit, and are politically strengthened, by a state-level reform might also leverage newfound strength to advocate for aligned reforms at the federal level. The geographic structure of representation in Congress provides a key avenue for this type of vertical, state-national feedback. Members of Congress represent geographically demarcated districts that are embedded in state policy landscapes. Shifts to those landscapes precipitated by state policy reforms can in turn affect the political pressures that members face. More specifically, to the extent that state policy reforms influence state political economies, this can affect the ability of organized economic interests to engage in politics and make demands on their representatives.

Finally, reforms achieved at the state level can affect the national interest group politics by drawing new actors into pro-reform coalitions. This dynamic is particularly relevant in considering the engagement of philanthropists, a growing topic of study in political science (Reckhow 2012, 2016). State policy experiments can provide a proof-of-concept of the legitimacy of some set of reforms, and thus draw philanthropic investment. Once invested, foundations might use their financial resources to fund advocacy groups working to propagate those new policies.

In the empirical portion of the dissertation, I apply this new theoretical perspective on policy interdependence in American federalism to three policy cases: rooftop solar policy, marijuana policy, and charter school policy. These are each areas in which state governments have taken the lead on driving forward policy reforms with major implications for sectors of the economy, and where, as I show, state government action has had implications for the interest group politics in the broader federal system.

Policy Feedback and Interdependence in American Federalism: Evidence from Rooftop Solar Politics

The past 10 years have witnessed rapid growth in rooftop solar power—power generated via distributed solar resources versus centralized plants—from under 1700 MW of installed capacity in 2010 to over 25,000 MW installed in 2019. While this represents just a small fraction of total installed electricity generation capacity in the U.S., prominent energy modelers envision a growing and ultimately significant role for rooftop solar as the energy transition from a fossil fuel dominated system to a renewables-dominated system proceeds. Indeed, the difficulty of siting large-scale renewables and transmission projects in the U.S. political economy further underscores the importance of developing small-scale and distributed sources of renewable power.

State policy decisions, particularly on pricing and interconnection rules, have been essential to the growth of rooftop solar. States with pro-solar policies like New Jersey have developed robust rooftop solar markets, while states like Tennessee without these policies have barely any rooftop solar. In the paper, I argue that these policies have also changed the interest group politics by developing countervailing business power to the electric utilities whose consumer market rooftop solar threatens. Greater rooftop solar penetration has spawned new political interests, most prominently large installers like Sunrun and SolarCity, whose business has depended on robust installation growth. These businesses leveraged economic growth to increase their political presence, mobilizing to expand and defend the state policies essential to their growth. The paper demonstrates, using a mix of quantitative and qualitative data, that installers' political mobilization was not restricted to the states with favorable policies that drove initial growth—rather, they also engaged politically in laggard states to seek to shift policy and create new markets that they could then expand into.

The quantitative analysis proceeds as follows. First, bringing together data on state rooftop solar policies with administrative data on installations, I leverage two-way fixed effects regression models to demonstrate faster rooftop solar growth in states with more favorable policies. Second, I bring together firm-level lobbying data with firm-level solar installation data and leverage multilevel regression models to show that an installers' lobbying in a particular state depends on its economic presence in that state—and also its economic presence across other states. These cross-state feedback effects appear to have had policy consequences. Two-way fixed effects models indicate that installer lobbying is associated with more favorable state policies, with larger effects in states with lower levels of rooftop solar penetration.

The case of South Carolina provides a useful example of how these dynamics can play out on the ground. South Carolina lagged behind other states on rooftop solar, even in the broadly anti-renewable Southeast part of the U.S., until recent years. This changed in 2014, when the state passed legislation that moved South Carolina's rooftop solar policy from an "F"—in the eyes of the pro-solar website *Freeing the Grid*—to an "A". My elite interviews suggest that Sunrun, which at the time was not actually operating in South Carolina, played an important role in pushing through the favorable legislation. Sunrun intervened late in the legislative process with a lobbying and social media campaign and negotiated several pro-rooftop solar changes to the bill. Sunrun's ability to intervene in South Carolina depended in part on the ability to grow its business and resources in other states like California that had *previously* adopted pro-solar policies.

Sunrun expanded into the South Carolina market in 2015, and since then has grown its operations there considerably. The company has also leveraged its economic presence in the state to, jointly with other clean energy and environmental groups, defend the initial 2014 law from rollback. This case thus highlights how prior state policies can, by shaping the political resources of organized interests, affect the interest group politics in other states.

State Politics and National Representation: Marijuana Politics in American Federalism

Even more so than in the case of rooftop solar, state actions have precipitated a major shift in marijuana policy over the past 20 years. Since California pioneered legalization of marijuana for medical use in 1996, 32 other states and Washington D.C. have followed suit. As of 2020, 15 states had also legalized marijuana for recreational use. This represents a profound shift from the policy regime associated with the War on Drugs that was initiated in the 1970's. And, like in the case of rooftop solar, these policy shifts have also engendered shifts in the interest group politics.

In particular, the advent of adult-use legalization, pioneered by Colorado and Washington in 2012, has driven rapid growth in the marijuana industry from just 3.5 billion dollars of revenue in 2014 to over 13.5 billion dollars of revenue in 2019. This has led the industry to develop a greater political presence, both in the states and at the federal level. The costs from federal prohibition have led the industry, unlike in the case of rooftop solar, to focus to a greater extent on federal policy than propagating reforms across the states. Federal lobbying from marijuana industry rose from just $45,000 in 2012 to $6 million in 2019. And members of Congress representing legalizing states have, I show, become critical allies in efforts to liberalize federal marijuana policy and resolve costly state-federal legal tension.

Take Cory Gardner (R-CO), for instance. There is little in Gardner's record prior to 2012 that would indicate he would become an important marijuana proponent. Yet, during his tenure in the Senate (2015-2021), Gardner became a central figure in federal marijuana policy. In 2018, Gardner vowed to block judicial nominees in the Senate until he received a commitment that the federal government would not prosecute marijuana industry (Everett 2018). In the 116th Congress, Gardner sponsored core marijuana-related legislation including the SAFE Banking Act and the STATES Act. It is no coincidence that Gardner represents the state of Colorado, which has one of the strongest marijuana industries in the country. Indeed, interview evidence suggests that the sway of marijuana industry and marijuana voters in Jared Polis's successful 2018 bid for governor was a major reason why Gardner, who anticipated a tough re-election in 2020 (which he ultimately lost), made marijuana such a priority.

To test whether the relationship between state-level legalization and representation in Congress generalizes, I leverage exogenous variation in likelihood of legalization generated by variation across the states in ballot initiative rules. This exogenous variation is necessary due to the inferential challenges in estimating the effects of state policy on national representation. Broadly speaking, to the extent that state policy decisions and representation in Congress are both shaped by factors like a state's overall ideology, I would expect a correlation between state policy and national representation without any causal relationship.

Variation in the availability of citizen initiatives across the states helps to overcome this causal identification problem in the case of marijuana policy. A number of states adopted procedures allowing citizens to enact statutes or constitutional amendments directly through statewide ballot initiatives in the Progressive era of the early 20th century. In the current era, ballot initiatives have been a critical tool for marijuana policy reform. The ability to bypass state legislatures is important because, as one advocate told me, citizens tend to be much more liberal on marijuana issues than their representatives in state legislatures. As a result, legalization efforts have been concentrated in states that allow ballot initiatives, and whether states allow initiatives strongly predicts legalization both for medical and recreational use. At the same time, whether states allow initiatives is not correlated with other factors generally associated with congressional behavior such as measures of ideology. And more importantly, whether states allow initiatives is not associated with member behavior on marijuana issues prior to the wave of state legalization initiated by California in 1996. This suggests that availability of the initiative is a valid instrument for estimating the effect of state legalization on national representation in the contemporary period.

I study the 116th Congress, which, as one journalist put it, was "the first Congress in history where, going into it, it seem[ed] that broad marijuana reforms [were] actually achievable" (Higdon 2019). Broadly speaking, I find evidence that state legalization affected national representation. Members of Congress representing legalizing states were more likely to sponsor or co-sponsor key pro-marijuana pieces of legislation. They were also more likely to cast certain pro-marijuana roll-call votes. Bringing quantitative evidence and elite interviews together to investigate mechanisms, I find the most support for the role of growing industry influence in legalizing states, but also find some support for the role of the initiative vote in signaling constituent preferences. I find little support for the potential alternative hypothesis that effects were driven by positive shifts to public favorability wrought by legalization.

How Policy Experiments Construct Interest Group Coalitions: Evidence from Education Politics

Like in the other two cases, state policy decisions regarding charter schools have driven major shifts to a sector of the economy and society: K-12 education. Charter schools, independent but publicly funded, have grown steadily since the early 2000's. As Finn, Manno, and Wright (2016) write: "Aside, perhaps, from mayoral control, chartering is by far the most significant manifestation of structural and governance innovation in public education…" (pg. 210). In 1999, there were just 507 charter schools operating. By 2017, nearly 7000 charter schools were enrolling over 3 million students—about 7 percent of overall public K-12 enrollment. Charter schools owe their existence to the adoption of "charter laws" across 40 states between 1991 and 2003, which allowed new schools to form apart from the traditional district structure.

Unlike in the case of marijuana policy, but like the rooftop solar case, charter school growth presents an existential threat to powerful organized economic interests—teachers unions. Charter schools generally have much lower rates of unionization than traditional public schools. The charter sector's growth, despite opposition from unions and other incumbent education interests, is notable. It has depended in part, I argue, on the development of a nationally-scoped network of pro-charter advocacy groups—which have on several occasions gone toe-to-toe with powerful teachers unions. In the paper, I examine the role of prior state policy decisions in seeding this pro-charter interest group network.

A key difference between the charter school policy case and the other cases studied is in the types of organized interests driving the sustainability and spread of reforms. In rooftop solar policy and marijuana policy, the story is relatively straightforward: state policy decisions gave rise to new industries that leveraged their economic growth to develop greater political influence. While charter growth precipitated by state policies has similarly generated new political interests in the form of large charter networks like Success Academy and KIPP, the political power of these organizations is highly limited. Since charter schools are mostly non-profits with limited revenue streams generally funneled into operations, the political activity of these charter networks has been modest compared to large marijuana and rooftop solar firms. Given that limitation, the financial backing of philanthropists like the Gates Foundation and the Walton Family Foundation has been crucial to building the pro-charter advocacy network.

But foundations' investments in charter advocacy did not arise in a vacuum. Drawing on elite interviews, I show that state policy decisions in the 90's promoting charter growth in leading states like Minnesota and California were instrumental to generating support from philanthropists and building the pro-charter group coalition. Leveraging state policy data and administrative data on charter schools, I first demonstrate the importance of favorable charter laws for promoting the growth of new charter schools. Though the great majority of the states permit charter schools, charter laws vary markedly in aspects like funding, caps on new schools, and authorization procedures. Variation across these dimensions greatly affects the ability of charter schools to establish and grow. In 2017, charter schools enrolled over 10 percent of total K-12 public school students in states like Colorado and Louisiana, but less than 1 percent in Washington state and Mississippi.

The emergence and growth of charter schools in states with favorable charter laws came at an opportune moment for foundations aiming to expand their education portfolios. Several newer foundations with living donors, dissatisfied with the state of education philanthropy, sought to provide more support to "jurisdictional challengers" (J. Mehta and Teles 2012)—organizations that they hoped would provide fresh ideas and energy by competing with elements of the traditional K-12 education system. Charter schools presented these foundations with an opportunity to do so. Thus, in the early 2000's, foundations provided a critical source of funds directly seeding new charter schools and developing operational infrastructure for establishing new schools.

As charter schools grew and began to present a meaningful challenge to incumbent education interests, the politics became more contested. Charter school boosters increasingly recognized the importance of maintaining and expanding pro-charter policy to sustain growth. Drawing on tax data, I document a shift in the mid-2000's, with foundations greatly increasing their charter advocacy grant-making over time. They expanded from primarily funding charter school operations to also providing grants to pro-charter education reform advocacy groups—thus engaging politically to defend prior investments made in the charter school movement.

Discussion

In each of the policy areas I study, reforms achieved at the state-level did not just produce learning and competitive pressures for other states—they also fundamentally restructured the broader interest group politics. State-level reforms created and empowered coalitions of organized interests that deployed newfound strength to expand and diffuse preferred policies across multiple states and up to the federal level. In terms of theoretical contribution, these papers thus demonstrate the gains to examining mechanisms of policy interdependence outside of learning and competition. In particular, they suggest that policies that affect the resources of organized interests are likely to have political and policy implications across the federal system.

The dissertation also compels scholars of federalism interested in exploring policy interdependencies to study other outcomes outside of the simple spread of policies across jurisdictions. When state policy reforms shift the resources or engagement of organized interests, the effects can go beyond the diffusion of those particular policy reforms. Take the marijuana case. Elements of the marijuana industry newly empowered by state legalization have not only lobbied for the diffusion of legalization to the federal level—they have also lobbied on issues of federal enforcement, banking regulations, tax policy, and others. Similarly, the pro-charter interest group coalition that formed following the passage of charter laws across a range of states in the 90's advocated for different policies from the federal government than the states. State policies can, in addition to potentially driving a policy diffusion process, shift the broader organized group landscape in a particular policy area (and potentially also in other policy areas)—thus opening avenues for additional reforms that were previously unavailable due to unfavorable interest group politics.

What this means for reformers seeking to change policy over the long term is that attention to multiple sites and levels of government is essential. There is growing interest in considering how policies might be sequenced over time, leveraging positive feedbacks to deconstruct blockages and ratchet up reforms (J. Hacker and Pierson 2019). These ideas are particularly compelling for considering the politics of decarbonization (Meckling, Sterner, and Wagner 2017; Pahle et al. 2018). This dissertation shows that space, in addition to time, is a relevant factor in considering how to ratchet up policy reforms. Reforms achieved at the state level can play a critical role in building an interest group coalition capable of not only expanding those state-level policies, but also propagating those and aligned policies to new locales.

Policy Feedback and Interdependence in American Federalism: Evidence from Rooftop Solar Politics

Scholars have long understood the American states as "laboratories of democracy," exploring how mechanisms of learning and competition lead to the diffusion of successful state policy experiments across the federal system. Drawing from policy feedback literature, I develop a new framework for studying policy interdependence in American federalism. I argue that state policies can, in addition to promoting learning and competition, also feed into the interest group politics in other states. Broadly speaking, the organized interests that benefit from, and are strengthened by, particular policy reforms might apply newfound strength to propagate them. Empirically, I study rooftop solar policy, an area in which state-level decisions have been fundamental to industry growth and the emergence of installers as political actors. Bringing together a variety of administrative, lobbying, and policy data, I demonstrate that solar installers used resources accumulated in early adopter of favorable rooftop solar policies to influence policy decisions elsewhere. For reformers, I suggest that subnational policy can be a crucial ingredient in building coalitions for (geographically) broader policy reform.

Once considered a backwater, state politics has become a critical arena of American politics. In the face of congressional gridlock, national-level political actors have turned to the states as venues for achieving their policy goals (Grossmann 2019; Alex Hertel-Fernandez 2019). Policy variation across the states is growing and is increasingly associated with whether Democrats or Republicans control state office (Grumbach 2018). Perhaps as a result, candidates for state office have amassed huge sums of campaign contributions from outside of their states in recent years (Kaneya and Yerardi 2018).

Renewed interest in state politics is in part driven by an understanding that state-level decisions have implications for politics and policy across the country. This understanding is reflected in a rich tradition of scholarship in American federalism examining the ways that policies adopted in one federal unit can affect politics and policymaking elsewhere (Berry and Berry 1990; Brandeis 1932; Gray 1973). At the core of this literature is the concept of states as "laboratories of democracy" (Brandeis 1932)—the idea that state lawmakers learn from policy experiments carried out elsewhere. Building on this concept, existing literature studying the diffusion of policies across the federal system has focused on mechanisms of learning and competition (Shipan and Volden 2006, 2008; Volden 2006).

This paper[2] argues that traditional policy diffusion mechanisms do not account for an important source of policy interdependence—namely, the effects of subnational policies on the capacities of interest groups to influence policy in the broader federal system. My theoretical argument builds on the classic finding in the policy feedback literature that policies shape the landscape of organized interests represented in the political system (Pierson 1993; Skocpol 1992; Walker 1991). I identify and explore mechanisms by which these dynamics can manifest across units and levels of government—bringing a focus to the intergovernmental effects of policy on interest group politics. Broadly speaking, subnational reforms that benefit particular organized interests also tend to strengthen them politically. These interests, in turn, might have an economic incentive to apply newfound strength to seek to propagate the reforms that benefit them. In this way, mechanisms of policy feedback can—like learning and competition—drive policy diffusion (e.g. adoption of a policy in one federal unit increases the likelihood that it will be adopted in other units).

Empirically, I examine cross-state policy feedback—the effects of state policy on the politics in other states—in distributed, or rooftop, solar policy.[3] Unlike traditional utility-owned centralized power sources, rooftop solar arrays are connected to distribution systems (versus transmission systems) and are generally owned or leased by customers. State-level policy played a key role in promoting the strong growth of rooftop solar over the last decade. I show that, by empowering new business interests that subsequently engaged politically across federal system, state solar policies affected the politics in other states. The clear role of state policy in the growth of a new industry makes rooftop solar an instructive case for examining cross-state feedback effects. But this is also a hard case to observe effects due to the power and opposition of incumbent electric utilities.

[2] This paper is forthcoming at *Perspectives on Politics.*

[3] I use these terms interchangeably, though technically speaking not all distributed solar is located on rooftops.

The empirical analysis proceeds in three general steps. First, I bring together data measuring state rooftop solar policies with administrative data on solar installations to investigate the relationship between policy and solar growth. Results from two-way fixed effects regression models indicate faster rooftop solar growth in states with pro-rooftop solar policies. Though findings are consistent with advocates' and industries' understanding (and the fact of their political engagement), this finding—by providing empirical evidence for the substantive importance of state policy—lays the groundwork for the subsequent analyses.

In the second step, I bring together firm-level lobbying disclosure data with firm-level system installation data to examine the feedback effects of state rooftop solar policies both in the states where they are adopted and in other states. I specifically examine the political engagement of large installer firms that have been central to efforts to expand and defend pro-distributed solar policies. Results from multilevel modeling indicate that a rooftop solar installer's lobbying in a particular state depends on its economic presence in that state—but also its economic presence across the states. In addition, by tracking the economic expansion and political activity of the two largest rooftop solar installers, I find evidence of firms seeking to influence policy in markets where they did not yet have an economic presence in preparation for potential expansion. These findings, combined with the results indicating the importance of state policy to industry growth, suggest that state policy decisions affected political contestation in other states. Installers relied on growth in early adopters of favorable rooftop solar policies to accumulate resources, and then deployed those resources to propagate favorable policies more broadly.

Third, I present analysis suggesting these cross-state feedback effects had policy consequences. Two-way fixed effects models indicate that installer lobbying is associated with more favorable state policies, with larger effects in states with lower levels of distributed solar penetration. Qualitative analysis of the case of South Carolina affirms the plausibility of installers influencing policy even in states where they did not have an economic presence. By partnering with local groups and hiring well-connected lobbyists, Sunrun (one of the largest installers) was able to drive policy shifts that led to the construction of a new market it could then expand into.

This paper contributes to a growing body of literature at the intersection of federalism, policy feedback, and interest groups (Darmofal et al. 2019; Finger and Hartney 2019; Meckling and Trachtman 2021; Stokes 2020). Recent advances have documented how federated unions rely heavily on resources from affiliates in states with favorable labor laws (Darmofal et al. 2019; Finger and Hartney 2019), and how renewable energy interests leveraged states with favorable policies as "beach-heads" for their expansion across the country (Stokes 2020). Empirically, I build on this developing literature by using a rich array of evidence to trace out a causal chain from state policy to shifts in interest group engagement to policy decisions in other states. Conceptually, while existing work in this area, especially that on labor unions, has focused on organizational maintenance, I bring a focus to the role of state policy in driving lobbying and policy expansion—thereby bridging this literature with scholarship on policy diffusion and policy interdependence.

By integrating policy feedback and policy diffusion concepts, this paper provides a framework for understanding and examining a myriad of interdependencies in our federal system that are difficult to study with existing theoretical frameworks. Subnational policies do not just motivate learning and competition: they also fundamentally affect the resources of organized interests that, in many cases, engage politically across the federal system. This can serve as a mechanism of policy diffusion, as groups that benefit from, and are strengthened by, particular subnational reforms deploy their newfound strength to propagate the reforms that benefit them. However, the cross-unit political engagement of organized interests empowered by subnational reforms will, in most cases, go beyond simply seeking to propagate those reforms. As a result, the perspective put forward here suggests that, in addition to potentially initiating a process of diffusion, subnational reforms can also more durably shape interest group competition in the broader federal system over long time horizons.

In addition to theoretical contributions, this paper also has practical implications for climate advocates. Well-designed climate policies not only drive shifts from fossil fuel energy infrastructure to renewables infrastructure, but also replace fossil fuel political *interests* with clean energy interests (Meckling et al. 2015). As I show, this positive feedback can manifest across state lines, lending weight to an institutionally and geographically pluralistic advocacy approach to climate politics.

Laboratories of democracy

Prominent theoretical perspectives for studying policy interdependence in American federalism have focused on three key mechanisms: political learning, competition, and firm preferences for unified standards.

The general concept of political learning goes at least as far back as Supreme Court justice Louis Brandeis's famous characterization of the states as "laboratories of democracy" (Brandeis 1932). The basic logic of political learning is straightforward. Re-election motivated government officials generally prefer policies that benefit their constituents. If officials observe that a policy is performing well in another federal unit, this indicates that the policy has a greater likelihood of succeeding in their own locale, so they are more likely to adopt it. As a result, well-performing policies, the theory suggests, will diffuse across units and levels of government (Boehmke and Witmer 2004; Gilardi, Füglister, and Luyet 2009; Volden 2006).

Of course, in practice, it is not so simple. As Gilardi (2010) points out, officials are concerned broadly with the political effects of adopting a particular policy, not just whether that policy worked well elsewhere. In Gilardi's analysis, whether learning leads to policy diffusion depends on officials' prior beliefs and ideologies, and experimental work supports the notion that ideology moderates political learning (Butler et al. 2017).[4] Broadly speaking, this finding suggests that political polarization can weaken learning as a diffusion mechanism.

In addition to learning from one another, governments also compete with one another for residents and businesses, and this competition can serve as a mechanism by which policy decisions in one federal unit affect decisions in another. Competition has long been recognized as an important feature of governance in federal systems. In Tiebout's (1956) seminal model, competition between municipalities for residents and tax revenue leads to lower taxes and more efficient government. The reason is that firms and individuals can "vote with their feet",

[4] Additionally, Shipan and Volden (2014) argue that policy expertise moderates whether learning leads to policy diffusion.

choosing where to live or do business based on the favorability of the policy and political environment—thereby putting pressure on governments to adopt and sustain effective policies.

While the upshot of Tiebout's model is generally positive, firms' and individuals' mobility across the federal system can also have negative consequences. Government competition for mobile individuals and firms can lead to a regulatory "race to the bottom" to the extent that governments seek to attract business investment, and believe that they can do so by relaxing regulations relative to competing federal units (Potoski 2001; Woods 2006). Competition might lead governments to converge on lower regulatory stringency than that preferred by constituents, as officials trade off public interest regulations for greater business investment and growth. While empirical evidence demonstrating a regulatory "race to the bottom" in American federalism is mixed, there is some evidence of these dynamics affecting decisions in environmental policy (Konisky 2007) and welfare policy (Volden 2002) among other areas.

These models of competition imply a general logic of policy diffusion, as policy adoption in one unit exerts pressure on competing units to adopt that same policy. Failure to keep up imposes costs on polities in loss of investment or residents. And similar to political learning, competition is considered to be a core mechanism of policy diffusion (Shipan and Volden 2008; Volden 2005).[5] But again, there is reason to think that polarization might blunt the effects of competition on policy diffusion. Under polarization and nationalization (Hopkins 2018), the transformation of state elections into referenda on the national parties reduces the incentive of state lawmakers to respond to competitive pressures through policy change.

The third broad mechanism of policy interdependence identified in existing literature is firm preferences for unified standards.[6] Due to the "marble-cake" structure of American federalism (Grodzins 1982), whereby different levels of government share regulatory authority (e.g. in healthcare, energy, education), large firms are often regulated at multiple levels of government. Since these firms can face costs from complying with regulations that differ across subnational units, national standards are generally preferred to state patchworks. Firms, therefore, might respond to the adoption of subnational regulations by advocating for federal policies that provide a unified regulatory landscape and potentially pre-empt future subnational regulations.

Elliott, Ackerman, and Millian's (1985) seminal legal study highlights the role of mobilization of regulated industries in response to subnational regulations in the passage of both the Motor Vehicle Pollution Act of 1965 and the Air Quality Act of 1967. In political science literature, the upward diffusion of standards due to the advocacy of regulated industries is associated with Vogel's concept of the "California effect" (1995). In a key empirical

[5] Competition can produce interdependent policymaking without necessarily leading to policy diffusion in a strict sense. For instance, Volden (2002) argues that competition to avoid becoming "welfare magnets" led states to systematically fail to increase welfare benefits to keep pace with inflation. In this case, competition enforced systematic *policy drift* (J. S. Hacker 2004) across the states, not diffusion.

[6] Policy diffusion scholarship has also identified mechanisms of *imitation* and *coercion*, but these are more marginal in the literature, and whether they should be included as core mechanisms is debated (Gilardi and Wasserfallen 2019; Maggetti and Gilardi 2016).

contribution, Vogel argues industry support for federal standards (versus state patchworks) drove the upward diffusion of California's auto emissions standards.

While the mechanisms of political learning and competition are driven by shifts in lawmakers' beliefs about which policies will best serve their constituents, this third mechanism is driven by shifts in firm preferences. The theoretical dynamic I propose in this paper similarly examines how subnational policies affect the mobilization of organized interests in other federal units. But, instead of studying how subnational policies shift national-level *preferences*, I consider how subnational policies affect the *capacities* of organized interests—and in turn their ability to mobilize resources to influence policymaking across the federal system (specifically, in other states).

By examining the role of interest group influence in driving policy interdependence, the perspective I put forward here also relates to the literature on the role of interest groups in mediating policy diffusion (Balla 2001; Garrett and Jansa 2015; Haider-Markel 2001; Mintrom and Vergari 1998). The key difference is that, while this literature treats interest groups as exogenous, I argue that the capacities of interest groups to influence policy is endogenous to prior policy decisions adopted in other federal units.

Policy Feedback and Interdependence

My theoretical argument draws directly from scholarship in the policy feedback literature examining the effects of public policies on organized interests. Much of this work examines how social welfare policies motivate beneficiaries or potential beneficiaries to organize into citizens groups to protect their benefits (Campbell 2003; Skocpol 1992).

A rich body of literature has also explored how policies shape the emergence and growth—and political capacities—of organized economic interests: particularly, businesses and unions (Anzia and Moe 2016; Hacker 2002; Mettler 2014). Businesses and unions are classic organized *vested interests*: groups that receive material benefits directly from particular policies and institutions, and can funnel resources back into the political system to shape policy trajectories (T. M. Moe 2015). Market rules influence which firms and industries grow (Polanyi 1957; Vogel 2018), and as a result which will have resources to engage in politics. Similarly, policies like collective bargaining rules directly shape the organizational strength and political power of unions (Hertel-Fernandez 2018).

Though the seminal policy feedback studies examine national policies (Campbell 2003; Mettler 2005; Skocpol 1992), some recent scholarship has explored how the institution of federalism interacts with policy feedback dynamics (Feigenbaum, Hertel-Fernandez, and Williamson 2018; Michener 2018; Stokes 2020). Studying Medicaid, Michener argues that social welfare policy variation across the states produces variation in individual-level political behavior across the states. Research focused on organized interests has a similar implication: variation in *policy* environments across the states, by shaping the relative strength of different organized interests, produces variation in *political* environments across the states. For instance, studying neighboring counties across state borders, Feigenbaum, Hertel-Fernandez, and Williamson find that the enactment of right-to-work laws affected elections by reducing union strength and political capacity.

Unlike these contributions, my goal is not to better understand how policies produce variation in politics across the states, but rather to better understand interdependent policymaking in American federalism. Policy feedback theory, I argue, offers unrealized potential for expanding our understanding of interdependence. A key tenet of the policy feedback literature is that the organized interests that benefit from particular policies are likely to have greater resources to defend those policies in future political rounds—producing a self-reinforcing feedback cycle. But, in a decentralized political system, groups might have an incentive not only to defend the subnational policies that benefit them, but also to seek to spread them. This is particularly relevant to economic interests (e.g. firms and unions), for whom the diffusion of favorable policies can drive revenue growth.

The structure of regulation in the US is what gives organized interests the incentive to leverage resources accumulated from a favorable reform in one subnational unit to engage politically in other units and federally. Most groups are affected by policy decisions in multiple states (not to mention localities) and the federal government. This structure advantages groups that are able to engage at multiple sites and levels of government to achieve policy goals and defend against threats (Hertel-Fernandez 2019; Skocpol, Ganz, and Munson 2000).

Recent literature has illuminated how organized interests deploy resources strategically across the federal system. Studying teachers unions, Moe (2011) documents how the National Education Association, recognizing the threat to the viability of its Utah affiliate, leveraged resources drawn from its California affiliate to block a 2007 pro-voucher ballot initiative proposed in Utah. Similarly, in recent work, Finger and Hartney (2019) demonstrate that teachers unions systematically transfer finances to states where labor laws are weakened to ensure their affiliates remains viable. One of the key insights in this literature is that unions recognize that their strength—and ability to influence politics and policy—depends on maintaining favorable policy environments across the federal system (see, also, Darmofal et al. 2019). While there is less work on firms, Stokes (2020) reports, using first-hand interviews, that renewable energy advocates understood the importance of resources and expertise gained in states with favorable policy environments for expanding into other states.

The notion that organized interests deploy resources strategically across the federal system—put together with the insight from the policy feedback literature that policies can shape the resources organized interests have at their disposal to engage politically—suggests that state (and more broadly, subnational) policies can have intergovernmental effects on interest group politics. More specifically, when states adopt policy reforms, the groups that benefit might leverage their newfound strength to seek to propagate those (or similar) reforms across and up the federal system. These intergovernmental policy feedbacks, or "policy feedback spillovers" (Stokes 2020), can manifest horizontally (e.g. policy in one state affects politics in another) and vertically (e.g. state policy affects national politics). This paper focuses on horizontal feedback via interest group mobilization across the states.[7]

Mechanisms of cross-state feedback are clearest for economic interests operating in multiple states, which are directly affected by policies adopted in each of the states where they operate. The groups that benefit from, and are strengthened by, policy reform adopted in one state have

[7] Some other recent work focuses on dynamics of vertical feedback (Meckling and Trachtman 2021a)

greater capacity to engage politically in others (e.g. lobbying, campaign contributions, etc.)—and might advance similar reforms to those previously adopted in the first state.

Operating across multiple states is not a pre-condition for these dynamics. Economic interests (especially firms) often seek to expand geographically across the states, and an expansion-minded group might leverage resources gained from favorable policy reforms in one state to seek to shift policy and construct new markets. For instance, as I will discuss, rooftop solar installers in several cases lobbied in states where they were not (at the time) operating to promote policy shifts that would allow them to profitably expand. Because lobbying is generally highly effective at the subnational level (Anzia 2018)—where voters are less capable of holding politicians accountable for representing their preferences (Rogers 2017)—firms' political efforts might bear fruit even in federal units where they do not (yet) have an economic presence.

In addition to shaping the resources that firms have at their disposal to engage politically across the federal system, state policies can also shape the *composition* of the broader advocacy environment by incubating new economic interests. While scholars have long argued that a benefit of federalism is the potential for learning from subnational experimentation (Brandeis 1932), another feature of federalism is that variation in policy landscapes can promote greater diversity in the landscape of organized interests that emerge. Subnational units offering favorable policy environments can provide emergent business interests with "beach-heads" from which they can expand across the federal system (Stokes 2020). To the extent that these firms are able to expand beyond their beachheads, their political influence might expand to other locales as well.

While this paper focuses on economic interests, some of the mechanisms outlined above are also relevant to citizens groups. Like firms and unions, some citizens groups depend on particular public policies to grow and accumulate resources (Walker 1991),and many operate across multiple federal units (Skocpol, Ganz, and Munson 2000). Even more broadly, this theoretical perspective relates to literature on how externally adopted policies can influence public opinion, and thereby lead to policy diffusion (Linos 2011; Pacheco 2012). The perspective put forward here, like the work in the literature on public opinion as a diffusion mechanism, confounds the traditional distinction made by Berry and Berry (1990) between external and internal determinants of policy decisions. Indeed, it shows that *external* policies can subsequently *affect* internal determinants (e.g. public opinion or interest group engagement).[8]

What are the political and policy implications of these intergovernmental policy feedbacks on interest group politics? In addressing this question, policy diffusion is the logical place to start. Building on seminal work from Crain (1966), diffusion has been the core theoretical and empirical framework by which scholars have analyzed political and policy interdependence across the US federal system (e.g. Berry and Berry 1990; Gray 1973; Shipan and Volden 2008). The empirical framework of policy diffusion scholarship, where scholars examine the effect of policy passage in one federal unit on the likelihood of passage in another, aligns with existing theoretical mechanisms of policy interdependence in the literature. As I discuss above, the

[8]To this end, earlier work from Walker (1969) emphasized that state policy decisions would likely be related to both internal and external drivers.

mechanisms of learning, competition, and firm preferences for unified standards all promote policy diffusion.

The intergovernmental feedbacks studied here can also lead to policy diffusion. An organized interest that benefits and draws resources from a policy adopted in one state might leverage those resources to advocate for the adoption of that same policy elsewhere. But organized interests might also respond to varying political (e.g. liberal versus conservative states), institutional (e.g. state or national government), and economic environments by advocating for different policies in different locales. As a result, policy feedback can also produce a wider range of intergovernmental policymaking outcomes (beyond diffusion) depending on how organized interests deploy their resources across the federal system. Studying these effects therefore requires attention to the engagement of organized interests (e.g. lobbying, campaign contributions, etc.), and attention to the total political implications of organized group engagement. The empirical portion of the paper follows this framework by examining how state policies affect interest group engagement, and ultimately policy and political outcomes, in other states in the case of rooftop solar policy.

To be clear, the theoretical argument suggests policy feedback mechanisms can operate *in addition to*, not *instead of*, conventional diffusion mechanisms of learning and competition. Therefore, in the empirical analysis, I do not aim to show that mechanisms of learning and competition have been absent (and I do not believe they have), but rather to show that mechanisms of cross-state policy feedback have played an important role in the politics of rooftop solar.

State Policy and the Rise of Rooftop Solar

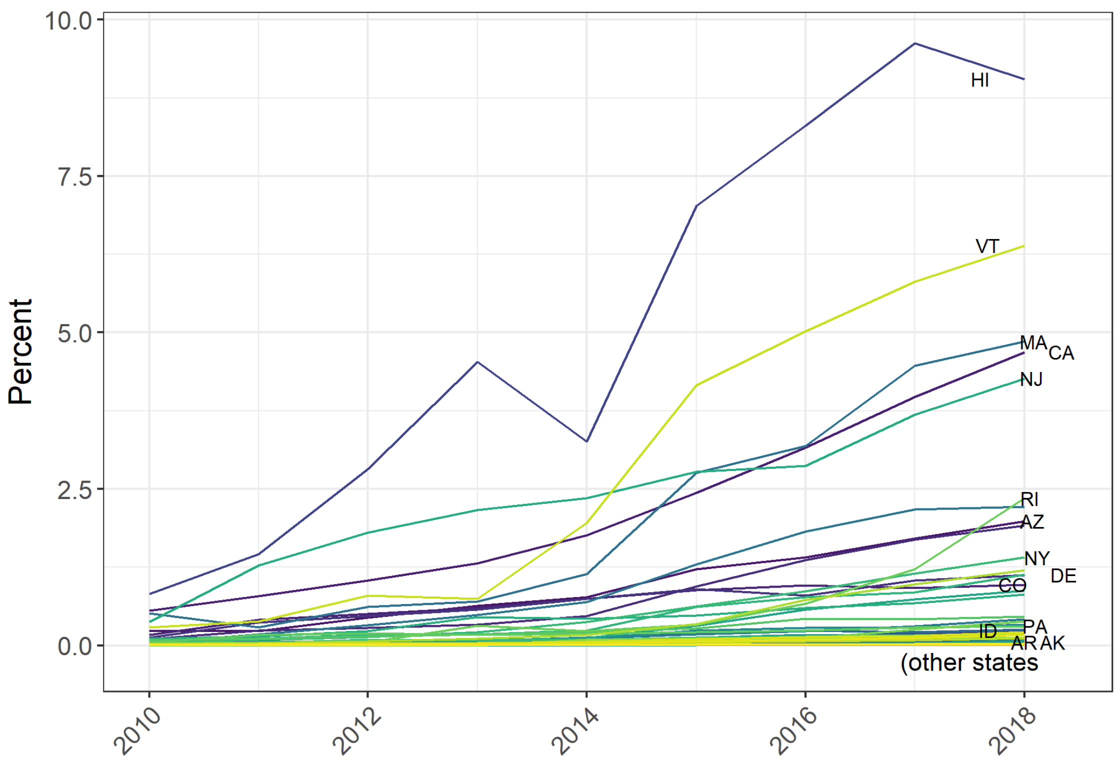
Distributed and rooftop solar has grown rapidly over the past decade. According to the U.S. Energy Information Administration (EIA), capacity increased from just under 1700 megawatts (MW) in 2010 to nearly 25000 MW in 2019. While this is still just a small fraction of generation capacity overall, in 2016 it accounted for fully 12 percent of new capacity additions, and analysts expect the industry to continue to grow rapidly over the next several decades (Annual Energy Outlook 2019). Rooftop solar now is seen by many climate advocates as a key piece of the energy transition.[9]

While the role of technological advance should not be understated—the price of solar panels has fallen exponentially, from 100 dollars per watt in 1975 to 10 dollars per watt in 1990 to under 1 dollar per watt in 2015 (Kavlak, McNerney, and Trancik 2018)—policy has played a key role at each step. Government R&D policy drove advances in technology, and deployment policy has driven cost declines through economies of scale and learning-by-doing (Ibid.). At the federal level, the most important market-stimulating policy for rooftop solar has been the Solar Investment Tax Credit (ITC). The ITC, enacted in 2006 and extended multiple times (most recently in 2015), provides a tax credit for the installation of both utility-scale and distributed solar systems. Solar advocates view the ITC as a critical component of solar energy's growth (Solar Investment Tax Credit (ITC) 2019).

[9] See, for instance, Jay Inslee's Evergreen Economy Plan.

But the growth of rooftop solar depends perhaps even more fundamentally on favorable state-level policies. Historically, states have taken the lead in shaping electricity generation, transmission, and distribution systems through policy and regulation (B. Rabe 2008). States have promoted rooftop solar through pricing policy, interconnection rules, rebates and tax credits, as well as mandates that utilities draw a determined amount of power from distributed sources. The importance of state policy to rooftop solar growth has led to enormous variation across the states, as demonstrated by Figure 1. Notably, many of the leading states like Vermont and New Jersey are not particularly sunny—but have pro-solar policies.

Figure 1: Distributed solar capacity as percent of total generation capacity by state (EIA)



Perhaps most politically controversially (at least in recent years), leading states have improved the economics of solar adoption by specifying how utilities must value the electricity produced "behind the meter" by distributed solar systems. Solar advocates generally support Net Energy Metering (NEM) pricing, which requires utilities to credit rooftop solar owners for the electricity they provide to the grid, and allow rooftop solar owners to draw upon those credits when they demand more electricity than they are producing (e.g. at night). Utilities generally support pricing regimes that value electricity produced "behind the meter" at (lower) rates closer to wholesale.

The Effect of State Policy on Rooftop Solar Growth

What is the relationship between state policies and rooftop solar growth? To address this question, I match solar capacity data from the U.S. Energy Information Administration (EIA) to data measuring the favorability towards distributed solar of each state's policy. Data on solar policy comes from the website *Freeing the Grid*, which is managed by two pro-distributed solar interest groups: *VoteSolar* and *Interstate Renewable Energy Council*. From 2007 to 2017, these groups graded state-level NEM and interconnection policies from F (anti-solar) to A (pro-solar). I average grades across these two dimensions to produce a measure from 1-5 of distributed solar policy favorability.[10] Variation in this measure across the states and over time is presented visually in the appendix. To measure solar capacity, I use EIA data available starting in 2010.

Two-way fixed effects and multilevel models are used to investigate the association between policies and rooftop solar growth for the 50 states from 2011 to 2017. These panel regression models account for potential confounders within years and states, and also account for concerns of reverse causation. Specifically, I model logged *increase* to rooftop solar capacity in state *s* and year *t* as a function of policy in state *s* at the start of year *t*. [11]

Results are presented in Table 1. Estimates from the two-way fixed effects model presented in column (1) suggest that, within states, a one-level change in policy is associated with a 17 percent increase in solar growth. Column (2) presents results from a multilevel model that allows for incorporation of state-level, time-invariant variables. Specifically, I model a state's solar resource,[12] GDP per capita, and electricity prices. The multilevel model yields similar estimates as the fixed-effects model. Altogether, the empirical analysis supports the view—widely shared by those in the field—that state policy is a crucially important factor driving distributed solar growth.

[10] Other state policies might also influence rooftop solar growth. This procedure is meant to produce broad measure of a state's approach towards distributed solar. Measurement error would generally make it more difficult to detect effects in this analysis.

[11] I add a constant of 5 to the distributed solar growth variable to reduce the number of negative values that cannot be logged. Results are robust to excluding negative observations, as demonstrated in Appendix Table A1.

[12] To measure solar resource, I use the National Renewable Energy Laboratory's estimates of average solar energy potential per meter-squared multiplied by a state's land area.

Table 1: Association between state policy and distributed solar growth

	Distributed solar growth (logged MW)	
	Fixed effects	*Multilevel model*
	(1)	(2)
Policy favorability (1-5)	0.17**	0.19***
	(0.08)	(0.06)
Solar potential		0.39***
		(0.11)
GDP per capita		0.04***
		(0.01)
Electricity price		0.10***
		(0.03)
Observations	339	332

Note: *p<.1 **p<.05 ***p<.01. Panel covers 50 states from 2011 - 2017. Reduced observations in column 3 reflects missing solar potential data for Alaska.

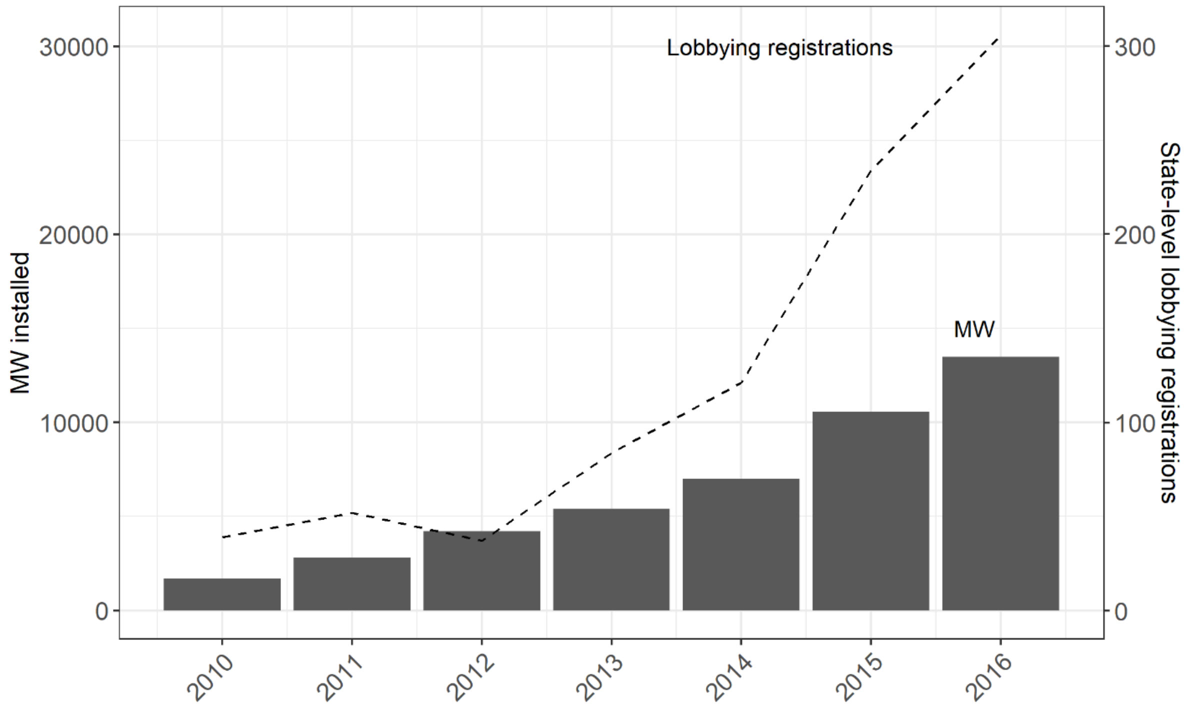
Rooftop Solar Growth and the Emergence of New Political Interests

The rise of rooftop solar has created new business opportunities and interests along an entire supply chain from manufacturing to installation, but large installers have been particularly politically active. Installers' key role is driven by two main factors. First, unlike manufacturers, the largest installers are domestic. Second, installation is highly labor intensive (The Solar Foundation 2018), which gives installers greater political leverage.

In the early 2000's, with the industry still undeveloped, installations were generally carried out by small, regional firms. Starting around 2007, several VC-funded firms entered the market offering "solar as a service" (Wesoff 2010). In this model, customers could lease third-party owned (TPO) systems instead of purchasing large systems outright, paying TPO installers, not utilities, for electricity. Notably, the major TPO installer firms emerging in this period—Sunrun and SolarCity—came out of California, where their business was bolstered by the California Solar Initiative, a large incentive program that ran through 2016. The industry's fast growth in the early 2010's was driven by the expansion of these large installers. For instance, Sunrun was active selling systems in just 7 states as of 2010, but by 2015 was operating in 15 states, and by 2019 was selling systems in 22 states.

As Figure 2 demonstrates, the period of economic expansion for large solar installers has also coincided with greater *political* engagement. From 2010 to 2016, the number of state-level lobbying registrations from installers that lobbied independently over the period (Sunrun, SolarCity, Vivint Solar, SunEdison, and SunPower) grew from under 50 to over 300.[13]

Figure 2: Distributed solar installations and state-level lobbying. Dashed line represents total state-level lobbying registrations from installers that lobbied independently over the period (Sunrun, SolarCity, Vivint Solar, SunEdison, and SunPower). Bars represent total U.S. MW of distributed solar.



Rooftop solar has grown despite opposition from incumbent electric utilities. Although models vary across the states, electric utilities generally profit by delivering power through transmission and distribution systems to customers. If customers are able to procure power more cheaply from solar panels on their roofs (whether the customer or a solar installer owns the panels), utilities' investments in grid infrastructure become less valuable.

Utilities for the most part acquiesced to the diffusion of NEM across the country in the late 1990's and early 2000's since, even with favorable pricing policies, the high cost of solar panels ensured rooftop solar would not threaten their business (Stoutenborough and Beverlin 2008). However, with solar panel costs dropping rapidly and the emergence of TPO installer firms in the early 2010's, electric utilities began leveraging their long-standing political sway to push

[13] SolarCity was acquired by Tesla in 2016, making patterns more difficult to track starting in 2017.

back. In efforts to retrench NEM and block the expansion of pro-rooftop solar policies,[14] utilities have in some cases partnered with fossil fuel, manufacturing, and conservative interests (Stokes 2020; Stokes and Breetz 2018). Despite its vast resources and connections, this coalition has met mixed success. Growth slowed, but was not halted, in states like Arizona where utilities successfully rolled back NEM—and utility victories were soon reversed in Nevada and Maine.

The Cross-State Feedback Effects of Solar Policies

One reason for utilities' mixed success is the feedback effects of prior policies that spurred the rooftop solar industry's growth. As the industry has grown, large installers have developed political operations capable of challenging utilities (even if they cannot match utilities' financial resources). Moreover, I argue that, in addition to "feeding back" into the politics where they are adopted, state policies have also "fed into" the politics *in other states* due to the horizontal mobilization of installers. Since the causal process is somewhat complicated, I first present a short illustrative case before presenting quantitative data indicating that the dynamics observed in the case are systematic.

Sunrun's Venture to South Carolina

South Carolina was a distributed solar laggard up until recent years. In 2014, South Carolina's NEM policy was given an "F" by the pro-solar website *Freeing the Grid*, and its interconnection policy was given a "D". That year, local environmental and clean energy groups worked with major utilities to draft new distributed solar legislation. Early versions of the bill, which featured a buy-all sell-all provision[15] and allowed utilities to use their monopoly status to dominate the solar market, were not seen as particularly favorable to distributed solar.

Sunrun intervened late in the process, mounting a lobbying and social media campaign advocating for several distributed solar-friendly revisions to the bill. Notably, Sunrun was not, at the time, selling systems in South Carolina. Rather, Sunrun's business depended on strong growth in states with favorable policy environments. At the time Sunrun was only active in states rated by *Freeing the Grid* as "A" or "B" for both NEM and interconnection policy, for an average overall score on a 1-5 scale of 4.6 (the average elsewhere was 3.0). Sunrun's intervention, while criticized by the utilities, likely had an effect. Favorable provisions like dedication of incentives to distributed solar were added to the bill, while options for utilities to meet targets through direct procurement were struck. To be sure, at the same time, the bill's success also depended fundamentally on prior work and negotiations with utilities from South

[14] NEM opponents generally argue that the policy produces a cross-subsidy from general ratepayers to owners of rooftop solar systems, although estimates of the size of the subsidy are disputed and depend on the amount of distributed generation on the grid (Barbose 2018).

[15] In buy-all sell-all systems, customers with distributed solar sell power to the grid at one rate and buy it back at another (generally higher) rate. This lowers the economic return of distributed solar relative to NEM.

Carolina environmental groups like Coastal Conservation League and Conservation Voters of South Carolina.[16]

With the new legal environment in place, Sunrun prepared to enter the market. In early 2015, Sunrun hired a lobbyist with a strong background in conservative Southeast politics (serving, for instance, as Lindsey Graham's political director in the 2014 cycle) to represent them in South Carolina and other states in the Southeast—their first Southeast-based policy hire. Sunrun's summer of 2015 entry, coupled with the new policy regime, spurred rooftop solar growth from just 6 MW at the end of 2015 to 127 MW by the end of 2017. As rooftop solar's economic presence grew, so did its lobbying presence. The number of dollars spent by the industry (excluding lobbying through broader solar trade associations) grew from 0 in 2013 to over 150,000 in 2017. From 2014 to 2017, South Carolina's *Freeing the Grid* NEM score went from "D" to "B"; its interconnection score went from "F" to "A". Moreover, rooftop solar growth precipitated an expansion of the coalition beyond long-standing environmental groups and emergent rooftop solar companies, with groups like VoteSolar and Solar Energy Industries Association (SEIA) developing a greater political presence.

The coalition of emergent clean energy interests and existing environmental groups has been crucial to defending and expanding the new policy regime. Utilities started hitting NEM caps in 2018,[17] far earlier than lawmakers and advocates had predicted. Solar advocates promoted a bill in the 2018 legislative session that would extend the cap indefinitely, but the utilities mounted an aggressive campaign against the bill. The bipartisan bill received majority support, but ultimately was not able to pass a procedural vote that required a 2/3 majority. The coalition of solar and environmental advocates regrouped in the 2019 session. While they were badly outspent by utilities in the 2018 cycle, in 2019, according to one solar advocate, the number of lobbyists representing each side was approaching parity—with Sunrun playing a major role particularly in highlighting the job-creation benefits of distributed solar.[18] The Republican Speaker of the House, perhaps not wanting to preside over another tough legislative battle that would divide his caucus, encouraged members to reach a deal. The Energy Freedom Act, which would eliminate the NEM cap in addition to promoting solar energy through other provisions like raising the maximum size of leased systems, passed unanimously in 2019.

Installer Growth and Horizontal Mobilization

In this section, I explore the extent to which the dynamics documented in the case of South Carolina are systematic. More specifically, I ask: to what extent is installer political activity in particular states related to installer economic growth in those states—and to what extent is installer political activity in particular states related to installer economic growth *outside* of those states?

[16] Interview with SC solar advocate, 8/23/2019; interview with SC solar advocate, 12/7/2020; interview with SC solar lobbyist, 11/4/2020.

[17] Many NEM policies, including the one in SC at this time, capped the total number of MW that would be eligible for NEM pricing for each utility. Once they hit caps, utilities would no longer be obligated to offer NEM pricing to customers.

[18] Interview with SC solar advocate, 8/23/2019; interview with SC solar advocate 12/7/2020.

To evaluate these questions, I match lobbying data from National Institute on Money in State Politics (NIMSP) to solar installation data from the U.S. Energy Information Administration (EIA), which I use to measure economic activity. According to NIMSP, only 5 installer firms lobbied state governments independently between 2015 and 2017: Sunrun, SolarCity, Vivint Solar, SunEdison, and SunPower. [19] These were also the top 5 firms by installed TPO capacity as of 2015. The analysis focuses on the relationship between installations and lobbying activity for these firms.[20] I should note that some smaller firms were politically active via membership in Solar Energy Industry Association and local industry groups, but this activity cannot be systematically documented.

NIMSP collects two types of lobbying data at the state-year level: total firm-level lobbying expenditures and firm-level lobbying registrations. While lobbying expenditures is a preferable measure, it is only available for 15 states from 2015 through 2017 (depending on state lobbying regulations). Lobbying registration data, on the other hand, is available over the full set of states. These data record the number of registered lobbyists who lobbied on behalf of a particular firm. The measures of lobbying expenditures and registrations are highly correlated ($\rho = .48$).

To measure installations, I use data available starting in 2015 recording the total third-party owned (TPO) capacity for each of the major installers.[21] Although it introduces some measurement error, TPO capacity provides a useful measure of a firm's economic activity since 1) over this period TPO capacity comprised a significant portion of total distributed solar installs (above 50% each year between 2012 and 2016), and 2) TPO development was an important piece of each of the firms' business models over this period.

I model lobbying activity for firm i in year y and state s as a function of 1) installed generation capacity for firm i in year y and state s; and 2) installed generation capacity outside of state s for firm i in year y.[22] The model includes a linear time variable to account for broader trends like growth in lobbying from distributed solar. I estimate multilevel models with random effects at the firm, state, and year levels to account for the hierarchical structure of the data. In column (1) of Table 2, the outcome variable is a binary measure of *whether* a firm lobbied in a particular state-year (e.g. had at least one lobbying registration).[23] In column (2), the outcome

[19] Rooftop solar firms have been much more active lobbying than contributing to political campaigns.

[20] SolarCity and Sunrun also lobbied through separate associations that they led. Up until 2015, Sunrun and SolarCity both lobbied through The Alliance for Solar Choice (TASC). In 2015, SolarCity split from TASC, forming the Energy Freedom Coalition of America (EFCA). In the main analysis, I code lobbying from TASC as Sunrun lobbying and lobbying from EFCA as SolarCity lobbying. Results are robust to excluding these organizations.

[21] Total installed capacity is not publicly available.

[22] In this setup, the firm-level variation in out-of-state capacity, conditional on in-state capacity, is determined by a firm's *overall* capacity across the states.

[23] I use OLS in this case to estimate a linear probability model (Angrist and Pischke 2008). Results are robust to logistic regression specification.

variable is the total number of lobbying registrations attributed to a particular firm (in a state-year). For this specification, I estimate a negative binomial model since the outcome is an over-dispersed count variable (Greene 2008). Finally, in column (3), the outcome is logged lobbying expenditures for the limited sample of states for which these data are available.

Table 2: Association between distributed solar capacity and lobbying within and across states

	Lobbying presence	Lobbying registrations	Lobbying dollars (logged)
	OLS	*Neg. Binomial*	*OLS*
In-state capacity (logged Mw)	0.08***	0.47***	0.71***
	(0.01)	(0.09)	(0.18)
Out-of-state capacity (logged Mw)	0.05**	0.48***	0.85**
	(0.02)	(0.18)	(0.38)
Observations	466	466	214

Note: *p<.1 **p<.05 ***p<.01. Years covered: 2015 - 2017. Coefficients from multilevel models with random effects at firm, state, and year levels.

Across specifications, results, presented in Table 2, indicate that firm lobbying in a state is increasing in its installed TPO capacity in that state *and* its installed capacity in other states (for a given year). The coefficients in column (1) indicate that a doubling of in-state capacity is associated with an 8-percentage point increase in the likelihood of an installer lobbying, while a doubling of out-of-state capacity is associated with a 5-percentage point increase likelihood of an installer lobbying in any particular state. Results from the negative binomial model also indicate that both in-state and out-of-state capacity matter for lobbying. The coefficient of .47 in column (2) suggests that a 1 percent increase in in-state capacity installed for a firm is associated with a .47 percent increase in number of retained lobbyists in that state (and a doubling in within-state capacity is associated with a 39 percent increase in number of retained lobbyists); the coefficient of .48 indicates that a 1 percent increase in out-of-state capacity is associated with a .48 percent increase in number of retained lobbyists in a given state (while a doubling in other-state capacity is associated with a 40 percent increase in number of retained lobbyists). I recover consistent results in the limited sample of states using logged lobbying expenditures as the outcome in a linear model. The coefficients suggest that a doubling of in-state capacity is associated with a 71 percent increase in lobbying expenditures, while a doubling of out-of-state capacity is associated with an 85 percent increase in lobbying expenditures in any particular state.

By showing that firm lobbying in any particular state depends on firm economic strength both within that state and across the states, these findings also suggests that *policy* in one state affects *lobbying* in another. That's because state policy affects installer business growth (see Table 1), which in turn drives installer lobbying across the states due to the horizontal mobilization of firms.

A particularly important case of cross-state feedback is where firms apply growth in states with favorable policy environments to seek to shape policy in potential new markets. To examine this dynamic, I track the economic and political (lobbying) presence across the states over time for the two largest and most politically active rooftop solar firms over the period: Sunrun and SolarCity. As illustrated by Table 3, both firms significantly expanded their political and economic presence from 2014 to 2016. While there is certainly significant overlap in the states where the firms were economically and politically active, both firms hired lobbyists in a number of states in which they were not selling systems. In 2016, for instance, SolarCity lobbied in 10 states in which it was not actively selling systems; Sunrun lobbied in 11 states where it did not have an economic presence. In many cases, these firms hired lobbyists *in advance* of economic expansion to particular states (Sunrun, as of 2020, operated in 4 of the 11).

Table 3: The Economic and Political Expansion of Sunrun and SolarCity

		2014	2015	2016
SolarCity	**SELLING**	AZ, CA, CO, CT, DE, HI, MA, MD, NJ, NV, NY, OR, PA, TX, WA	AZ, CA, CO, CT, DE, HI, MA, MD, NJ, NH, NM, NV, NY, OR, PA, RI, TX, VT, WA	AZ, CA, CO, CT, DE, FL, HI, MA, MD, NH, NJ, NM, NV, NY, OR, PA, RI, SC, TX, UT, VA, VT, WA
	LOBBYING	AZ, CA, CT, MA, MN*, NJ, NY, OH*, OK*, UT*, VA*,	AZ, CA, CO, CT, HI, IL*, MA, MD, MI*, MN*, NJ, NM, NV, NY, OK*, OR, PA, RI, SC*, TX, VA, WA	AZ, CA, CO, CT, FL, HI, IA*, IL*, KY*, LA*, MA, MD, ME*, MI*, MN*, NH, NJ, NM, NY, OH*, OK*, PA, RI, TN*, TX, VA, WA
Sunrun	**SELLING**	AZ, CA, CO, CT, HI, MA, MD, NJ, NV, NY, OR, PA,	AZ, CA, CO, CT, DE, HI, MA, MD, NH, NJ, NV, NY, OR, PA, SC	AZ, CA, CO, CT, DE, HI, MA, MD, NH, NJ, NV, NY, OR, PA, SC
	LOBBYING	AZ, CA, CT, HI, MA, NJ, NY, RI*, WA*	AZ, CA, CT, HI, IL*, MA, ME*, MI*, MN*, NH, NJ, RI*, SC, WA*, WI*	AZ, CA, CT, HI, IL*, IN*, LA*, MA, MD, ME*, MI*, MN*, MS*, NH, NJ, NY, RI*, SC, TN*, UT*, WA*, WI*

Note: *Denotes states where firms lobbied without actively selling systems. Data from firm websites and NIMSP.

The Policy Effects of Cross-State Feedback

I now turn to the policy consequences of installer political engagement in the states. Estimating the influence of lobbying is a difficult enterprise (Anzia 2018; Baumgartner et al. 2009) . Though organized interests are widely understood to be influential (Gilens and Page 2014), studies of interest group lobbying often estimate null effects (Baumgartner et al. 2009; Baumgartner and Leech 1998). The empirical approach I take has advantages over prior approaches since it leverages variation in policy outcomes both across states (Anzia 2018) and over time.

I rely on data previously discussed from *Freeing the Grid* measuring the favorability of state distributed solar policies on a 1-5 scale, as well as data from NIMSP on the lobbying activity of large distributed solar firms. I model policy in state *s* and year *t* and as a function of the number of firms lobbying in state *s* and year *t-1*, and use two-way fixed effects panel regression to adjust for state-specific and year-specific confounders.

Results are presented in Table 4. Across specifications, I find that firm lobbying is statistically significantly associated with policy favorability. The coefficient of .11 in column (1) suggests that the presence of an additional firm lobbying is associated with an increase of .11 in favorability of state policies in the following year (on a 1-5 scale). Column (2) presents results from a specification that also includes a measure of rooftop solar capacity at the state-year level. That the coefficient on firm lobbying remains roughly the same suggests the observed association is not driven by underlying industry growth. Finally, in column (3), I interact the number of firms lobbying with state-level rooftop solar capacity to explore how the effect of firm lobbying varies according to the degree of economic penetration of rooftop solar in a state. The negative, and statistically significant, coefficient on the interaction term suggests that the effect of firm lobbying on policy is greater in states with smaller presence of rooftop solar industry. This indicates that the behavior documented in the prior section of firms lobbying in states where they do not yet operate is particularly important for policy decisions.

Table 4: Rooftop solar firm lobbying is associated with pro-distributed solar state policy

	State policy score (1-5)		
	(1)	(2)	(3)
Number firms lobbying	0.11***	0.10**	0.20***
	(0.04)	(0.04)	(0.05)
Distributed solar capacity (logged MW)		0.10*	0.07
		(0.06)	(0.06)
Number firms lobbying * distributed solar capacity			−0.07***
			(0.02)
Observations	349	349	349

Note: Coefficients from panel regression models with state and year fixed effects. Years covered: 2011 - 2017. *p<.1 **p<.05 ***p<.01.

Discussion

To summarize, I have shown that: 1) favorable rooftop solar policy leads to rooftop solar industry growth, 2) rooftop solar industry growth leads to greater lobbying from rooftop solar industry *both* in the states where growth takes place as well as in other states, 3) rooftop solar firms have in a number of cases sought to influence policy in states where they are not yet active, and 4) installer lobbying is associated with more favorable policy, particularly in places where the industry has less of an economic presence. Taken together, the empirical analyses trace out a causal process whereby adoption of favorable rooftop solar policies in leading states affected the interest group politics—and ultimately policy decisions—in other states.

Of course, the empirical analysis is not without its limitations. In particular, establishing causal inference in policy feedback and interest group influence research is a major challenge (Anzia 2018; Campbell 2012). In this case, neither policy enactment nor interest group lobbying is randomly assigned, nor are there apparent natural experiments to leverage. Yet, by bringing together a multitude of both state- and firm-level data, this paper provides evidence in support of the proposed theoretical framework, and an empirical setup on which scholars working across different policy areas can build.

In addition, the evidence presented does not rule out that traditional diffusion mechanisms of learning and competition have also shaped state-level rooftop solar policy and politics. It clearly demonstrates, however, that these traditional mechanisms *are not the whole story*. An analysis of interdependent policymaking in this case that failed to consider the effects of state policies on the resources installers had at their disposal to engage politically in other states would be incomplete. Moreover, it is likely that the dynamics of cross-state policy feedback on interest group politics studied here can also serve to *facilitate* mechanisms of learning and competition. For instance, when installers lobbied in states where they had yet to establish an economic presence, they likely initiated a learning process among state lawmakers.

Future research building on this paper might seek to refine methods for distinguishing the types of policy feedback spillovers explored here from traditional diffusion mechanisms. The standard policy diffusion designs are limited in their ability to parse mechanisms (Gilardi and Wasserfallen 2019), and the feedback dynamics studied here will not always lead to diffusion (the spread of particular policies) in a strict sense. Broadly speaking, studying intergovernmental policy feedback in a federal context requires close attention not just to patterns of policy adoption in different units, but also to the political engagement of organized interests across the federal system. Scholars might pay particularly attention to two particular types of groups: first, groups with federated structures that can swiftly leverage resources from one jurisdiction to influence policy in another; and second, business interests seeking to expand.

Studying the intergovernmental effects of policies on interest group politics also likely requires examinations over longer periods of time than conventional policy diffusion approaches. Diffusion mechanisms like learning and competition might manifest quickly—since they depend only on the beliefs of lawmakers—while the intergovernmental feedbacks studied here depends on long-run shifts to interest group systems. Indeed, the case of rooftop solar examined here is likely an outlier in the speed by which state policies gave rise to new interests.

By adopting this empirical approach, scholars can further extend the theoretical framework developed in this paper. A natural extension is vertical policy feedback (e.g. how state policies affect national politics). The organized interests that benefit from, and are strengthened by, particular state-level reforms might, in addition to advocating for the propagation of those reforms across the states, advocate for the national-level adoption of those or aligned reforms. These effects have likely been limited in the case of distributed solar, where key decisions are made at the state level. Indeed, while SolarCity, Sunrun, Vivint, SunPower, and SunEdison spent just under 9 million dollars lobbying in the 15 states that collected expenditure data between 2015 and 2017, they collectively spent just 2.25 million dollars lobbying the federal government over the same period (NIMSP and Center for Responsive Politics). But there is some anecdotal evidence that the growth of the distributed solar lobby, driven in part by state-level decisions, has been important to the national politics of issues like tariffs on solar panels and the Solar Investment Tax Credit (e.g. House letter to the USITC 2017).

Future research might also consider the conditions under which strategic actors intentionally leverage state policy as a political tool in building a political coalition for broader reform—or seeking to dismantle opposing organized interests (Hertel-Fernandez 2018). Importantly, politicians often face a collective action problem in their efforts to use policy for political gain. Even when a broader party or interest group benefits from a particular policy, individual lawmakers can have incentive to defect (Anzia and Moe 2016). This collective action problem is particularly pronounced for politicians seeking to use state policy for national-level political gain (Trachtman 2020b). As a result, we might expect federated groups with political operations across sites and levels of government to be most equipped to strategically harness dynamics of intergovernmental policy feedback (Hertel-Fernandez, Skocpol, and Lynch 2016; Trachtman 2020).

While this paper demonstrates the force of intergovernmental feedbacks on interest group politics, these mechanisms are likely more limited in other cases. The aggressive growth strategy of installers, combined with the crucial role of state policy in driving growth, provided a strong incentive for installers to mobilize politically across the states. At the same time, even as rooftop solar firms have mobilized, incumbent electric utilities have been able to prevent pro-solar reforms across a number of states, and in some cases, roll them back (Stokes 2020). Forward-looking incumbents engaged across sites and levels of government in the federal system can, in this way, use the political system to prevent competitors from gaining strength. Moreover, in policy areas like immigration or marriage equality, where subnational policy decisions are less likely to engender major shifts in the broader interest group landscape, we are unlikely to observe strong policy feedback spillovers operating through organized interests.

But at the same time, there are a broad swath of policy issues for which the mechanisms I explore here are likely quite relevant. Indeed, the emergence of supportive interests with a stake in new policy regimes is a fundamental feature of sustainable policy reforms (Patashnik 2008). These mechanisms are particularly relevant to the politics of the energy transition, where liberal-leaning states have led the way, but where there are significantly more greenhouse gas emissions to be abated in conservative-leaning areas. While rooftop solar is just a small piece of the energy transition, similar ideas apply to other elements like utility-scale renewables and energy efficiency (Meckling and Hughes 2018; Trachtman 2019). In general, policy feedbacks in energy governance tend to be quite powerful, since policies that replace fossil fuel infrastructure with clean energy infrastructure also replace fossil fuel *interests* with clean energy interests (Bernstein and Hoffmann 2018; Meckling et al. 2015).

More broadly, states play important regulatory roles across a number of policy areas, and their decisions can affect the *political* resources of organized interests active (or potentially active in the future) in other states. For instance, in the education system, state policy has been instrumental to the steady growth of charter schools in recent years, which in many states and districts now pose a meaningful challenge to the traditional public-school model—as well as to the teachers unions that draw strength from that model. As charter schools have grown, so has the charter school lobby, as wealthy foundations have allied with charter networks to push forward policies across the states, and also in local and federal politics (Henig, Jacobsen, and Reckhow 2019) .

The general scope conditions for these types of effects are quite broad. Subnational policies must give rise to new organized interests (in this case rooftop solar installers) or significantly influence the capacities of existing interests. And the organized interests affected by subnational policies must leverage newfound strength to mobilize horizontally across the federal system. Though this paper focuses specifically on the effects of state policies on business interests, elements of the proposed perspective also likely apply to other types of organized interests (e.g. unions and citizens groups), as well as to subnational jurisdictions apart from the US states (e.g. cities and non-U.S. federal systems).

There are reasons to think, in addition, that these types of dynamics are at play even in some areas where we do not observe shifts to policy or interest group landscapes: they can be baked into the status quo. The period of rooftop solar policy and politics I study saw massive policy and interest group changes over a relatively short period of time, which renders the dynamics of policy feedback across the states highly visible. Similar mechanisms, though, can enforce policy *stability* across the federal system. Many powerful organized interests draw strength from policies in place in jurisdictions across the federal system and use their resources to block threatening policies at multiple sites and levels of government (Moe 2011). These dynamics are difficult to study since they tend to lead to non-action. But studying policy areas in flux like rooftop solar can provide insight into forces of stability.

State Policy and National Representation: Marijuana Politics in American Federalism

Members of Congress represent geographically demarcated districts embedded in subnational policy environments. Drawing on policy feedback literature and literature on congressional representation, I argue that, because of this institutional configuration, subnational policy adoption can affect national representation. More specifically, policy reforms in the states they represent can increase pressures members face from organized groups and individuals in their constituencies to promote aligned federal policies. Empirically, I examine the effects of state marijuana legalization. The inferential design leverages differences across the states in statewide citizen initiative institutions, which provides exogenous variation in legalization. Instrumental variables analysis indicates legalization influenced pro-marijuana bill sponsorship and roll calls in the 116th Congress. The evidence points to growing influence of industry in legalizing states—including the ability to mobilize employees and customers—as the key mechanism, thus underscoring the importance of a political economy perspective for studying interdependencies in American federalism.

During his tenure in the Senate (2015-2021), Cory Gardner (R-CO) became a central figure in federal marijuana policy. In 2018, Gardner vowed to block judicial nominees in the Senate until he received a commitment that the federal government would not prosecute marijuana industry (Everett 2018). In the 116th Congress, Gardner sponsored core marijuana-related legislation including the SAFE Banking Act and the STATES Act.

Gardner was not always so pro-marijuana. He opposed Colorado's landmark 2012 ballot initiative legalizing marijuana for adult-use (Birkeland 2019), and there is little in his record prior to 2012 that would indicate he would become an important marijuana proponent. At a basic level, Gardner's pro-marijuana turn appears to be driven by a policy shift in the state he represented. The adoption of adult-use legalization in 2012 led to rapid marijuana industry growth in Colorado, which, as of 2018, took in the most industry revenue per capita of any state. The industry, according to journalist accounts, has gained leverage in Colorado politics, compelling even conservative politicians like Gardner to support industry demands (Fertig 2020; Herndon 2018).

That a policy shift in the state of Colorado might affect the future politics—in this case by shaping the behavior of a member of Congress—accords broadly with the notion of policy feedback, whereby "policy, once enacted, restructures subsequent political processes" (Skocpol 1992, 58). Yet, these dynamics do not fit cleanly within existing policy feedback frameworks for two reasons. First, the policy feedback studies that investigate lawmaking as an outcome tend to rely on broad historical institutional analysis of qualitative data (e.g. Patashnik 2008; Pierson 1994)—not micro-level, quantifiable examinations of lawmaker behavior. While, more recently, the policy feedback literature has taken a micro-level turn, research in this vein has focused on the effects of policies on *individual-level* behavioral outcomes like turnout and attitudes (see Campbell, 2012 for a review), not the behavior of lawmakers. As a result, we have accumulated much quantitative evidence on how policies affect voters, and to a lesser extent, interest groups, but little on how it matters for lawmaking and public policy decisions. The second reason has to do with how policy feedback mechanisms operate within the federal system of American government. Classic studies of policy feedback examine the political implications of national policies, with scholars only more recently turning their attention to the subnational level. Most of this subnational-level work examines the effects of state policies on the politics in the states they were adopted. In this paper, I argue that state policy decisions can also affect how states and districts are represented at the national level.

Broadly speaking, this is because members of Congress represent geographically demarcated units that are embedded in state policy landscapes, and these policy landscapes affect the political pressures that they face. First, state policies structure state economies, and in so doing can affect the ability of organized economic interests to engage in politics and make demands on their representatives. Second, state policies can affect the mobilization and preferences of individual voters, and thereby condition the pressures faced by re-election seeking members. Finally, beyond potentially shaping preferences, state policy enactment might send a *signal* of constituent preferences that can be difficult for members of Congress to ignore. Put together, these mechanisms suggest the adoption of a policy at the state level can increase the pressure on members of Congress to promote aligned federal policies.

Empirically, I examine marijuana policy reform, a case that provides critical analytical leverage for testing the argument. The wave of state-level legalization over the past two decades has produced great variation in policy landscapes across the states. Moreover, the importance of the statewide citizen initiative—only available in 24 of the states—for passing legalization provides exogenous variation that allows for causal estimation of the effect of state policy shifts on representation in Congress.

Does marijuana legalization in the states they represent affect members' behavior in Congress? Studying the 116th Congress, I find evidence that it does. Using whether states permit citizen initiatives as an instrument, I find that members of Congress representing legalizing states were more likely to sponsor or co-sponsor key pro-marijuana pieces of legislation, and also more likely to cast certain pro-marijuana roll-call votes. Bringing quantitative evidence and elite interviews together to investigate mechanisms, I find the most support for the role of growing industry influence in legalizing states, but also find some support for the role of signaling constituent preferences. I find little support for the notion that effects were driven by positive shifts to public favorability wrought by legalization.

Though inability to precisely decompose mechanisms is a limitation, such a decomposition is not critical for the paper's core contributions, which are two-fold. First, this paper provides novel theory and evidence on the ways that the policy terrain affects lawmaking in Congress. Establishing causation using quantitative designs in policy feedback research is notoriously difficult (Campbell 2012). This study is, to my knowledge, the first to leverage a quantitative causal inference design to estimate the effect of prior policy decisions not just on voter behavior or interest group mobilization, but also on the actions of lawmakers in Congress. In doing so, it has the potential to serve as a bridge between work in policy feedback and scholarship on Congress.

Second, this study contributes to a growing body of literature that is fruitfully applying ideas about policy feedback to the study of policy interdependence and diffusion in American federalism. While recent work has illuminated how state policies can "feed into" the interest group politics in other states and at the national level (Finger and Hartney 2019; Meckling and Trachtman 2021b; L. Stokes 2020; Trachtman 2020a), this study explores how state policy decisions shape the politics in Congress. In doing so, it demonstrates the importance of federalism as an institution that structures policy and political change over time in American politics.

The paper unfolds as follows. First, I develop the core theoretical framework linking state policy decisions to representation in Congress. I proceed to introduce the case—the politics of marijuana—and the design for estimating the causal effect of state legalization on the behavior of members of Congress. I next present the main empirical results, discuss the evidence on the contributions of different mechanisms, and conclude.

State Policy and Lawmaking in the U.S. Congress

What determines how members of Congress represent their states and districts? While analyses have highlighted diverse drivers of congressional behavior including ideology (Poole and Daniels 1985) and partisanship (Lee 2009), a consistent finding in the literature is that members represent the preferences of the citizens (Canes-Wrone, Brady, and Cogan 2002) and organized groups (Hall and Wayman 1990) that make up their constituencies.

Individual- and group-level inputs are often taken, in this literature, as exogenous. But these factors, in addition to influencing policy, are also shaped by previously established policy through dynamics of policy feedback. Scholars have identified several mechanisms. Broadly speaking, considering individual behavior, policies both condition the *resources* that individuals can devote to politics and the way they *interpret* the role of government in their lives (Pierson 1993). Considering organized interests, policies can incentivize beneficiaries to form citizens groups to advocate for the preservation or expansion of policies (Campbell 2003). Public policies can also, by changing the rules governing the economy, increase (or decrease) the political capacities of organized economic interests like firms and unions (Mettler 2014).

If policies can affect the behavior of individuals and the landscape of organized interests, and members of Congress are responsive to the individuals and organized interests that make up their constituencies, we might then expect policy feedback dynamics to ultimately influence the lawmaking process. Indeed, classic historical institutional accounts have traced the full policy feedback cycle, showing how previously adopted policies reshaped the politics, and in doing so, affected the decisions of lawmakers decades later (J. S. Hacker 2002b; Pierson 1994). The strength of this historical institutional scholarship is the wide lens and attention to macro-level change. However, this also means that it is more limited for generating expectations about how shifts to policy landscapes might affect the decisions of individual lawmakers. And because more micro-level policy feedback work generally focuses on intermediate outcomes at the voter and interest group levels, we have accumulated little quantitative evidence that captures the full policy feedback cycle.

One important exception is Campbell's (2003) analysis of the relationship between Social Security and senior political participation. While Campbell's seminal account is mainly concerned with the individual and group-level feedback effects of Social Security, one chapter investigates outcomes in Congress, thereby completing the "participation-policy cycle" (pg. 124). Campbell shows that, while Democratic members across the board tended to oppose cuts to programs that principally benefit seniors, Republican members' willingness to vote for program cuts depended in part on the number of seniors in their districts. This analysis provides useful evidence but does not provide a clear-cut test of the core hypothesis that the prior adoption of pro-senior policies affected lawmaker behavior in a future political era. The reason is that we would expect members representing districts with more seniors to vote for more pro-senior policies even in the absence of prior policy adoption driving seniors' political mobilization.[24] Ideally, we would be able to compare the behavior of members representing districts in locales featuring pro-senior policies to the behavior of members representing locales without pro-senior policies. But, because programs like Social Security have national scope, there is limited variation to leverage.

This paper relies on state policy variation for empirical leverage. Scholars of policy feedback are increasingly interested in state policy, and broadly speaking, studies have shown that state policies can produce the same sorts of feedback effects on voters (Clinton and Sances 2018; Michener 2018) and interest groups (Anzia and Moe 2016; Feigenbaum, Hertel-

[24] And to be clear, Campbell does not frame the analysis as a causal test of the effect of Social Security policy on lawmaking, but rather as part of a broader narrative linking the development of senior programs, greater senior participation, and lawmaking.

Fernandez, and Williamson 2018) as national ones. The approach I take here is somewhat different. Instead of examining policies' political implications in the states where they are passed, I examine the national-level political implications. In particular, I focus on how state policy decisions in the places they represent shape lawmakers' behavior in Congress.

There are several reasons why state policy decisions might affect representation in Congress. The first set of explanations I put forward focus on how state policies structure states' political economies. State policy decisions can influence what sorts of economic activities are profitable, and as a result, which types of firms establish and grow—as well as which fail. And while this paper focuses on firms, the same is true of another set of powerful organized economic interests: labor unions. The ability of unions to develop and maintain organizational strength is heavily influenced by state policies like collective bargaining rules and "right-to-work" laws (Anzia and Moe 2016).

This matters also for politics. The organized interests that develop and grow their economic presence will also have greater political heft (and the opposite for interests that are economically weakened). These interests will therefore be in a stronger position to influence national politics. Moreover, the groups that benefit from, and are strengthened by, state-level policy decisions are likely to also benefit from the adoption of aligned policies at the national level—so might leverage their newfound strength towards that end. One core potential avenue for doing so is putting pressure on members of Congress representing geographic areas where they have a significant presence. It is well-established that members of Congress generally are more responsive to the interests of industries that employ constituents and provide state and local tax revenue in the districts they represent. What is novel here is the understanding that *which* interests grow and develop a strong presence can be a function of prior state-level policy decisions.

In considering the mechanisms linking state policy to congressional representation, members' re-election motive is a good starting point (Mayhew 1974). Members generally care about their re-election, and firms and unions have demonstrated an ability to transform their economic presence into political power by engaging in elections. Firms mobilizing employees to support their political interests is widespread in contemporary American politics (Alexander Hertel-Fernandez 2016). Similarly, mobilizing members in elections is a key source of union political strength (Moe 2011). Journalistic accounts and my own elite interviews have highlighted the importance of mobilizing employees (and customers) in the growing political sway of the marijuana industry, especially in states that have adopted adult-use (versus just medical-use) legalization (Herndon 2018).

A second reason members might support industries with a presence in their districts draws on the logic of structural power (Lindblom 1977). Because their re-election prospects depend in part on economic performance (Healy and Malhotra 2013), members of Congress have an incentive to support policies that benefit business interests central to economies in the places they represent—even in the absence of active corporate political mobilization. Governors also, for the same reason, might use their sway with members of Congress to advocate for federal laws that align with state policies and programs (Karch and Rose 2019). While marijuana industry's economic contribution remains small relative to major industries like healthcare and energy, it is highly labor intensive and, in many states, growing rapidly (Weed 2020). Moreover, high taxes on marijuana are often used to fund state programs in areas like education and criminal justice, and also to bolster general fund revenues (How do marijuana taxes work? 2020). The importance of industry tax revenue for budgets and programs in the states they represent thus gives members of Congress representing legalizing states another reason to support pro-marijuana federal laws.

In addition to conferring structural power and the ability to mobilize employees or members, state policies that benefit particular organized interests also might provide those interests with a greater capacity to deploy financial resources: lobbying and campaign contributions. Though money is generally ineffective at buying roll-call votes in Congress, research suggests it can shape how members allocate their time and attention. Hall and Wayman's (1990) seminal study, for instance, found that, while PAC contributions from organized interests had no effect on roll call voting, contributions did affect the time that members spent working on issues promoted by contributors—a result that has been corroborated experimentally (Kalla and Broockman 2016). Of course, firms and unions can also contribute to the campaigns of members representing districts where they do not have an economic presence. In the marijuana case, as I will show, the industry has mostly targeted members representing legalizing states, but also contributed to campaigns elsewhere. The focus on members representing legalizing states may reflect a strategy of seeking to increase the time and attention that members already inclined to support marijuana reform—perhaps because of other mechanisms associated with industry growth in their districts—spend on the issue.

The mechanisms discussed above focus on organized interests, but public policies also affect individual-level mobilization and attitudes (Campbell 2012). Citizens living in states that adopt reforms—after experiencing them "on the ground"—may become more comfortable with their national adoption. In cases like marijuana where new policies establish new markets and products, consumers can also be a powerful coalition—especially when organized by the firms that sell to them (Culpepper and Thelen 2020).

In considering member responsiveness to shifts in individual-level political behavior, there is ample evidence that members' roll call votes are correlated with the preferences of constituents in their districts (Bartels 1991), and that policy is broadly dynamically responsive to shifts in public attitudes (Erikson, Mackuen, and Stimson 2002). At the same time, more recent findings suggest that member responsiveness might be decreasing. As the major parties have polarized, a greater share of variation in member behavior is explained by partisanship, so a competitive district might be represented very differently depending on the outcome of a close election (Bafumi and Herron 2010). More broadly, studies show that even if member behavior is correlated with voter preferences, there remains a large overall gap between public preferences and public policy (Lax and Phillips 2012).

One reason is that politicians misperceive the preferences of their constituents. Comparing surveys of state legislators to Cooperative Congressional Election Study data, Broockman and Skovron (2018) find that lawmakers consistently believe the preferences of their constituents are more conservative than they actually are. These biases likely extend to the U.S. Congress. Conducting surveys of senior congressional staffers, Hertel-Fernandez, Mildenberger, and Stokes (2019) find that staffers have skewed perceptions of public attitudes driven, they argue, by a reliance on conservative and business interests for policy information.

This brings us to a final potential mechanism: state policy as *signal* of constituent preferences. When states adopt particular policies, it provides information to members of Congress representing those states about the preferences of their constituents. This is especially true in cases where state policy is enacted via initiative, which has been a crucial element of liberalizing state marijuana laws. In addition to providing information, these votes can provide political ammunition, giving election opponents the chance to highlight cases where members of Congress are "out-of-step" with their constituents' *expressed* preferences.

Each of these mechanisms—shifts to interest group resources, shifts in individual-level mobilization, and signals of constituent preferences—are likely to produce positive feedback from state policy to congressional representation. I would therefore expect members to respond to the adoption of policies in the states they represent to be more likely to support aligned policies at the federal level. In the next section, I introduce the empirical context and design for examining this relationship.

State Marijuana Legalization and Representative Behavior

Marijuana politics has several features that make it particularly suitable for investigating the causal effect of state policy on representation in Congress. First, as I discuss below, the key role of the ballot initiative in state legalization of marijuana provides exogenous variation in likelihood of legalization that can be leveraged for causal inference. Second, legalization has produced clear, sizable, and fast changes to states' policy and interest group landscapes: between 2010 and 2020 industry revenue increased by nearly tenfold (Medical & Recreational Marijuana 2019).

Beyond being a suitable empirical case to examine policy feedback dynamics in Congress, the politics of marijuana is important to understand because of the policy implications. Marijuana prohibition has direct and sizable consequences for people's lives. In 2018, with marijuana already having been legalized for adult-use in 10 states, 40 percent of total drug arrests in the U.S. were for marijuana-related offenses—with a full 92 percent of those arrests just for possession (Gramlich 2020). Convictions for marijuana possession can produce life-altering costs, affecting eligibility for public housing and student financial aid, employment opportunities, child custody determinations, and immigration status among other things (The War on Marijuana in Black and White 2013). For these and other reasons, many advocates see marijuana policy as a crucial piece of broader criminal justice reform (Altieri 2020).

Marijuana policy also has important economic implications. As legalization has advanced, industry revenue has grown steadily from a total of $3.5 billion in legal sales in 2014 to over $13.5 billion in legal sales in 2019 (U.S. Legal Cannabis Market Growth 2019) and marijuana industry is now one of the fastest areas of job growth in the U.S. (Murphy 2019).

Marijuana Politics and Policy in the U.S.

Marijuana was first effectively prohibited in the U.S. under federal law by the Marihuana Tax Act of 1937.[25] The drug's illegality was made official under the Controlled Substances Act of 1970, which, in classifying marijuana as a Schedule 1 drug, prohibited all uses.

[25] Rather than outright prohibition, the Marijuana Tax Act imposed steep excise taxes on all marijuana sales, deterring production and consumption (in that era the authority to regulate medicines was reserved for the states).

Though marijuana remains a Schedule 1 drug at the federal level, in the past 25 years state actions have spearheaded a steady liberalization of marijuana policy. California's Proposition 215 of 1996, which permitted the use of marijuana for medical purposes, initiated a wave of state medical marijuana laws. By the end of 2020, the use of marijuana for medical purposes was legal in 33 states, with another 14 states permitting marijuana with limited THC content for medical use. More recent years have seen the expansion of adult-use marijuana legalization at the state level; between 2012 and the end of 2020, 15 states legalized marijuana for adult use.

The state-level liberalization of marijuana laws has been driven by a combination of increasing public favorability and well-funded advocacy organizations working across the country. Support for marijuana legalization increased from 31 percent of the public in 2000 to 68 percent in 2020 (Brenan 2020). Advocates have taken advantage of favorable public opinion by relying heavily on citizen initiatives, and organizations like Marijuana Policy Project (MPP) have developed expertise in running initiative campaigns.

Even as the legal landscape of marijuana has shifted dramatically at the state level, federal law has remained largely stagnant. Lack of progress at the federal level has led to growing conflict between state and federal laws, leaving the burgeoning industry in a highly fragmented legal environment. Most notable is uncertainty over enforcement of federal laws prohibiting marijuana (Higdon 2019). But in addition, federal prohibition limits industry access to banking and other financial services and limits small businesses' access to tax deductions.

Warming public attitudes, industry growth, and growing costs from state-federal policy conflicts have produced momentum for reform in Congress. Several pro-marijuana bills were introduced in the 115th Congress, but Republican majorities kept them from being brought to floor votes. With various forms of legalization continuing to spread across the states, and Democrats taking control of the House in 2018 elections, advocates and industry interests saw the 116th Congress as a crucial opportunity to advance reform at the federal level. As one journalist wrote: "This is the first Congress in history where, going into it, it seems that broad marijuana reforms are actually achievable" (Higdon 2019).

Efforts from advocates and industry coalesced around three broad goals—each with a related proposed bill—in the 116th Congress. First, and narrowest in scope of the three, was providing the marijuana industry with greater access to banking services. The proposed SAFE Banking Act would "create protections for depository institutions that provide financial services to cannabis-related legitimate businesses and service providers for such businesses" (Perlmutter 2019). The second major goal was broadly protecting industry and consumers in states that have legalized marijuana from federal interference or prosecution. The STATES Act would exempt individuals and corporations operating legally according to state law from federal enforcement. The third and broadest goal was amending the Controlled Substances Act to end federal prohibition on marijuana. The MORE Act would both end federal prohibition as well as expunge prior convictions. Notably, support for the MORE Act comes to a greater extent from advocates than from industry interests, which have focused on narrower bills.[26]

[26] Interview with marijuana policy advocate, 5/13/2020.

Instrumental Variables Design

Even using state policy variation for leverage, causally estimating the feedback effects of prior policies on the actions of lawmakers poses inferential problems. Since policy adoption is nonrandom, any observed relationship between subnational policy and member behavior might be driven simply by a correlation in the preferences of subnational policymakers and members of Congress—not by the theoretical mechanisms discussed above. In this case, the types of states that legalize marijuana are also likely to be the types of states that elect representatives that are more progressive on marijuana policy, making it difficult to estimate the effect of legalization on representation in Congress.

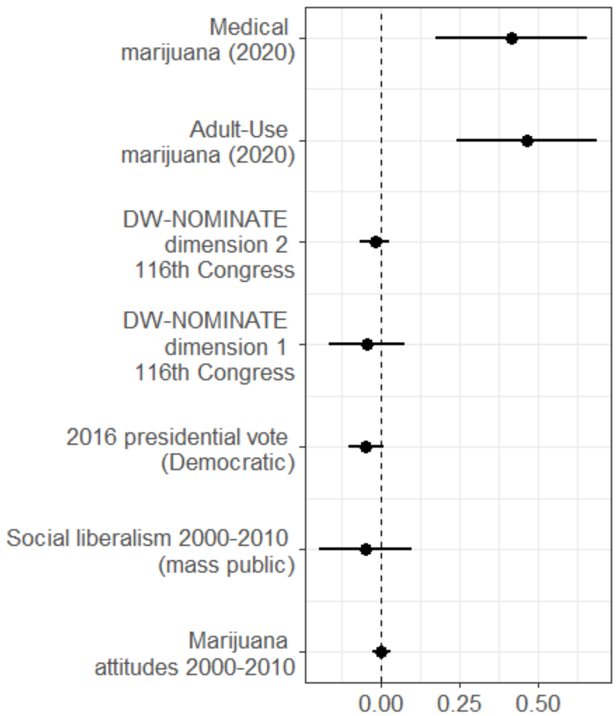
This paper relies primarily on an instrumental variables (IV) design for causal inference. The IV design draws specifically on the fact that citizen initiatives have been a fundamental tool for legalization advocates. The first 8 states to legalize marijuana for adult-use did so via citizen initiative. For pro-marijuana organizations, whether states allowed initiatives has been a major factor in determining where to allocate time and resources. The importance of the initiative, according to one advocate, stems from the fact that the public generally holds more liberal views on marijuana than representatives in state legislatures.[27] As of the end of 2020, whether a state allowed citizen initiatives was highly correlated with whether it permitted marijuana for adult use (ρ = .51) and whether it allowed medical marijuana (ρ = .44)—the first requirement for a valid instrument.

To serve as a valid instrument, initiative status (whether they are allowed to enact statutes or constitutional amendments) must also, conditional on observables, only be associated with member behavior through the mechanism of legalization (the "exclusion restriction"). There is good reason to think this is the case. Initiative processes were generally put into place around the turn of the 20th century in response to pressure from elements of the Progressive movement—long before marijuana policy was a salient issue. (Appendix Figure B1 provides each state's initiative rules.) If initiative status were related to congressional representation on marijuana issues through mechanisms other than legalization, then we would expect these rules to also be related with factors generally associated with the behavior of members of Congress. But, as indicated by Figure 1, whether a state allows citizen initiatives is unrelated to the factors political scientists generally believe to drive congressional behavior. First, initiative status is uncorrelated with measures of congressional ideology in the 116th Congress. In addition, it is slightly *negatively* correlated with 2016 Democratic presidential vote share, which should bias results downwards to the degree it is not accounted for in analysis. Finally, it is neither correlated with state-level measures of attitudes towards marijuana legalization nor state-level measures of social liberalism in the mass public from 2000 to 2010 (Caughey and Warshaw 2016, 2018).[28]

[27] Interview with Marijuana Policy Project (MPP) senior official, April 2019.

[28] Measures are derived from aggregating policy questions across polls using a group-level item-response model.

Figure 1: Whether states allow citizen initiatives is correlated with marijuana legalization and uncorrelated with factors generally associated with congressional behavior. Points represent bivariate association between whether a state allows citizen initiatives and each outcome. Outcome are standardized to a 0-1 scale. 95 percent confidence intervals are calculated using standard errors clustered at the state level.

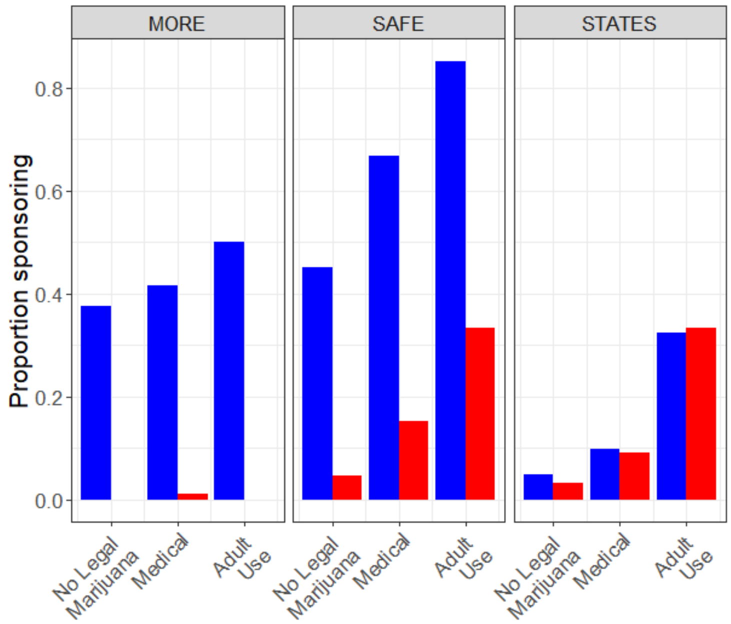


The Effect of State Marijuana Legalization on Bill Sponsorship and Roll Calls

I now turn to examining the effects of legalization on bill sponsorship and roll calls in the 116th Congress,[29] starting with bill sponsorship since there is more data (many more bills have been introduced than have been voted on). I focus on the three bills discussed above at the core of the industry and advocacy groups' agenda: the SAFE Banking act; the STATES Act; and the MORE Act. Figure 2 demonstrates that members of Congress representing states with more liberal marijuana laws were descriptively more likely to sponsor liberal marijuana legislation, but this association does not provide evidence of a causal effect.

[29] This was the first since the initiation of the state-level adult-use legalization wave in 2012 in which advocates and industry interests perceived an opportunity for significant legislative progress.

Figure 2: Bill sponsorship by state legalization status. Bars represent proportion of members sponsoring or co-sponsoring each bill. Blue bars are Democrats, and red bars are Republicans.



Analysis using citizen initiative rules as an instrument, though, as discussed above, can provide causal leverage. The key treatment is a measure of state marijuana legalization status at the end of the 116th Congress.[30] In the main analysis, I code the treatment variable as 0 for states with neither medical nor adult-use, 1 for states with medical marijuana, and 2 for states with adult-use legalization.[31] Treatment is instrumented by whether a state allows citizen initiatives as discussed above. For outcomes, first, I record binary measures of whether members sponsored or co-sponsored each of the SAFE Banking Act, STATES Act, and MORE Act. I also estimate a broader marijuana *bill sponsorship score* by computing the proportion of the 14 priority pieces of legislation promoted by the industry group National Cannabis Industry Association (NCIA) sponsored or co-sponsored by each member. (The distribution of the *bill sponsorship score* by party and legalization status is provided in the appendix, Figure B2.)

Two-stage least squares regression is used to estimate the effect of liberalization of state-level marijuana law on these outcomes. The first stage predicts adult-use marijuana legalization from the ballot initiatives variable. First stage results presented in the appendix (Table B1)

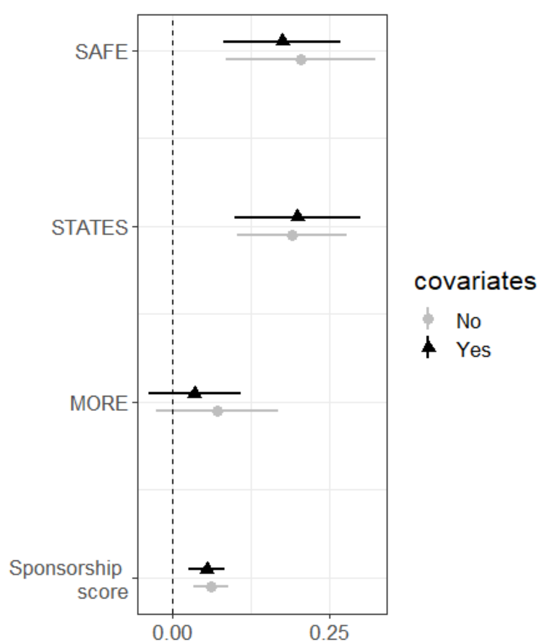
[30] Status at the end of the Congress is used since a shift in legalization occurring in the middle of the Congress could plausibly affect member behavior for the remainder.

[31] Since citizen initiatives predict both medical and adult-use legalization, the IV analysis cannot parse their separate effects. In addition, there remains significant policy variation within the categories of medical-use and adult-use. For instance, states vary on the availability of licenses for cultivation and distribution. Measurement error in the treatment should attenuate estimates, making it more difficult to detect effects. Results are robust to coding only adult-use states as "treated".

demonstrate that citizen initiative rules are a strong instrument for legalization. The second stage estimates the relationship between predicted legalization and bill sponsorship.[32] I estimate models both with and without state- and member-level covariates: party-identification (PID), ideology (DW-NOMINATE); and state-level covariates: 2016 Democratic presidential vote share; and social liberalism of the mass public.

Estimates are presented in Figure 3. For the SAFE Banking Act and the STATES Act, I estimate that state-level marijuana legalization increased the likelihood that members (representing those states) sponsored liberal marijuana bills. The non-covariate adjusted coefficient of .24 for the SAFE Banking Act, for instance, indicates a 1-point shift in legalization status (from prohibition to medical, or medical to adult-use) is associated with an increase of 24 percentage points (SD = .50) in likelihood that members sponsored the Act. I estimate effects of similar magnitude for the STATES Act. I do not estimate a statistically significant effect for the MORE Act, which may be driven by the fact that sponsorship of this bill was more partisan than the others (see Figure 2). Turning to members' broader *bill sponsorship scores*, I find evidence of a causal relationship. The coefficient of .06 suggests that a 1-point shift in legalization status is associated with an increase of .06 (SD = .11), which corresponds to .84 additional NCIA-supported bills sponsored on average.

Figure 3: Effects of state marijuana legalization on bill sponsorship in the 116th Congress. Estimates are derived from two-stage least squares regression. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level.



Of course, the validity of these results depends on the exclusion restriction. One concern is that ballot initiative processes are somewhat more common in the western part of the country, an

[32] Analysis uses the *ivreg* function in the *AER* package in R.

area that is also potentially ideologically more pro-marijuana. But, as I demonstrate in the appendix (Figure B3), results are generally consistent (though with reduced precision) when excluding western states from the analysis.

That said, there remains the concern that there is some unobservable underlying difference between initiative and non-initiative states driving the findings. But if the association between ballot initiative rules and marijuana bill sponsorship were driven by mechanisms unrelated to state-level legalization, we would expect an association between initiative rules and congressional behavior on marijuana *prior* to the current era of legalization. Here, I present a falsification test demonstrating that this is not the case. Specifically, I investigate which members sponsored a series of bills introduced in the 1980's that would have rescheduled marijuana to Schedule II, thereby allowing doctors to prescribe the drug to patients in need (subsequently referred to as "rescheduling bills"). The first in the series of rescheduling bills, HR 4498, was introduced in the 97th Congress (in 1981) and co-sponsored by a bipartisan group of 84 members. Similar pieces of legislation were introduced in the 98th and 99th Congresses (HR 2292 and HR 2232 respectively).

Figure 4: Reduced form relationship between citizen initiatives and bill sponsorship pre- and post-legalization wave. Left panel presents reduced-form relationship between citizen initiatives and sponsorship of rescheduling bills prior to legalization wave. Right panel presents reduced-form relationship for the 116th Congress. 95 percent confidence intervals calculated using standard errors clustered at the state-level.

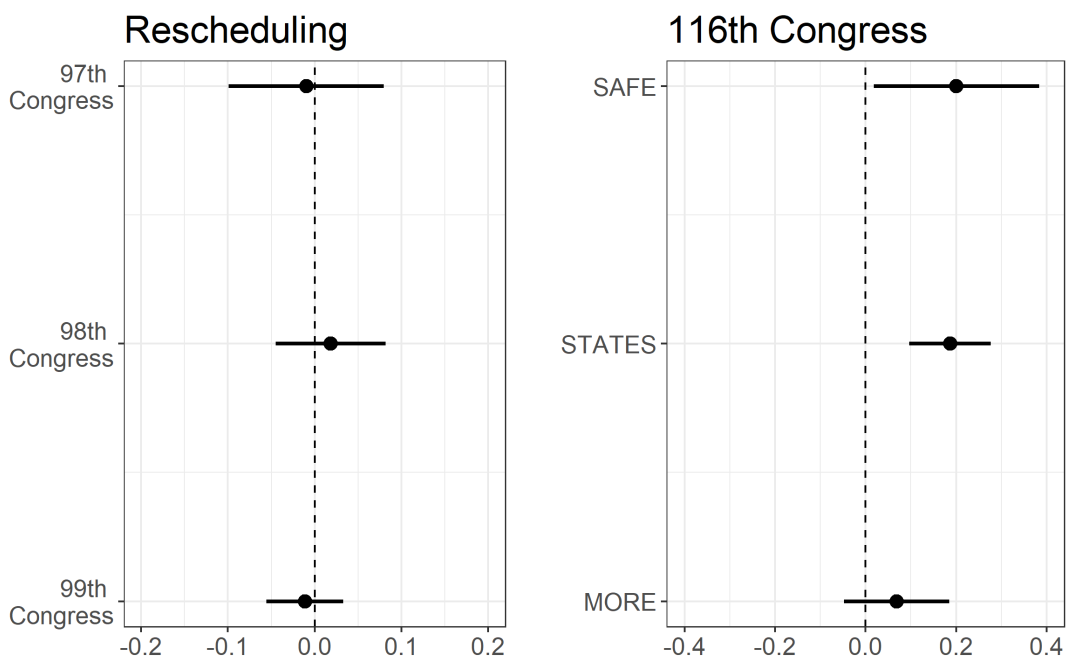


Figure 4 demonstrates no correlation between initiative rules and bill sponsorship in the 97th through 99th Congresses. On the other hand, the right panel of Figure 4 presents a positive reduced-form relationship between initiative rules and sponsorship of the SAFE Banking Act and the STATES Act in the 116th Congress. This test therefore provides support for the exclusion restriction assumption necessary for a causal interpretation of the IV analysis.[33]

I now turn to an investigation of the effect of the liberalization of state marijuana laws on members' roll-call votes on marijuana issues. This analysis is necessarily more restricted than the analysis of bill sponsorship since few roll calls have been taken. In June 2019 and July 2020, the House passed amendments (267-165 and 254-163 respectively) that would prevent the Department of Justice (DOJ) from using funds to prosecute marijuana offenses in jurisdictions where it is legal;[34] in September 2019 the House passed the SAFE Banking Act 321-103; and in December 2020 the House passed the MORE Act 228-164.[35]

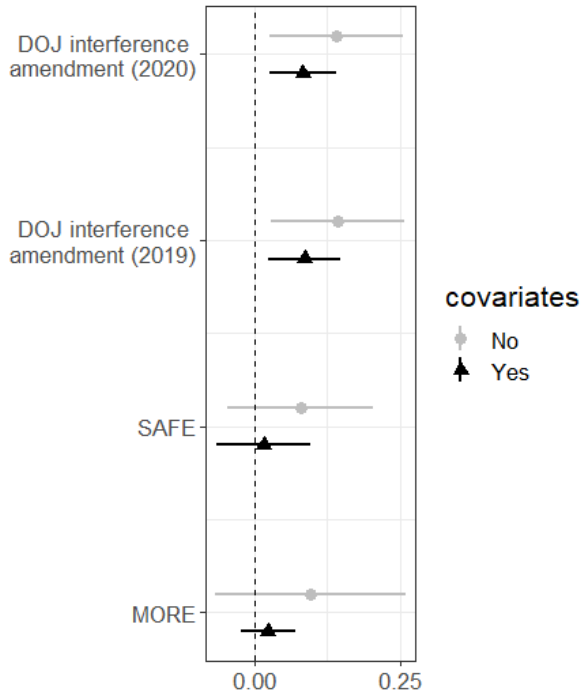
The IV analysis of roll calls has a similar structure as the bill sponsorship analysis, except the main outcome is a binary indicator for whether members supported the legislation (versus sponsored). Results, presented in Figure 5, indicate that legalization did affect whether members voted for budget amendments to restrict the DOJ. The covariate-adjusted coefficient estimates of .09 for the 2020 version and .07 in 2019 indicate that a 1-point shift in legalization status (from prohibition to medical, or medical to adult-use) is associated with an increase of 7 and 9 percentage points, respectively, in likelihood of votes in favor. Interestingly, though results presented above indicate that legalization affected whether members *sponsored* the SAFE Banking Act, I do not find that legalization had a statistically significant effect on roll call voting for this bill. I also estimate a null result for the MORE Act, which was for the most part a party-line vote (only 6 Democrats voted against, and only 5 Republicans in favor).

[33] As an additional check, I also conduct the main analyses using regression adjustment for identification versus the instrumental variables method. This approach does not rely on the exclusion restriction assumption, but instead assumes that congressional members representing legalizing and non-legalizing states are otherwise comparable conditional on measures of ideology, party identification, state-level Democratic vote share in the 2016 Presidential election, and estimated state-level ideology. As shown in the appendix (Figure B6), this approach yields similar estimates as the instrumental variables approach.

[34] Since these amendments are part of the federal budget, they must be renewed every year.

[35] The Senate has not voted on any of these bills.

Figure 5: IV estimates of the effect of state marijuana legalization on roll calls in 116th Congress. Estimates are derived from two-stage least squares regression. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level.



Overall, the evidence on roll-call voting is mixed. That said, the stronger estimated effects of state legalization on bill sponsorship compared to roll-call voting is consistent with the mechanism of industry influence: interest groups are generally more adept at shaping members' attention than their highly visible roll-call votes (Hall and Wayman 1990). Indeed, statistically significant findings on roll calls were observed only for the DOJ amendments, which were somewhat lower-profile votes.

Investigating Mechanisms

In developing the paper's theoretical argument, I proposed that state policy might affect representation in Congress by, first, shaping the political economy in ways that influence the pressures faced by reelection-seeking members; and second, by sending signals that provide information about constituent preferences. While providing a precise decomposition of the role of these potential mechanisms in the empirical case is not possible with the available data, in this section I bring together quantitative and qualitative evidence to provide some insight as to how these mechanisms have contributed to the overall effect observed. As part of gathering qualitative data, I conducted 8 semi-structured elite interviews with individuals working in marijuana politics and policy.

In considering how state legalization affected the pressures faced by members of Congress, it is worth considering, first, the extent to which legalization has actually affected organized economic interests. The answer is: quite a lot, especially in states adopting adult-use legalization. According to NCIA, as of 2018 the average state with medical marijuana featured sales of $21 per capita (an average of 100 million dollars in total revenue), while the average state with adult-use legalization featured sales of $130 per capita (an average of over a billion dollars in revenue).[36]

Revenue growth in legalizing states has increased the capacity of industry interests to engage politically at the national level. To examine exercise of instrumental power, I draw on lobbying and campaign contributions data collected by the Center for Responsive Politics. The data reveal a sharp increase in lobbying from marijuana industry coinciding with recent state adoption of adult-use legalization. Annual federal lobbying from the marijuana industry has grown from just 45,000 dollars in 2012—the year that Colorado and Washington voters legalized marijuana for recreational use by ballot initiative—to nearly 6 million dollars in 2019 ("Marijuana Lobbying Profile" n.d.). Campaign contributions data also suggest that legalization has affected the political presence of marijuana industry. Firms in the industry did not donate to congressional campaigns prior to the 2018 cycle. In the 2018 cycle, however, marijuana industry interests contributed in 19 percent of House races in states with adult-use marijuana, and just 2 percent of House races elsewhere. Discrepancies for the Senate were less stark, with contributions in 7 percent of races with adult-use marijuana, and 5 percent of races elsewhere. IV analysis again using citizen initiative rules to instrument for legalization suggests this relationship is causal (see appendix, Figure B9).

In addition to leveraging its growing resources for lobbying and campaign contributions, the marijuana industry has leveraged its economic growth to engage politically by mobilizing consumers and employees. For instance, in Colorado, Governor Jared Polis collaborated with industry interests to turn out marijuana consumers and industry employees in his 2018 re-election. As part of this effort, the campaign matched the state's database of marijuana employees to the voter file to identify potential supporters, and then sent them targeted text messages and mailers (Frank 2018). The sway of marijuana industry and marijuana voters in Polis's 2018 bid was a major reason why former Senator Cory Gardner, who anticipated a tough re-election in 2020 (which he ultimately lost), made marijuana such a priority in the 116th Congress.[37]

Outside of industry mobilization, another potential mechanism is that state legalization leads the broader public in legalizing states to be more liberal on marijuana, which then drives members of Congress to respond by supporting marijuana reform. To investigate the association between marijuana legalization and public attitudes, I use state-level estimates of support for marijuana legalization collected by Caughey and Warshaw (2020).[38] Using a difference-in-differences design, I compare changes to public opinion in legalizing states to changes in public opinion over the same time period in a set of similar non-legalizing states. More specifically, I leverage a method recently developed by Xu (2017), which is particularly useful since it allows

[36] Public data for other years is not yet available.

[37] Interview with marijuana advocate 12/21/2020; interview with marijuana lobbyist 11/4/2020.

[38] Estimates are weighted based on raked state-level weights using race, education, gender, and age. I use weighted estimates instead of estimates from multilevel regression and poststratification (MRP) since smoothing from MRP might make it more difficult to detect treatment effects (Caughey and Warshaw 2019; Lewis and Linzer 2005).

for implementation of synthetic controls in cases of multiple treated units and variable treatment periods. The method uses a linear interactive fixed effects model to impute counterfactuals for each treated unit (states legalizing marijuana). I consider legalization of marijuana for medical use and for adult use separately.

Figure 6: Marijuana legalization is not associated with changes to state-level public opinion. Solid lines represent average support for marijuana legalization in legalizing states. Dashed line represents average support in comparable non-legalizing states.

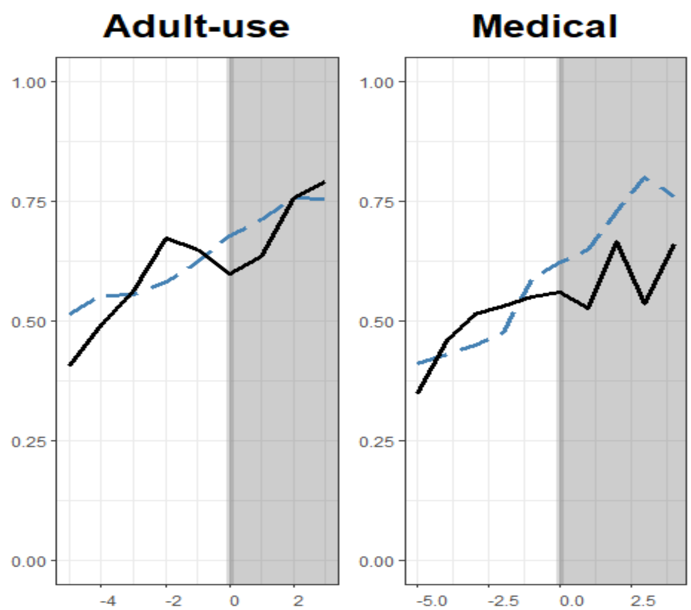


Figure 6 plots average support for marijuana legalization over time for both the treated states and the synthetic controls. In addition to estimates of state-level support for legalization, the model also includes estimates of mass ideology (cultural and economic dimensions) (Caughey and Warshaw 2020). If legalization led to greater public support for marijuana, we would expect the solid series representing legalizing states to jump above the dashed series at treatment (year 0 in Figure 6). The evidence, though, suggests no such effect. Indeed, public opinion, for both adult-use and medical, is slightly more favorable in the synthetic control group, though not statistically distinguishable from the treated group. This suggests that state-level legalization has not disproportionately improved public opinion in the states where it is adopted.[39]

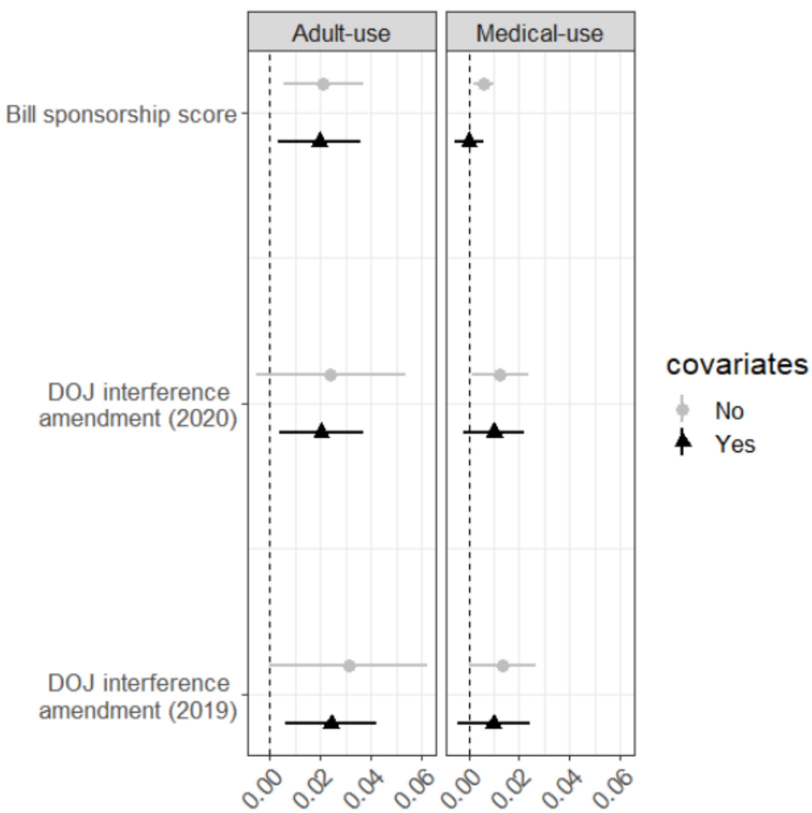
However, even if it did not drive improved public opinion, it is likely that marijuana legalization—especially in the majority of cases when it was enacted via ballot initiative—provided a signal of public favorability to lawmakers in Congress. This is the mechanism that, along with growing influence of industry in legalizing states, interviewees working as lobbyists and policy advocates were most likely to raise. It is difficult to investigate quantitatively, though. One analysis that can provide insight into the importance of this mechanism is exploring the

[39] State legalization may well have improved public opinion *across all states*, but if this were the case, it would not be expected to differentially affect members of Congress representing legalizing versus non-legalizing states.

relationship between the length of time since legalization and representation. If signaling were driving the effect of legalization on representation, we would expect members representing states with more recent (and thus more salient) legalization votes to adopt more pro-marijuana positions. If industry influence were more fundamental, we would expect members representing states that legalized further in the past, and where industry had a greater amount of time to develop, to adopt more pro-marijuana positions.

Figure 7 presents models with members' bill sponsorship scores (recall, this is the proportion of the bills promoted by the NCIA sponsored by the member) and roll calls on the votes for which a positive effect of legalization was estimated as outcomes, and the number of years of legalization for a members' home state as the key independent variables. The left panel presents results for adult-use states and the right panel presents results for medical-use states (without adult-use). Broadly speaking, results lend support for the industry influence mechanism—not signaling. For adult-use states, in both bivariate and covariate-adjusted models, years since legalization is positively and statistically significantly associated with both bill sponsorship and roll-call outcomes. I recover similar results in the bivariate models of medical-use legalization, but they are not robust to covariate adjustment. This may reflect the adult-use legalization tends to have a much greater effect on industry growth than medical-use legalization.

Figure 7: Years since legalization is associated with pro-marijuana bill sponsorship and roll calls. Points represent OLS coefficient estimates on variable recording years since legalization, with bill sponsorship and roll-call votes as outcomes. Lines are 95 percent confidence intervals computed using standard errors clustered at the state level.



To be sure, this analysis does not rule out the signaling mechanism, and the fact that this mechanism was mentioned by several interviewees working in marijuana politics suggests this would be an incorrect conclusion. Rather, it suggests that in comparing the mechanisms of signaling to industry influence, growing industry influence is likely playing a greater role in mediating the relationship between state marijuana legalization and national representation in Congress.

Discussion

Using an IV design that leverages exogenous variation in marijuana legalization from longstanding differences in the availability of citizen initiatives, I have shown that the policy landscapes in the states they represent affect the behavior of members of Congress. I observed strongest effects for bill sponsorship, but also effects on certain lower-profile roll-call votes. The evidence suggests the strongest mechanism driving these effects is growing industry influence in legalizing states, though other mechanisms—particularly signaling of public preferences—cannot be ruled out.

The set of analyses is not without its limitations. One limitation is a short temporal window. Since adult-use legalization and the emergence of the marijuana industry are relatively new phenomena, data is limited. For instance, only a few roll-call votes related to marijuana legislation have been taken since the state legalization wave began. As more data become available, researchers will be able to extend the analyses performed here. In addition, while this study indicates a causal link between state-level adult-use legalization and representation in Congress, there remains uncertainty with respect to the mechanisms. Finally, it should be noted that these analyses likely underestimate the full effects of state legalization on the politics in Congress. While this paper demonstrates the effect of legalization on members representing legalizing states relative to non-legalizing states, mechanisms like growing industry presence in Congress are likely to affect legislators across the country—they are simply more pronounced in legalizing states.

Future empirical work can build on the theoretical framework developed here to explore the role of different mechanisms in different policy cases. For instance, the role of signaling is likely unusually important in this case due to the role of the ballot initiative compared to cases where state policy reform is achieved via legislation. The findings on the role of state policy in structuring state political economies and, as a result, the pressures faced by members is likely to be more broadly generalizable to other policy areas.

Consider, for instance, climate change. Industries reliant on the burning of fossil fuels are enormously powerful in American politics, spending vast amounts of money on lobbying and campaign contributions in federal (Brulle 2018) as well as state and local politics (L. Stokes 2020). Organized interests enriched by the extraction and burning of fossil fuels have also become a key organizing force within the Republican Party (Skocpol 2013). The power of these groups in our politics is built atop a set of policies in place across the federal system that not only fail to adequately price the negative externalities of burning fossil fuels (Metcalf 2019), but also subsidize the production of fossil fuels (Fossil Fuel Subsidies: A Closer Look at Tax Breaks and Societal Costs 2019). But as states governments continue to adopt and strengthen policies driving the transition to renewable energy (B. G. Rabe 2004), this is likely to reshape the pressures faced by members of Congress, potentially opening new opportunities for federal policy.

Or consider policing. The killing of George Floyd in May 2020 led to widespread protests calling for actions across levels of government to enact major policing reforms, including in Congress (Ferris, Caygle, and Bresnahan 2020). Though these reforms are widely popular (Newell 2020), a major impediment to their enactment is the power of police unions, which leverage financial resources and ability to mobilize members to prevent reforms (Broadwater and Edmondson 2020). Analysis drawing on the framework proposed here might explore the degree to which the power of police unions to prevent reform in Congress is bolstered by pro-police state and local policies.

One key scope condition for this mechanism is the degree to which policy areas feature strong *vested interests* dependent on material benefits from government policies (Moe 2015). Considering the role of state and local policy in congressional representation, another key scope condition is the degree to which governance is shared between federal, state, and local levels—a core feature of American federalism (Grodzins 1982). The scope of subnational authority in American federalism and increasingly active role of state governments in American politics (Franko and Witko 2018; Grumbach 2018) means it is crucial that we develop a better understanding of the implications of state policies for the broader polity.

The potential applicability of the interest group mechanism identified in this paper across policy domains also has implications for fundamental models of lawmaking in American politics. Standard models conceive of lawmakers as primarily driven by the preferences of the median voters in their districts, which are generally taken as exogenous (Downs 1957). Alternative perspectives suggest that lawmakers are primarily responsive to the pressures of organized interests seeking to advance policy goals, and moreover, that the *ability* of competing groups to influence politics is structured by the existing policy-scape (J. S. Hacker and Pierson 2014). Findings presented here support the notion that existing policy, in part by shaping interest group capacities, affects congressional representation. This paper therefore provides quantitative empirical grounding for the difficult-to-test arguments in favor of the policy-focused approach—and one empirical framework for scholars working in this vein.

How Policy Experiments Construct Interest Group Coalitions: Evidence from Education Politics

Wealthy foundations have taken on increasingly prominent roles influencing education policy in the U.S. This paper uses a mix of qualitative and quantitative evidence to study the drivers and implications of the engagement of major foundations in the politics of charter schools. I show that states that adopted favorable charter laws, in addition to empowering charter schools as political actors, also drew wealthy foundations into the charter policy space by enabling them to make investments in developing new schools. Foundations later sought to protect those investments, leveraging strategic grant-making to drive the growth of a pro-charter advocacy network with national scope. Foundation-funded groups have in turn played a major role in efforts to defend and expand pro-charter policies. Findings underscore the importance of state policy experimentation in catalyzing new interest group coalitions, with implications for ideas about policy reform in American federalism.

In recent years, contests over policies governing charter schools have generated some of the most hard-fought battles in state politics. In 2016, Massachusetts voters rejected a ballot initiative that would have lifted the state's cap on charter schools to allow 12 new schools each year after a $33 million campaign—at that point the most expensive in the state's history. A few years later, in 2019, on the other side of the country, California Governor Newsom signed legislation adding restrictions to new charter schools after a big-money campaign pitting teachers unions against charter advocates.

That teachers unions and other incumbent organized interests in the K-12 education sector would resist charter schools makes good sense. Teachers unions are some of the most active and well-resourced organized interests in American politics, particularly at the state and local levels where most education policy is made (Moe 2011). Teachers at charter schools are much less likely to be unionized (Gooray 2018), so the rise of charter schools poses an acute threat to their continued strength. And while funding formulas vary across the states, broadly speaking, the more students enroll in charters the less funding is available to district schools, so the growth of charter schools also threatens union jobs in the long run.

What is somewhat more surprising is the emergence of a well-resourced pro-charter advocacy coalition battling to defend and expand chartering. This coalition often includes charter schools themselves, who also are sometimes able to drum up grassroots support among the parents of their students. But, as of 2017, charter schools only enrolled about 6 percent of all public-school K-12 students (Public Charter School Enrollment 2020). Even large charter networks like The Knowledge is Power Program (KIPP) do not have the resources to go toe-to-toe with teachers unions in the political sphere. And charter school parents are usually lower-income people of color—not a group seen as particularly powerful in American politics. More fundamental to the pro-charter political coalition than the schools themselves are wealthy philanthropists and the advocacy groups they fund. For instance, Great Schools, which spent $23.6 million in 2016 to try (unsuccessfully) to raise a cap on the number of charter schools in Massachusetts was bank-rolled primarily by the Walton family and Michael Bloomberg (Jason 2017). Indeed, existing research has documented how the coordinated engagement of wealthy foundations has been fundamental to the emergence of a pro-charter coalition of interest groups combining a national scope with local on-the-ground presence (Ferrare and Setari 2018).

This paper traces the emergence and growth of this pro-charter coalition and studies its implications for the politics of education. I argue that the rise of the pro-charter education coalition depended fundamentally on early policy victories during a particular "window of opportunity" (Kingdon 1984) for the charter school movement. Advocates took advantage of the broad attention to education reform in the 90's and early 2000's to pass "charter laws" across a wide range of states. These laws provided a legal framework for new charter schools to be authorized. I show that, even though a majority of states adopted charter laws in this period, charter sector growth depended fundamentally on a smaller set of states with highly pro-charter policies.

This growth, I argue, was essential for building a broader political coalition supported by foundations. In the 90's and early 2000's, foundations' (and their grantees') primary role was to provide financial and technical support to charter schools to get up-and-running. But the involvement of these foundations in directly supporting schools and other charter operations planted the seeds for subsequent *political* engagement. As charter schools grew and came under increasing pressure from hostile teachers unions, foundations recognized that the continued growth and viability of the charter school sector depended not just on their operational support—but also on the development of a pro-charter political coalition. Drawing on data submitted to the IRS by non-profit organizations (990 forms), I document a shift in foundation grant-making towards greater political advocacy. Elite interviews suggest that key foundations recognized the importance of building political capacity through grant-making to defend earlier investments in the charter movement. The consequences of the rise of this foundation-funded, nationally-scoped, political coalition have been profound. Exploring several mini-cases, I show how foundation-funded groups have been fundamental to efforts to expand charter schools to new locales—and seek to defend charter schools in places where they have gained a foothold.

This analysis has implications for our understanding for how reforms challenging incumbent vested interests can unfold over time. As Finn, Manno, and Wright (2016) write: "Aside, perhaps, from mayoral control, chartering is by far the most significant manifestation of structural and governance innovation in public education…" (pg. 210). What is interesting about this case for the literature on public policy reform is that, unlike other durable reforms (Patashnik 2008), the advent of charter schools—except in some extreme cases like New Orleans (T. M. Moe 2019)—has largely failed to dislodge incumbent education interests. While charter school policy reforms have, to an extent, politically empowered charter schools and charter networks themselves, these interests have been less important to the broader pro-charter coalition than foundations. More so than generating their own interest group supports by conferring benefits (Pierson 1993), early charter laws changed the politics by drawing previously sidelined political actors—in this case, foundations—into the charter coalition.

The role of philanthropists in politics is a growing and important topic of study in political science (Finger 2018a; Reckhow 2012, 2016). With greater inequality concentrating wealth at the top of society, foundations have developed ever-greater financial resources (Goss 2016). In addition, a growing cadre of living donors have sought to leverage strategic grant-making and political engagement to accelerate structural change by driving policy shifts (Tompkins-Stange 2016). But this paper shows the relationship also goes in the other direction: how foundations engage in politics is shaped by prior policy decisions through policy feedback dynamics (Pierson 1993; Skocpol 1992).

The paper unfolds as follows. I first provide background on the growth of charter schools in the U.S. and discuss the importance of state policy decisions for the charter school sector. I then trace the emergence of a pro-charter political coalition, highlighting the role of state experimentation with charter laws in building this coalition. I proceed to present several mini-cases that underline the importance of this pro-charter political coalition to expanding and defending charter laws. Finally, I discuss implications for understandings of policy reform over time in American federalism and conclude.

State-level Reforms Drive Charter Growth

Laws allowing for the establishment of public charters schools were adopted in 40 states in the 90's and early 2000's. The first to adopt was Minnesota, which passed its charter law in 1991. The federal government also adopted new charter school policy in this period. The Federal Charter School Program, initiated in 1994 by amendments to the Elementary and Secondary Education Act, directed critical funding to support the growth of charter schools in states that allowed them (Benezra 2016).

The expansion of charter schools generally coincides with greater choice in K-12 education. Where charters have become established, parents can opt to send their children to either publicly funded charter schools (though some charters have long wait-lists) or district schools tuition-free. Charter schools are publicly funded, but privately operated. Governance from authorizers under state jurisdiction, versus local school districts, generally allows them greater autonomy than traditional public schools

Charter schools' political momentum came in part from renewed attention to education policy in the 80's and 90's. Several reports were published in the early 1980's highlighting major issues in the American K-12 education system. The most famous of these was *A Nation at Risk* (1983), which famously claimed that: "Our society and its educational institutions seem to have lost sight of the basic purposes of schooling, and of the high expectations and disciplined effort needed to attain them" (pg. 1). The report's call for politicians to pay greater attention to education was heeded, even as the analysis underpinning its key findings were later disputed (Huelskamp 1993). In the 1980's, the states and the federal government experimented with a wide range of education reforms ranging from teacher certification standards to more standardized testing to school-based management.

Most of the reforms adopted in this period operated within the highly bureaucratic system established by progressives in the early 20th century. Indeed, new policies on standards and testing were designed to further bureaucratize and centralize the education system. These types of reforms, Chubb and Moe (1990) argued in their influential *Politics, Markets, and America's Schools*, were destined to fail, since they failed to address the institutional problems underlying K-12 education's woes. The most important factor determining a school's performance, they proposed (drawing on existing empirical research), was its level of autonomy. And a top-down bureaucratic management structure was anathema to holding schools accountable while maintaining school autonomy. Market control, versus democratic control, they argued, would allow for greater school autonomy and, as a result, improved academic performance. Chubb and Moe thus pushed for an alternative set of reforms aimed at decentralizing the education system, instilling choice, and leveraging market competition to achieve improvements.

Similar ideas were also being promoted on the left side of the political spectrum. In 1988, University of Massachusetts professor (and former public-school teacher) Ray Budde released

Education by Charter: Restructuring School Districts.[40] Budde advocated for allowing innovative teachers to apply for special charters to create new programs, thus devolving authority down to teachers and enhancing their autonomy. American Federation of Teachers (AFT) president Al Shanker latched onto the chartering concept and promoted it as a way for teachers and their unions to maintain their central role in the face of seemingly inevitable education reforms. Chartering thus emerged in this period as a “middle-path” between the highly rigid existing system and a privatized system of vouchers promoted by those on the far right of the political spectrum (Friedman 1955).

Policy entrepreneurs first took chartering from concept to law in the state of Minnesota. The effort was led by Joe Nathan, a former Minnesota teacher who had written a book promoting the charter school concept and then worked for the National Governors Association’s (NGA) education reform group commissioned by Lamar Alexander and Bill Clinton. Nathan partnered with Ted Kolderie from Citizens League, a moderate “good government” Minnesota think-tank, and former State Senator Ember Reichgott Junge (DFL) to develop and enact a bill that would put in place a process for schools to apply for charters to operate independently of school districts. The Minnesota bill was ultimately supported by a minority of the Democratic party (which controlled the legislature), but by enough Republicans to pass.

Bipartisan support within the “window of opportunity” (Kingdon 1984) generated from attention to education reform was critical to overcoming opposition from teachers unions and school boards in Minnesota, and later, elsewhere (Mintrom and Vergari 1998). Contrary to Al Shanker’s hopes, charter laws generally did not establish a role for teachers unions in the chartering process, instead generally specifying that new charter schools could operate outside of negotiated collective bargaining contracts. Unions were (rightly) concerned that charter schools would be difficult to unionize, leading to losses of membership and union jobs. As far as school boards were concerned, chartering would diminish their power by allowing newly forming schools to apply directly to “authorizers” under state government jurisdiction.

Though teachers unions generally had significant influence, particularly within the Democratic party, members of both parties wanted to stake out strong positions responding to perceived failures in the American education system (Mintrom and Vergari 1997). In addition, the prospect of vouchers loomed over the charter campaigns, in some cases smoothing the way for chartering. As one advocate in Connecticut said: "charters were advocated by groups whose embrace was intended to head off vouchers and other groups who saw them as a step toward vouchers or as the half-way to seek if they couldn’t get vouchers” (Mintrom 1997, 8). Similarly, in California, which adopted its charter law in 1992, advocates used the threat of a potential ballot initiative establishing a school voucher program to win votes. Though some Republicans

[40] Budde had previously released a paper with these ideas in 1974, but received little attention. Joe Loftus released a similar proposal also in 1988: https://www.educationevolving.org/pdf/JoeLoftus1988CharterProposal.pdf.

would have preferred more radical policy shifts towards vouchers, many saw the charter laws as a step in this direction.

Efforts to diffuse charter laws benefited also from a network of policy entrepreneurs sharing information and, in some cases, traveling state-to-state to draft bills and shepherd votes (Finger 2018b; Mintrom and Vergari 1998). There was also a growing network of supportive governors led by Lamar Alexander and Bill Clinton and operating through the NGA. Put together, this was a successful formula for the establishment of charter laws: by 2003, a full 40 states had passed charter school legislation.[41]

Table 1: Timeline of initial state charter laws

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
MN	CA	CO	AZ	AK	CT	MS	ID	OK		IN	IA	MD
		GA	HI	AR	FL	NV	MO	OR			TN	
		MA	KS	DE	IL	OH	NY					
		MI		LA	NJ	PA	UT					
		NM		NH	NC		VA					
		WI		RI	SC							
				TX								
				WY								

Note: Charter laws were later adopted in ME (2011), WA (2012), AL (2015), and KY (2017).

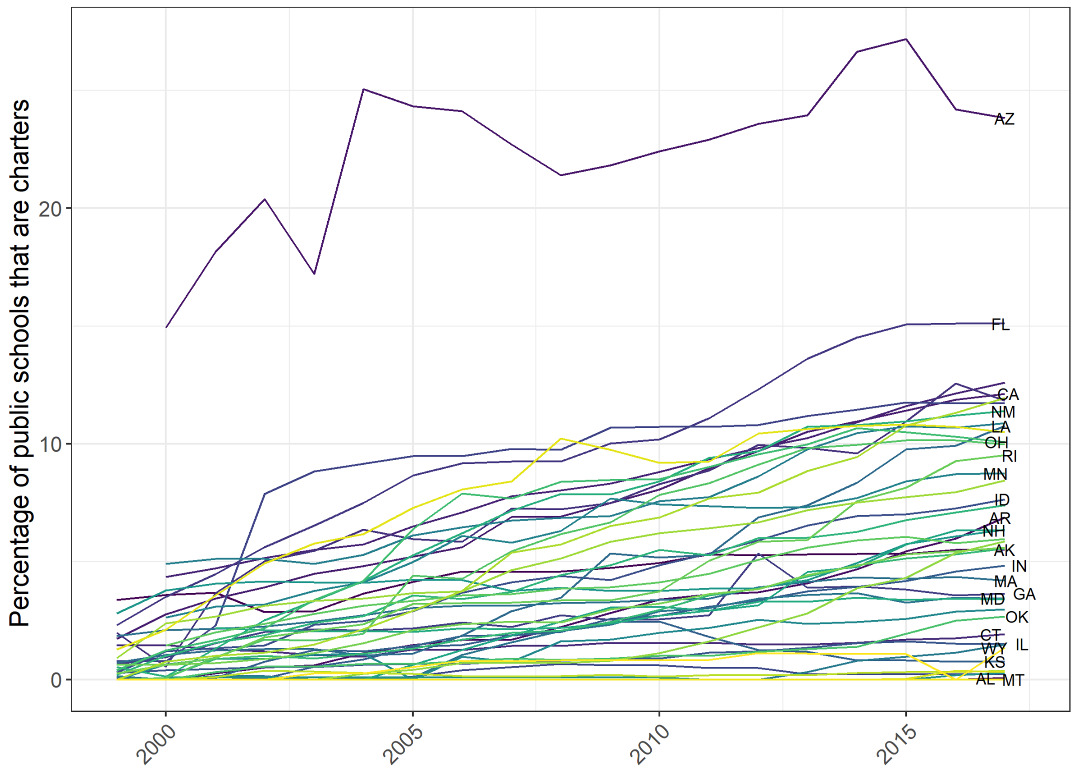
The simple tally of the adoption of charter laws presented in Table 1, though, obscures the significant variation in the specifics of these laws. In many states, charter opponents recognized that even if they could not prevent charter laws from being passed, they could use their political sway to dilute the laws and make it difficult for new charter schools to get a foothold. States that simply used “copy-paste” legislation from others were more likely to have weaker (less likely to give rise to charter schools) laws (Mintrom 1997). By contrast, charter laws crafted to respond to a state’s specific needs generally were better for charter schools.

The favorability of a state’s charter law affected how much charter growth it would see. Growth depended heavily on states that had more generous funding formulas, higher caps on the number of schools that could be newly authorized, and less stringent authorization procedures (Henig 2018). By 2000, around two-thirds of the 1497 charter schools that had opened were

[41] Charter advocates also won important policy victories at the federal level. In 1994, Congress established the Federal Charter Schools Program (CSP) as an amendment to the Elementary and Secondary Education Act of 1965. The CSP provides funds to states that establish charter schools, and also directly to charter schools. These funds are important because often money doesn’t flow to schools until they have “butts in seats.” Funding has increased over time and was re-upped in 1998. Note that establishment of CSP was driven in large part by members of the advocacy coalition that was forming and passing charter laws in the states, and key members of Congress were those representing early adopters of strong charter laws like MN and MA (Benezra 2016).

located in the 8 states whose charter policies were rated as an "A" by the Center for Education Reform (a pro-charter organization).[42] And the majority of charter schools outside of those 8 states were located in the 10 states rated as a "B". Charter growth has remained concentrated in states with favorable charter laws.[43] In 2017, the top 10 states in terms of charter penetration (charter schools as a percentage of total public schools) had an average charter law score from the Center for Education Reform of 151.7 (out of 240), compared to just 109.4 in other states.[44]

Figure 1: Charter schools as a percentage of total public schools, by state.



A Political Coalition Emerges

The adoption of charter laws in the states has also changed the politics—as the literature on "policy feedback" effects would suggest it might (Pierson 1993). In the realm of social welfare,

[42] Those 8 states included California and Texas, accounting for one-third of overall public schools at that time

[43] Arizona has been a positive outlier when it comes to charter growth. The state has been notorious for its lenient requirements for establishing schools and lack of stringent standards for closing poor-performing charters.

[44] The score includes factors relating to ability for growth (e.g. stringency of caps), school autonomy, and funding. See https://edreform.com/wp-content/uploads/2017/03/CSLAWS_SCORECARD_2017.pdf.

program beneficiaries tend to organize to protect and expand the policies that help them (Campbell 2003). Similarly, policies that benefit organized economic interests like firms and unions "feed back" into the politics by enhancing the resources these interests have at their disposal to make demands in the political sphere (J. S. Hacker 2002a). The degree to which policies generate these supportive feedback effects factors critically into their durability and expandability (Patashnik 2008). Reforms that reshape the politics by empowering supporters and disempowering opponents tend to prevail and potentially even expand. Reforms that fail to do so are often retrenched or eroded over time (Patashnik 2008; L. Stokes 2020).

In the case of charter politics, the obvious candidates to defend and expand charter laws, and thus drive feedback effects, are charter schools themselves. Charter schools owe their existence to the state charter laws adopted mostly in the 90's and early 2000's allowing charter schools to establish. They also receive critical funding from federal government programs. Their ability to sustain themselves and grow depends on the preservation and expansion of pro-charter policies—they are *vested interests* (Moe 2015). Thus, a policy feedback perspective suggests that charter schools would leverage their growth in the K-12 education sector toward a greater political presence—both to defend against threats and take opportunities to expand the policies that benefit them.

This has occurred, to an extent. State charter school associations have emerged as important actors in education politics, particularly in states with significant charter school sectors. The California Charter Schools Association, for instance, has become a powerful interest group in California education politics—it spent roughly 18 million on lobbying and campaign contributions in 2015 and 2016.[45] It has also leveraged the ability to mobilize charter parents, alumni, students, and school staff for political advocacy (Zinshteyn 2017). In addition, leaders of large charter school networks[46] have engaged in several high-profile political battles. For instance, Eva Moskowitz, the head of Success Academy Charter Schools, took center stage in mid-2010's battles with New York City Mayor Bill de Blasio over co-location of charter schools with traditional public schools in city-owned school buildings (Bergner 2014).

Yet, the political influence of charter schools themselves is also constrained. For one, they tend to have limited budgets. Even with federal funding, charter schools generally receive less money per student than traditional public schools (Finn Jr., Manno, and Wright 2016). These funds are needed for educational purposes, generally leaving little left over for lobbying. And though charter schools can sometimes politically mobilize the parents of their students, the

[45] See, https://cal-access.sos.ca.gov/Campaign/Committees/Detail.aspx?id=1339522&session=2015

[46] A growing proportion of charter schools are part of non-profit Charter Management Organizations (CMOs). These include well-known networks like KIPP, Uncommon Schools, Achievement First, and others. Many are also part of similar, but for-profit, groups called Education Management Organizations.

families served by charter schools are more likely to be low-income and people of color (Wang, Rathbun, and Musu 2019)—groups that generally have less political sway.

Nonetheless, as the role of charter schools in K-12 education has grown over the first two decades of the 21st century, so too has a powerful pro-charter advocacy coalition. Unlike the relatively shallow network of policy entrepreneurs driving initial charter school laws, elements of this coalition have maintained a steady presence in state capitols, local politics, and in Washington (Finn Jr., Manno, and Wright 2016). Elements have also, in several cases, gone toe-to-toe with powerful teachers unions (Johnston 2014).

The coalition includes charter schools and their associations as well as education advocacy groups. Many of these groups are associated with national networks—primarily Policy Innovators in Education Network (PIE Network) and the newer 50-State Campaign for Achievement Now (50CAN)—that are active on charter policy and other education policy issues. Some accounts have suggested that certain wealthy foundations have played a significant role in bolstering this coalition through strategic grant-making. (Busemeyer and Thelen 2020; Ferrare and Setari 2018; Reckhow and Snyder 2014). Yet, the literature lacks systematic evaluation of the role of philanthropists in growing the pro-charter political coalition, and how this relationship has developed over time.

One investigation that can help to illuminate the degree to which the charter school coalition is dependent on foundation funding is examining revenue sources for charter school associations. These associations, as mentioned above, have been critical to defending and expanding charter laws. We might suspect that the role of foundations in supporting charter school associations would shift over time. In the early 2000's, with fewer charter schools to draw member revenue from, it is reasonable to think they'd be highly dependent on philanthropic funding—but, in the 2010's, with the charter school sector better-established, they might have greater revenue from member schools, with foundation funding thus playing a relatively smaller role.

I collect and analyze original non-profit revenue data for charter school associations to assess how revenue sources have changed over time. These data come from IRS 990 forms, which non-profits claiming federal tax-exempt status are required to file on a yearly basis. I examine the 32 organizations listed as partners of the National Alliance for Public Charter Schools (the national umbrella organization),[47] and the National Alliance itself. The IRS 990 forms provide organizations' main revenue sources, and the total. The two largest line items, generally, in the revenue streams are 1) contributions and grants, and 2) program service revenue.[48] While contributions and grants also include grants from the government, stakeholder interviews suggest the great majority comes from foundations—whereas the majority of program service revenue comes from member organization (charter schools) dues.

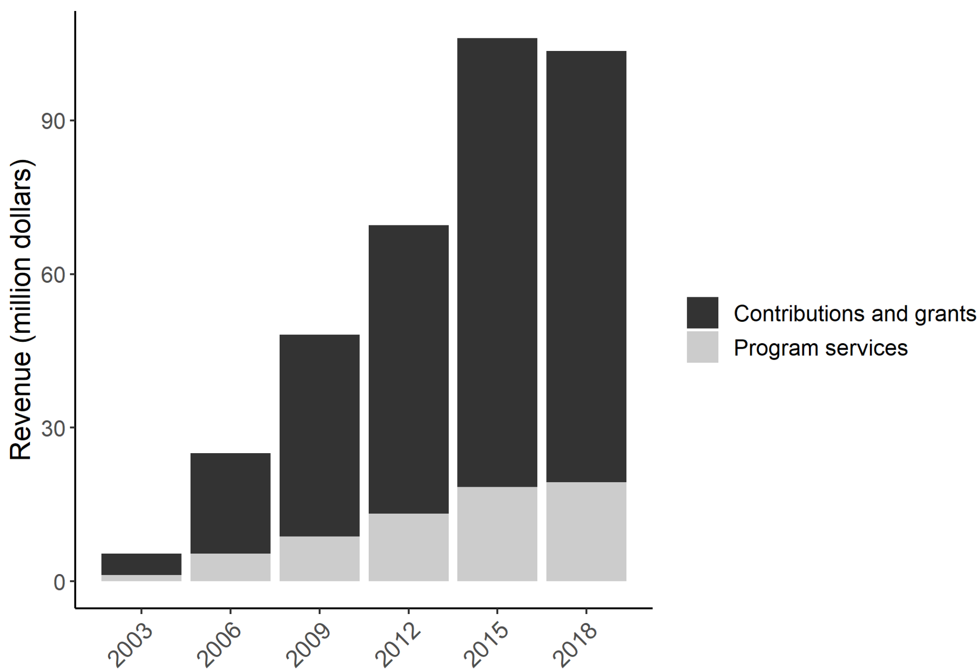
[47]The appendix lists these organizations. See, also, www.publiccharters.org/our-work/what-we-stand-for/partners.

[48] Other, generally smaller, sources of revenue include investment income and miscellaneous other income.

The data demonstrate a massive growth in charter school association revenue between 2003 and 2018. The 13 charter school associations operating in 2003 took in just under $6 million in total revenue in that year. But by 2018 the number of charter school associations had grown to 33, and the total revenue had grown over 17-fold to over $100 million. Indeed, charter school association revenue has grown much faster than charter schools themselves. (From 2003 to 2018, the number of charter schools operating grew a bit less than 3-fold, from 2540 to 7427.)

As expected, charter school associations relied heavily on contributions and grants in the sector's early years. In 2003, for instance, only 21 percent of charter school association revenue came from program services, while 70 percent of revenue came from contributions and grants (recall, these contributions are largely philanthropic). What is striking is that this breakdown has remained roughly constant, even as the number of charter schools and size of charter networks has grown considerably. The amount of total charter school association revenue from program services has hovered between 17 and 22 percent of the total—while the amount from contributions and grants has hovered at closer to 80 percent. Even as the charter school sector grew, the political advocacy arm remained dependent on philanthropic funding for critical financial resources.

Figure 2: Sources of revenue for charter school associations. Sample includes listed affiliates of the National Alliance of Public Charter Schools. *Source:* Author's analysis of IRS 990 forms.



Policy Feedback and Foundations in Charter School Politics

How did foundations become such important backers of the pro-charter coalition that has emerged over the past two decades? Here, I present a mix of qualitative and quantitative evidence suggesting that a policy feedback lens is critical to understanding the role of foundations in charter school politics. The broad point is that the adoption of charter laws in the states allowed foundations to make investments in new schools—which they later supported with investments in pro-charter political advocacy.

Foundations played a limited role in charter school politics during the initial diffusion of charter laws in the 90's. [49] As discussed above, this was a period when a network of policy entrepreneurs was able to exploit a "window of opportunity" to push through chartering legislation—despite opposition from incumbent K-12 education interests. This changed when charter schools started to establish in the late 90's in early-adopting states. At the time, newer foundations with living donors like the Gates Foundation were interested in expanding their education portfolios, and had a higher risk tolerance and desire to experiment than more long-standing organizations like the Ford Foundation and Carnegie Foundation (Tompkins-Stange 2016). In addition to supporting existing organizations, these newer foundations also sought to promote organizations that would compete with the traditional educational system structure—what Mehta and Teles (2012) call "jurisdictional challengers." Newer foundations were also seeking to invest in organizations in the education policy space that would eventually develop their own revenue streams, and no longer need philanthropic support.

The passage of charter laws in the states and emergence of charter schools presented the opportunity for these foundations to do just that by funding charter schools. In addition to providing newer foundations the opportunity to fund jurisdictional challengers, the establishment of charter schools in leading states provided a crucial "proof of concept" for the legitimacy of chartering. Chartering's legitimacy as an education policy reform was also bolstered by early assessments demonstrating charters' positive effects on certain metrics of student achievement (e.g. Hoxby 2003).

The flood of new charter schools also produced significant demand for foundation dollars from the charter school sector. Charter schools generally only begin to receive significant funding from state and local governments once students enroll. Potential schools thus must secure outside funding to get up-and-running prior to enrolling students. While the federal Charter School Program provided some funding for school creation, the sector still had a huge need for seed funding. In the late 90's and early 2000's, philanthropists like the Gates Foundation, Walton Family Foundation, and Broad Foundation became a crucial source of funding. In addition to providing funds directly to schools, foundations also supported the initiation and growth of organizations like the NewSchools Venture Fund that would provide its own seed funding to new charter schools. Beyond providing seed funding, foundations offered many charter schools continuing grants that supplemented relatively scarce public monies (depending on the state) once the schools were operating.

[49] While the Walton Family Foundation had maintained a school choice focus within education policy for some time, it was previously more focused on vouchers than charter schools.

While existing research has documented the important role of foundations in charter school politics (Ferrare and Setari 2018; Johnston 2014), we have limited evidence tracing out empirically how foundation support for the charter school sector has progressed over time. In this section, I draw on IRS 990 data to bring empirical analysis to bear on this question. My analysis builds on prior data collection efforts using IRS 990 forms from Reckhow and Snyder (Reckhow 2012, 2016; Reckhow and Snyder 2014) and Ferrare and Setari (2018). Reckhow and Snyder collected grant-making data from the 15 largest foundations by K-12 education spending in 2000, 2005, and 2010, and coded the data by type of recipient organization. Ferrare and Setari also collected grant-making data for 15 foundations, but for the years 2009, 2012, and 2014, specifically focusing on grant-making to the charter sector. [50]

In this analysis, I focus on five foundations that, according to Ferrare and Setari's data, disbursed the great majority of grant money to the charter sector in the period they examine. More specifically, I study foundations that spent over $10 million and disbursed more than 10 grants to charter school sector organizations across 2009, 2012, and 2014.[51] To integrate these data with the data from the prior years, I coded the broader set of K-12 education grants identified by Reckhow and Snyder according to whether the recipient was in the charter sector. I also coded whether the recipient performed some operational role in the charter sector (e.g. school, venture fund, authorizer), and whether the recipient did policy advocacy on charter issues. Finally, drawing on newer IRS 990 forms, I identified grants to organizations in the charter sector from these five foundations for the years 2016 and 2018, and coded recipients according to their main functions in the charter sector.[52]

I first investigate grant-making to the charter school associations (affiliates of the National Alliance for Public Charter Schools) investigated in the prior section. As demonstrated by Figure 3, the major foundations increased grant-making to charter school associations markedly over time. Whereas grant-making to affiliates of the National Alliance for Public Charter Schools was less than $1 million in 2005, by 2012 it had jumped to over $22 million before leveling off. Grants remained at over $15 total through 2018. This lends support to the view that the increased

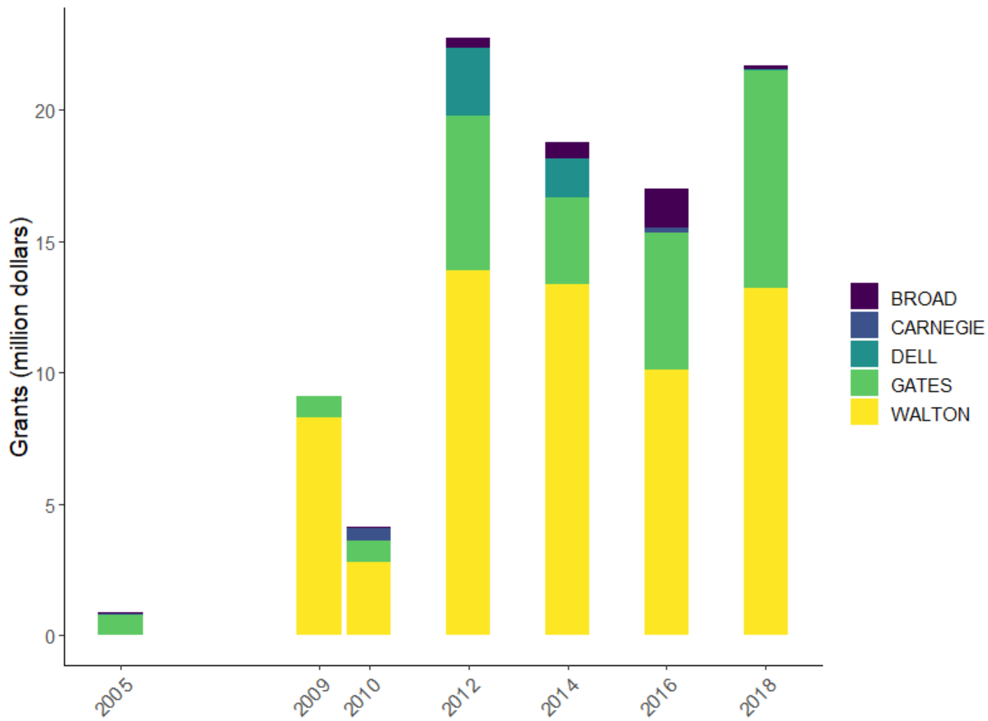
[50] Ferrare and Setari investigate a different set of 15 foundations than Reckhow and Snyder, but with significant overlap.

[51] These foundations: The Eli and Edythe Broad Foundation, The Carnegie Foundation, The Michael and Susan Dell Foundation, The Bill and Melinda Gates Foundation, and the Walton Family Foundation, accounted for 92 percent of total grant-making dollars to the charte schoolr sector from the broader set of 15 foundations.

[52] I coded whether the organization was a school or school network; played some other operational role in the sector (e.g. authorizer); and whether the organization engaged in charter school advocacy. This was ascertained by whether organizations mentioned charter schools on their websites. Some organizations had operational and advocacy functions, such as associations of charter schools that do lobbying but also provide technical assistance and support to members. These organizations are coded as advocacy in the main analysis, but split out more granularly in appendix Figure C2.

charter school association revenues from contributions and grants demonstrated in Figure 2 was driven by a growth in philanthropic backing.

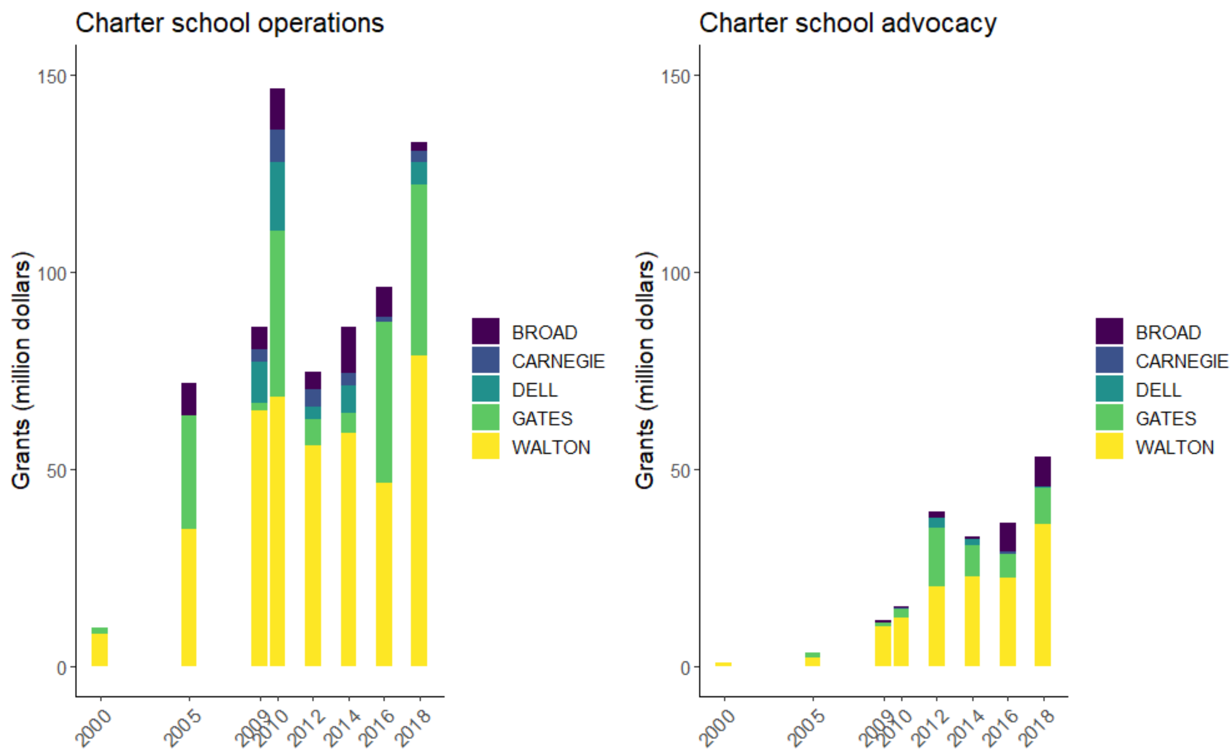
Figure 3: Grant-making to charter school associations from top five charter donors. *Sources*: Author's analysis of IRS 990 forms, Ferrare and Setari (2018), Reckhow and Snyder (2014)



I now broaden the investigation to grant-making to charter school sector organizations more generally. In 2000, the five foundations in the sample gave over $10 million in grants to schools and ancillary organizations (like NewSchools Venture Fund). As demonstrated by Figure 4 grant-making on charter operations rose markedly from 2000 to 2010 before leveling off. Grant-making on schools and operations peaked in 2010 with total expenditures of just under $150 million. Afterwards, grant money dropped—driven by less grant-making from the Gates Foundation—before rising back up in 2018.

Turning to organizations involved in charter advocacy, in 2000, the amount spent by these five foundations on charter advocacy grant-making was just $1.2 million. But by 2010, this had risen more than ten times to $15 million, and by 2018 grant-making on charter advocacy exceeded $50 million. Overall, the evidence supports the notion of a shift in foundation charter strategy to greater grant-making on advocacy, versus operations, over time. In 2000, just 11 percent of total grant-making dollars from these five major foundations to the charter school sector went to organizations involved with advocacy. The percent of total funding going to advocacy remained under 15 percent through 2010. But in 2012, around 35 percent of charter sector grant-making dollars went to advocacy organizations. The percent going to advocacy remained over 25 percent also in 2014 and 2018.

Figure 4: Grant-making to the charter sector from top five charter donors. *Sources*: Author's analysis of IRS 990 forms, Ferrare and Setari (2018), Reckhow and Snyder (2014)



Evidence from semi-structured interviews clarify aspects of the shift in philanthropic strategy from charter school operations to operations plus advocacy. Overall, I conducted interviews with eight individuals with executive-level positions (or former positions) at major foundations funding the charter school sector or organizations in the charter school sector supported by these foundations.[53]

Interviewees broadly emphasized the importance of foundations for providing a highly capitalized countervailing force to the financial and organizational power of teachers unions. As one long-time charter advocate said, "The important thing about foundations is they are hugely

[53] I received informed consent from each of the interviewees. I established how the interviews would be used in our research, and also established guidelines for confidentiality. Interviewees were asked what level of attribution they preferred. Such interviews are deemed not human subjects research by the UC Berkeley Committee for the Protection of Human Subjects since the focus is not on characteristics of the individuals, but rather on political dynamics on which the individuals have expertise.

wealthy… they could take a flyer on charter schools without it occupying a big piece of their budget."

Interviewees also broadly emphasized the importance of laws enabling schools to establish for drawing support from major foundations. According to the executive for education grant-making at the Bill and Melinda Gates Foundation, the foundation increased charter advocacy grant-making significantly over the course of the 2000's as it recognized the importance of politics and policy in determining how successful charter schools would be. In addition, the founder of the NewSchools Venture Fund said: "Early on it was pretty much just funding schools… it was only later that foundations got more involved in politics and policy." Several interviewees suggested that the emergence of charter schools in early-adopting states was particularly important in pulling center-left foundations into charter policy. More conservative foundations like the Walton Family Foundation were attentive to politics earlier on, but it took having schools on the ground and advocates actively fund-raising to draw greater grant-making on charter school advocacy from the more liberal and centrist foundations.[54]

Interviewees emphasized how grant-making efforts built on themselves. According to a former executive at the Gates Foundation, decision-makers at the foundation realized, through experimentation, that the foundation's grant-making generated a multiplier effect. Greater availability of grants for advocacy increased the number of advocacy groups forming, and these groups, once formed, would continue to apply for grants from the Gates Foundation and other large funders. In addition, as major foundations increased their grants to charter advocacy, and more charter advocacy organizations formed, charter schools became a major topic of discussion at philanthropic meetings, which grew the pot of money for charter advocacy. This ultimately contributed to the formation of advocacy networks like the PIE Network and 50CAN.

Ramping up of charter advocacy in the mid-2000's and 2010's was in part a response to shifts in the political environment. By 2003, charter laws had been adopted in a full 40 states. But, despite this great success, the charter movement faced serious challenges. Charter laws were passed in a "fog of enactment" (L. Stokes 2020)—their implications for the K-12 education sector were, at the start, highly uncertain. Of particular importance, and uncertain at the time, was the degree to which charter schools would be unionized. Charter schools turned out to be very difficult to unionize, and just as the establishment of schools in leading states served as "proof of concept" for foundations to increase their involvement, it also provided the evidence teachers unions needed to intensify their opposition. This only added to the demand for the pro-charter advocacy funded by philanthropists.

National Coalitions, Local Conflicts

The 2000's and 2010's saw charter school penetration steadily grow, with charters starting to play a major role in large cities including New Orleans, Los Angeles, Detroit, and Washington, D.C. The charter school sector benefited from strong support from both the Bush and Obama administrations. In particular, Race to the Top (RTTT), Obama's signature first-term

[54] Interview with foundation official, 4/27/2021.

education initiative, offered competitive grants to states based in part on their support for charter schools. Yet, despite federal support, the state politics remained highly contested, as incumbent education interests—principally teachers unions—continued to leverage their political sway to limit the growth of charter schools. In this section, I present several mini-cases that illustrate the critical role of the rise of charter advocacy organizations in state charter politics episodes.

Diffusing to new states

I turn first to two episodes that illustrate aspects of the politics of expanding chartering to new states after the initial wave from 1991 to 2003. Most of the states that still did not have charter laws after 2003 were in rural areas of the country (e.g. Montana, South Dakota, Vermont). Chartering has been seen principally as an education reform that could benefit metropolitan areas with many schools among which families might choose. As a result, advocates and pro-charter politicians historically spent less energy trying to pass charter laws in more rural states.

One such rural state late to chartering is Alabama. Even though bordering states Georgia, Mississippi, Tennessee, and Florida adopted charter laws during the initial wave in the 90's and early 2000's, Alabama, did not until 2015.[55] What is notable about the 2015 Alabama expansion is the composition of the coalition of organizations leading the effort. The pro-charter coalition included Black Alliance for Educational Options (BAEO), StudentsFirst, a new organization called Alabama Coalition for Public Charter Schools, and the Business Council of Alabama (Prothero 2014). Both BAEO and StudentsFirst were national education advocacy groups that developed—with significant philanthropic funding—as charter schools grew in other states.[56] The Alabama Coalition for Public Charter Schools, now known as New Schools for Alabama, was a new philanthropy-funded organization that established to push for the development of a charter school sector in Alabama.

Put together, the pro-charter side was a coalition of foundation-funded advocacy groups from out-of-state with local business interests—aligned largely with Republican state lawmakers. This differed from early charter expansion in the 90's, which depended on a network of policy entrepreneurs that was able to rally support from a mix of Republican and Democratic state lawmakers. The opposing coalition, on the other hand, did not look so different. It was spearheaded by the Alabama Educators Association, an affiliate of the National Education Association (the nation's largest teachers union).

While rural Alabama is typical of late charter adopters, Washington state is not. In many ways, Washington's political economy resembles early adopters and charter leaders like California, Minnesota, Colorado, and Massachusetts. But, unlike in these similar states, charter advocates were not able to overcome opposition from the powerful Washington Education Association (WEA) and other incumbent education interests during the initial charter law wave.

[55] One potential explanation is that teachers unions are stronger and better organized in Alabama than in other states in the Southeast.

[56] BAEO ceased operations in 2017.

It was not for lack of trying. Charter laws were introduced each year from 1995 to 1999, each time passing in the lower chamber but failing in the state Senate (Barkan 2016).

A relatively modest charter law was finally passed in 2004, but it was overturned via ballot initiative later in the year. The WEA organized the referendum against the legislation and won support from key Democratic lawmakers. Even though they were outspent by the pro-charter side, with prominent donors including Bill Gates, Don Fisher, Jeff Bezos, and John Walton, the anti-charter side was able to highlight the potential for other on-going education reforms outside of chartering—successfully portraying the new charter law as unnecessary (Johnston 2014).

Charter proponents were finally able to push through a charter law via initiative in 2012. They benefited from a confluence of federal incentives for charter development through Obama's RTTT initiative, and local issues with Seattle Public Schools undermining public confidence in the education system (Johnston 2014). But the expansion of charter schools to Washington state also depended critically on Bill Gates and the Gates Foundation, which had, since the early diffusion of charter laws in the 90's, become a major supporter of efforts to expand charter schools. Outside of Gates, the charter initiative was very well-funded by the "usual suspects" in pro-charter philanthropy, including Microsoft co-founder Paul Allen and Alice Walton of the Walton family (Shaw 2012).

Broadly speaking, the politics of expanding charter laws to Alabama and Washington looked quite different from the early wave of chartering. For one, teachers unions were more aggressive in their opposition. But, the pro-charter side benefited from the support of philanthropists and philanthropy-funded advocacy organizations that had emerged in part as a result of the growth of charter schools in early-adopting states. This thus demonstrates the importance of the policy feedback framework for understanding shifts in the interest group politics of chartering over time.

A Changing Politics in Early Adopters

At the same time as charter advocates sought to spread charter laws and charter schools to new states, they were also defending and expanding bills in states with more developed charter sectors. In many of these states, initial charter laws included caps on the number of charter schools that could be authorized. As a result, continued charter growth required new legislation to raise caps—which benefited teachers unions and other charter school opponents in their efforts to curb charter growth.

California was a charter school pioneer, adopting its initial charter law in 1992 just a year after Minnesota. By 2002, 350 charter schools had opened, and charter leaders were increasingly recognizing the need for greater coordination and political representation. This led to the formation of the California Charter Schools Association (CCSA) in 2003. Initially, the CCSA was focused to a greater extent on supporting new schools than on politics. At that time, charter opposition from incumbent education interests was muted—teachers unions saw charter schools as a “curious experiment”,[57] not an existential threat. Teachers unions were much more determined at the time to prevent school voucher programs from taking hold.

By 2013, with 1085 charter schools established and nearly 8 percent of total public-school students in charter schools, teachers unions had begun to push back more forcefully. And in response, CCSA grew into an organization with significant capacity for political advocacy—in part because it was able to raise a huge amount of foundation funding. While the unions had significant influence in the legislature, Governors Arnold Schwarzenegger and Jerry Brown were both pro-charter, and would veto legislation they saw as harmful to the sector. Despite governor support, according to charter advocates, the regulatory environment grew more stringent over time, making it difficult for new schools to form and for existing ones to expand.

This came to a head in 2018 with the election of Governor Gavin Newsom. Newsom was endorsed by the California Teachers Association, and the CCSA had organized a group of donors to spend $23 million supporting the campaign of the more pro-charter candidate: former Los Angeles Mayor Antonio Villaraigosa (S. Mehta and Mason 2018). In 2019, Newsom signed a bill that enhances the authority of local school boards to reject new charter schools, with other restrictive charter bills in the pipeline (Fensterwald 2019). Charter advocates are now uncertain about the future of charter schools in California, with some predicting a turn back to vouchers in the education reform community.

Massachusetts was also an early charter adopter, passing its initial charter law in 1993 as part of a “grand bargain” on education that offered greater funding to high-poverty districts in exchange for competition and accountability. Massachusetts was highly selective about authorizing charter schools and maintained stringent caps limiting the sector from growing quickly. The result has been slow charter growth. But the schools that have emerged are some of the best-performing charters in the country (Candal 2018). The success of this formula generated a bipartisan consensus supporting limited charter school growth combined with strict caps and authorization procedures that persisted through the 90’s and early 2000’s.

This began to change with the election of Deval Patrick as governor in 2006, who took the reins from pro-charter Mitt Romney. Patrick had rallied significant support and funding from teachers unions and school boards in his election. The Massachusetts state legislature was also growing more anti-charter with the departure of key figures who had driven forward the landmark 1993 education bill. Advocates were able to raise charter caps in 2010, but with help from the federal RTTT, and also with major strings attached. In particular, new charter school spots would only be available to charter networks already operating in the state.

Even with pro-charter Charlie Baker, a moderate Republican, elected in 2014, lack of support in the State Senate limited prospects to raise caps again and open new schools. Some charter advocates determined that their best shot at raising caps was a ballot initiative. They were able to marshal a huge amount of financial support for “Yes on 2”, particularly from Michael Bloomberg and the Walton family. But the teachers unions, who drove the campaign against the

[57] Interview with former CCSA executive, 4/28/2021.

initiative, were also able to raise a huge pot of money. Ultimately, the initiative lost badly, and was widely seen as a disaster for the charter movement in Massachusetts. Since then, there has been little support for new efforts to raise caps and open new charter schools.

Both the California and Massachusetts cases highlight the role of major philanthropists in funding pro-charter political advocacy in states with developed charter sectors. In California, philanthropists provided critical support for the powerful CCSA, and in Massachusetts, philanthropists funded the campaign to raise charter caps in 2016. Yet, these cases also highlight how, as the charter sector has grown, the politics has become more fraught in liberal-leaning states. With charter schools posing a greater threat, teachers unions have used their political sway in these states to make it more difficult for growth to continue.

Discussion

Changing public policy is much more difficult than preserving the status quo, and enacting reforms that challenge vested economic interests is particularly difficult (Moe 2015). In these cases, even when new policy is made, changes are susceptible to erosion and rollback. New policies' susceptibility to rollback depends to a great degree on whether they dislodge the political power of incumbent interests, and also whether they contribute to the growth of pro-reform interest group coalitions (Patashnik 2008). Charter school policy represents a case in which some reforms challenging incumbent education interests have been achieved and sustained, even though the incumbents have for the most part held onto their political power. What is more, this has occurred even as charter schools themselves—the organized interests most vested in the preservation and expansion of pro-charter policies—remain politically weak relative to their opponents.

This paper argues that a critical factor in the successes the charter movement has seen was the emergence of a foundation-funded pro-charter advocacy network. The emergence of this network depended on the ability of policy entrepreneurs to enact charter laws during a favorable "window of opportunity." These laws allowed charters to form, which provided a proof-of-concept and demand for resources that drew attention and prioritization from certain foundations. Foundations, in turn, followed up their investments in seeding new charter schools with investments in political capacity to defend and expand pro-charter laws.

This case helps inform our understanding of the role of philanthropists in driving policy reform in the American political economy. Whereas historically philanthropists were seen in the political science literature primarily as patrons to civil society organizations (Lowry 1999), philanthropists increasingly directly engage in politics (Reckhow 2012, 2016)—particularly when it comes to education policy. Newer foundations with living donors have been more likely to promote reforms and fund jurisdictional challengers like charter schools (J. Mehta and Teles 2012). Foundations, I show, provided the pro-charter advocacy coalition with critical resources to build political strength before charter schools had the resources to support themselves politically. Thus, the pro-charter coalition was able to compete with powerful incumbent interests even before the challenger pro-charter industry had developed.

Yet, this case also highlights the dangers of relying on philanthropic foundations to build political strength. The political winds have shifted on charter schools. While core elements of the Democratic party were strong supporters in the past, the party has increasingly aligned more closely with teachers unions against chartering. Support from Republicans remains lukewarm, with many focusing to a greater extent on promoting school voucher programs. With political support eroding, some foundations have distanced themselves from the charter school issue. They are able to do so, in part, because they have less at stake in the politics than charter schools and advocates themselves—not to mention teachers unions and others in the anti-charter camp. The foundations are not really vested interests. Unlike these other groups, foundations' organizational maintenance, at the end of the day, does not depend on the trajectory of charter policies. The very feature that makes them powerful—their resources, and the fact that their resources do not necessarily depend on winning political victories—also makes them unreliable coalition-members.

Conclusion

The American economy is not serving Americans as well as it could. At the macro-level, economic growth has failed to deliver wage gains for most Americans, leading to soaring inequality (Piketty, Saez, and Zucman 2018). Meanwhile, a carbon-intensive economy continues to pollute the air with greenhouse gases, contributing to a warming climate whose negative effects will disproportionately affect lower-income Americans. On a sectoral level, there are fundamental, and fixable, problems with how critical areas of the economy and of society work, from healthcare to energy to education to criminal justice. Shifting government policies is essential to reforming these critical sectors to work better for Americans—as well as, more broadly, to direct the American economy towards greater equity and sustainability.

Yet, the politics of reforming sectors of the economy, not to mention aspects of the macro-economy, via government policy is notoriously fraught. Even if existing policy delivers poor results, the status quo is hard to change. For one, interest group politics generally favors the status quo. Groups with a material stake in the existing policy regime—"vested interests" (Moe 2015)—are generally better-organized and better-positioned to block policy than reform coalitions. Incumbent businesses are often the most powerful forces resisting reforms, but are not alone. Government bureaucrats, employees and unions, and individual consumers and citizens often fiercely resist potential reforms that threaten their positions in the economy.

American political institutions also favor the status quo. Separation of powers increases the number of "veto points" in the system, and thus the number of actors that can block policy shifts they oppose. The structure of American federalism, featuring strong institutional authority for state governments, can make it more difficult for the national government to initiate and implement reforms. Reformers that shift focus to the state level must reckon with potential "race to the bottom" pressures wrought by inter-state competition, and vested interests that tend to wield even more power at lower levels of government. Federalism thus, in many ways, toughens the task of reforming the economy through shifts in government policy.

Yet, barring major institutional changes to American federalism itself, this is the system within which reformers must operate. And this dissertation has shown that American federalism, for all its problems, also offers opportunity. State authority can be leveraged to strategically ratchet up reforms, as new state policies generate supportive interest group coalitions that work to propagate those reforms across and up the federal system. By reshaping the interest group politics, state policy victories can open new policy avenues for reformers.

In many ways, though, this dissertation raises more questions than it answers. I have, for the most part, traced a relatively simple dynamic: state policy reforms empower new interest group coalitions that then use that power to propagate the reforms that benefit them. (The charter schools case is a bit different due to the somewhat enigmatic role of philanthropic foundations, but the structure is similar.) Studying these dynamics is important, and challenges the dominant approach in the diffusion literature, which focuses on mechanisms of learning and competition. Yet, the cross-state and state-national feedbacks studied in this dissertation are just one piece of a broader research agenda on American federalism and the political economy of policy reform. The goal of this research is to develop a better understanding of how the institution of federalism in the U.S. shapes the ability for government to drive shifts in the economy through public policy. In pushing this agenda forward, I will broaden in several directions.

First, I will review and develop more theory on the capacities and limitations of different levels of government in the federal system when it comes to driving reforms to sectors of the economy. Critical to what states (and other subnational governments) offer is a diversity of political and institutional landscapes. This means that "windows of opportunity" for policy shifts open in different states at different times. For instance, the political make-up of California means that prospects for aggressive climate and clean energy policies have been much better there than at the federal level—even if theoretical models of collective action suggest that the federal government would generally be better suited to climate change mitigation. State politics also offers variation in institutional rules that makes certain reforms more feasible. In the case of marijuana policy, the ability for reformers to use ballot initiative in states that allow them was critical to advancing legalization of marijuana for medical and adult-use. This then changed the national politics, driving greater support for pro-marijuana policies from members of Congress representing legalizing states.

But, at the same time, state-level reforms are limited by issues of scope, coordination, and budget. These are best elucidated by way of example. In the case of climate change mitigation, the scope problem is that the liberal states where achieving policy reform is more feasible are also the states that tend to be the least carbon-intensive. "Lower-hanging" emissions reductions are more likely to be found in carbon-intensive, conservative states—but these are places where the politics is less favorable. Turning to the coordination issue, variation in policy stringency across the states can lead to "carbon leakage", pushing emissions from states with strict policies to states with weaker ones (Fowlie and Reguant 2018). And finally, state governments are generally too budget-constrained to afford major decarbonization-focused investment programs of the sort proposed in 2021 by the Biden administration. These weaknesses highlight the importance of federal policy. The federal government can pass laws that apply to the entire country (not to mention influence policies adopted in other nations), and thus resolve problems of scope and coordination. It can also take on debt to fund major programs.

At the same time, waiting for the federal government to act, especially when it comes to issues like climate change that require fast action, is a risky strategy. Achieving major policy reforms at the federal level is rare. With high polarization, and with control of Congress hotly contested, the minority party has greater incentives to block the majority's agenda (Lee 2009). In many policy areas, federal government authority and bureaucratic capacity is constrained. For instance, most education governance is carried out at the state and local levels. While the federal government can, and often does, offer "carrots" and "sticks" to incentivize particular state education policies, the ability of the federal government to directly shift policy is limited. The same holds for electric power regulation, which is primarily carried out by state-level commissions.

The fact that different governments have different capacities to drive forward reforms highlights the importance of the interdependencies and positive feedbacks across the federal system studied in this dissertation. As I argue, achieving state-level reforms can generate shifts in the interest group landscape that increase reformers' chances of success at the federal level and in other states. But these interdependencies go beyond the relationships I have studied in the dissertation in several directions, two of which I discuss below.

First, while the dissertation focuses on how state policies structure the national politics through policy feedback mechanisms, this relationship also goes in the other direction: from the federal government down to the states. For instance, in the case of charter school policy, the Obama administration's *Race to the Top* program offered financial incentives for states to promote charter schools. This in turn provided a boost to charter advocates operating at the state level. In the rooftop solar case, the effects of pro-solar state policies on the development of the industry were magnified by federal tax incentives. These examples also highlight the different capacities of states and the federal government—in both, the federal government was able to leverage financial power to shape state policy decisions.

Second, while the dissertation focuses on how state policy reforms drive the formation and strengthening of supportive interest group coalitions, another important dynamic to explore in the broader project is how the adaptation of incumbents to subnational policy environments affects their national-level political positions. A working paper with Jonas Meckling shows that electric utilities operating in states with more aggressive climate and clean energy policies take more pro-climate positions in national politics—even accounting for a wide array of potential confounding variables. Utilities operating in states with aggressive policies made greater investments in clean energy, and thus subsequently had less to lose from potential federal greenhouse gas emissions regulations. More generally, firms in highly regulated sectors take public policy into account in determining business practices and investment strategies. And across a number of sectors, firms are regulated at multiple levels of government. This suggests, broadly, that subnational policies that affect incumbent firms' investments will also affect national interest group coalitions.

Finally, while the discussion to this point has focused on the institution of federalism, my hope is that this broader project will also push forward existing understandings of the political economy of reform. Much of the older literature on policy reform focuses on cycles of media attention and agenda-setting (e.g. Baumgartner and Jones 1993), but this is potentially less relevant to policy areas featuring strong "repeat-player" vested economic interests. Even if reforms are achieved in one cycle, they might be quickly rolled back or eroded over time (Patashnik 2008; L. Stokes 2020). While Patashnik sheds valuable light on the policy design features that enhance durability, these design choices are endogenous to other aspects of the politics, so there is more to be understood. Moe's (2019) and Stokes' (2020) books on vested interests in education and energy policy, respectively, highlight the *difficulty* of achieving sustainable reforms in key sectors—but are shorter on explanations for why reforms might succeed despite status quo pressures. In my future research agenda, I hope to develop a greater understanding of when and why reforms that challenge vested economic interests sometimes succeed.

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Appendix A: Supplemental Information for *Policy Feedback and Interdependence in American Federalism: Evidence from Rooftop Solar Politics*

Figure A1: Rooftop solar policy favorability by state over time. *Source:* Freeing the Grid.

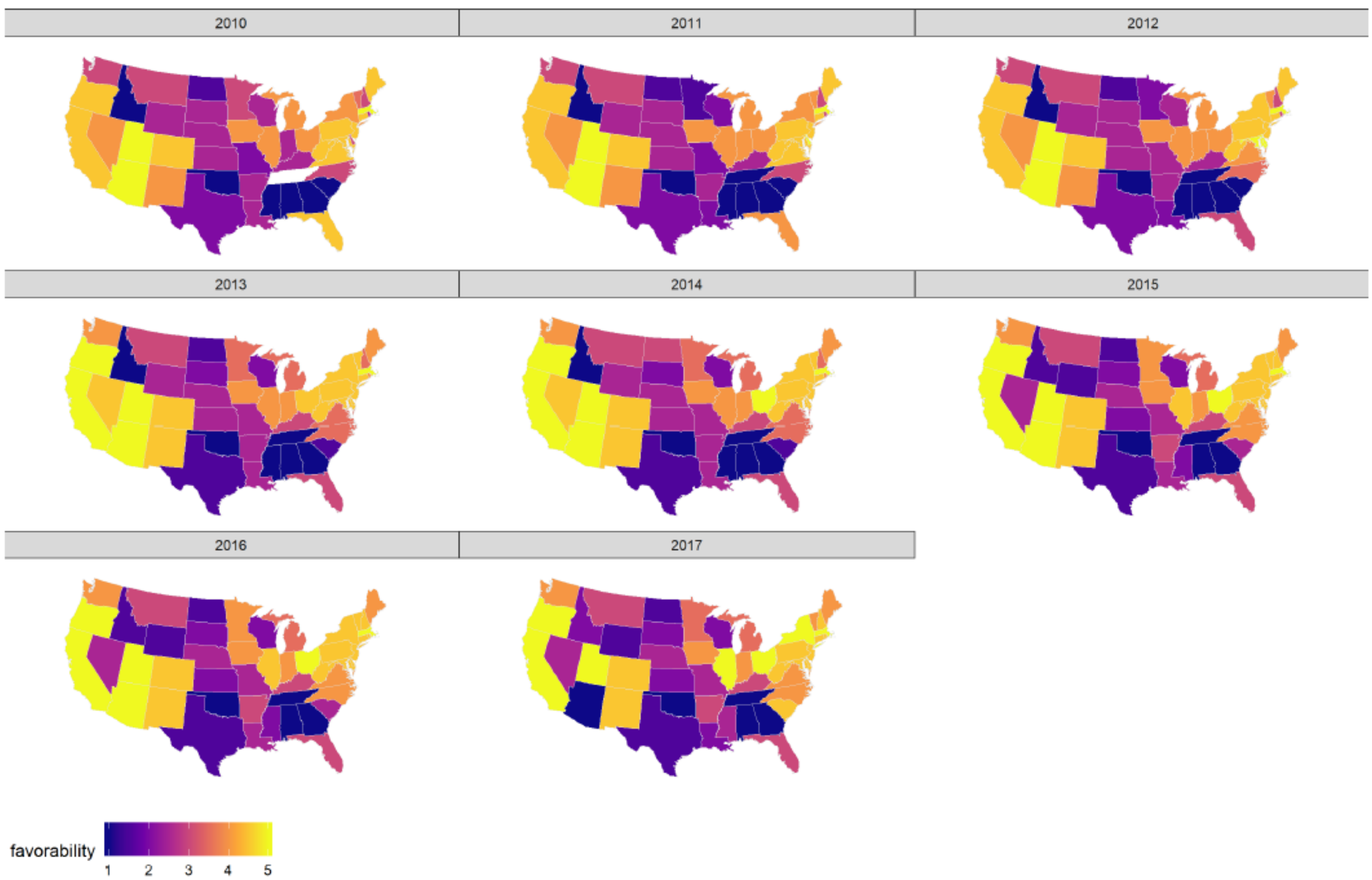


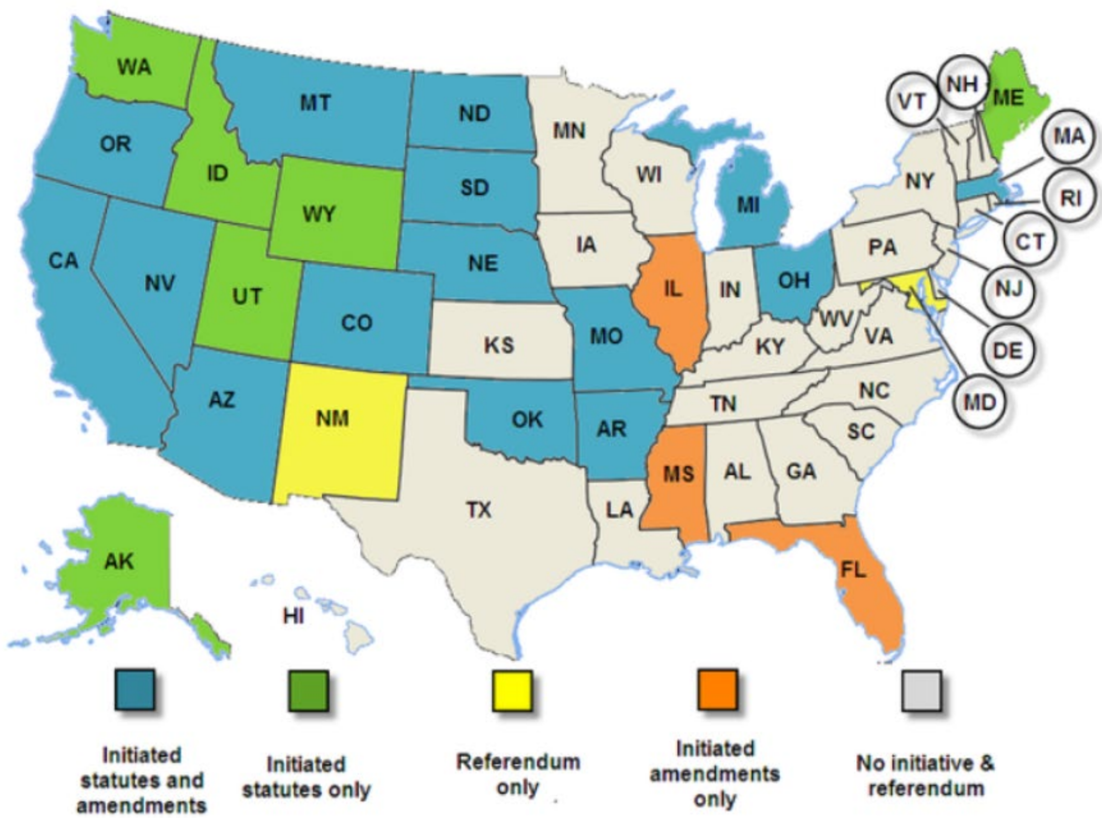
Table A1: Association between state policy and distributed solar growth, robustness to dropping negative observations

	Distributed solar growth (logged MW)	
	Fixed effects	*Multilevel model*
	(1)	(2)
Policy favorability (1-5)	0.38***	0.47***
	(0.12)	(0.10)
Solar potential		0.54***
		(0.20)
GDP per capita		0.03*
		(0.02)
Electricity price		0.17***
		(0.05)
Observations	313	306

Note: *p<.1 **p<.05 ***p<.01. Panel covers 50 states from 2011 - 2017. Reduced observations in column 3 reflects missing solar potential data for Alaska.

Appendix B: Supplemental Information for *State Policy and National Representation: Marijuana Politics in American Federalism*

Figure B1: Citizen initiative rules



Source: Ballotpedia

Figure B2: Bill sponsorship score distributions by legalization status

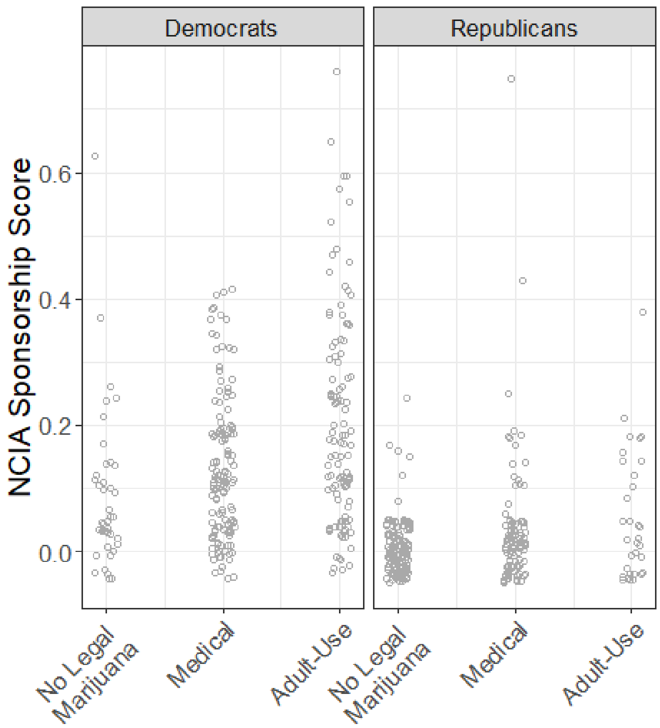
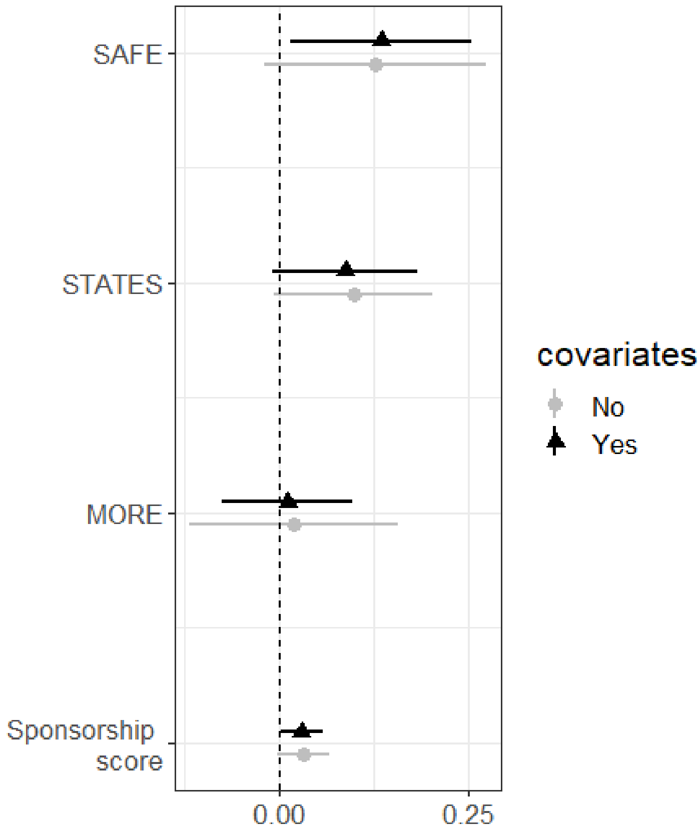


Table B1: First stage regression results

	Marijuana legalization status	
	(1)	(2)
Ballot initiative	0.98^{***}	0.87^{***}
	(0.05)	(0.03)
Democratic PID		0.09
		(0.10)
DW-NOMINATE dimension 1		-0.04
		(0.11)
DW-NOMINATE dimension2		0.01
		(0.06)
2016 Democratic presidential vote share		2.48^{***}
		(0.35)
Social liberalism 2000s		0.40^{***}
		(0.07)
Observations	544	542
F Statistic	396.99^{***} (df = 1; 542)	298.64^{***} (df = 6; 535)

Note: **p<0.01

Figure B3: Effects of state marijuana legalization on bill sponsorship in the 116th Congress, excluding western states.[58] Figure presents estimates from two-stage least squares regression. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level.



[58] These include: AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA.

Figure B4: Effects of state marijuana legalization on bill sponsorship in the 116th Congress, alternative legalization status coding. Figure presents estimates from two-stage least squares regression. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level. In this specification, states with legalized adult-use marijuana are coded as "treated", with medical-use and prohibition states in the control group.

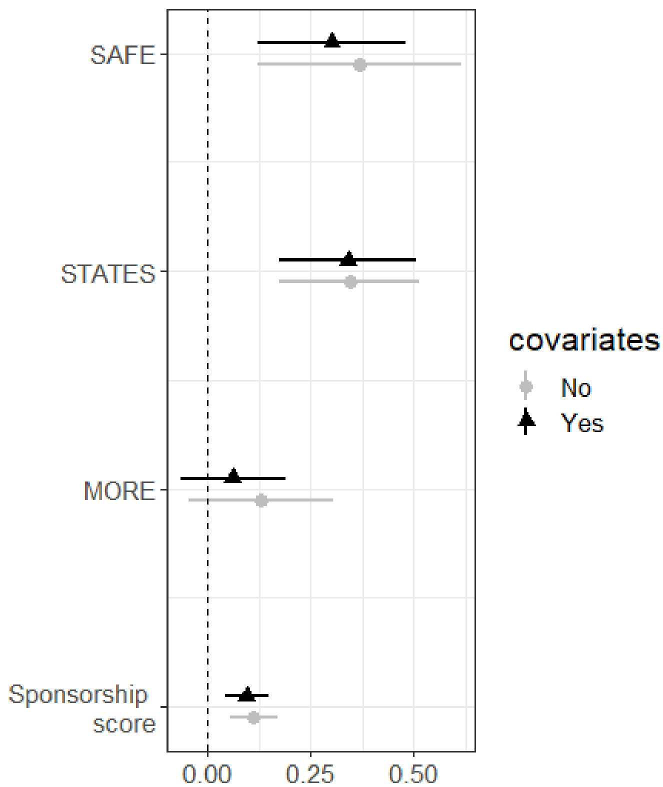


Figure B5: Effects of state marijuana legalization on bill sponsorship in the 116th Congress, by party. Figure presents estimates from two-stage least squares regression. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level.

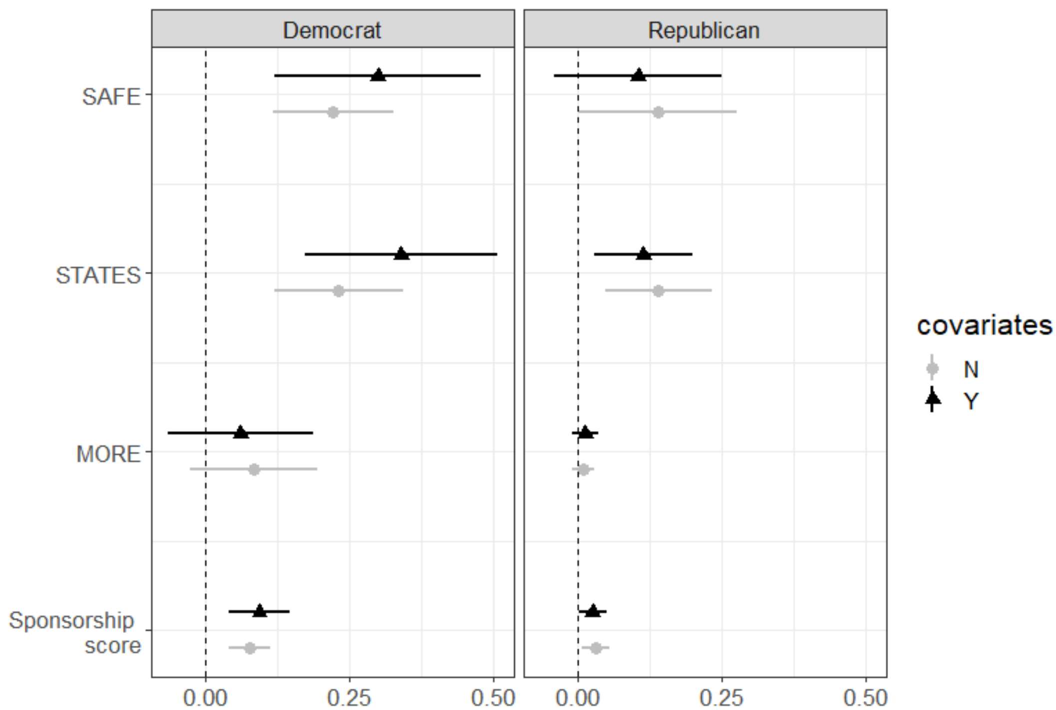


Figure B6: Effects of state marijuana legalization on bill sponsorship in the 116th Congress, covariate adjustment specification. Covariates include party identification, ideology (DW-NOMINATE first and second dimensions), 2016 presidential vote (state-level), and social liberalism (state-level).

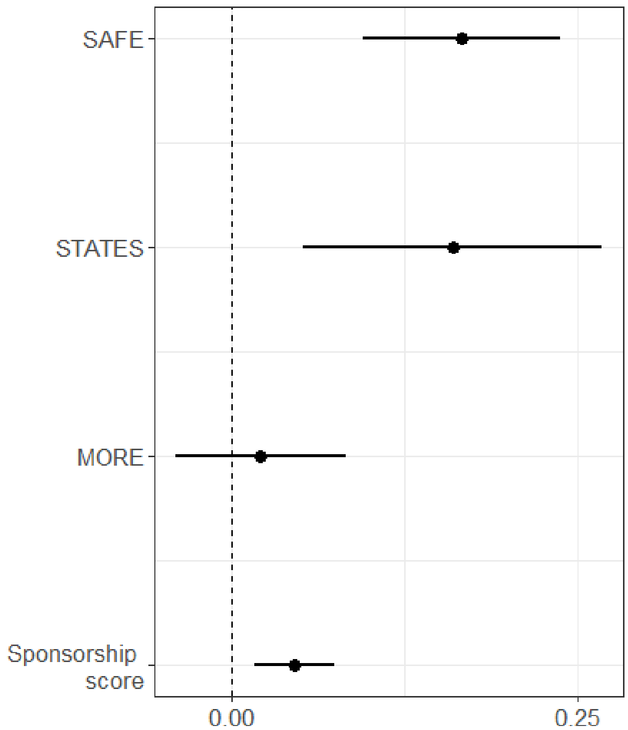


Figure B7: Effects of state marijuana legalization on roll-call voting in the 116th Congress, covariate adjustment specification. Covariates include party identification, ideology (DW-NOMINATE first and second dimensions), 2016 presidential vote (state-level), and social liberalism (state-level).

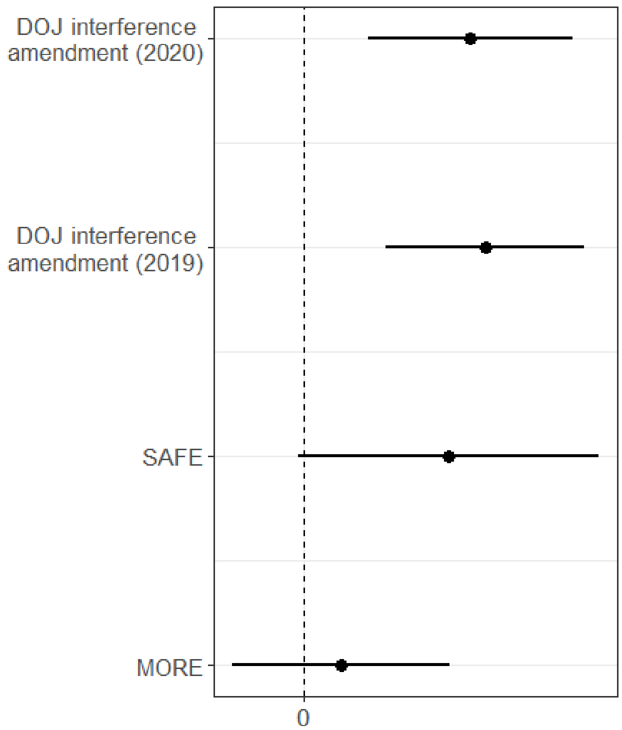


Figure B8: Proportion of 2018 congressional elections with marijuana industry contributions by legalization status

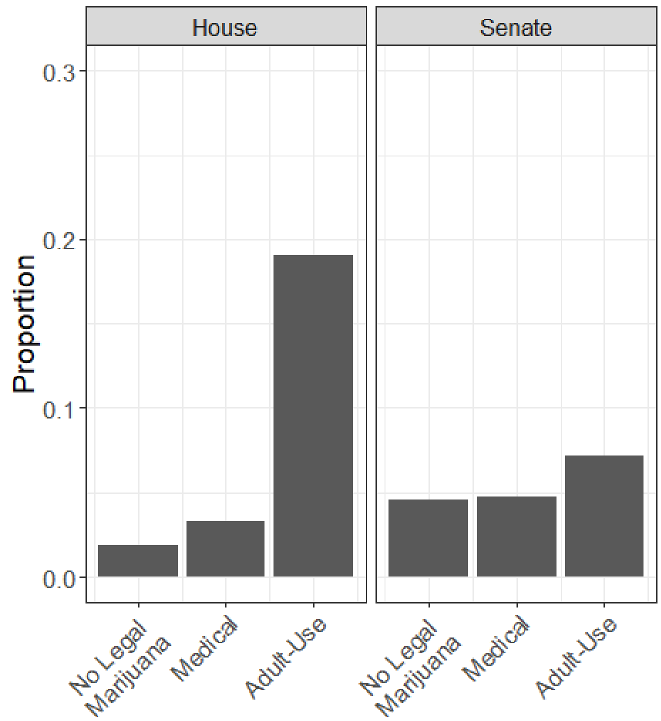
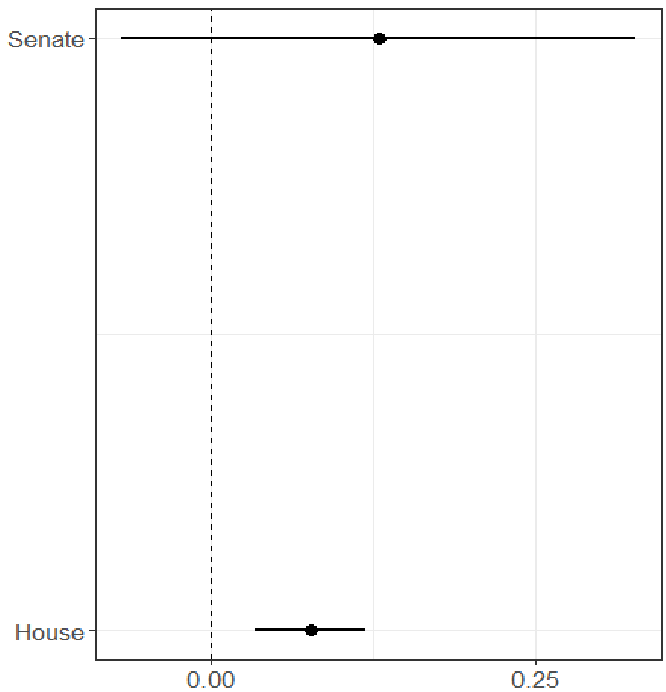


Figure B9: Effect of legalization on receiving campaign donations from marijuana industry in 2018 election cycle. Figure presents estimates from two-stage least squares regression. Outcome is a binary indicator for receiving contributions from marijuana industry. State legalization status is instrumented by citizen initiatives rules. 95 percent confidence intervals are calculated using standard errors clustered at the state-level.



Appendix C: Supplemental Information for *How Policy Experiments Construct Interest Group Coalitions: Evidence from Education Politics*

Figure C1: Students enrolled in charter schools as a percentage of total public school students, by state.

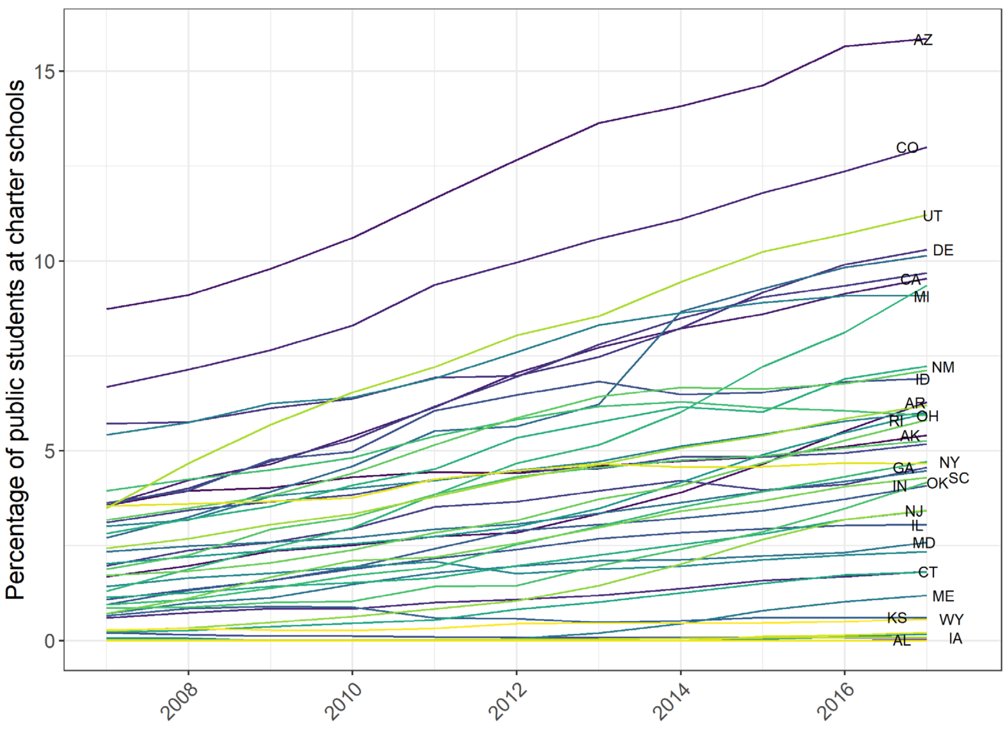


Table C1: Affiliates of National Alliance of Public Charter Schools

Arizona Charter Schools Association
Arkansas Public School Resource Center
Bluum
California Charter Schools Association
Colorado League of Charter Schools
Delaware Charter Schools Network Inc.
Florida Charter School Alliance Inc
Florida Consortium of Public Charter Schools Inc
Georgia Charter Schools Association
Illinois Network of Charter Schools
Maine Association for Charter Schools
Massachusetts Charter Public School Association
Michigan Association of Public School Academies
Milwaukee Charter School Advocates
Minnesota Association of Charter Schools
Mississippi First
National Alliance for Public Charter Schools
New Jersey Charter Public Schools Association
New Schools for Alabama
New Schools for New Orleans
New York City Center for Charter School Excellence
North Carolina Association for Public Charter Schools
Northeast Charter Schools Network Inc
Oklahoma Public School Resource Center
Pennsylvania Coalition of Public Charter Schools
Public Charter Schools of New Mexico
Rhode Island League of Charter Schools
South Carolina Association of Public Charter Schools
Tennessee Charter School Incubator
Texas Charter Schools Association
Thomas B Fordham Institute
Utah Association of Public Charter Schools
Washington State Charter Schools Association

Figure C2: Components of charter advocacy grant-making. Figure presents total grant-making from five foundations studied to organizations with charter advocacy component, organized by type. *Free market education* denotes organizations with school choice advocacy component. *Operations plus charter advocacy* denotes organizations with some operational role in the charter sector that also does advocacy work.