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ABSTRACT

Why do individuals join interest groups? Through what channels do interest groups and public policy affect one another? We study these questions by analyzing the interplay among labor unions, minimum wages, news coverage, and public opinion. Over the past decade, labor unions have played a significant role in advocating for state and federal minimum wage increases. Over this period, we find that each dollar in minimum wage increase predicts a 5 percent increase (0.3 pp) in the union membership rate among individuals age 16–40. We document four additional facts that shed light on the mechanisms that may underlie this finding. First, while we find increases overall in union membership, we find declines among the minimum wage's most direct beneficiaries. This is consistent with a classic "free-riding" hypothesis. Second, we find increases in union membership among much broader groups that are not directly affected by the minimum wage. Third, we find that minimum wage increases predict increases in unions' favorability ratings among the public. Fourth, we find that events in the legislative histories of minimum wage increases predict increases in counts of newspaper articles that simultaneously discuss the minimum wage and key players in the labor movement. Overall coverage of organized labor shifts towards articles that discuss the minimum wage. These facts are consistent with models in which a desire to affiliate with "effective advocacy" is an important driver of the decision to participate in unions and other politically oriented groups.

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Section I: Introduction

Over the past decade, labor unions have emerged as advocates for historically high minimum wages. Since its inception in 2012, the "Fight for $15" movement has received substantial union support, ranging in intensity from simple expressions of solidarity to financial and organizational aid.[2] Over this same period, the public's view of labor unions has become more favorable. Against this backdrop, we analyze the interplay among labor unions, minimum wages, news coverage, and public opinion. We assess what factors might drive participation in groups like labor unions, and how public policy and interest groups affect each other.

We document that recent minimum wage increases have preceded increases in union membership. Over the past decade, a one-dollar increase in a state's minimum wage predicts a 5 percent increase in union membership among those ages 16–40. As detailed below, we assess the case for interpreting this link as causal and find that case to be relatively strong.

Increases in minimum wages predict a greater likelihood of union membership among groups of workers that do not benefit directly from minimum wage hikes. Why might this be? We find that minimums wage increases lead to news coverage that links minimum wages to key players in the labor movement. Higher minimum wages also predict higher public esteem for unions. Union membership may thus rise in the wake of minimum wage hikes because individuals value affiliating with groups that deliver "effective advocacy," even if they do not

[2] The AFL-CIO's website, for example, includes "restoring the minimum wage to a living wage" in its statement of policy priorities for improving pay and benefits. (Accessed at the following link on May 5, 2020: https://aflcio.org/issues/better-pay-and-benefits). The Service Employees International Union (SEIU) has been relatively public regarding its operational and financial support for the Fight for $15. In a representative statement linking the fortunes of unions and the Fight for $15, SEIU President Mary Kay Henry wrote in 2019, "This movement will not stop until workers across the country win the $15 an hour and union rights they've demanded since Day One." (Accessed at the following link on April 10, 2020: http://www.seiu.org/2019/01/seius-henry-fight-for-15-and-a-union-is-winning-for-americas-working-people-changing-whats-possible.)

benefit personally from the outcome of that advocacy. We also find that minimum wage increases reduce union membership among the workers who are most likely to benefit directly. This finding is consistent with a classic free-riding hypothesis, since unions and the minimum wage may be substitutable sources of bargaining power in the low-wage labor market.

Our effort to isolate the causal effect of minimum wages on union membership faces three standard but nontrivial challenges. First, it could be that union strength was already rising in states that enacted minimum wage increases. That is, the correlation we observe may reflect reverse causality. Second, the correlation could arise from factors, like strengthening labor markets, that might simultaneously stimulate employment, union membership, and preferences for raising minimum wages. Third, states that are favorably disposed toward high minimum wages may, perhaps by chance or perhaps due to other policies, have been affected by other factors that increased rates of union membership.

We investigate the relevance of these threats to our estimation framework through a standard set of best-practice robustness checks. To investigate the relevance of preexisting trends in union membership, we use event-study estimators to check for such trends directly. We find no evidence that trends in union membership had diverged before the enactment of minimum wage increases. We also investigate whether we obtain similar results if we implement synthetic control methods. These methods are designed to ensure that "treatment" and "control" states followed similar trajectories before the implementation of minimum wage increases. We find that synthetic control methods yield results similar to our more basic, baseline approach.

We further investigate the relevance of economic shocks that might shape both union membership trends and preferences over minimum wage increases. When we control for proxies

for macroeconomic conditions, we find that the relationship between minimum wages and union membership rates strengthens. Further, we find that variation in minimum wages is uncorrelated with changes in other labor market regulations. Our results are also robust to controlling for the partisan composition of state governments. Finally, we implement a simple matching approach to check for the relevance of differences in states' baseline union membership rates. Our findings are robust to using these alternative methods.

Taken together, our initial analysis finds robust evidence that recent minimum wage increases have led to increases in union membership rates. We next take our analysis further in an attempt to differentiate among alternative theories of the causes of union membership. To do so, we begin by investigating which groups of workers become more likely to be members of unions following minimum wage changes.

To analyze the mechanisms through which minimum wage increases shape union membership, we consider three distinct groups of workers. The first group consists of individuals who are directly affected by minimum wage increases. The second group consists of individuals who may be indirectly affected due to their employment as high-skilled workers in minimum-wage-intensive industries. The third group consists of individuals in industries that are unlikely to be affected by the minimum wage. Our proxies for these groups involve differences across industries, between the public and private sector, and between high- and low-education workers. As we show through analyses of wage data, high-education workers and public-sector workers have wages that are not affected by the minimum wage. Wage data reveal that the minimum wage's direct impacts are concentrated among young and low-education individuals in low-wage food service and retail industries.

Our analysis reveals that minimum wage increases affect union membership rates among the groups we analyze in distinctive ways. First, we find strong evidence for gains in union membership among workers with high levels of education, in particular when they are employed in the public sector. Second, we find declines in union membership among low-skilled individuals in low-wage industries.[3] This second group contains the minimum wage's direct beneficiaries. Importantly, this second group thus consists of workers for whom a minimum wage increase may substitute for the bargaining power associated with union membership.

Finally, we assess several mechanisms through which alternative theories of union membership might work. First, we investigate whether minimum wage increases predict increases in union wage premiums. We find that they do not. Second, we find that news coverage tracks key moments in the legislative histories of minimum wage increases.[4] Minimum wage changes predict spikes in the number of articles that jointly discuss the benefits of minimum wages and key players in the labor movement. Further, we show that events in the legislative histories of minimum wage changes do not increase total coverage of organized labor, but shift the character of that coverage towards articles about minimum wages. Finally, using polling data, we find that minimum wage increases predict increases in the favorability of public perceptions of labor unions.

[3] Notably, this is true of a sample of individuals who remain employed in those industries, implying that they experienced direct positive effects of minimum wage changes. Indeed, we provide direct evidence that this group's wages are quite strongly and positively impacted by the minimum wage changes we analyze.

[4] Using counts of local news articles assembled using LexisNexis, we find that minimum wage increases are associated with increases in articles about the minimum wage, including those that quote labor advocates or otherwise discuss key players in the labor movement. We also observe increases in counts of articles about the minimum wage at crucial stages in the legislative process, including the months in which state legislators introduced minimum wage legislation and the months in which such legislation was passed.

Our findings relate to several literatures of potential interest. First, we add to a long history of work on the determinants of union membership. A relevant slice of this literature considers Right to Work laws. These laws enable workers to benefit from a union's presence without paying dues, which raises free-rider considerations (Lumsden and Petersen, 1975; Ellwood and Fine, 1987; Moore, 1998). Our emphasis on the role of unions as participants in social or political movements connects to Freeman (1998), who analyzes the "spurt" of union membership growth connected to society-wide economic change during the Great Depression. In our analysis, we find evidence that union membership rates can be shaped by the enactment of popular labor market policies with which unions have actively associated themselves. That said, we also find that the free-rider considerations raised by studies of Right to Work laws are a relevant concern, as the minimum wage's direct beneficiaries become less likely to join unions following minimum wage increases.

Second, we contribute to the literature on the question of what unions actually do. This question is perhaps most famously associated with the aptly named "What Do Unions Do?" by Freeman and Medoff (1984). Much of this literature focuses on estimating union wage premiums (Freeman and Medoff, 1981; Hirsch and Schumacher, 2001) and assessing how changes in union density affect wage inequality (Card, 1996; Card, Lemieux, and Riddell, 2004; Farber, Herbst, Kuziemko, and Naidu, 2018). Some work in the economics literature has focused on the role of unions as "a voice both at the work place and in the political arena" (Freeman and Medoff, 1979). Our analysis of news coverage provides evidence that the labor movement participates in the political process, in part, by shaping news coverage of minimum wages. In this news environment, minimum wage increases predict increases in union membership and improvement in public sentiment toward unions.

Third, we relate our evidence to potential channels through which an interest group might accumulate members and influence. One channel, for example, is for a group to work towards the material benefit of its members (Buchanan, 1965; Olsen, 1965). Interestingly, we find that the minimum wage's most direct beneficiaries become less, rather than more, likely to join unions. As noted above, this finding is consistent with models that emphasize a classic "free-riding" concern. In addition, we find that increases in union membership are prevalent among high education workers and public sector employees, neither of which benefit directly from the minimum wage. This finding is consistent with models in which membership is responsive to an interest group's reputation for effective, public-spirited advocacy (Clark and Wilson, 1961; Wilson, 1973). Our analyses of news coverage and public opinion polls provide suggestive evidence on the mechanisms through which these effects might operate.

Finally, research in political science and political economy has long analyzed the interplay between interest groups and policy. Within this broad area of inquiry, a relatively small set of papers has focused on the impacts of policy on subsequent politics.[5] Research in this vein has focused primarily on cases in which policies created constituencies out of their direct beneficiaries.[6] Anzia and Moe (2016) analyze a case in which policy directly shaped the potential influence of an already organized group — namely, public-sector unions. They show

[5] Research on the activities of interest groups and other political factions has tended to focus on characterizing their effects on the political process rather than on the drivers of their membership prospects. Relevant theoretical studies in the political economy literature include work by Baron (1994), Grossman and Helpman (1996), Persson (1998), Besley and Case (2003), and Dewan and Shepsle (2011). Empirical evidence consistent with important roles for interest groups is somewhat sparse. Anzia (2019) argues that the literature's lack of evidence on the importance of interest groups may reflect its lack of focus on subnational politics, which can yield more opportunities to execute credible empirical strategies than can research focused exclusively on federal politics.

[6] Perhaps the most famous example involves the enduring constituency created by the Social Security system (Campbell, 2003). Schattschneider (1935) similarly emphasizes the interest groups created by the Smoot-Hawley Tariff of 1929. More recently, Clinton and Sances (2018) and Baicker and Finkelstein (2019) have analyzed the effects of access to Medicaid on political participation. The latter analyses find nontrivial but transitory effects.

that changes in public-sector labor law nontrivially shaped future politics and that legislators' votes on these laws suggest a sophisticated understanding of their long-run effects. In our analysis, we find that minimum wage policy influences the subsequent fortunes of the labor movement. We provide evidence that labor groups can attract members by contributing to policy victories and shaping media narratives, which can elevate their status in public opinion. Our analysis thus connects to a broad line of research on how the efforts of organized groups can shape policy, public opinion, and their own future prospects.[7]

Our paper proceeds as follows. Section II discusses theories that can help shed light on individuals' decisions to participate in groups. Section III describes the data we use to study the relationship between minimum wage changes and union membership rates. Section IV presents our empirical methodology. Section V presents our initial analyses of the relationship between minimum wage increases and union membership rates. Sections VI and VII present evidence on the plausibility of key theories of interest group membership, as well as the mechanisms through which they may work. Section VIII concludes.

Section II: What Factors Drive Participation in Interest Groups?

How do interest groups accumulate members and influence? Many strategies exist, and the effectiveness of these strategies will vary in nuanced ways across settings. Research in

[7] A long-running literature on the influence of organized groups is regularly associated with Schattschneider (1960), including his early analysis of the interest groups created by the Smoot-Hawley Tariff of 1929 (Schattschneider, 1935). As recently described by Hacker and Pierson (2014), this line of research emphasizes the centrality of organized groups that seek to advance policy agendas, frame debates, and shape public opinion. Recent proponents of this tradition highlight its usefulness for making sense of the rise in polarization, as documented by Poole and Rosenthal (1984, 2000, 2011); Gentzkow, Shapiro, and Taddy (2019); and others.

economics and political science has developed a number of insights into these issues. We do not attempt to summarize those literatures exhaustively. Instead, we offer some lines of intuition that guide our thinking and can help to interpret our empirical analysis.

One approach for interest groups to accumulate influence and membership is to improve their members' material well-being. This will typically come through the services the group provides to its members (Buchanan, 1965; Olsen, 1965; Berman, 2000). In the case of unions, these tend to include higher wages, better benefits, and greater voice in the workplace (Freeman and Medoff, 1984). A recent paper by Murphy (Forthcoming) highlights the impact of unions on well-being through the provision of legal insurance against allegations of misconduct.

In our setting, a key question is whether a minimum wage increase raises the return to workers from becoming union members. This channel of direct improvement in material well-being may apply, for example, if minimum wages shift compensation structures for both minimum wage workers and higher skilled workers. The potential relevance of this channel can be investigated, in part, by asking whether minimum wage changes alter union wage premiums.

Because minimum wage increases apply to both union and non-union workers, it is quite possible for minimum wage increases to reduce union wage premiums. This raises a question of free riding; a non-union worker need not pay dues to benefit from a minimum wage increase for which the union advocated. The minimum wage's direct beneficiaries may thus become less, rather than more, likely to join unions. Minimum wage increases may substitute for the wage gain such workers might previously have obtained by joining the union. Membership rates among the minimum wage's direct beneficiaries provide an opportunity to explore the relevance of free riding linked to the direct material benefits of union membership.

Why might unions advocate for minimum wage increases despite risks of free riding? A variety of non-monetary motivations may be at work. Frymer and Grumbach (Forthcoming), for example, discuss how both the actions of unions and the views of their members can be shaped by broader, coalitional demands of the political process. As Sobel (2005) effectively illustrates, alternative sets of non-monetary motivations may not readily be distinguished from one another through evidence on people's decisions alone (e.g., the decision to join a union). Nonetheless, evidence on supplemental features of the environment may shed some light on which mechanisms are at work.

One possibility is that improvements in the well-being of potential members may spark loyalty and reciprocity (Falk 2007; Falk and Fischbacher, 2006). Reciprocity would tend to apply to workers who benefit the most, directly or indirectly, from an increase in the minimum wage.

An additional channel through which interest groups might accumulate influence is by enhancing their public image as advocates. Through advocacy, for example, an interest group might enhance its reputation for effectiveness and public spiritedness among its potential members (Clark and Wilson, 1961; Wilson, 1973). We shed light on the potential relevance of this channel through several pieces of analysis.

We first assess the plausibility of the "public image" channel by analyzing the minimum wage's effects on union membership among relatively high-wage groups of workers. That is, we investigate union membership among workers who are not plausibly affected, either directly or indirectly, by the minimum wage itself. This includes highly educated workers and individuals who are employed in the public sector. We confirm in wage data that the wages of individuals in these groups are unaffected by minimum wage increases.

We further pursue the public image channel through analyses of news coverage and public opinion. Our analysis of newspaper articles focuses on linkages between events in the legislative histories of minimum wage increases, news coverage of the minimum wage, and news coverage of organized labor. For the public image channel to be relevant, it is necessary that unions' advocacy for minimum wages receive some form of public attention. Our analysis of news coverage speaks to this question. Finally, we analyze the relationship between minimum wage changes and public approval of organized labor, as expressed in public opinion polls.

Section III: Data

In this section we discuss the data sources used in our analysis. The policy variation of interest involves minimum wage changes. The primary outcome of interest is union membership. Control variables in our analysis include demographic characteristics, proxies for variations in macroeconomic conditions, and variables related to states' political landscapes and other labor market policies. We also analyze data on public perceptions of unions and novel data on news coverage of key events in the political and legislative histories of minimum wage increases.

Union Membership Rates

The primary dependent variable in our analysis is an indicator for an individual's union membership status. Union membership has long been tracked by the Current Population Survey (CPS) conducted by the Bureau of Labor Statistics (BLS). Specifically, individuals are asked about their union membership as part of the expanded battery of questions known as the

Earnings Survey. These questions are asked of individuals during the fourth and eighth months of their participation, which occur 12 months apart from one another. These interviews are known collectively as the Outgoing Rotation Group (ORG) interviews of the CPS. To the best of our knowledge, these are the largest, continually running, nationally representative surveys in which individuals are asked about their membership in labor unions.

Additional Data from the CPS ORG Files

Our analysis uses several additional pieces of information from the ORG samples of the CPS. First, in many of our specifications we control for demographic characteristics including age and education, which are correlated with individuals' skills as well as with their likelihood of being a member of a union. These controls are of relevance to our analysis in large part because our analysis samples, while meant to be nationally representative, may exhibit nontrivial sampling variations given that we analyze variations across states and over time among population subgroups.

Second, we conduct several analyses of samples or dependent variables that are defined based on an individual's industry, occupation, or sector. The CPS collects information on "worker class," which refers broadly to the distinction between the public and private sectors. This division of workers is of interest to our analysis of union membership because private-sector union membership has exhibited a substantial long-run decline while public-sector unionization has remained robust.[8] We also utilize information on workers' industries and

[8] According to the BLS (2015, 2019), the share of private-sector workers who are union members has fallen from around 17 percent in 1983 to 6.2 percent in 2019. The corresponding share of public-sector workers has remained steady at roughly one-third during this period.

occupations so that we can focus a subset of our analyses on individuals in minimum-wage-intensive segments of the labor market. Finally, we use CPS variables that contain information about individuals' wage rates, including whether a respondent is paid by the hour and whether their earnings or hourly wage rate is imputed by BLS (Clemens and Strain, 2019).

Effective Minimum Wage Rates and Legislative Events

Our data on states' effective minimum wage rates and on key dates in the legislative process draw on many sources. Our primary source for key dates in the legislative process is the National Conference on State Legislatures. These dates have been cross-checked against myriad news articles, reports from state labor departments, and legislative texts. For state-by-month minimum wage rates, we use data compiled by Clemens, Hobbs, and Strain (2018). These minimum wage rates have been checked against the complementary database of Vaghul and Zipperer (2019). The map in Figure 1 illustrates which states enacted minimum wage increases during our sample period, while Table 1 presents information on implementation dates.

Additional Control Variables

Our analysis incorporates data on macroeconomic covariates that may be relevant as control variables. As in our past work (Clemens and Strain 2018a, 2018b, 2019), we proxy for variations in housing markets using a statewide median house price index from the Federal Housing Finance Agency (FHFA). We proxy for aggregate economic performance using data on state income *per capita* from the Bureau of Economic Analysis (BEA). We also analyze data on

states' political landscapes, which are taken from NCSL (2020), and data on assorted state labor market policies, which are updated and maintained by Sorens, Muedini, and Ruger (2008).

LexisNexis Data on Newspaper Mentions of Minimum Wages and the Labor Movement

We also examine the impact of minimum wage increases and new minimum wage legislation on newspaper coverage. Using LexisNexis, we construct a dataset measuring mentions of "minimum wage" and labor advocacy organizations, including the Economic Policy Institute (EPI), National Employment Law Project (NELP), and the Service Employees International Union (SEIU), in state newspapers.

For all queries, we restrict our searches to English language newspaper articles from the 50 US states and Washington, DC, published between January 1, 2010, and December 31, 2019. We exclude articles LexisNexis flags as "highly similar" (same publication name, location, and date; same author; and very similar content) to avoid counting duplicate copies. From each article in a given query, we extract the publication name, date, and state from the article metadata. We process the LexisNexis data to construct counts at the state-by-month-by-year level. More details on the LexisNexis data are available in Appendix A.

Pew Survey Data on Public Perceptions of Labor Unions

We use survey data collected by the Pew Research Center to examine broad trends in recent sentiment toward labor unions. The Pew surveys we analyze were conducted in February and August 2011; June 2013; January, February, and March 2014; March 2015; and April 2018.

We use responses to the question: "Is your overall opinion of labor unions very favorable, mostly favorable, mostly unfavorable or very unfavorable?" We also include information on a respondent's age, education level, and family income as controls for our analyses.[9]

Summary Statistics

Table 2 presents summary statistics on our primary analysis samples. Among individuals age 16–40, we observe that the share of individuals reporting union membership increased from an average of 6.5 percent from 2011–14 to 6.9 percent from 2015–19 in states that increased their minimum wages. In states that did not increase their minimum wages, the fraction unionized decreased slightly, from an average of about 3.9 percent to 3.7 percent. Employment, house prices, and income *per capita* all rose over this period. These variables increased more in states that had minimum wage changes than in those that did not.

Section IV: Estimation Frameworks

This section describes our empirical strategy for estimating the effect of minimum wage increases on union membership rates. For our primary analyses, we estimate two closely related specifications with moderately different strengths and weaknesses for the task at hand. The first

[9] The surveys contain a total of 10,746 respondents from all 50 states plus Washington, DC. After dropping observations in which age, education, and income are missing, we have 9,474 respondents. Of these respondents, 901 selected "never heard of" or "can't choose" or refused to respond to the question, leaving 8,573 respondents. We use all individuals age 18–64 as our main sample, containing 6,421 respondents.

regression we estimate is equation (1) below, in which we correlate union membership rates with continuous panel variation in states' effective minimum wage rates:

$$U_{i,s,t} = \beta_1 MW_{s,t} + \alpha_{1s}\, State_s + \alpha_{2t}\, Time_t + X_{i,s,t}\,\gamma + \varepsilon_{i,s,t}. \qquad (1)$$

All estimates of equation (1) include state and time fixed effects, so that β_1 can be interpreted as a difference-in-differences-style estimate of the relationship between changes in minimum wage rates and changes in the likelihood that an individual is a union member. The vector *X* contains sets of control variables that vary across the specifications we estimate. $U_{i,s,t}$ is an indicator for whether individual *i* residing in state *s* in time period *t* reports being a union member.

The goal of our empirical analysis is to provide causal evidence on whether there is an effect of minimum wage increases on union membership rates. Causal estimation of this effect faces nontrivial challenges. Overall economic activity, for example, may be correlated with a state's tendency to raise the minimum wage as well as with both the overall number of jobs and perhaps with the fraction of jobs that are likely to be union jobs. Our analysis also faces a threat of reverse causality. That is, a union movement that is growing in strength may be a movement that is simultaneously gaining new members and succeeding in its advocacy for minimum wage increases.

Although it is impossible to rule out all possible threats to causal identification, we can provide evidence on the relevance of threats that take several forms. First, within the framework of equation (1) we explore the robustness of our estimates to controlling for proxies for broader macroeconomic conditions that could influence union membership. We do so by controlling for quarterly state income per capita and a quarterly index of quality-adjusted house prices. We similarly control for changes in states' political landscapes.

Second, we check for evidence on whether union membership rates began rising prior to the enactment of minimum wage increases. We do this by estimating the event study specification below:

$$U_{i,s,t} = \sum_{p(s,t)\neq 0} \beta_{p(s,t)} Increased_s \times Event\ Year_{p(s,t)} + \alpha_{1s} State_s + \alpha_{2t} Time_t + X_{i,s,t}\gamma + \varepsilon_{i,s,t}. \quad (2)$$

Equation (2) differs from equation (1) with respect to the manner in which policy variation in states' minimum wage regimes is included in the specification. In equation (2), we interact a set of "event time" dummy variables with an indicator for whether a state implemented a minimum wage increase during our sample period. The event time dummy variables are coded to correspond with specific numbers of years relative to the enactment of a state's first minimum wage increase during the sample. We omit the interaction for the time period describing the year immediately prior to the first minimum wage in increase, which we define as year $p(s,t) = 0$. The coefficients of interest can thus be interpreted as differential changes in union membership rates from the year prior to the first minimum wage increase to the reference year. For reference years less than 0, the point estimates thus provide evidence on whether divergent trends in union membership had occurred prior to the minimum wage increase's enactment. This provides evidence on the potential relevance of concerns related to endogenous policy. Estimates for years following the minimum wage increase track the dynamics with which union membership rates subsequently evolved.

A final dimension of robustness on which we can provide evidence relates to a general difference between states that have implemented minimum wage increases and those that have not. States that have implemented minimum wage increases have disproportionately been states with high baseline union membership rates. We thus implement both equation (1) and equation

(2) on subsamples that remove states with unusually high or low baseline union membership rates from the sample. Estimates on this sample involve states with similar baseline patterns of unionization, and thus provide evidence on the potential relevance of this final source of concern.

Further, we construct estimates using synthetic control methods. To do so, we construct separate synthetic control groups to match the baseline level and trajectory of the union membership rate for each of the states that enacted a minimum wage increase during our sample. In all cases, we construct the synthetic control groups from the sample of states that enacted no minimum wage increases. To probe the robustness of our synthetic control estimates and mitigate concerns about "cherry picking" (Ferman, Pinto, and Possebom, 2020), we implement two approaches to constructing synthetic controls. In the first, we construct synthetic control groups using all values of the dependent variable (the union membership rate) for all time periods up to the period during which a state's first minimum wage increase was implemented. In the second, we exclude the union membership rate from the year preceding the minimum wage increase and include our macroeconomic covariates as predictors instead.

Estimating the Relationship Between Minimum Wage Increases on the Union Wage Differential

In addition to examining the effects of minimum wage changes on union membership rates, we also explore the relationship between minimum wage increases and differentials between union and nonunion wages. For this analysis, we estimate the following specification:

$$W_{i,s,t} = \beta_1 MW_{s,t} + \beta_2 U_{i,s,t} + \beta_3 MW_{s,t} \times U_{ist} + \alpha_{1s}\, State_s + \alpha_{2t}\, Time_t + X_{i,s,t}\,\gamma + \varepsilon_{i,s,t}. \qquad (3)$$

Similar to equation (1), equation (3) uses continuous variation in state minimum wages and includes state and time fixed effects. $W_{i,s,t}$ is the hourly wage rate of employed individual *i* in state *s* in time period *t*. $U_{i,s,t}$ is an indicator for whether the individual is a union member. The coefficient of interest, β_3, estimates the relationship between minimum wage increases and the wage differential for union relative to nonunion workers. Similar to our previous analyses, we include age and education controls as well as controls for state house prices and state income per capita. Since differences in wages vary greatly by industry and occupation, we also include industry and occupation fixed effects for all three-digit census occupation and industry codes. As discussed when we present estimates of equation (3), properly interpreting β_3 is difficult because, as shown through our estimates of equation (1), minimum wage increases predict changes in which workers belong to unions.

Analysis of Newspaper Coverage

To investigate the relationship between minimum wage legislation and news coverage, we estimate variants of the following specification using a Poisson regression model:

$$\mathrm{E}(News_{s,t}|Z_{s,t}) = \exp(\beta_1 LMW_{s,t} + \beta_2 FMW_{s,t} + \beta_3 stateintroduced_{s,t} + \beta_3 statepassed_{s,t} + \beta_4 substatepassed_{s,t} + \alpha_{1s}\, State_s + \alpha_{2t}\, Time_t + X_{s,t}). \quad (4)$$

Here, $News_{s,t}$ is a count of articles from newspapers in state *s* published in month *t*. The outcomes we analyze include counts of articles that reference the minimum wage and counts of articles that reference both the minimum wage and a key player from the labor movement. The vector $Z_{s,t}$ includes the full set of covariates on the right-hand side of the expression.

The primary covariates of interest involve key dates associated with minimum wage legislation. $LMW_{s,t}$ is an indicator for whether a state changed its minimum wage between month *t* and the previous month. $FMW_{s,t}$ is an indicator for whether a state is scheduled to change its minimum wage between month t and month, $t + 1$. The variable $stateintroduced_{s,t}$ is an indicator for the month in which a state's legislature first introduced an ultimately successful bill to increase minimum wage. The variable $statepassed_{s,t}$ is an indicator for the month a legislature passed a minimum wage increase.

The vector $X_{s,t}$ includes two sets of additional covariates. First, it includes time and place varying indicators for worker strikes related to the Fight for $15 movement, the tenure of Ed Murray as Mayor of Seattle, and the Occupy Wall Street protests. These events are associated with increased news coverage of minimum wages, but they do not directly involve changes in minimum wages due to new legislation. Second, we include the same macroeconomic covariates as in earlier models. Like earlier models, equation (4) includes state and time fixed effects.

Estimating the Effect of Minimum Wage Increased on Public Perceptions of Labor Unions

Finally, we examine how minimum wage increases shape public opinion toward labor unions. To do so, we estimate the following specification using continuous variation in state minimum wage rates:

$$A_{i,s,t} = \beta_1 MW_{s,t} + \alpha_{1s}\, State_s + \alpha_{2t}\, Time_t + X_{i,s,t}\,\gamma + \varepsilon_{i,s,t}. \qquad (5)$$

Here, $A_{i,s,t}$ is a measure of opinion toward labor unions for respondent *i* from state *s* in year *t*. We code the dependent variable equal to 1 if an individual responded "very favorable," 0.75 if

"favorable," 0.25 if "unfavorable," and 0 if "very unfavorable," to the question: "What is your overall opinion of labor unions?" We code the responses "Don't know," "Can't choose," and "Refused" as missing. All specifications include state and time fixed effects. Some specifications control for age, education level, recorded income bracket, and other assorted demographic characteristics.

Section V: Estimates of the Relationship Between Minimum Wages and Union Membership

This section presents our analysis of the relationship between minimum wage changes and unionization rates. We begin with presentations of unadjusted data on the evolution of union membership rates and their correlation with changes in states' minimum wage rates. We then present our baseline regression analysis and robustness checks.

Initial Evidence on the Evolution of Union Membership Rates

Figures 2 and 3 provide a descriptive look at the evolution of union membership rates from 2011 through 2019. The scatterplot in Figure 2 presents state-level changes in minimum wages and union membership rates from the first years of our analysis sample (2011–14) to the later years of our analysis sample (2016 through the end of 2019). The relationship is distinctively upward sloping, revealing that minimum wage increases were positively correlated with changes in union membership rates.

The four panels of Figure 3 present time series on union membership rates. The figure reports separate time series for states that enacted minimum wage increases and those that did not. The panels differ with respect to the samples of states. Panel A reports time series that average across all states. From 2011 through 2019, the data reveal that union membership rates increased by roughly 0.4 percentage point (roughly 6 percent on a baseline mean of just over 6.5 percentage points) in states that enacted minimum wage increases. In states that did not enact minimum wage increases, union membership rates declined by roughly 0.3 percentage point (or roughly 9 percent on a baseline mean of 3.3 percentage points).

The sample used to construct Panel B is constrained to include states with baseline (i.e., 2011-2014) union membership rates between 2.5 percent and 7.5 percent. We analyze this second sample because states that enacted minimum wage increases were disproportionately likely to be states with high rates of union membership at baseline. Panel B reveals that we find trends similar to those observed in Panel A when we focus on states with more closely matched union membership rates in our baseline period. The divergence is, if anything, more striking. Membership rates rise by roughly 0.7 percentage points in states that enacted minimum wage increases while declining marginally in those that did not. In subsequent analysis we more formally match states that enacted minimum wage increases with other states using synthetic control methods.

In Panels C and D, we further explore the robustness of the relationship between minimum wages and unionization rates using synthetic control analysis. This analysis provides a further check for the potential relevance of differences in the baseline levels and trajectories of unionization rates in states that increased minimum wages relative to those that did not. As

described in Section IV, we use two approaches to construct synthetic control groups in order to guard against "cherry picking" concerns. In Panels C and D, which present averages across the "treatment" and "synthetic control" groups using our two methods, we center all series on the year during which a given "treatment" state's minimum wage first increased.

Comparing our treatment and synthetic control groups, the differential movements in union membership rates are quite similar to those observed in Panels A and B. The series move in parallel from three years prior to each treatment state's first minimum wage increase through the year of the minimum wage increase itself. The series subsequently diverge. By the fourth year following the initial minimum wage increase, a differential of just over 1 percentage point has emerged in Panel C, and of 0.8 percentage point in Panel D. The 0.8 percentage point differential is roughly 16 percent relative to the baseline mean of 5 percentage points.

Regression Estimates of the Relationship Between Minimum Wages and Union Membership

This section presents estimates of equations (1) and (2). The estimates serve two purposes. First, they quantify and put error bounds around the magnitude of the relationships presented in Figures 2 and 3. Second, they provide frameworks within which we can probe the case for interpreting associations between minimum wages and union membership rates as a causal impact of minimum wage increases.

Table 3 presents estimates of equation (1), which analyzes the relationship between union membership rates and continuous variation in the minimum wage. The estimate in column 1 reveals that, over our analysis sample, a one-dollar increase in a state's minimum wage predicts a 0.24 percentage point (roughly 5 percent relative to the mean across all states) increase in union

membership rates among individuals age 16–40. The p-value on the test for whether this estimate is statistically distinguishable from 0 is less than 0.01. Column 2 shows that the magnitude of the relationship between union membership and a one-dollar minimum wage increase declines modestly if we include exhaustive sets of age and education indicator variables as controls. Column 3 shows that the magnitude rises if we control for two proxies for the overall performance of states' economies—namely, the log of aggregate state income per capita and an index of median house prices. Finally, Column 4 shows that controlling for both the proxies for macroeconomic conditions and the demographic covariates yields a coefficient of 0.29 percentage points. This final specification, which is our baseline specification of equation (1), implies that each dollar of minimum wage increase generated an increase in union membership rates of roughly 6 percent. The results in Table 4 show that our point estimates are modestly reduced when we restrict the sample to states that had baseline unionization rates greater than 0.025 and less than 0.075.

In the regressions presented thus far, our analysis samples have consisted of individuals age 16–40. Table 5 presents evidence on why. Specifically, it presents estimates from the most-controlled specification in Table 3 (namely, the specification that includes our macroeconomic covariates as well as our age and demographic covariates) on subsamples that partition the population age 16–60 based on age. Each column presents estimates for a five-year age band. Estimates are regularly positive and strongly distinguishable from 0 for individuals age 16–40; they are economically small and indistinguishable from 0 for individuals age 41–60. The absence of changes in union membership among individuals age 41–60 is unsurprising, as the likelihood of transitioning into union membership status declines dramatically as individuals age out of

their 20s and 30s (Budd, 2010). We thus focus our analysis on individuals in the first half of their careers.

In Figure 4, we plot the coefficients and standard errors from our baseline event study specification, described by equation (2). We observe two key facts. First, the coefficients in the pre-increase periods ("–4 or less" through "0") are all statistically indistinguishable from zero. We thus see no evidence of divergence in the trends experienced by our treatment and control groups prior to the implementation of a state's first minimum wage change. This finding supports a causal interpretation of our estimates. Second, following the implementation of minimum wage increases, we observe a distinctive upward trajectory in union membership rates. Within three years of a state's first minimum wage increase, union membership rates have risen by 0.4 percentage points relative to states that enacted no increases during our sample period. Within four years, the differential increase is 0.5 percentage points. Both the three-year and four-year increases are statistically distinguishable from 0 at the 0.01 level.

The panels of Figure 5 present evidence on the robustness of the baseline event-study estimates presented in Figure 4. The robustness analysis explores the relevance of three dimensions of our specifications. The first is whether they include macroeconomic covariates as control variables. The second is whether the definition of minimum wage increases excludes increases enacted due to long-standing inflation indexation previsions.[10] The third is whether the dependent variable is restricted to union membership or includes individuals who report that they are covered by union contracts despite not reporting that they are members. The panels of Figure 5 reveal that our key findings are largely robust to the choices we make along all three of these

[10] Brummund and Strain (2020) find that employment responds differently to inflation-indexed minimum wage increases relative to traditional, nominal minimum wage increases.

dimensions of our event-study estimator. The estimates for years "t = 1" through "t = 3" are almost uniformly the same across panels. The estimate for year "t = 4 or more" changes to a visually, though not statistically, detectable degree when we define minimum wage changes to exclude inflation-indexed changes. This may be driven by composition because states with inflation indexing rules enacted their first minimum wage increases quite early in the sample, and thus contributed multiple years of observations to the time period defined as "t = 4 or more."

Two points are of interest regarding the magnitudes of the point estimates we observe in the panels of Figure 5. First, the "medium run" estimate we observe in years "3" and "4 or more" are in line with what one would expect to find based on the estimates in Table 3. Among states that enacted minimum wage increases over this period, the average increase enacted as of 2019 was on the order of $2. Our baseline estimate of equation (2), which appears in column 4 of Table 3, implies that a $2 minimum wage increase predicts a 0.58 percentage point increase in union membership. This is almost exactly in line with the medium-run effect we observe in several panels in Figure 5.

It is also of interest to consider the evolution of point estimates from years "1" and "2" to years "3" and "4 or more." The estimates suggest a gradually unfolding increase in the relationship between minimum wage increases and union membership. This is consistent with standard "stock" and "flow" dynamics emphasized in prior research on the determinants of union membership rates. The key point is that the overall union membership we observe in any given cross-section of CPS data is a stock. As has been observed in analyses of the relationship between union membership and Right to Work laws, the stock of union membership will tend to respond gradually through a policy change's effects on membership flows (Ellwood and Fine,

1987; Moore, 1998). This is consistent with what we observe. These dynamics also relate to why we observe impacts of minimum wage changes on union membership among individuals in the first half of their career, but not among those in the second half of their careers.

Finally, Appendix Tables C1, C2, and C3 provide evidence that the relationship between minimum wages and union membership rates is not driven by omitted factors related to the political ideology of the party in power. First, Table C1 shows that our results are robust to adding control variables for the party in control of state legislatures, of the governor's mansion, and for cases in which either Democrats or Republicans have unified control of state government.[11] While the partisan control of state government has a strong cross-sectional correlation with minimum wage policy, as shown in Table C2, we show in Table C1 that changes in partisan control are not contaminating our estimates. Second, we show in Table C3 that our identifying variation in minimum wages in largely uncorrelated with changes in other labor market regulations enacted by states. Our measures of these regulations come from updated databases maintained by Sorens, Muedini, and Ruger (2008). They span issues including Right to Work laws, workers' compensation, paid leave, and the legality of noncompete agreements.

Section VI: Investigating Theories of Interest-Group Membership

In this section, we present evidence that speaks to the plausibility of alternative theories of interest-group membership. We do this by presenting analyses that divide the population into subsamples that (1) are directly affected by the minimum wage, (2) may be indirectly affected by

[11] These variables come from the State and Legislative Partisan Composition Database from the National Conference of State Legislatures (NCSL, 2020).

the minimum wage, or (3) are not plausibly affected by the minimum wage. We also present evidence on the relationship between minimum wage increases and union wage differentials.

Analyses of Subgroups of Workers

In this section, we provide evidence on which types of workers and demographic groups are more likely to become members of unions in the wake of minimum wage increases. The subgroups we analyze differentiate between individuals who might be directly impacted by the minimum wage, who might benefit indirectly from the minimum wage, and whose employment and wages have no plausible connection to the minimum wage. To be more specific, we distinguish between public- and private-sector workers, between high- and low-education workers, and between workers employed in high- and low-wage industries.

We first explore the relationship between minimum wage increases and public- versus private-sector union membership. This distinction is relevant for two reasons. First, public- and private-sector unions have been on different paths for decades; private-sector unions have declined, while public-sector unions have retained their strength. Second, minimum wage increases tend to affect neither the wages nor the employment of public-sector workers.

We estimate our full sample regression using dependent variables that differentiate between public- and private-sector union membership. These specifications are designed so that our overall estimate can be readily decomposed into public and private components. The estimates, which appear in Table 6, imply that public-sector union membership accounts for roughly half the overall increase we observe. For further context, note that public-sector union membership accounts for roughly half of all union membership among individuals age 16–40 at

baseline, but less than 15 percent of this group's employment. On average across these broad groups of workers, the minimum wage has a weak correlation with wages (Panel B).

We next add an education dimension to our analysis of both public- and private-sector union membership. Specifically, we analyze the relationship between minimum wage increases and public- versus private-sector union membership among individuals with at least some college education. We analyze this sample to further probe the evidence that minimum wage increases cause increases in union membership among groups that are not directly affected by the minimum wage. The estimates in Panel B of Table 7 reveal, as should be expected, that minimum wage increases have no impact on these groups' wage rates. The estimates in Panel A reveal that minimum wage increases quite strongly predict increases in these groups' rates of union membership. Together, these results provide evidence that a comprehensive theory of union membership will need to include nonmaterial factors.

Our next piece of analysis focuses on individuals employed in minimum-wage-intensive industries. Specifically, we focus on the food-service and retail industries. We present this analysis in Table 8. Panel A presents estimates of the impact of minimum wage increases on these individuals' union membership rates, while Panel B presents estimates of impacts on wages. Each column presents an analysis of a different subsample, with individuals differentiated based on age and education.

The estimates in columns 1 and 2 focus on individuals who are employed in food-service and retail industries and who are between ages 16 and 21. The estimates in columns 1 and 2 of Panel B reveal that these individuals' wages are quite strongly impacted. On average, a $1 increase in the minimum wage predicts a wage increase of around 32 cents for these individuals.

The estimate is modestly larger in column 1, where we do not include controls for macroeconomic covariates, relative to column 2.

The estimates in columns 1 and 2 of Panel A reveal that young individuals in low-wage occupations are less likely to belong to unions following minimum wage increases. Note that this sample consists of individuals who are employed and who experienced wage gains due to minimum wage increases. The sample thus contains the minimum wage's direct beneficiaries. The decline in this group's union membership thus appears inconsistent with theories that view membership and payment of dues as a form of reciprocity.

While the evidence in columns 1 and 2 is inconsistent with a reciprocity-oriented theory of union membership, it is consistent with "free riding." The free-rider problem has received attention in research on the effects of Right to Work laws on union membership. Right to Work laws tend to reduce union membership because they enable workers to benefit from union-negotiated wages without paying dues (Baird, 1998). More generally, these laws allow workers to sidestep union restrictions on who can work. For young retail and food-service workers, a minimum wage increase and union membership can be viewed as substitutable sources of bargaining leverage. Consequently, the minimum wage increase reduces the direct material benefit these individuals might obtain from joining a union.

Among moderately skilled individuals in minimum-wage-intensive industries, we find no evidence of changes in union membership. Interestingly, while the estimates lack statistical significance, we tend to find a positive relationship between minimum wages and union membership for older workers in these industries. This is of interest because these individuals may benefit indirectly if minimum wage increases result in increases in employers' skill

requirements (Clemens, Kahn, and Meer, 2020). Because the estimates are imprecise, however, the evidence is less strong than the evidence we see elsewhere.

Estimates of the Relationship Between Minimum Wage Increases and Union Wage Differentials

In this section, we present estimates of the relationship between minimum wage increases and union wage differentials. Effects of minimum wage increases on union wage differentials may shed light on the relevance of direct material interests for individuals' decisions to join unions. That said, our estimates must be interpreted with caution due to concerns linked to selection. That is, we have shown that minimum wage increases predict increases in union membership rates. Observed changes in union wage differentials may thus be driven by changes in the composition of which workers are in unions.

Our estimates of the relationship between minimum wages and union wage differentials are in Table 9. In column 1, we estimate that the relationship between minimum wages and the union wage differential is negative across all employed workers. In columns 2 and 3, we estimate the relationship separately for private- and public-sector workers. Columns 4 and 5 focus on workers in low-wage industries. Finally, in columns 6, 7, and 8 we analyze sub-samples that are differentiated by educational attainment. The relationship between minimum wage increases and the union wage differential is positive for workers in the food-service and retail industries, but negative in all other groupings we consider.

In most specifications, we observe a negative relationship between minimum wages and union wage differentials. This provides additional evidence that a narrow notion of material interest is unlikely to be the primary driver of changes in union membership. A key caveat to this

interpretation is that union wage premiums may shift due to changes in the composition of union workers. This may explain the positive relationship we observe in column 4 of Table 9, for example, since the analysis in Table 8 revealed that young workers in the food-service and retail industries become less likely to be members of unions following minimum wage increases. That said, our evidence on union wage premiums has implications that are consistent with our earlier subsample analyses. That is, we see no evidence to suggest that increases in union membership among high-education individuals are driven by material benefit in the form of higher wage.

Section VII: Investigating Mechanisms Underlying the "Effective Advocacy" Model of Interest-Group Membership

In this section, we consider mechanisms through which the "effective advocacy" model of interest-group membership might operate. We first analyze patterns of news coverage of minimum wage legislation and the labor movement. We then present evidence on the relationship between minimum wage increases and public sentiment toward unions.

Newspaper Mentions of Key Moments in the Fight for $15 Movement

Figure 6 provides a descriptive look at our time series for counts of newspaper articles that reference the minimum wage. Panels A, B, and C present time series for New York, California, and Washington, while Panel D presents a time series for all states that enacted no minimum wage increases during our analysis period. For ease of visual comparison, we normalize by the population associated with the states in question.

The series in Figure 6 track important events in states' minimum wage histories. The series for New York (Panel A) exhibits a substantial increase from January through April 2016. This period corresponds with coverage of the introduction and passage of New York's legislation to increase the minimum wage to $15. There is also a sustained elevation in New York's coverage of the minimum wage beginning early in 2012, which follows the disbandment of the Occupy Wall Street encampment. Turning to California (Panel B), the most dramatic spike in coverage corresponds with the signing of SB 3, which is California's legislation for raising the minimum wage to $15. In Washington, coverage of the minimum wage escalated substantially with the election of Seattle mayor Ed Murray, who made the $15 minimum wage one of his signature issues. Washington's most noticeable spike in coverage corresponds with the months surrounding the November 2016 passage of Ballot Initiative 1433, which called for the statewide minimum wage to rise to $13.50 in 2020. Elsewhere in the country, the largest coverage spikes occurred around the months of national strikes by food-service workers.

We draw three conclusions from our inspection of data on news coverage of the minimum wage. First, we are reassured by the fact that the series exhibits spikes at key moments in the legislative and political histories of states' minimum wages. Second, the figures provide evidence on the appropriate functional form for tracking the relationship between news coverage and various events. While most key events generate short-lived spikes in news coverage, some generate sustained increases in coverage. Third, the figures provide evidence that news coverage tracks a diverse set of events, including moments in legislative histories, moments in protest movements, and electoral moments like the victory of Seattle mayor Ed Murray. These facts guide the empirical specification we use to track the relationship between minimum wage coverage and key legislative and political events.

Table 10 presents our analysis of the relationship between newspaper coverage and key legislative and political events. That is, the table presents estimates of equation (4). The dependent variable is the count of newspaper articles at the state-by-month level. The entries in the table are exponential transformations of the coefficients estimated from equation (4). The table entries can thus be interpreted as changes in the relative frequency of news articles. An estimate of 1.2, for example, implies that newspapers published 1.2 times more minimum wage articles in months associated with a particular class of events relative to other months.

The estimates are consistent with the descriptive anecdotes from Figure 6. We find that there are substantial increases in news coverage of the minimum wage following both the passage and implementation of minimum wage increases.[12] Further, we find that New York City's Occupy Wall Street protests and the election of Seattle mayor Ed Murray predict sustained increases in the intensity of minimum wage coverage. These estimates reveal that key moments in the Fight for $15's history predict appreciable increases in news coverage of minimum wages.

Analysis of Newspaper Mentions of Minimum Wages and the Labor Movement

Tables 11 through 15 present our analysis of the relationship between legislative events and newspaper articles about the minimum wage and the labor movement. As in Table 10, the presented estimates associated are exponential transformations of key coefficients from equation (4). In this analysis, our paper joins past work like that by Schmidt (1993) and Panagopoulos and

[12] The point estimate of 1.17 from Column 6 implies that newspapers publish roughly 1.17 times more articles on the minimum wage in months with a minimum wage increase. Coverage also increases in months when state or local minimum wage legislation is passed, with about 2.5 times more articles published in months when new statewide legislation is passed and about 1.3 times more articles written in months when new local legislation is passed.

Francia (2009) in using "content analysis" of the news to study unions.[13] We find that the passage and implementation of minimum wage changes predicts increases in news articles that simultaneously reference minimum wages and key players in the labor movement.

In Table 11, the dependent variable we analyze captures counts of newspaper articles that discuss the minimum wage and make broad references to labor unions, organized labor, or the labor movement. We observe strong increases in the number of articles connecting the minimum wage and the labor movement when states pass new minimum wage legislation. We do not see increases, however, when municipalities pass minimum wage legislation. Organized labor was also quite strongly linked to minimum wages in news coverage in the wake of the Occupy Wall Street movement and the election of Ed Murray. For minimum wage articles that make general references to organized labor, we do not detect significant movement in the months surrounding the implementation of minimum wage changes.

Table 12 provides a more tangible connection between the labor movement and news articles about the minimum wage. For Table 12, the dependent variable captures counts of articles that jointly reference the minimum wage and either the Economic Policy Institute (EPI) or the National Employment Law Project (NELP). Both of these organizations have close connections to the labor movement and advocate regularly for progressive policies. The

[13] Schmidt (1993) examines media coverage and public perceptions of unions during the 1980s and finds that coverage centered on strikes negatively affects perceptions of unions, particularly among people who have no group attachment to unions. Analyzing Gallup and ANES survey data, Panagopoulos and Francia (2009) find that union approval was high from the 1940s to 1970s, decreased during the 1970s and 1980s, and has risen since then, even as union membership has simultaneously declined.

governing boards of both organizations, for example, include officers of key groups in the labor movement.[14]

For Table 13, the dependent variable captures counts of articles that jointly reference the minimum wage and the Service Employees International Union (SEIU). SEIU was an early supporter of the Fight for $15 movement and efforts to unionize low-wage workers in the food-service and retail industries. SEIU is also the second-largest union in the United States, with nearly two million members as of 2020.

In the months surrounding the enactment of minimum wage increases, we observe increases in the prevalence of news articles that link minimum wages and key players in the labor movement. Our estimates of these increases in news coverage are statistically strongest in the month when a new state minimum wage increase goes into effect, as well as the month just before it goes into effect. These articles sometimes include announcements that an upcoming minimum wage increase will raise wages for some precisely specified number of workers. There is also evidence, though estimated less precisely, of substantial increases in coverage during the months in which state bills mandating new minimum wage increases are passed. Our reading of a sample of the underlying article suggests that journalists may solicit quotes from labor policy advocates as they write articles about impending or recently enacted minimum wage increases.

[14] As of September 2020, for example, NELP's governing board included the director of policy and legislation for the SEIU chapter 32BJ, which has 145,000 members, and the secretary-treasurer of the American Federation of State, County, and Municipal Employees (AFSCME): https://www.nelp.org/about-us/board-of-directors/. EPI has a more direct link to organized labor, as the organization was funded by a set of labor unions at its inception. As of March 2020, EPI's board of directors was chaired by the chairman of the AFL-CIO, with other board members having leadership roles in AFSCME, the Communication Workers of America, and the International Association of Machinists and Aerospace Workers: https://www.epi.org/about/board/.

Conversely, policy advocates may approach journalists with analyses and commentary to support their journalistic writing.

While minimum wage increases predict substantial increases in articles that connect the minimum wage with NELP and EPI, we find much smaller effects for the SEIU. The absence of increases in news coverage of the SEIU at the time of minimum wage increases is quite interesting. SEIU appears to have made relatively modest progress in its effort to organize food-service workers. This is reflected in SEIU's aggregate membership figures, as well as in our earlier finding that minimum wage increases have had no detectable effect on unionization among food-service and retail workers. As emphasized above, this may reflect the fact that the minimum wage is a substitute for a union's bargaining clout among the very low-wage workers SEIU is attempting to organize.

Other results of interest involve select events in the history of the Fight for $15 movement. The tenure of Seattle mayor Ed Murray, for example, predicts sustained increases in news coverage that connects the minimum wage and the labor movement. The same is also true over an extended period following the Occupy Wall Street protests in New York. Unlike the other events we study, news coverage following Occupy Wall Street is far more likely to connect the minimum wage to the SEIU.

In Table 14, we turn to overall coverage of the labor movement. The dependent variable analyzed in Table 14 captures counts of articles that reference the labor movement whether they reference the minimum wage or not. Interestingly, we find essentially no evidence that events in the history of minimum wage increases predict increases in the overall flows of articles about organized labor. The sole exception involves a rise in newspaper articles that reference organized

labor in the wake of New York's Occupy Wall Street movement. Most coefficients are statistically indistinguishable from null effects. The months in which a piece of minimum wage legislation is introduced appear, if anything, to be associated with a reduction in the flow of articles that reference organized labor.

Table 15 ties our analysis of news coverage together by analyzing the minimum wage's prevalence in articles that reference organized labor. That is, the estimates describe the relationship between events in the history of minimum wage legislation and the fraction of articles about organized labor that also make reference to the minimum wage. The results presented in Tables 11 and 14 suggest that this relationship will tend to be positive, and indeed it is. That is, in Table 14 we found that minimum wage events predict no change in the prevalence of articles about organized labor, while in Table 11 we found that the passage of minimum wage increases (and other events to varying extents) predict strong increases in counts of articles that reference both organized labor and the minimum wage. Note that for Table 15 we estimate the ordinary least squares counterpart of equation (4). Since the dependent variable is a share, it does not exhibit the skewness that led us to estimate Poisson models for our analyses of article counts.

The results in Table 15 reveal that a diverse set of events in the minimum wage's history predict increases in the tendency for news coverage of organized labor to reference the minimum wage. As in Table 11, the economically largest coefficients are associated with the month in which minimum wage legislation was passed. The point estimates imply that in the month minimum wage legislation is passed, articles that reference organized labor became, on average, 11 percentage points more likely to be articles that reference the minimum wage. The months in which minimum wage increases are implemented, as well as the month prior to implementation,

are associated with more modest increases in the tendency for articles about organized labor to reference the minimum wage. The same is true of key political events in the minimum wage's recent history. Over the last decade, the forward movement of minimum wage legislation has thus had tangible impacts on how organized labor is discussed by newspapers.

Figure 7 shows that the relationship between state minimum wage legislation and news coverage of organized labor can be seen in national trends. Panel A of Figure 7 displays several facts involving yearly, national counts of news articles. First, it shows that the total number of articles in our data set that mention the labor movement was quite stable from 2010 to 2019. Second, it shows that the number of articles that mention either the minimum wage or both the minimum wage and organized labor rose substantially between 2012 and 2014. These counts then plateaued and declined moderately after 2016. Panel B shows that the share of articles about organized labor that also mention the minimum wage follows a similar trend. That is, between 2012 and 2014, the composition of news articles about organized labor exhibit a sustained shift towards articles that also discuss the minimum wage. This change in the composition of coverage of organized labor coincides with the first wave of minimum wage legislation to be introduced and subsequently passed between 2011 and 2019.

Regression Estimates of Minimum Wage Changes and Public Perceptions of Labor Unions

Shifts in news coverage may influence how the public views labor unions. We turn to the public's attitude toward labor unions in our final piece of analysis. Table 16 presents our analysis of the relationship between minimum wage increases and unions' favorability ratings in public opinion surveys. We find that increases in minimum wages predict modest increases in the

prevalence of favorable views of unions. Appendix B presents additional results on the robustness of this finding.

How might these results relate to our earlier findings? Earlier, we found that newspapers change their coverage of unions when states legislate and enact minimum wage increases. Specifically, news coverage of organized labor becomes more likely to reference the minimum wage. Given the minimum wage's popularity, it is intuitive that news coverage of this sort may lead the public to have more favorable views of unions. The public's views of unions may also improve in states that enact minimum wage increases because their unions are establishing themselves as effective policy advocates.

Section VI: Discussion and Conclusion

Our analysis has investigated the interplay among labor unions, minimum wages, news coverage, and public opinion. Unions have advocated extensively for recent minimum wage increases. In the wake of recent minimum wage legislation, we find that union membership has tended to rise among individuals in the first half of their careers.

We use this setting to differentiate among several models of membership in unions or other interest groups. We find support for the idea that minimum wage increases benefit unions by improving their public image as effective advocates. Following minimum wage increases, we find that workers whose wages are not affected become more likely to both join a labor union and to have favorable views of labor unions. By contrast, the direct beneficiaries of minimum

wage increases become less likely to join. The latter finding points to the relevance of free-riding concerns that have been emphasized in past research on the effects of Right to Work legislation.

Finally, we analyze news coverage of political and legislative moments in the minimum wage movement's recent history. This analysis provides evidence on a potential mechanism behind the minimum wage's effects on union membership. We find that the passage and enactment of minimum wage increases predict increases in newspaper coverage that discusses both the minimum wage and key players in the labor movement. Inspection of the underlying articles provides suggestive evidence of a successful public relations strategy. That is, analysts in the labor movement help shape news coverage by disseminating analyses as journalists write stories about the enactment of minimum wage increases. Improved access to analyses may, in turn, shape the favorability of news coverage. At a minimum, by making their analyses accessible, advocates can increase the likelihood that news coverage conveys their point of view.

An understanding of the relationships among interest groups, news coverage, public opinion, and public policy is important for understanding the democratic process. Our analysis illustrates how groups can gain influence by developing reputations for being effective, public-spirited advocates. Groups' competition for voters' loyalties may thus occur, at least in part, through media strategies and demonstrations of effective advocacy. More research is needed, however, to understand the mechanisms through which such strategies might work and to explore their generality.

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Table 1. List of States with Minimum Wage Changes from 2011 to 2019, Year of First Statutory Increase and Year of First Indexed Increase

State	Year of First Statutory Increase	Year of First Indexed Increase
Alaska	2016	
Arizona	2017	2012
Arkansas	2015	
California	2014	
Colorado	2017	2012
Connecticut	2014	
Delaware	2014	
District of Columbia	2014	
Florida		2011
Hawaii	2015	
Maine	2017	
Maryland	2015	
Massachusetts	2015	
Michigan	2014	
Minnesota	2014	
Missouri	2019	2013
Montana		2012
Nebraska	2015	
New Jersey	2014	
New York	2013	
Ohio		2012
Oregon	2016	2012
Rhode Island	2013	
South Dakota	2015	
Vermont	2015	2012
Washington	2017	2012
West Virginia	2015	

Note: Data on minimum wage changes come from Clemens, Hobbs, and Strain (2018), Vaghul and Zipperer (2019), and a number of complementary sources. The table lists states that enacted minimum wage changes over the course of our primary analysis sample. Unlisted states are those for which the minimum wage did not change between January 1, 2011, and December 31, 2019. Note that this excludes New Mexico, Nevada, and Illinois, which passed minimum wage legislation in 2019, but which did not enact a minimum wage increase until 2020, which is outside of our analysis sample.

Table 2: Sample Summary Statistics: CPS MORG and Supplemental Data for 2011-2014 and 2015-2019

	(1)	(2)	(3)	(4)
Years	2011-2014	2015-2019	2011-2014	2015-2019
Sample	Never Increased Min Wage		Increased Min Wage	
Employed	0.654	0.687	0.642	0.683
	(0.476)	(0.464)	(0.479)	(0.465)
Unionized	0.0389	0.0369	0.0646	0.0688
	(0.193)	(0.189)	(0.246)	(0.253)
Hourly Wage ($)	14.14	16.32	15.04	17.74
	(20.81)	(21.81)	(21.81)	(23.02)
Hours Worked per Week	23.88	25.30	23.03	24.79
	(20.84)	(20.64)	(20.50)	(20.34)
Age (years)	27.75	27.87	27.73	27.98
	(7.165)	(7.158)	(7.163)	(7.106)
House Price Index	281.2	339.2	386.1	496.7
	(51.43)	(57.83)	(114.3)	(144.3)
Income Per Capita ($1000s)	41.97	48.00	47.37	56.38
	(4.625)	(5.433)	(6.995)	(9.119)
Effective Minimum Wage ($)	7.366	7.362	7.791	9.472
	(0.317)	(0.311)	(0.516)	(1.230)
Observations	213,860	272,827	287,141	320,523

Notes: This table reports summary statistics for two sample groups. Columns 1 and 2 report averages and standard deviations (in parentheses) for employed individuals, ages 16-40, living in states that had no minimum wage increases. Columns 3 and 4 report averages and standard deviations (in parenthesis) for employed individuals, ages 16-40, living in states which had at least 1 minimum wage change between 2011 and 2019. Entries for unionized, hourly wages, hours worked, and age summarize data from the Current Population Survey Outgoing Rotation Groups (CPS ORG). There are 8,120 observations with missing hourly wages. These observations are associated with individuals who are not paid hourly and did not report their usual hours worked. The house price index is the quarterly all-transactions state-level index published by the Federal Housing Finance Agency (FHFA). Income per capita is average state-level personal income per capita from the Bureau of Economic Analysis (BEA). The effective minimum wage variable is the maximum of the state and federal minimum wage for large employers, as assembled independently by Clemens, Hobbs, and Strain (2018) and Vaghul and Zipperer (2019) using a number of sources.

Table 3. Relationship Between Minimum Wage Increases and Union Membership Rates Among Individuals Ages 16-40, 2011-2019

	(1)	(2)	(3)	(4)
Dependent Variable	Individual is a Union Member			
Effective Minimum Wage	0.0024***	0.0019**	0.0031***	0.0029***
	(0.0008)	(0.0009)	(0.0006)	(0.0006)
House Price Index Divided by 1,000			-0.0384*	-0.0410*
			(0.0208)	(0.0229)
Ln(Income per Capita)			0.0223	0.0148
			(0.0188)	(0.0206)
Age and education controls	No	Yes	No	Yes
Adjusted R-squared	0.0144	0.0379	0.0144	0.038
Observations	1,094,351	1,094,351	1,094,351	1,094,351

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership. The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of all individuals ages 16 to 40. Columns 1 and 2 report the effect of minimum wage changes on the probability of union membership, and columns 3 and 4 report the effect of minimum wage changes on the probability of union membership controlling for quarterly state-level house prices and income per capita. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month-year and state fixed effects. Age and education controls consist of a dummy variable for each education group and age. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Relationship Between Minimum Wage Increases and Union Membership Rates Matching on Membership Rates from 2011-2014 Among Individuals Ages 16-40, 2011-2019

	(1)	(2)	(3)	(4)
Dependent Variable	Individual is a Union Member			
Effective Minimum Wage	0.0019**	0.0015	0.0029***	0.0028***
	(0.0009)	(0.0010)	(0.0006)	(0.0010)
House Price Index Divided by 1,000			-0.0410*	-0.0565**
			(0.0229)	(0.0274)
Ln(Income per Capita)			0.0148	0.0309
			(0.0206)	(0.0257)
Matched on baseline membership rates	No	Yes	No	Yes
Adjusted R-squared	0.0379	0.0306	0.0380	0.0306
Observations	1,094,351	732,098	1,094,351	732,098

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership. The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of all individuals ages 16 to 40. Columns 1 and 2 report the effect of minimum wage changes on the probability of union membership, and columns 3 and 4 report the effect of minimum wage changes on the probability of union membership controlling for quarterly state-level house prices and income per capita. In columns 2 and 4, the sample is restricted to states with baseline union membership rates between 2.5 and 7.5 percent, which roughly covers the range of common support for states that did versus did not enact minimum wage increases. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month-year, state, age, and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Examining Heterogeneity in the Effect of the Minimum Wage on Union Membership and Hourly Earnings by Worker Age, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A	Dependent Variable: Individual is a Union Member								
Effective Minimum Wage	-0.0005	0.0045***	0.0024*	0.0017	0.0043***	-0.0026	0.0007	-0.0004	-0.0010
	(0.0005)	(0.0012)	(0.0014)	(0.0018)	(0.0015)	(0.0017)	(0.0014)	(0.0016)	(0.0013)
House Price Index/1,000	0.0248*	-0.0597	-0.0932***	0.0004	-0.0431	0.0511	-0.0492	0.0643	0.0414
	(0.0136)	(0.0430)	(0.0241)	(0.0400)	(0.0404)	(0.0422)	(0.0309)	(0.0405)	(0.0462)
Ln(Income per Capita)	0.0220	0.0433	0.0473	-0.0633	-0.0159	0.0490	0.0216	-0.0700	-0.0549
	(0.0156)	(0.0387)	(0.0294)	(0.0541)	(0.0403)	(0.0522)	(0.0512)	(0.0555)	(0.0416)
Age range	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
Adjusted R-squared	0.0090	0.0143	0.0249	0.0335	0.0357	0.0377	0.0359	0.0348	0.0310
Observations	218,543	208,437	221,318	226,362	219,691	222,103	235,101	248,878	244,212
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel B	Dependent Variable: Hourly Wages Earned								
Effective Minimum Wage	0.2837***	0.1703***	-0.0544	-0.0987***	-0.1029**	-0.0750	-0.1061**	-0.0702	-0.0210
	(0.0550)	(0.0495)	(0.0453)	(0.0359)	(0.0448)	(0.0464)	(0.0438)	(0.0438)	(0.0388)
House Price Index/1,000	1.3813	-1.3223	-0.0567	0.7689	2.1139**	1.6907	1.7809**	-0.5619	0.4296
	(1.1953)	(1.2867)	(1.1399)	(0.9777)	(0.9592)	(1.2678)	(0.8783)	(0.9841)	(1.1268)
Ln(Income per Capita)	1.1663	2.6387**	2.4945*	-0.3446	-1.4774	-1.2546	-0.2816	-0.5703	-1.5049
	(1.1417)	(1.2905)	(1.3590)	(1.5616)	(1.1180)	(1.6476)	(1.1697)	(1.1003)	(1.1521)
Age range	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
Adjusted R-squared	0.1122	0.2137	0.2043	0.2145	0.2013	0.1842	0.1721	0.1557	0.1400
Observations	74,795	142,489	168,984	174,522	171,303	173,772	181,498	184,085	163,733

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership (Panel A) and hourly wages earned (Panel B). The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG. Each column reports estimates of the effect of minimum wage increases on union membership among workers within a 5-year age range. Panel A includes all respondents in the indicated age range, and panel B includes all respondents in the indicated age range who are employed. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month-year, state, age, and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Relationship Between Minimum Wage Increases and Union Membership, and Hourly Wages Earned Among Individuals Ages 16-40 Working in the Public or Private Sector, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A DV: Worker is a Union Member	Any Union		Public Union		Private Union	
Effective Minimum Wage	0.0019**	0.0029***	0.0009*	0.0016***	0.0011**	0.0013***
	(0.0009)	(0.0006)	(0.0006)	(0.0005)	(0.0004)	(0.0003)
House Price Index/1,000		-0.0410*		-0.0218		-0.0204
		(0.0229)		(0.0141)		(0.0134)
Ln(Income per Capita)		0.0148		-0.0014		0.0183*
		(0.0206)		(0.0160)		(0.0096)
Adjusted R-squared	0.0379	0.0380	0.0383	0.0383	0.0154	0.0154
Observations	1,094,351	1,094,351	1,094,351	1,094,351	1,094,351	1,094,351
Panel B DV: Hourly Wages Earned	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All Workers		Public Sector		Private Sector	
Effective Minimum Wage	0.0301	0.0052	-0.0536	-0.0599	0.0425	0.0161
	(0.0280)	(0.0339)	(0.0396)	(0.0567)	(0.0274)	(0.0326)
House Price Index/1,000		0.2475		-0.5742		0.3611
		(0.8313)		(1.4072)		(0.7885)
Ln(Income per Capita)		0.9124		1.2149		0.8201
		(0.9120)		(1.6080)		(0.8585)
Adjusted R-squared	0.3581	0.3581	0.3425	0.3425	0.3548	0.3548
Observations	732,093	732,093	87,971	87,971	644,988	644,988

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership (Panel A) and hourly wages earned (Panel B). The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of individuals ages 16 to 40. Columns 1 and 2 report the estimated effect of minimum wage changes on union membership among all workers, columns 3 and 4 report the estimated effect of minimum wage changes on public-sector union membership, and columns 5 and 6 report the effect of minimum wage changes on private-sector union membership. The samples in Panel A are not conditioned on public vs. private sector employment, so that the relevant results roughly sum to the results from columns 1 and 2. For the wage analysis in Panel B, the sample in columns 3 and 4 is restricted to those employed in the public sector, while the sample in columns 5 and 6 is restricted to those employed in the private sector. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month, year, month-year, state, age, and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Relationship Between Minimum Wage Increases and Union Membership, and Hourly Wages Earned Among Individuals with Some Education Beyond High School Ages 16-40 Working in the Public or Private Sector, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A DV: Worker is a Union Member	Any Union		Public Union		Private Union	
Effective Minimum Wage	0.0022*	0.0036***	0.0013	0.0025***	0.0010**	0.0011**
	(0.0012)	(0.0010)	(0.0008)	(0.0007)	(0.0004)	(0.0005)
House Price Index/1,000		-0.0471		-0.0341		-0.0133
		(0.0326)		(0.0213)		(0.0147)
Ln(Income per Capita)		0.0026		-0.0086		0.0141
		(0.0341)		(0.0233)		(0.0149)
Adjusted R-squared	0.0354	0.0354	0.0344	0.0344	0.0130	0.0130
Observations	618,845	618,845	618,845	618,845	618,845	618,845
Panel B DV: Hourly Wages Earned	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All Workers		Public Sector		Private Sector	
Effective Minimum Wage	0.0124	0.0102	-0.0453	-0.0541	0.0232	0.0239
	(0.0248)	(0.0346)	(0.0469)	(0.0674)	(0.0240)	(0.0330)
House Price Index/1,000		-0.4302		-0.3013		-0.4764
		(0.8429)		(1.6718)		(0.7817)
Ln(Income per Capita)		0.7890		0.9318		0.7059
		(1.0287)		(1.9572)		(0.9252)
Adjusted R-squared	0.3449	0.3449	0.3096	0.3096	0.3469	0.3469
Observations	474,469	474,469	73,409	73,409	402,305	402,305

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership (Panel A) and hourly wages earned (Panel B). The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of individuals ages 16 to 40 with at least some college education. Columns 1 and 2 report the estimated effect of minimum wage changes on union membership among all workers with at least some college education, while columns 3 and 4 report the estimated effect of minimum wage changes on public-sector union membership and columns 5 and 6 report the effect of minimum wage changes on private-sector union membership. The samples in Panel A are not conditioned on public vs. private sector employment, so that the relevant results roughly sum to the results from columns 1 and 2. For the wage analysis in Panel B, the sample in columns 3 and 4 is restricted to those employed in the public sector, while the sample in columns 5 and 6 is restricted to those employed in the private sector. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month, year, month-year, state, age, and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 8. Relationship Between Minimum Wage Increases and Union Membership, and Hourly Wages Earned Among Individuals Working in the Restaurant or Retail Industries, 2011-2019

Panel A DV: Union Member	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16-21		Ages 22-29		Ages 30-50 & Less than High School		Ages 30-50 & High School or Greater	
Effective Minimum Wage	-0.0021*	-0.0042***	-0.0009	-0.0005	0.0007	0.0008	-0.0008	0.0027
	(0.0012)	(0.0015)	(0.0016)	(0.0015)	(0.0016)	(0.0018)	(0.0023)	(0.0018)
House Price Index/1,000		0.0829		-0.0403		0.0336		-0.0801
		(0.0539)		(0.0423)		(0.0506)		(0.0709)
Ln(Income per Capita)		-0.0144		0.0407		-0.0534		-0.0598
		(0.0430)		(0.0477)		(0.0553)		(0.0536)
Adjusted R-squared	0.0133	0.0134	0.0136	0.0136	0.0201	0.0201	0.0154	0.0156
Observations	49,598	49,598	59,056	59,056	47,310	47,310	53,818	53,818
Panel B DV: Hourly Wages	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16-21		Ages 22-29		Ages 30-50 & Less than High School		Ages 30-50 & High School or Greater	
Effective Minimum Wage	0.3383***	0.3085***	0.1585***	0.1733***	0.0796	0.0456	-0.0006	-0.1226**
	(0.0308)	(0.0359)	(0.0406)	(0.0637)	(0.0548)	(0.0852)	(0.0546)	(0.0582)
House Price Index Divided by 1000		0.4648		-1.5595		2.0459*		4.3435***
		(0.9030)		(1.6810)		(1.1403)		(1.6038)
Ln(Income per Capita)		0.9011		1.5818		-1.2810		-0.2003
		(1.0757)		(1.7311)		(2.0865)		(2.1820)
Adjusted R-squared	0.1395	0.1395	0.1696	0.1696	0.0721	0.0721	0.1217	0.1219
Observations	49,542	49,542	58,890	58,890	47,115	47,115	53,380	53,380

Notes: This table reports regression results examining the effect of minimum wage changes on the probability an individual reports being a union member (Panel A) and hourly wages earned (Panel B). The coefficients are from estimates of equation (1), which is described in the main text. The samples are from the CPS ORG and consist of individuals working in the following industries: eating and drinking places (1990 Census industry code 641) and retail (1990 Census industry codes 580-691). Columns 1 and 2 include all individuals ages 16 to 21, columns 3 and 4 include individuals ages 22-29, columns 5 and 6 include individuals ages 30-50 with less than a completed high school education, and columns 7 and 8 include individuals ages 30-50 with a completed high school or greater education. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month-year, state, age, and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 9. Relationship Between Minimum Wages, Union Membership, and Wages Among Employed Individuals Ages 16-40, 2011-2019

DV: Hourly Wages	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	All Employed	Privately Employed	Publically Employed	Narrow Low Wage Industries	Broader Low Wage Industries	Less than High School	High School or Greater	College or Greater
Effective Minimum Wage	0.0231	0.0302	-0.0510	0.1686***	0.0780**	0.1016**	0.0150	-0.0401
	(0.0258)	(0.0240)	(0.0634)	(0.0350)	(0.0305)	(0.0466)	(0.0262)	(0.0331)
Union Member	2.1312***	2.3178***	1.5033***	-0.8014*	2.5868***	0.9895	2.0893***	1.3434***
	(0.2129)	(0.2928)	(0.3244)	(0.4378)	(0.3305)	(0.8536)	(0.2161)	(0.3289)
Effective Minimum Wage X Union	-0.1101***	-0.1494***	-0.0341	0.1551***	-0.1639***	-0.0209	-0.1062***	-0.0655*
	(0.0297)	(0.0418)	(0.0375)	(0.0541)	(0.0428)	(0.0963)	(0.0304)	(0.0357)
House Price Index Divided by 1000	0.6521	0.8322	-0.2293	0.5343	0.8204	2.2636*	0.4250	-0.0640
	(0.6655)	(0.6254)	(1.3067)	(0.6485)	(0.7035)	(1.1664)	(0.6598)	(0.7809)
Ln(Income per Capita)	0.0748	-0.1342	1.3076	-0.3289	0.1542	0.9987	-0.0630	0.1802
	(0.7503)	(0.7236)	(1.2984)	(0.7000)	(0.7629)	(1.3008)	(0.8226)	(1.0991)
Adjusted R-squared	0.4951	0.5023	0.4177	0.4489	0.4774	0.3505	0.4794	0.3136
Observations	732,090	643,542	88,506	164,611	376,011	70,321	661,748	247,924

Notes: This table reports regression results examining the effect of minimum wage changes, union membership, and wages. The coefficients are from estimates of equation (3), which is described in the main text. The samples are from the CPS ORG and consist of employed individuals ages 16-40. Column 1 includes all employed individuals, column 2 includes all individuals employed in the private sector, and column 3 includes all individuals employed in the public sector. Column 4 includes all individuals working in the following industries: eating and drinking places (1990 Census industry code 641) and retail (1990 Census industry codes 580-691), and column 5 includes all individuals working in eating and drinking and retail industries as well as manufacturing, construction, and personal services industries. Column 6 includes all employed individuals with less than a completed high school education, column 7 includes all employed individuals who completed high school, and column 8 includes all individuals who have completed a four-year college degree. Variable definitions and sources are discussed in the note to Table 2 (and in the main text of the paper). All specifications include month-year, state, age, and education fixed effects as well as fixed effects for all 1990 Census 3-digit industry and occupation codes. Age and education controls consist of a dummy variable for each education group and age. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 10. Relationship Between Minimum Wage Changes, New Minimum Wage Legislation, and Mentions of Minimum Wages in Newspaper Articles By State, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Count of Articles Mentioning "minimum wage"					
Change in Minimum Wage from Previous Month	1.1644***	1.1679***	1.1929***	1.1859***	1.1733***	1.1668***
	(0.0656)	(0.0665)	(0.0643)	(0.0667)	(0.0507)	(0.0510)
Change in Minimum Wage in Following Month		1.0833	1.1072*	1.1037*	1.0907*	1.0870
		(0.0554)	(0.0604)	(0.0638)	(0.0544)	(0.0572)
Month First State Minimum Wage Legislation Introduced			1.1905	1.1807	1.1871	1.1715
			(0.1535)	(0.1511)	(0.1518)	(0.1497)
Month First State Minimum Wage Legislation Passed			2.4411***	2.4304***	2.5226***	2.5056***
			(0.4745)	(0.4747)	(0.4993)	(0.5057)
Month First Local Minimum Wage Legislation Passed			1.3417***	1.3304***	1.3526***	1.3421***
			(0.1356)	(0.1314)	(0.1344)	(0.1314)
Post Occupy Wall Street Protests				3.0093***		3.2024***
				(0.2647)		(0.3503)
Ed Murray Mayor of Seattle				1.3957***		1.4727***
				(0.0611)		(0.0906)
House Price Index Divided by 1000					1.0014	1.0019*
					(0.0010)	(0.0011)
Income per Capita					1.0000	1.0000
					(0.0000)	(0.0000)
Pseudo R-squared	0.7913	0.7915	0.8012	0.8041	0.8033	0.8066
Observations	5,508	5,508	5,508	5,508	5,508	5,508

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on how often state newspapers mention minimum wages. The coefficients are from estimates of equation (4), which is described in the main text. State newspaper articles come from LexisNexis. The dependent variable is the number of articles published in state newspapers per month. Coefficients reported are incidence rate ratios. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage Ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 11. Relationship Between Minimum Wage Changes, Minimum Wage Legislation, and Mentions of Minimum Wages and Unions in Newspaper Articles By State, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Count of Articles "minimum wage" AND "organized labor"					
Change in Minimum Wage from Previous Month	1.0739	1.0746	1.0788	1.0703	1.0448	1.0367
	(0.1295)	(0.1310)	(0.1319)	(0.1349)	(0.1041)	(0.1065)
Change in Minimum Wage in Following Month		1.0219	1.0300	1.0282	0.9881	0.9854
		(0.0746)	(0.0807)	(0.0849)	(0.0715)	(0.0753)
Month First State Minimum Wage Legislation Introduced			1.0445	1.0342	1.0501	1.0366
			(0.1910)	(0.1888)	(0.1978)	(0.1966)
Month First State Minimum Wage Legislation Passed			1.6331***	1.6227***	1.7832***	1.7671***
			(0.1980)	(0.1988)	(0.2140)	(0.2176)
Month First Substate Minimum Wage Legislation Passed			1.0213	1.0136	1.0311	1.0250
			(0.1051)	(0.1022)	(0.1003)	(0.0982)
Post Occupy Wall Street Protests				2.8110***		2.7151***
				(0.3290)		(0.2707)
Ed Murray Mayor of Seattle				1.4870***		1.5171***
				(0.0767)		(0.0913)
House Price Index Divided by 1000					1.0005	1.0010
					(0.0009)	(0.0010)
Income per Capita					1.0001***	1.0001***
					(0.0000)	(0.0000)
Pseudo R-squared	0.7198	0.7198	0.7212	0.7232	0.7272	0.7291
Observations	5,508	5,508	5,508	5,508	5,508	5,508

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on how often state newspapers mention minimum wages and labor unions in the same article. The coefficients are from estimates of equation (4), which is described in the main text. State newspaper articles come from LexisNexis. The dependent variable is the number of articles published in state newspapers per month. Coefficients reported are incidence rate ratios. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 12. Relationship Between Minimum Wage Changes, Minimum Wage Legislation, and Mentions of Minimum Wages and EPI or NELP in Newspaper Articles By State, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Count of Articles Mentioning "minimum wage" AND "Economic Policy Institute" or "National Employment Law Project"						
Change in Minimum Wage from Previous Month	1.6351**	1.6972***	1.7010***	1.6991***	1.6103***	1.6103***
	(0.3232)	(0.3354)	(0.3252)	(0.3254)	(0.2644)	(0.2649)
Change in Minimum Wage in Following Month		1.9596***	1.9678***	1.9675***	1.8759***	1.8773***
		(0.3504)	(0.3470)	(0.3434)	(0.2977)	(0.2964)
Month First State Minimum Wage Legislation Introduced			0.8101	0.8062	0.8396	0.8368
			(0.3241)	(0.3209)	(0.3338)	(0.3308)
Month First State Minimum Wage Legislation Passed			2.5838*	2.5795	2.8748*	2.8700*
			(1.4899)	(1.4864)	(1.5588)	(1.5572)
Month First Substate Minimum Wage Legislation Passed			1.3315	1.3260	1.3288	1.3264
			(0.3109)	(0.3051)	(0.2946)	(0.2919)
Post Occupy Wall Street Protests				1.3825		1.1112
				(0.3857)		(0.2705)
Ed Murray Mayor of Seattle				1.2238***		1.1716**
				(0.0649)		(0.0775)
House Price Index Divided by 1,000					0.9992	0.9993
					(0.0023)	(0.0024)
Income per Capita					1.0001**	1.0001**
					(0.0000)	(0.0000)
Pseudo R-squared	0.3900	0.3941	0.3977	0.3978	0.4032	0.4032
Observations	5,508	5,508	5,508	5,508	5,508	5,508

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on how often state newspapers mention minimum wages and EPI or NELP in the same article. The coefficients are from estimates of equation (4), which is described in the main text. State newspaper articles come from LexisNexis. The dependent variable is the number of articles published in state newspapers per month. Coefficients reported are incidence rate ratios. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage Ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 13. Relationship Between Minimum Wage Changes, Minimum Wage Legislation, and Mentions of Minimum Wages and SEIU in Newspaper Articles By State, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Count of Articles Mentioning "minimum wage" AND "Service Employees International Union"					
Change in Minimum Wage from Previous Month	0.9088	0.9144	0.9049	0.9044	0.8927	0.8920
	(0.1896)	(0.1900)	(0.1846)	(0.1846)	(0.1859)	(0.1860)
Change in Minimum Wage in Following Month		1.2772**	1.2785**	1.2771**	1.2749**	1.2724**
		(0.1491)	(0.1512)	(0.1509)	(0.1557)	(0.1548)
Month First State Minimum Wage Legislation Introduced			1.1985	1.1973	1.1902	1.1885
			(0.4295)	(0.4295)	(0.4330)	(0.4335)
Month First State Minimum Wage Legislation Passed			1.2969	1.2983	1.4157	1.4192
			(0.5203)	(0.5219)	(0.5376)	(0.5406)
Month First Substate Minimum Wage Legislation Passed			0.6490***	0.6475***	0.6563***	0.6553***
			(0.1088)	(0.1087)	(0.1039)	(0.1039)
Post Occupy Wall Street Protests				2.6417***		2.1906***
				(0.5180)		(0.5991)
Ed Murray Mayor of Seattle				0.9917		0.9541
				(0.0728)		(0.0811)
House Price Index Divided by 1,000					0.9982	0.9983
					(0.0016)	(0.0017)
Income per Capita					1.0001***	1.0001***
					(0.0000)	(0.0000)
Pseudo R-squared	0.5412	0.5415	0.5421	0.5422	0.5444	0.5445
Observations	5,300	5,300	5,300	5,300	5,300	5,300

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on how often state newspapers mention minimum wages and the Service Employees International Union in the same article. The coefficients are from estimates of equation (4), which is described in the main text. State newspaper articles come from LexisNexis. The dependent variable is the number of articles published in state newspapers per month. Coefficients reported are incidence rate ratios. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage Ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 14. Relationship Between Minimum Wage Changes, Minimum Wage Legislation, and Mentions of Organized Labor in Newspaper Articles By State, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Count of Articles Mentioning "organized labor"					
Change in Minimum Wage from Previous Month	1.0661	1.0691	1.0633	1.0568	1.0279	1.0242
	(0.0679)	(0.0688)	(0.0691)	(0.0727)	(0.0723)	(0.0734)
Change in Minimum Wage in Following Month		1.1047*	1.0928	1.0869	1.0662	1.0623
		(0.0612)	(0.0615)	(0.0607)	(0.0634)	(0.0625)
Month First State Minimum Wage Legislation Introduced			0.7863**	0.7839**	0.7666**	0.7702**
			(0.0956)	(0.0937)	(0.0944)	(0.0930)
Month First State Minimum Wage Legislation Passed			0.9627	0.9621	1.0142	1.0101
			(0.1280)	(0.1277)	(0.1342)	(0.1360)
Month First Substate Minimum Wage Legislation Passed			1.0206	1.0159	1.0121	1.0095
			(0.0759)	(0.0731)	(0.0687)	(0.0679)
Post Occupy Wall Street Protests				1.5843***		1.4123***
				(0.1073)		(0.1616)
Ed Murray Mayor of Seattle				1.0346		0.9852
				(0.0279)		(0.0434)
House Price Index Divided by 1000					0.9984	0.9987
					(0.0012)	(0.0012)
Income per Capita					1.0001**	1.0001**
					(0.0000)	(0.0000)
Pseudo R-squared	0.8367	0.8368	0.8371	0.8385	0.8408	0.8415
Observations	5,508	5,508	5,508	5,508	5,508	5,508

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on how often state newspapers mention organized labor in articles. The coefficients are from estimates of equation (4), which is described in the main text. State newspaper articles come from LexisNexis. The dependent variable is the number of articles published in state newspapers per month. Coefficients reported are incidence rate ratios. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage Ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 15: Relationship Between Minimum Wage Changes, Minimum Wage Legislation, and the Share of Newspaper Articles Mentioning Organized Labor that also Mention Minimum Wages, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: Share of Articles Mentioning "organized labor "that also Mention "minimum wage"					
Change in Minimum Wage from Previous Month	0.0184*	0.0195*	0.0210**	0.0209**	0.0203*	0.0203*
	(0.0100)	(0.0100)	(0.0101)	(0.0101)	(0.0102)	(0.0102)
Change in Minimum Wage in Following Month		0.0235**	0.0248**	0.0250**	0.0241**	0.0243**
		(0.0113)	(0.0113)	(0.0113)	(0.0112)	(0.0112)
Month First State Minimum Wage Legislation Introduced			0.0237	0.0230	0.0225	0.0220
			(0.0182)	(0.0185)	(0.0178)	(0.0180)
Month First State Minimum Wage Legislation Passed			0.1134***	0.1127***	0.1147***	0.1141***
			(0.0352)	(0.0352)	(0.0343)	(0.0343)
Month First Substate Minimum Wage Legislation Passed			0.0397	0.0391	0.0392	0.0387
			(0.0251)	(0.0252)	(0.0250)	(0.0251)
Post Occupy Wall Street Protests				0.0148***		0.0088*
				(0.0032)		(0.0050)
Ed Murray Mayor of Seattle				0.0290***		0.0247***
				(0.0051)		(0.0057)
House Price Index Divided by 1,000					-0.0002*	-0.0001*
					(0.0001)	(0.0001)
Ln(Income per Capita)					0.2441*	0.2308
					(0.1437)	(0.1478)
Adjusted R-squared	0.2599	0.2606	0.2655	0.2656	0.2663	0.2662
Observations	5,508	5,508	5,508	5,508	5,508	5,508

Notes: This table reports regression results examining the effect of minimum wage changes and minimum wage legislation on the share of newspaper articles that mention organized labor and minimum wages. State newspaper articles come from LexisNexis. The coefficients are from estimates of an ordinary least squares variant of equation (4), which is described in the main text. The dependent variable is the share of articles mentioning organized labor that also mention minimum wages published in state newspapers per month. Data on dates in the legislative histories of state minimum wage come largely from the National Council of State Legislatures and were compiled by Clemens, Hobbs, and Strain (2018). Data on local minimum wage ordinances comes from the Inventory of City and County Wage Ordinances at the UC Berkeley Labor Center and city websites. Variable definitions and sources are discussed in Appendix A. All specifications include month-year, and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table 16. Relationship Between Minimum Wage Increases and Attitudes Toward Unions, Ages 18-64

	(1)	(2)	(3)	(4)
Dependent Variable	Approve of Unions 4-category			
Effective Minimum Wage	0.0221***	0.0225***	0.0216**	0.0212**
	(0.0077)	(0.0082)	(0.0083)	(0.0083)
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Education Fixed Effects	No	Yes	Yes	Yes
Age Fixed Effects	No	No	Yes	Yes
Income Fixed Effects	No	No	No	Yes
Adjusted R-squared	0.0131	0.0257	0.0329	0.0365
Observations	6,421	6,421	6,421	6,421

Notes: This table reports regression results examining the effect of minimum wage increases on attitudes toward unions. The coefficients are from estimates of equation (5), which is described in the main text. The sample is respondents ages 18-64 from Pew Political Attitudes Surveys in 2011, 2013, 2014, 2015, and 2018. The dependent variable is equal to 1 if an individual responded "very favorable" 0.75 if "favorable", 0.25 if "unfavorable", and 0 if "very unfavorable" to the question: "What is your overall opinion of labor unions?" Responses "Don't know", "Can't choose", and "Refused" were coded as missing. Column 1 reports results from our baseline specification, column 2 includes education-level fixed effects, and column 3 and 4 include age and income group fixed effects. Variable definitions and sources are discussed in appendix B (and in the main text). All specifications include year and state fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

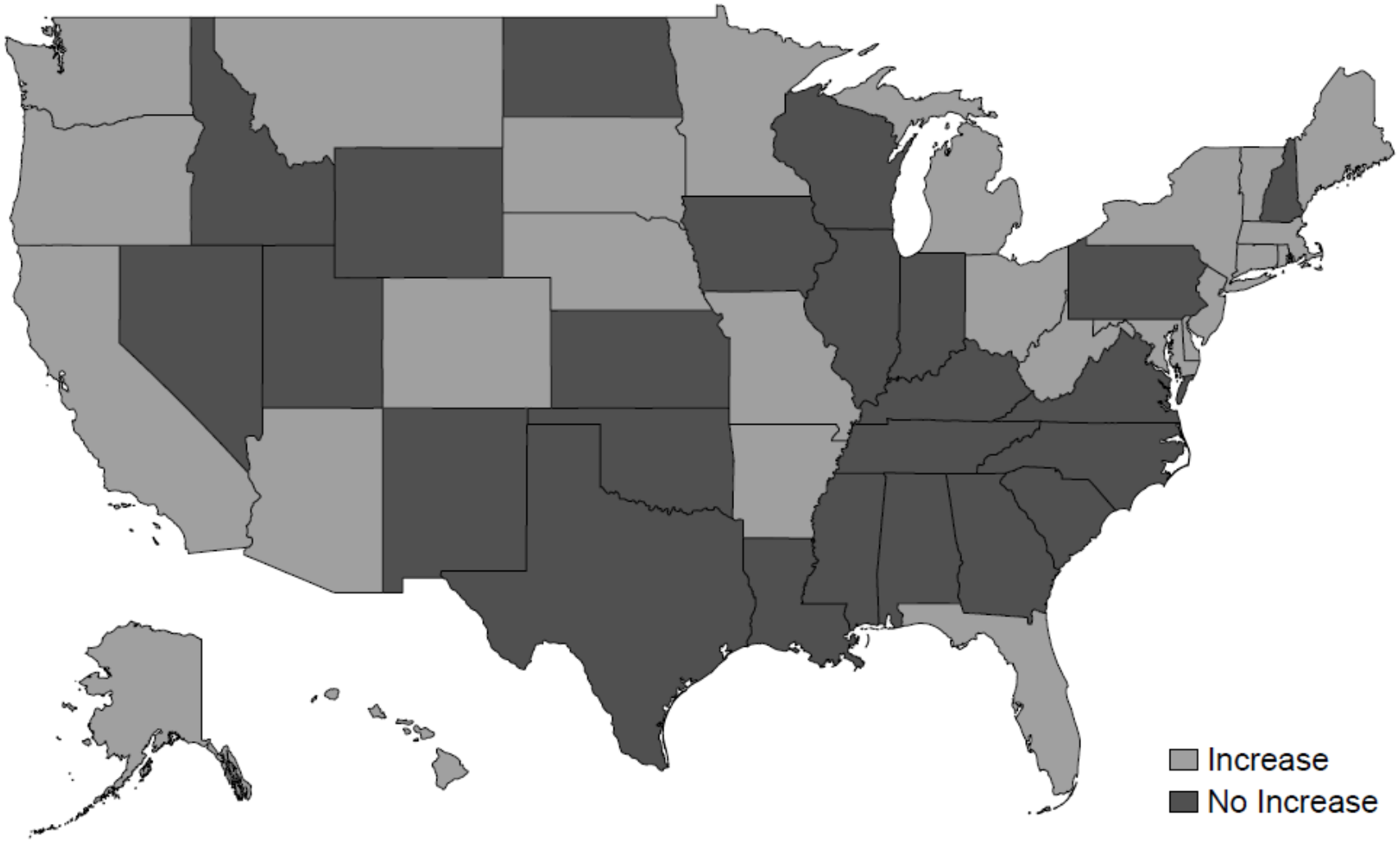

Figure 1. States Enacting Minimum Wage Increases 2011–19: This map shows states that did and did not have minimum wage increases between January 1, 2011, and December 31, 2019. Data on minimum wage changes come from Clemens, Hobbs, and Strain (2018), Vaghul and Zipperer (2019), and a number of complementary sources.

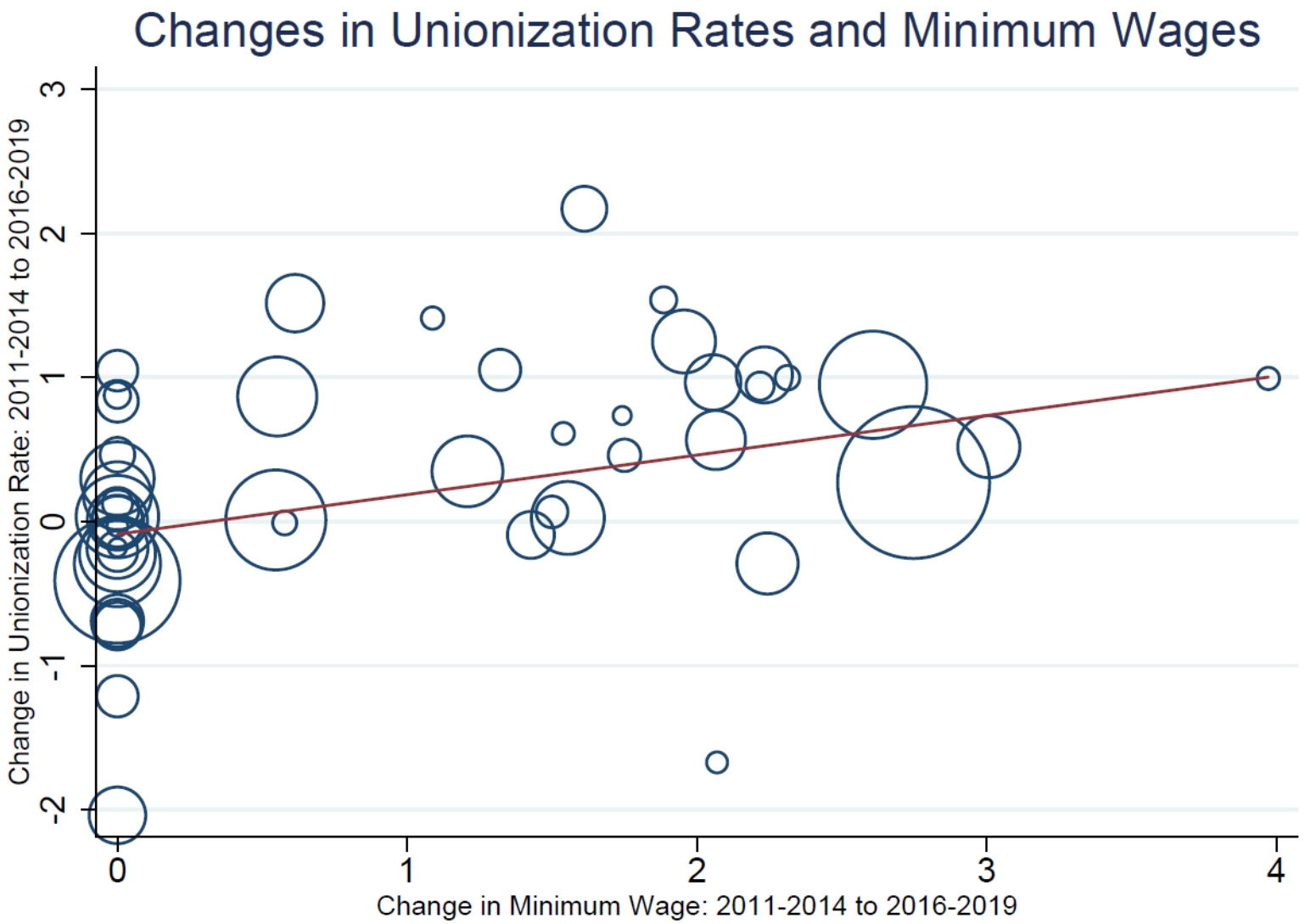

Figure 2. Changes in Unionization Rates and Changes in Minimum Wages: This figure plots the percentage point change in the unionization rate among individuals ages 16-40 against the change in the minimum wage in dollars between 2011–14 and 2016–19. Each bubble represents a state, and the size of the bubbles is proportional to state population. The red line represents the simple linear fit of changes in unionization rates against changes in minimum wages.

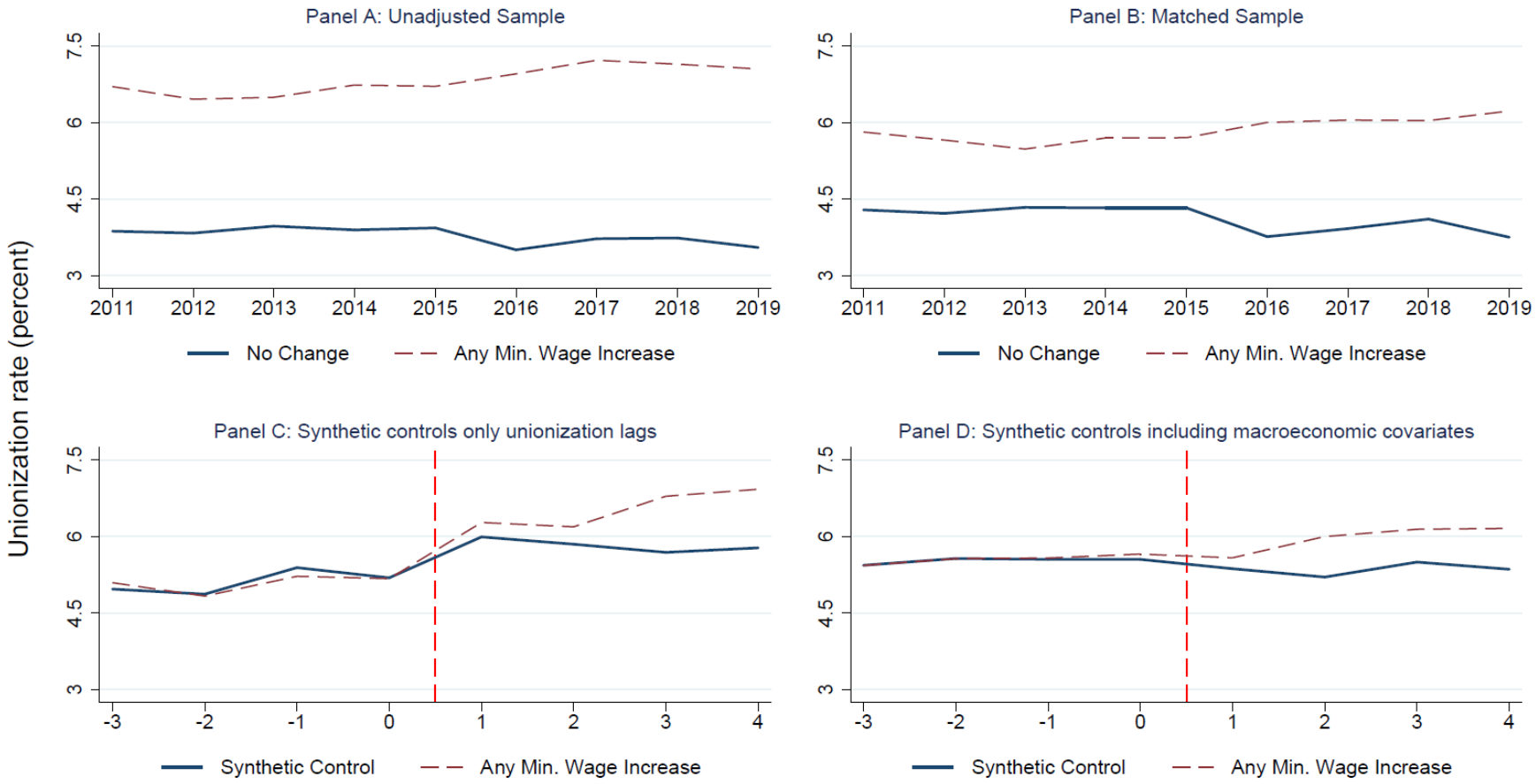

Figure 3. Time Series of Unionization Rates: This figure shows the evolution of unionization rates over time for individuals ages 16-40 in states that did versus did not increase minimum wages. Panel A displays unadjusted unionization rates from 2011 to 2019. Panel B restricts the sample of states to those with baseline unionization rates greater than 2.5 percent or less than 7.5 percent. Panels C and D display average unionization rates for increaser states relative to synthetic control groups constructed as described in the main text. In these panels, time 1 corresponds with the year of the treatment state's first minimum wage increase.

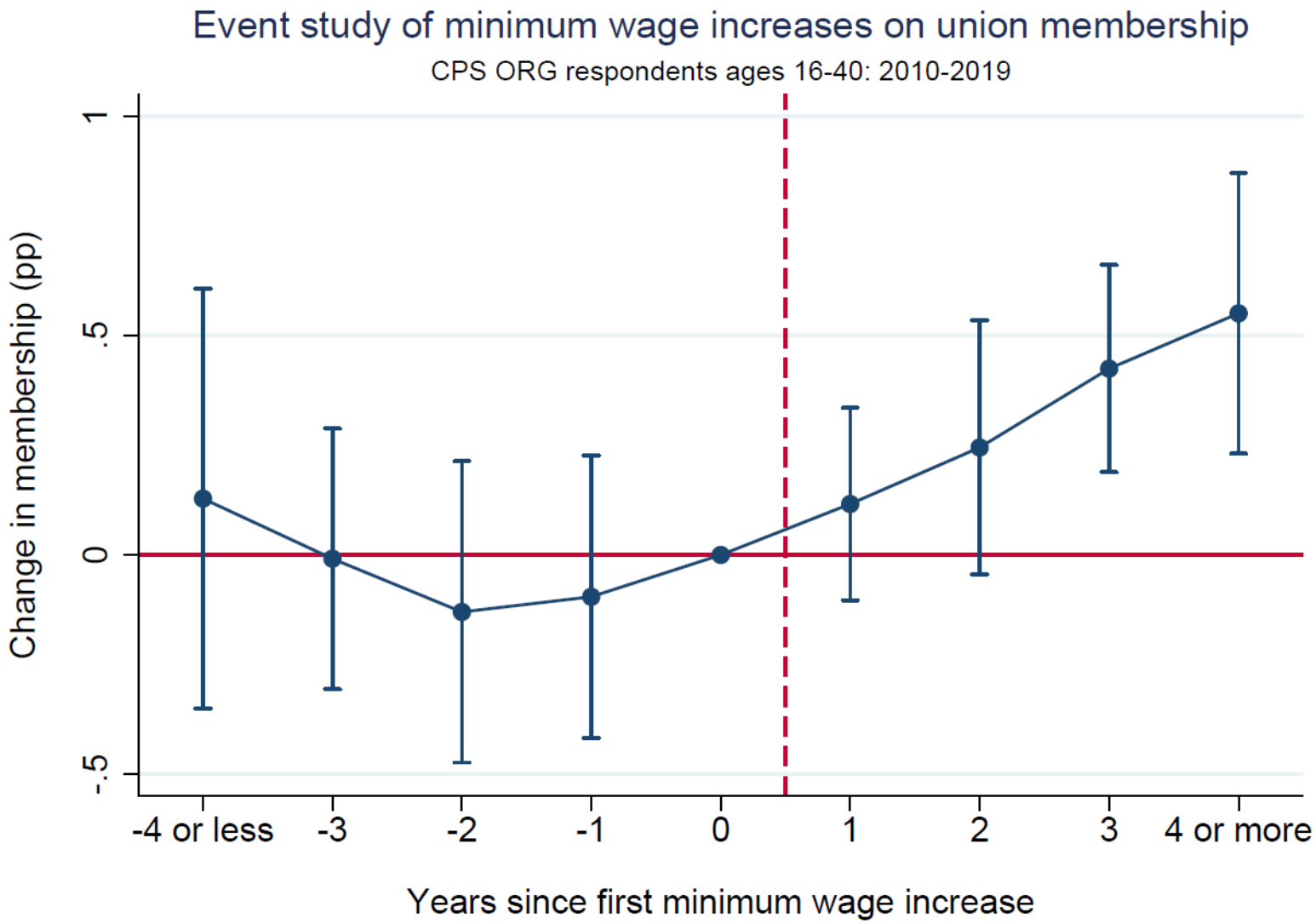

Figure 4. Event Study of Minimum Wage Increases on Union Membership. This figure plots coefficients and 95 percent confidence intervals from event study regressions of union membership on state minimum wage increases, as described by equation (2). The underlying regression is our baseline model, which includes quarterly, state-level controls for a housing price index and personal income per capita.

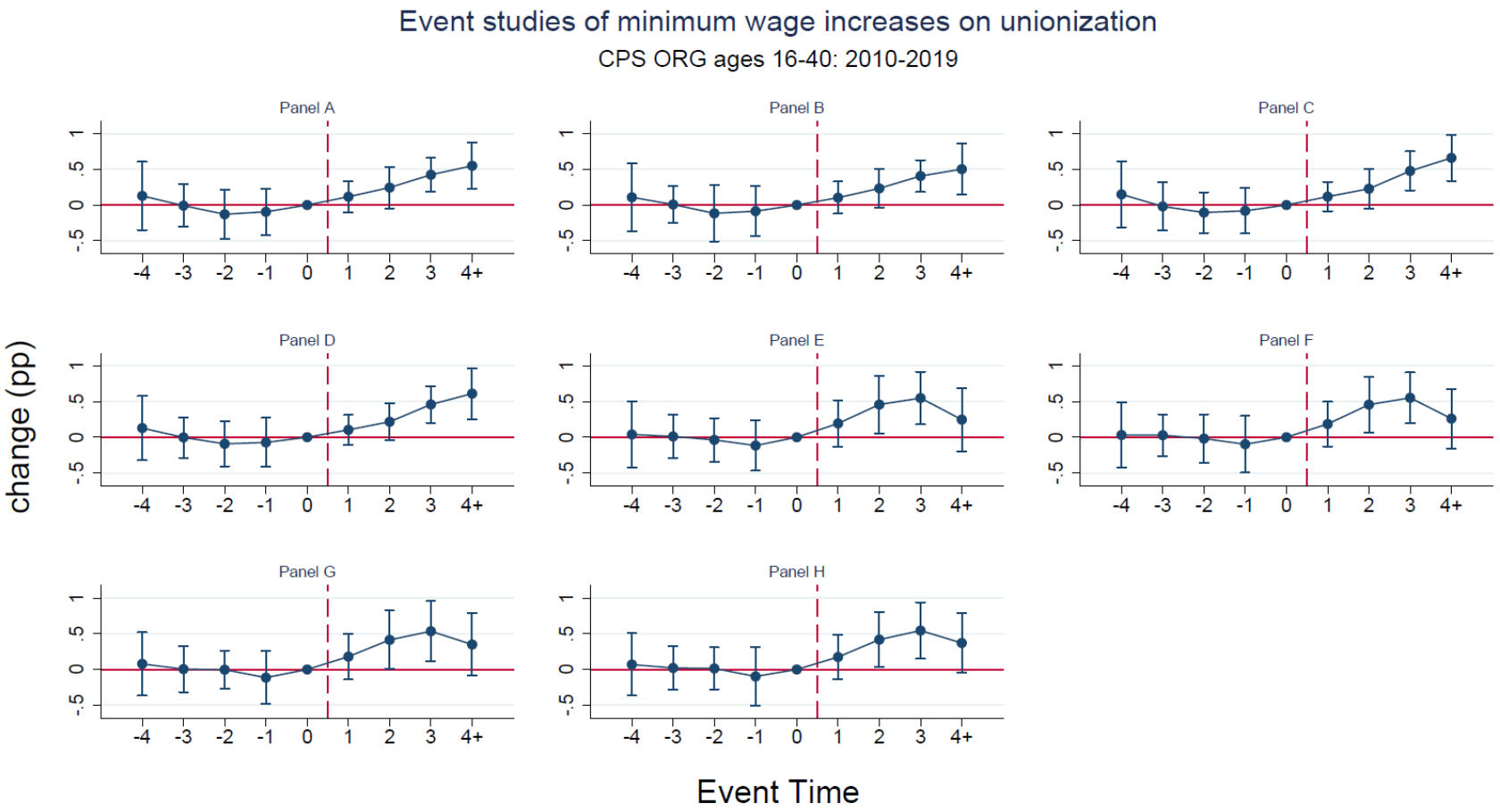

Figure 5. Event Studies of Minimum Wage Increases on Union Membership. This figure plots coefficients and 95 percent confidence intervals from event study regressions of union membership on state minimum wage increases, as described by equation (2). Panels A–D include all minimum wage increases, while Panels E–H exclude increases driven by inflation indexation provisions. Other variations across panels involve the inclusion (Panels A, C, E, and G) or exclusion (Panels B, D, F, and H) of macroeconomic covariates as control variables and whether the dependent variable is restricted to union membership (Panels A, B, E, and F) or includes individuals who report that they are covered by union contracts despite not reporting that they are members (Panels C, D, G, and H).

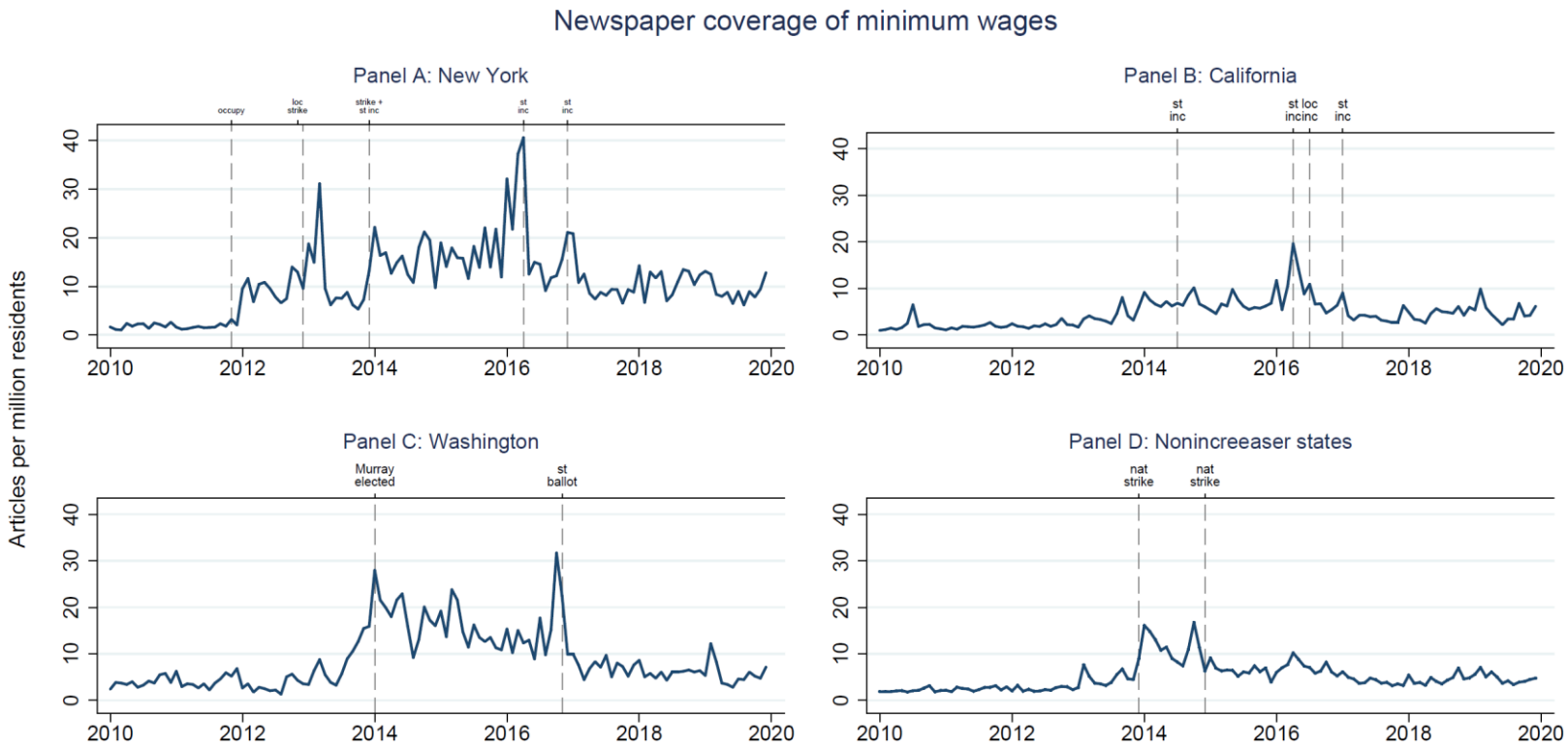

Figure 6. News Coverage of the Minimum Wage Over Time. This figure displays the number of minimum wage articles per million residents in state newspapers, as constructed using counts of articles from LexisNexis. Panels A–C display results for New York, California, and Washington. Panel D displays average results for all states that did not increase their minimum wages over our primary analysis period. Labeled events include months in which state or local minimum wage increases were voted on or enacted, months associated with events including the election of Seattle mayor Ed Murray (Washington only) and the disbandment of the original Occupy Wall Street encampment (New York only), and months associated with local or national strikes by food-service workers.

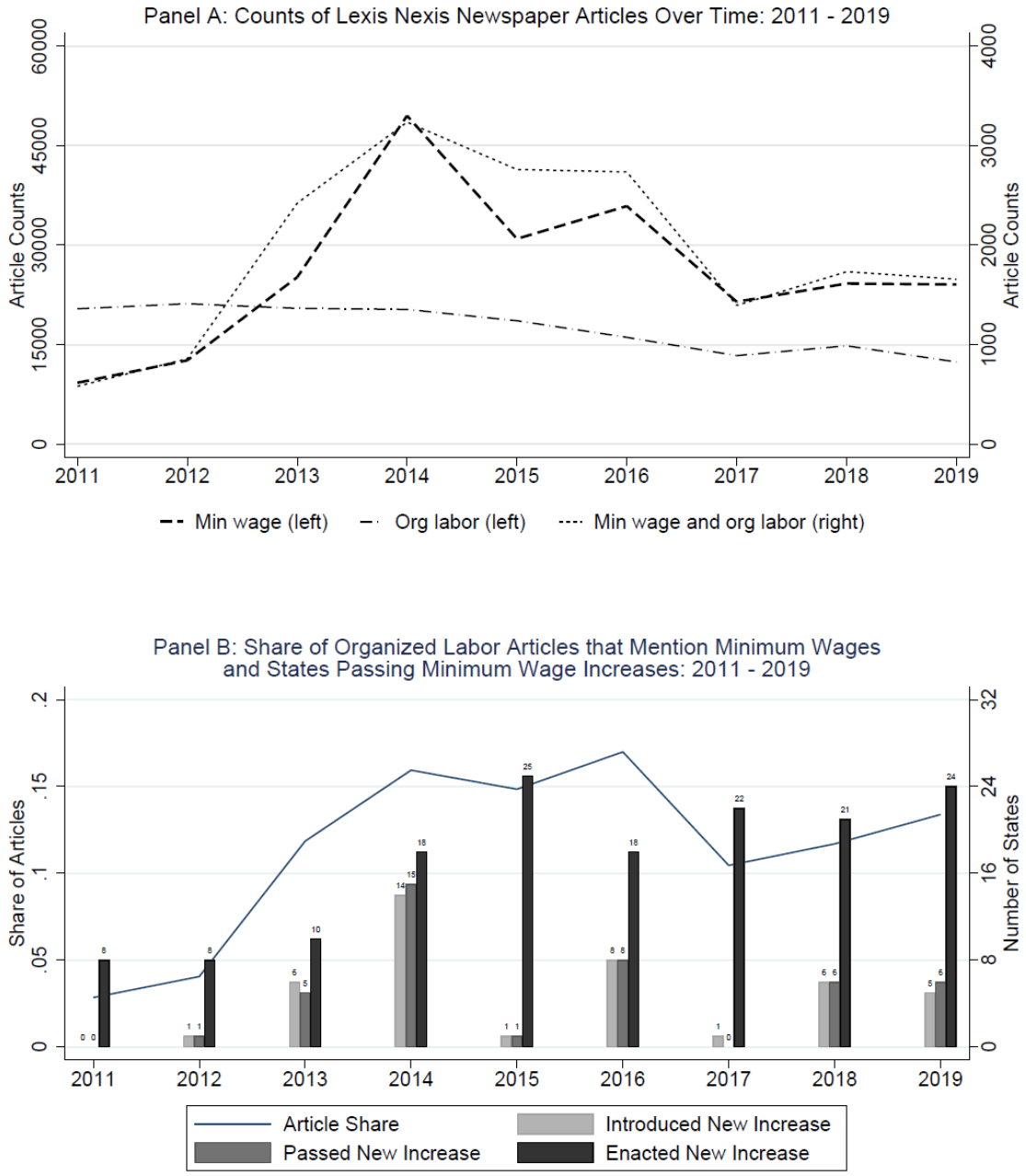

Figure 7. Minimum Wage and Organized Labor Articles Over Time. These figures plot the evolution of media coverage of minimum wages and organized labor over time. Panel A plots the annual counts of US newspaper articles that mention the minimum wage or organized labor (left axis) and the number of US newspaper articles that mention both the minimum wage and organized labor in the same article (right axis). Panel B plots the share of articles mentioning organized labor that also mention minimum wages. Panel B also illustrates the number of states in which new and ultimately successful minimum wage legislation was introduced, the number of states in which such legislation passed, and the number of states enacting a minimum wage increase in a given year. The count of the number of states enacting a minimum wage increase includes increases enacted due to inflation indexing provisions. The newspaper articles come from LexisNexis and the searches used are described in more detail in Appendix A.

Appendix A. Additional Details on LexisNexis Data

LexisNexis includes full text articles from 787 US state newspapers.[15] Previous research has utilized LexisNexis searches to analyze issues including media coverage intensity and sentiment regarding economic issues. Berge and Jordà (2011) use counts of news articles from LexisNexis mentioning "recession" to track the business cycle. Birz and Lott (2011) use newspaper articles from LexisNexis to examine how news coverage of the economy affects stock returns. Lamla and Lin (2014) use articles from LexisNexis to examine the effect of media reporting on consumer inflation expectations in Germany. Many papers have also used data from LexisNexis searches to estimate political bias in media reporting (Groseclose and Milyo, 2005; Ho and Quinn, 2008; Lott and Hassett, 2014).

We query the database to construct measures capturing how frequently minimum wages are mentioned in state newspapers over time, using the following searches:

"minimum wage"

"minimum wage" AND "Economic Policy Institute"

"minimum wage" AND "National Employment Law Project"

"minimum wage" AND "Service Employees International Union"

"minimum wage" AND ("organized labor" OR "labor group*" OR "labor union**" OR "National Employment Law Project" OR "Economic Policy Institute" OR "Service Employees International Union")

[15] As of September 22,2020.

We also query the database to see how often organized labor or labor advocacy groups are mentioned (whether or not the article mentions the minimum wage) using the following search:

"organized labor" OR "labor group*" OR "labor union**" OR "National Employment Law Project" OR "Economic Policy Institute" OR "Service Employees International Union"

In our analysis, we also include indicator variables for a set of political events that were associated with increases in the counts of news articles that reference the minimum wage. The first is for New York on all dates following the beginning of the Occupy Wall Street protests. The second is for the tenure of Ed Murray as mayor of Seattle. Finally, we include indicator variables for dates of local and national strikes related to the Fight for $15.

Local strike dates:

- New York: November 2012 and April 2013
- Illinois: April 2013
- Michigan: May 2013
- Missouri: May 2013
- Washington: May 2013
- Wisconsin: May 2013

National strike dates:

- July 2013
- August 2013
- December 2013
- December 2014

- April 2015
- November 2015

Table A1 displays the number of articles mentioning “minimum wage” and related terms by state. From these results, we observe more populous states tend to have more articles written about the minimum wage over this period. Additionally, states with more articles referencing the minimum wage do not necessarily also have more articles referencing unions, organized labor, or pro-union organizations. There is considerable regional variation in how often these terms are mentioned in conjunction with the minimum wage.

Table A2 displays the number of unique newspapers mentioning the minimum wage and related terms by state, as well as the total number of newspapers queried by state. We observe most states have articles from a large number of newspapers published in that state, except for low-population states with relatively few articles about the minimum wage or organized labor. This finding suggests our results are not driven by reporting preferences in a small number of publications, but are broad trends across the majority of newspapers available.

Table A1: Newspaper Articles Mentioning Minimum Wages and Related Terms by State, January 1, 2011 - December 31, 2019

State	"minimum wage"	"org labor"	"min wage" AND "org labor"	AND "EPI"	AND "NELP"	AND "SEIU"
Alabama	2,128	1,143	128	34	32	18
Alaska	635	513	38	8	5	1
Arizona	3,653	1,273	131	14	26	25
Arkansas	1,530	357	53	10	14	6
California	19,893	21,446	1,991	250	185	574
Colorado	2,463	1,110	129	41	30	24
Connecticut	3,702	2,134	241	64	19	60
Delaware	1,235	506	100	25	26	24
District of Columbia	6,616	6,679	787	183	85	197
Florida	11,739	6,184	778	224	179	165
Georgia	1,612	791	86	19	13	14
Hawaii	1,419	966	71	16	13	9
Idaho	2,852	1,046	110	22	12	28
Illinois	12,486	9,559	1,061	248	126	220
Indiana	3,762	3,340	268	80	51	37
Iowa	8,288	4,183	590	141	53	123
Kansas	2,352	1,338	164	40	33	29
Kentucky	3,596	1,616	234	78	39	17
Louisiana	2,516	1,076	147	43	22	22
Maine	4,082	2,181	292	55	27	14
Maryland	3,829	2,270	268	115	41	42
Massachusetts	13,054	6,879	905	200	119	183
Michigan	6,792	7,235	416	69	39	103
Minnesota	4,138	2,175	272	48	39	64
Mississippi	1,352	725	70	26	17	8
Missouri	4,199	2,517	304	64	62	70
Montana	880	463	31	3	7	4
Nebraska	1,806	929	86	15	15	5
Nevada	841	708	74	26	18	17
New Hampshire	2,867	2,513	271	60	26	62
New Jersey	7,890	5,474	646	137	80	159
New Mexico	3,653	1,420	141	40	17	8
New York	24,647	14,889	1,838	361	299	347
North Carolina	6,505	2,664	261	88	36	41
North Dakota	1,116	745	93	24	21	7
Ohio	7,399	5,611	625	151	151	196
Oklahoma	1,046	592	47	17	3	3
Oregon	1,945	1,629	145	21	23	49
Pennsylvania	7,928	7,363	714	160	76	155
Rhode Island	2,545	2,405	234	49	26	60
South Carolina	2,579	1,441	150	39	34	24
South Dakota	437	216	51	13	17	7
Tennessee	2,584	2,036	160	52	22	23
Texas	5,728	3,351	379	94	55	83
Utah	1,408	1,001	78	37	13	6
Vermont	1,936	1,127	149	49	43	23
Virginia	4,735	2,728	279	73	33	68
Washington	6,813	4,180	529	88	49	158
West Virginia	2,091	1,833	176	53	24	35
Wisconsin	3,669	2,957	296	72	38	52
Wyoming	124	39	5	5	0	0
Total	233,095	157,556	17,092	3,844	2,433	3,669

Notes: Data on newspaper articles containing search terms come from LexisNexis. Searches were restricted to English news articles from newspapers located in the 50 US states and Washington DC. Articles were assigned to states using the publication location metadata provided by LexisNexis. Articles were assigned to all states included in the publication location data in cases where more than one state was included. Because of this, the totals indicated in this table are slightly larger than the number of newspapers articles on LexisNexis.

Table A2: Unique Newspapers Mentioning Minimum Wages and Related Terms by State, January 1, 2011 - December 31, 2019

State	"minimum wage"	"org labor"	"min wage"AND "org labor"	AND "EPI"	AND "NELP"	AND "SEIU"	Total Newspapers
Alabama	6	6	6	5	6	5	7
Alaska	3	3	3	1	2	1	4
Arizona	8	8	8	4	4	5	11
Arkansas	4	4	3	3	3	2	8
California	47	48	44	34	33	40	82
Colorado	8	8	7	6	5	6	9
Connecticut	4	4	3	3	3	3	5
Delaware	2	2	2	2	2	2	2
District of Columbia	12	12	11	11	8	8	35
Florida	32	31	28	25	20	24	52
Georgia	8	8	7	4	3	5	18
Hawaii	5	4	3	3	3	1	7
Idaho	7	7	7	6	2	3	7
Illinois	15	15	14	12	11	13	27
Indiana	9	9	9	8	7	6	18
Iowa	6	6	6	6	5	6	8
Kansas	6	6	5	5	4	2	8
Kentucky	5	5	4	4	4	4	7
Louisiana	11	10	9	8	5	5	17
Maine	7	7	5	5	5	3	7
Maryland	8	8	7	8	6	7	11
Massachusetts	15	15	14	14	10	13	20
Michigan	20	20	18	13	7	16	24
Minnesota	6	6	6	5	6	5	11
Mississippi	6	6	4	4	3	2	8
Missouri	5	5	5	5	5	5	10
Montana	5	5	5	2	2	2	6
Nebraska	3	3	3	2	2	2	4
Nevada	4	4	4	4	2	3	10
New Hampshire	4	4	4	3	4	3	5
New Jersey	18	17	17	15	12	15	24
New Mexico	12	13	12	10	5	5	13
New York	34	33	30	22	23	26	56
North Carolina	16	16	12	10	8	8	22
North Dakota	2	2	2	2	2	2	2
Ohio	26	26	24	16	20	20	39
Oklahoma	4	5	3	3	2	1	6
Oregon	7	6	6	4	4	5	12
Pennsylvania	25	25	24	19	14	17	33
Rhode Island	3	3	3	3	3	3	3
South Carolina	9	8	7	5	7	5	13
South Dakota	1	1	1	1	1	1	2
Tennessee	12	11	11	10	6	5	15
Texas	17	16	16	11	10	12	32
Utah	5	4	3	3	2	3	6
Vermont	6	5	6	5	5	5	5
Virginia	9	9	9	7	6	6	10
Washington	13	13	12	12	12	11	19
West Virginia	3	3	3	3	2	2	3
Wisconsin	18	18	17	15	9	14	21
Wyoming	2	2	1	1	0	0	3
Total Number of Newspapers	523	515	473	392	335	368	787

Notes: Data on newspapers publishing articles containing search terms come from LexisNexis. Searches were restricted to English news articles from newspapers located in the 50 US states and Washington DC. Newspapers were counted based on their unique publication name, and were assigned to states using the publication location metadata provided by LexisNexis. Newspapers were assigned to all states included in the publication location data in cases where more than one state was included.

Table B1: Relationship Between Minimum Wage Increases and Attitudes Toward Unions, Ages 21–40

	(1)	(2)	(3)	(4)
Dependent Variable	Approve of Unions 4-Category			
Effective Minimum Wage	0.0323**	0.0323**	0.0319**	0.0306*
	(0.0154)	(0.0151)	(0.0150)	(0.0160)
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Education Fixed Effects	No	Yes	Yes	Yes
Age Fixed Effects	No	No	Yes	Yes
Income Fixed Effects	No	No	No	Yes
Adjusted R-Squared	0.0154	0.0279	0.035	0.0401
Observations	2,241	2,241	2,241	2,241

Note: This table reports regression results examining the effect of minimum wage increases on attitudes toward unions. The coefficients are from estimates of equation (5), which is described in the main text. The sample is from Pew Political Attitudes Surveys in 2011, 2013, 2014, 2015, and 2018. The dependent variable is equal to 1 if an individual responded "very favorable," 0.75 if "favorable," 0.25 if "unfavorable," and 0 if "very unfavorable" to the question: "What is your overall opinion of labor unions?" The responses "Don't know," "Can't choose," and "Refused" were coded as missing. Column 1 reports results from our baseline specification, Column 2 includes education-level fixed effects, and Columns 3 and 4 include age and income group fixed effects. Variable definitions and sources are discussed in Appendix B (and in the main text). All specifications include year and state fixed effects. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B2: Relationship Between Minimum Wage Increases and Attitudes Toward Unions, Ages 18–97

	(1)	(2)	(3)	(4)
Dependent Variable	Approve of Unions 4-Category			
Effective Minimum Wage	0.0201***	0.0202***	0.0190***	0.0190***
	(0.0055)	(0.0055)	(0.0057)	(0.0056)
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Education Fixed Effects	No	Yes	Yes	Yes
Age Fixed Effects	No	No	Yes	Yes
Income Fixed Effects	No	No	No	Yes
Adjusted R-Squared	0.0142	0.0245	0.0318	0.0353
Observations	8,571	8,571	8,571	8,571

Note: This table reports regression results examining the effect of minimum wage increases on attitudes toward unions. The coefficients are from estimates of equation (5), which is described in the main text. The sample is from Pew Political Attitudes Surveys in 2011, 2013, 2014, 2015, and 2018. The dependent variable is equal to 1 if an individual responded "very favorable," 0.75 if "favorable," 0.25 if "unfavorable," and 0 if "very unfavorable" to the question: "What is your overall opinion of labor unions?" The responses "Don't know," "Can't choose," and "Refused" were coded as missing. Column 1 reports results from our baseline specification, Column 2 includes education-level fixed effects, and Columns 3 and 4 include age and income group fixed effects. Variable definitions and sources are discussed in Appendix B (and in the main text). All specifications include year and state fixed effects. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table B3: Relationship Between Minimum Wage Increases and Attitudes Toward Unions, Ages 18–64

	(1)	(2)	(3)	(4)
Dependent Variable	Approve of Unions Binary			
Effective Minimum Wage	0.0211*	0.0218*	0.0209*	0.0205*
	(0.0108)	(0.0114)	(0.0114)	(0.0116)
State Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Education Fixed Effects	No	Yes	Yes	Yes
Age Fixed Effects	No	No	Yes	Yes
Income Fixed Effects	No	No	No	Yes
Adjusted R-Squared	0.0106	0.0208	0.0303	0.0337
Observations	6,421	6,421	6,421	6,421

Note: This table reports regression results examining the effect of minimum wage increases on attitudes toward unions. The coefficients are from estimates of equation (5), which is described in the main text. The sample is respondents age 18–64 from Pew Political Attitudes Surveys in 2011, 2013, 2014, 2015, and 2018. The dependent variable is equal to 1 if an individual responded "very favorable" or "favorable" and equal to 0 if an individual responded "unfavorable" or "very unfavorable" to the question: "What is your overall opinion of labor unions?" The responses "Don't know," "Can't choose," and "Refused" were coded as missing. Column 1 reports results from our baseline specification, Column 2 includes education-level fixed effects, and Columns 3 and 4 include age and income group fixed effects. Variable definitions and sources are discussed in Appendix B (and in the main text). All specifications include year and state fixed effects. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix C. Robustness Analyses Involving State Politics and State Labor Law

Table C1: Relationship Between Minimum Wage Increases and Union Membership Controlling for Party Control of State Government, Ages 16-40

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Individual is a Union Member				
Effective Minimum Wage	0.0029***	0.0029***	0.0029***	0.0029***	0.0029***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
House Price Index/1,000	-0.0410*	-0.0418*	-0.0412*	-0.0411*	-0.0426*
	(0.0229)	(0.0229)	(0.0228)	(0.0227)	(0.0229)
Ln(Income per Capita)	0.0148	0.0143	0.0147	0.0145	0.0148
	(0.0206)	(0.0213)	(0.0206)	(0.0210)	(0.0213)
Democratic control of legislature		0.0013			0.0027
		(0.0023)			(0.0043)
Split control of legislature		0.0022			0.0031
		(0.0025)			(0.0028)
Democrat governor			0.0003		0.0015
			(0.0012)		(0.0032)
Democrat governor and legislature				0.0000	-0.0006
				(0.0011)	(0.0032)
Republican governor and legislature				-0.0003	0.0017
				(0.0018)	(0.0037)
Observations	1,094,351	1,094,351	1,094,351	1,094,351	1,094,351

Notes: This table reports regression results examining the effect of minimum wage increases on the probability of union membership. The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of all individuals ages 16 to 40. Column 1 reports results from our baseline specification, in table 3, column 4. Column 2 includes controls for whether Democrats had a majority in the state legislature and whether control was split between Democrats and Republicans. Column 3 includes controls for whether the state governor was Democratic. Column 4 controls for whether Democrats or Republicans control both the governorship and the state legislature, and column 5 includes all controls. Information on state government control comes from the National Conference of State Legislatures. All specifications include year-month, state, age and education fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table C2: Correlations Between Labor Market Policies and State Government Control

Main Variable	(1) Effective Minimum Wage	(2) Right to Work Law
Democrat control of legislature	0.535***	-0.633***
Split control of legislature	0.0460***	-0.184***
Democrat governor	0.395***	-0.604***
Democrat governor and legislature	0.506***	-0.551***
Republican governor and legislature	-0.438***	0.694***

Notes: This table reports correlations between the effective minimum wage in a given state (column 1) or whether a state has a right to work law (column 2), with whether the state legislature and/or governorship is controlled by Republicans or Democrats. Information on state government control comes from the National Conference of State Legislatures. Correlation coefficients are weighted by state population. *** p<0.01, ** p<0.05, * p<0.1

Table C3. Relationship Between State Labor Market Policies and Minimum Wage Variation

Dependent Variable	(1) Right to Work Law	(2) Prevailing Wage Law	(3) Mandatory Worker Comp	(4) WC Covered Share	(5) Antidiscrimination	(6) Employer Verification	(7) Paid Family Leave	(8) Non-competes Allowed
Effective Minimum Wage	–0.0239	0.0098	0.0076	0.0002	–0.0723*	–0.0236	0.0854	No
	(0.0262)	(0.0219)	(0.0078)	(0.0023)	(0.0407)	(0.0169)	(0.0589)	Variation
House Price Index/1,000	–0.7703*	0.3921	0.2607	0.0049	–0.3477	–0.0640	–1.1077	
	(0.4240)	(0.3547)	(0.2549)	(0.0144)	(0.6352)	(0.2480)	(0.7848)	
Ln(Income per Capita)	0.5459	–0.1366	–0.4605	–0.0236	0.8493	–0.4413	0.4984	
	(0.4086)	(0.3010)	(0.4363)	(0.0585)	(0.7490)	(0.4066)	(0.5528)	
Observations	860,742	860,742	734,984	614,876	493,114	860,742	613,616	860,742

Note: This table reports regression results examining the effect of minimum wage variation on the probability that states also have enacted other labor legislation. The coefficients are from estimates of equation (1), which is described in the main text. The sample is from the CPS ORG and consists of individuals age 16–40. Each column reports results from a regression with the indicated labor law as the dependent variable. Labor law data are from Sorens, Muedini, and Ruger (2008). Differences in sample sizes across columns reflect differences in the years and states for which labor law data were available. Column 1 reports results for state Right to Work laws. Column 2 reports results for whether a state has a prevailing wage law. Column 3 uses a law requiring that employers pay worker compensation. Column 4 uses the share of workers covered by unemployment insurance also covered by worker's compensation. Column 5 uses an indicator for whether a state has additional employer antidiscrimination laws. Column 6 uses an indicator for whether private employers are required to verify workers are legal residents. Column 7 uses an indicator for whether a state has a paid family leave policy, and Column 8 uses an indicator for whether states allow noncompete agreements for broad groups of workers. All specifications include year-month, state, age and education fixed effects. Standard errors are clustered at the state level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.