Do Higher Minimum Wages Decrease Union Membership in Minimum-Wage-Intensive Industries?

by

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Abstract

Over the past decade, organized labor has played a significant role in advocating for minimum wage increases. In this paper, we investigate the effects of minimum wage increases on union membership among individuals in minimum wage intensive industries. We find no evidence of a change in union membership among high-skilled workers in these industries. Consistent with a "free-riding" hypothesis, we find evidence that minimum wage increases predict declines in union membership among low-skilled workers in these industries. These workers are the minimum wage's most direct beneficiaries.

Keywords: Political economy, social choice, minimum wage, unionization
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Section I: Introduction

Over the past decade, labor unions have emerged as important advocates for historically high minimum wages. For example, since its inception in 2012, the U.S.-based "Fight for $15" movement has received substantial union support, ranging in intensity from simple expressions of solidarity to financial and organizational aid.[†] As shown in Figure 1, this has occurred against a backdrop of declining or low rates of private sector union membership including in minimum wage intensive industries (Panel A), and an active decade of state and local minimum wage policy making (Panel B).

On the one hand, this advocacy may appear puzzling because a higher minimum wage may be a substitute for a labor union's bargaining power. On the other hand, advocating for minimum-wage workers may increase those workers' interest in joining a union.

In this paper, we investigate and quantify the effect of minimum wage increases on union membership in minimum-wage-intensive industries. We consistently document the absence of a positive relationship between minimum wage increases and union membership for any group of workers employed in minimum-wage-intensive industries. In addition, we find evidence that minimum wage increases reduce union membership among the minimum wage's most direct beneficiaries. Consistent with a free-riding hypothesis of the sort put forth by Olson (1965), low-

[†] 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.) A realignment of labor unions in greater support of minimum wages has emerged in a number of industrialized economies, as observed by Ress and Spohr (2022) and described in far greater detail by Müller and Schulten (2020).

skilled workers in food service and retail appear to treat the minimum wage as a substitute for the services of unions.

These findings contribute to a literature in economics and industrial relations on the role and activities of labor unions (Freeman and Medoff, 1985). They also further our understanding of the economic effects of the minimum wage and connect to a broader literature on the interplay between interest groups, policy making, and the political process (Anzia, 2019). As an analysis of the effects of minimum wages on union membership, this paper joins two recent papers on the effects of the January 2015 introduction of Germany's minimum wage. Bellman *et al.* (2021) find that the minimum wage resulted in a non-trivial increase in the rate at which firms exit collective agreements, though a modest effect on overall participation in collective bargaining. Ress and Spohr (2022) find no effect of Germany's introduction of the minimum wage on membership among the minimum wage's direct financial beneficiaries.

Section II: Data and Empirical Methods

The dependent variable in our analysis is an indicator for an individual's union membership status, which is included in the Current Population Survey (CPS). Participants are asked about their union membership twice, as part of the expanded interviews known as the Outgoing Rotation Group (ORG).

Our analysis uses several additional pieces of information from the CPS. These include age and education, which are correlated with individuals' skills as well as their likelihood of union membership, and the industry in which individuals work. We analyze samples of individuals who work in the food-service and retail industries, both of which are minimum-wage

intensive industries. Union membership in these industries varies substantially across states, as shown in Appendix Figure A1. Our data on states' minimum wage rates come from Clemens, Hobbs, and Strain (2018), while the National Conference of State Legislatures is our primary source for key dates in the legislative process. In the U.S. context, the minimum wage applies to hourly wages. The applicable minimum wage is the higher of the federal, state, or local minimum wage associated with a given labor market area.

Finally, our analysis incorporates data on macroeconomic covariates that may be relevant as control variables. As in our contemporaneous analyses of the minimum wage's employment effects (*e.g.*, Clemens and Strain, 2021), we proxy for variations in housing market performance using a quarterly, statewide median house price index from the Federal Housing Finance Agency (FHFA). We proxy for aggregate economic performance using quarterly data on state income per capita from the Bureau of Economic Analysis (BEA). These covariates may be necessary because the strength of the recovery from the 2008 financial crisis and Great Recession varied considerably across states; a more robust economic expansion might independently spur membership in unions among workers seeking to ensure that they share in the macroeconomic gains. Specifically, income per capita is a standard macroeconomic control variable, and the house price index captures variation across states in a sector particularly important to the 2008 recession and subsequent recovery (Clemens and Strain, 2021).

Our initial regressions take the form of equation (1) below, which we estimate using Ordinary Least Squares regressions:

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

$U_{i,s,t}$ is an indicator for whether individual *i* residing in state *s* in month *t* reports being a member

of a union, and $MW_{s,t}$ is the effective minimum wage in state *s* in month *t*. All estimates of equation (1) include state and time fixed effects, making β_1 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.

Causal estimation of the effect of minimum wage increases on union membership faces nontrivial challenges. Overall economic activity 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.

One method for addressing these concerns is to estimate "standard" and "stacked" event study models. The standard event study model takes the form of equation (2) below, in which the $\beta_{p(s,t)}$ coefficients estimate the dynamic effect of minimum wage increases on union membership:

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

Specifically, the $\beta_{p(s,t)}$ coefficients trace out differential changes in union membership in states that enacted minimum wage changes relative to states that did not enact minimum wage changes. $Event\ Year_{0,}$ (i.e., the event year for which $p(s,t) = 0$) is defined as the 12 months leading up to the enactment of a state's first minimum wage during our sample period, and the dynamic

treatment effects are estimated relative to period $p(s,t) = -1$.[‡]

We also estimate stacked event study models, described by equation (3). The equation is estimated on a data set constructed through the following steps. First, we create separate, event-by-cohort-specific data sets for each policy cohort, by which we refer to the group of states that implemented their first minimum wage increase during a particular month. Each cohort-specific data set consists of the relevant policy cohort plus the set of control states that implemented no minimum wage changes across the duration of our sample. We then append (or "stack") these policy-cohort data sets on top of one another. As discussed, for example, by Baker, Larcker, and Wang (2022), the stacked event study is not prone to potential biases that can afflict the "standard" event study model when treatment events are staggered over time and treatment effects are heterogeneous.

$$U_{i,s,g,c,t,p(s,t)} = \sum_{g \neq 0} \sum_{p(s,t) \neq 0} \beta_{g,p(s,t)} Increased_s \times Event\ Year_{p(s,t)} + \alpha_{1s,c}\, State_{s,c} + \alpha_{2t}\, Time_t + X_{i,s,t}\, \gamma + \varepsilon_{i,s,t}. \quad (3)$$

Section III: Empirical Analysis

The estimates in columns 1 and 2 of Table 1 focus on individuals ages 16 to 21 who are employed in food-service and retail industries. These estimates suggest that young individuals in low-wage industries are less likely to belong to unions following minimum wage increases.

This sample consists of employed individuals who experience some of the largest wage

[‡] As shown in Clemens, Hobbs, and Strain (2018), the legislation underlying newly legislated increases was typically passed early in year 0 and introduced earlier still.

gains following minimum wage increases, as shown in Appendix Table A1 and A2. Our negative estimates are thus consistent with the "free riding" hypothesis where the legislated minimum wage acts as a substitute for the union's bargaining clout. For these young food-service and retail workers, minimum wage increases reduce the direct material benefit these individuals might obtain from joining a union. An interesting piece of context is that young workers may be inclined to free ride in part because their employment in food-service and retail jobs tends to be short-lived.

In columns 3 and 4, we report negative though more modest and statistically insignificant effects for food-service and retail workers ages 22 to 29. Among more experienced individuals in minimum-wage-intensive industries — in particular those ages 30 to 50 as analyzed in columns 5 through 8 — we find no evidence of changes in union membership. The full set of estimates in Table 1 are robust to the addition of controls for industry fixed effects (Appendix Table A3) as well as for the continuation of any state-level trends that predate the enactment of minimum wage legislation (Appendix Table A4).

We now turn to event study analyses. For food-service and retail workers below age 30, panels A and B of Figure 2 show a decline in union membership beginning over the 12 months immediately preceding the enactment of statutory minimum wage increases. For older food-service and retail workers (panels C and D), we find no effect. The results are similar whether the specifications incorporate demographic and macroeconomic covariates and whether we use the standard or stacked event study model. The event study coefficients for periods -2 and -3 in each of the four panels are centered around zero and statistically insignificant. We thus observe no evidence that the treatment and control groups in each sample were on divergent trends prior to the passage of recent minimum wage legislation. This finding increases our confidence that

the decline in union membership we document is being driven by those increases.

The changes we estimate among the lower-skilled individuals in food service and retail are substantial relative to the low baseline rates of union membership in these industries. The event study estimates, for example, which average around -0.005 in event-year 0 and thereafter, implies a decline of just under 20 percent relative to the sample mean of just under 3 percent for the individuals in this sample. The standard and stacked event studies each deliver very similar point estimates, and they do so whether the regressions include or exclude the macroeconomic covariates. The estimates for the lower-skilled individuals tend to be statistically distinguishable from 0 at the 95 percent confidence interval in the traditional estimator and at only the 90 percent confidence interval in the stacked estimator. In Table 1, the estimate for the very least skilled individuals is statistically distinguishable from 0 at the 99 percent level in the regression that includes the macroeconomic covariates and at the 90 percent level in the regression that does not. Overall, we thus interpret the evidence that minimum wage changes reduced union membership among the least skilled individuals in food-service and retail industries as being reasonably strong. We emphasize that the absence of evidence for an increase in union membership is uniform across specifications.

Section IV: Discussion and Conclusion

The most striking and consistent finding across our estimates is the absence of a positive relationship between minimum wage increases and union membership for any skill groups employed in minimum-wage-intensive industries. This finding is evidence against the most intuitive hypothesis to explain why unions advocate for minimum wage increases: that higher

minimum wages might increase union membership among the direct beneficiaries of higher wage floors. Moreover, our analysis finds that, following minimum wage increases, the direct beneficiaries of those increases become less likely to be members of labor unions. This suggests that minimum wage workers might “free-ride" by treating a legislated minimum wage as a substitute for a union’s bargaining clout.

Why, then, do labor unions so actively and publicly support minimum wage increases? A number of alternative hypotheses and mechanisms may be at work. In their analysis of the effects of Germany’s minimum wage on union membership, for example, Ress and Spohr (2022) note that successful campaigns to increase minimum wages could enhance unions’ prospects through multiple channels and, in doing so, may increase the non-financial motivations for joining a union. Ress and Spohr (2022) note that a union-supported minimum wage may elevate “awareness and appreciation of union achievements,” which may increase union membership by elevating a sense of solidarity. Similarly, successful advocacy for high minimum wages might enhance workers’ perceptions that a union’s future efforts will benefit them financially even if they did not benefit directly from the minimum wage itself.

A mechanism that has the potential to enhance both of these channels is the possibility that successful advocacy might shape both public opinion and the manner in which unions are discussed in the news. Further analyses of these hypotheses and mechanisms may be a fruitful direction for future research. Given the rich variation in bargaining institutions across countries (contrasting, for example, the decentralization of U.S. labor markets to approaches taken elsewhere), identifying variations in the empirical relevance of various mechanisms may be of particular interest.

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Tables and Figures

Table 1. Relationship Between Minimum Wage Increases and Union Membership Among Individuals Working in the Restaurant or Retail Industries, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16–21		Ages 22–29		Ages 30–50 & High School or Less		Ages 30–50 & Greater than High School	
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 Divided by 1000		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)
Dependent Variable Mean	0.0241	0.0241	0.0289	0.0289	0.0377	0.0377	0.0292	0.0292
Adjusted R-squared	0.0134	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

Notes: This table reports regression results examining the effect of minimum wage changes on the probability an individual reports being a union member. The samples are from the CPS ORG and consist of all 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 16–21, columns 3 and 4 include individuals ages 22–29, columns 5 and 6 include individuals ages 30–50 with a completed high school or less education, and columns 7 and 8 include individuals ages 30–50 with some education beyond high school. Data on state minimum wages come from the Department of Labor, the quarterly all transactions state house price index comes from the FHFA, and data on state quarterly income per capita comes from the BEA. 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

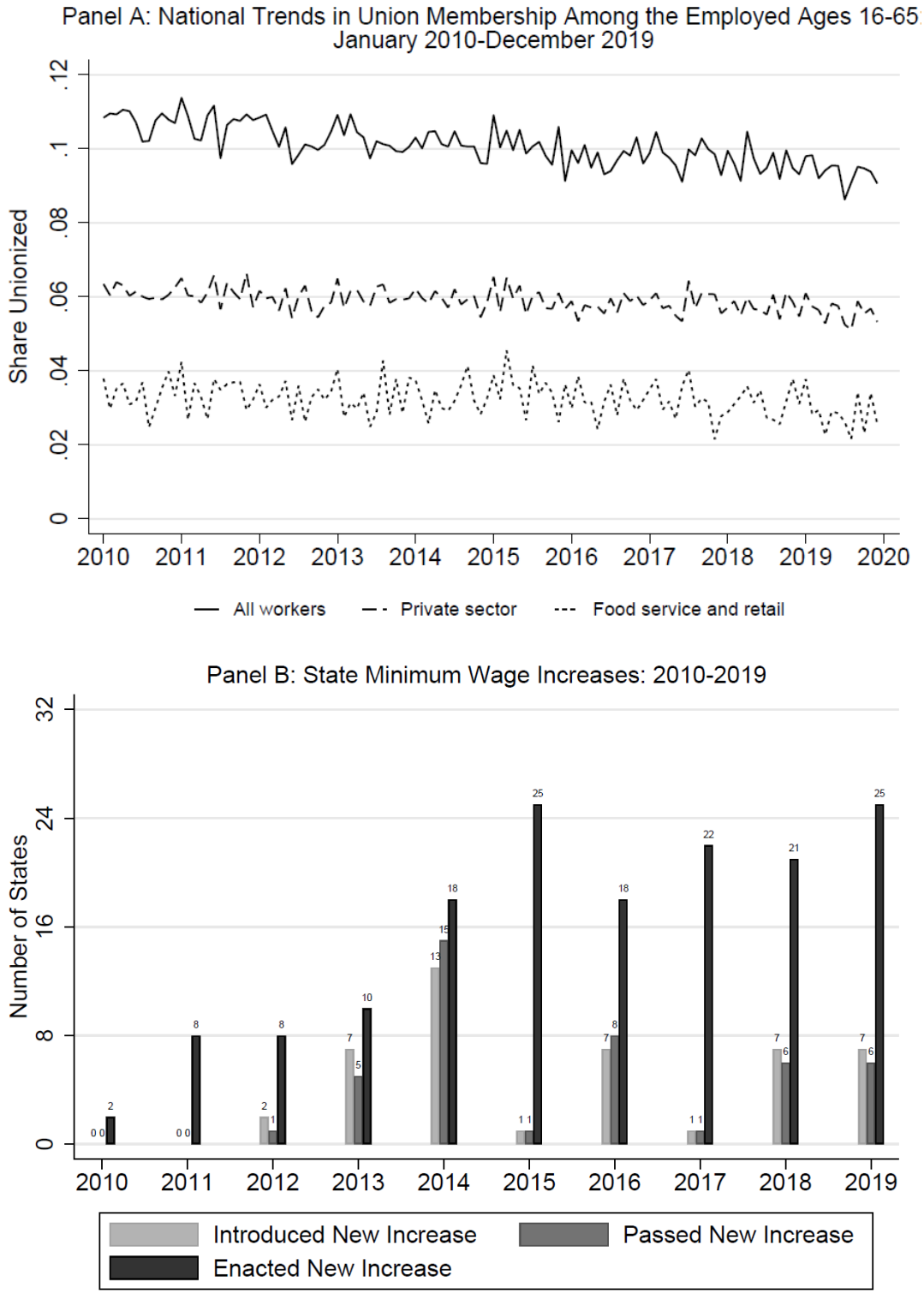

Figure 1. National Trends in Union Membership and Minimum Wage Policy. Panel A displays the share of employed workers in the CPS ORG ages 16-65 that are members of a labor union. The solid line plots the unionized share among all workers, the dashed line plots the unionized share among all private sector workers and the dotted line plots the unionized share among workers in the food-service or retail industries. Average shares are calculated using individual weights from the CPS ORG. Panel B 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.

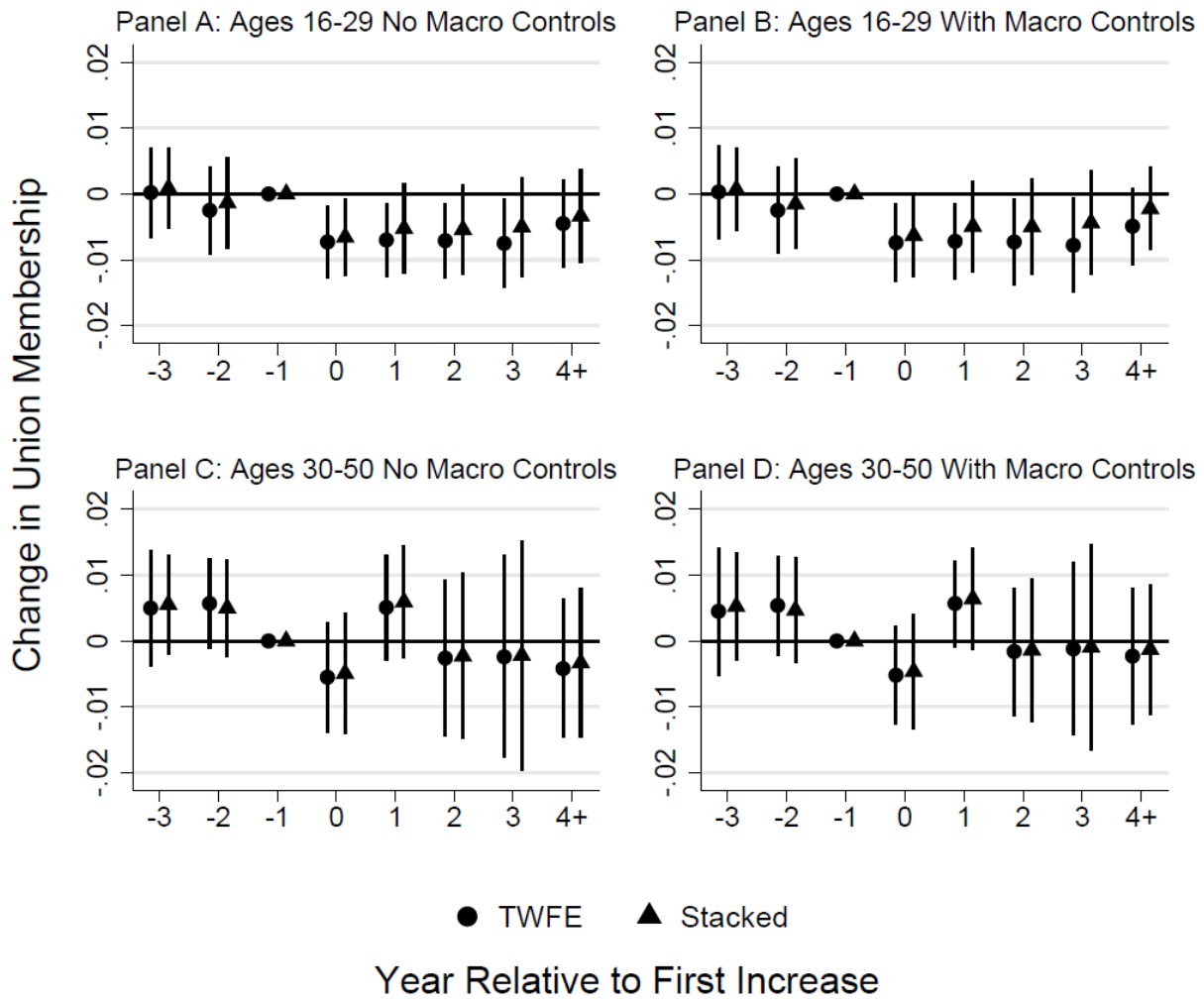

Figure 2. Standard Event Studies Estimated Using Two Way Fixed Effects and Stacked Event Studies of Minimum Wage Increases on Union Membership Among Workers Ages 16-29 and 30-50 in Food Service and Retail. Relative to Period -1. This figure plots coefficients and 95 percent confidence intervals from event study regressions of union membership on state minimum wage increases using the model described in equation (2). The sample for all panels consists of CPS ORG respondents working in the food-service or retail industries. The macroeconomic controls included in Panels B and D include quarterly, state-level controls for a housing price index and personal income per capita. Standard errors are clustered at the state level.

Appendix Tables and Figures

Table A1. Relationship Between Minimum Wage Increases and Hourly Wages Among Individuals Working in the Restaurant or Retail Industries, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16–21		Ages 22–29		Ages 30–50 & High School or Less		Ages 30–50 & Greater than High School	
Effective Minimum Wage	0.3379***	0.3076***	0.1579***	0.1721***	0.0793	0.0452	0.0001	-0.1211**
	(0.0308)	(0.0358)	(0.0405)	(0.0634)	(0.0547)	(0.0849)	(0.0546)	(0.0581)
House Price Index Divided by 1000		0.4789		-1.5456		2.0496*		4.3291***
		(0.9022)		(1.6794)		(1.1375)		(1.6061)
Ln(Income per Capita)		0.9052		1.5899		-1.2783		-0.2123
		(1.0761)		(1.7285)		(2.0854)		(2.1817)
Dependent Variable Mean ($/hr)	9.3235	9.3235	12.1744	12.1744	14.1021	14.1021	17.4807	17.4807
Adjusted R-squared	0.1395	0.1396	0.1696	0.1696	0.0721	0.0721	0.1218	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 hourly wages. The samples are from the CPS ORG and consist of all 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 16–21, columns 3 and 4 include individuals ages 22–29, columns 5 and 6 include individuals ages 30–50 with a completed high school or less education, and columns 7 and 8 include individuals ages 30–50 with some education beyond high school. Hourly wages are top-coded at $25. Data on state minimum wages come from the Department of Labor, the quarterly all transactions state house price index comes from the FHFA, and data on state quarterly income per capita comes from the BEA. 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 A2. Relationship Between Minimum Wage Increases and Hourly Wages Among Individuals With Non-Imputed Wages Working in the Restaurant or Retail Industries, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16–21		Ages 22–29		Ages 30–50 & High School or Less		Ages 30–50 & Greater than High School	
Effective Minimum Wage	0.5434***	0.5287***	0.2915***	0.2675***	0.2271***	0.1610*	0.0719	-0.0712
	(0.0245)	(0.0438)	(0.0557)	(0.0659)	(0.0543)	(0.0863)	(0.0550)	(0.0751)
House Price Index Divided by 1000		-0.2459		-2.1837		1.8672		4.0907**
		(1.0540)		(1.9362)		(1.7790)		(2.0120)
Ln(Income per Capita)		1.1505		4.4950**		0.4519		1.0376
		(0.6950)		(2.2067)		(1.8394)		(2.7386)
Dependent Variable Mean ($/hr)	8.9781	8.9781	11.4391	11.4391	12.5734	12.5734	16.1431	16.1431
Adjusted R-squared	0.2155	0.2155	0.1947	0.1948	0.0973	0.0974	0.1346	0.1348
Observations	33,312	33,312	36,588	36,588	27,259	27,259	30,263	30,263

Notes: This table reports regression results examining the effect of minimum wage changes on hourly wages. The samples are from the CPS ORG and consist of all individuals who do not have imputed wage rates 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 16–21, columns 3 and 4 include individuals ages 22–29, columns 5 and 6 include individuals ages 30–50 with a completed high school or less education, and columns 7 and 8 include individuals ages 30–50 with some education beyond high school. Hourly wages are top-coded at $25. Data on state minimum wages come from the Department of Labor, the quarterly all transactions state house price index comes from the FHFA, and data on state quarterly income per capita comes from the BEA. 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 A3. Relationship Between Minimum Wage Increases and Union Membership Among Individuals Working in the Restaurant or Retail Industries Including 2-digit Industry Fixed Effects, 2011-2019

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16–21		Ages 22–29		Ages 30–50 & High School or Less		Ages 30–50 & Greater than High School	
Effective Minimum Wage	-0.0025*	-0.0043***	-0.0006	-0.0006	0.0006	0.0005	-0.0005	0.0027
	(0.0013)	(0.0015)	(0.0017)	(0.0015)	(0.0015)	(0.0018)	(0.0022)	(0.0017)
House Price Index Divided by 1000		0.0893*		-0.0346		0.0316		-0.0906
		(0.0530)		(0.0407)		(0.0494)		(0.0670)
Ln(Income per Capita)		-0.0336		0.0506		-0.0419		-0.0326
		(0.0465)		(0.0483)		(0.0509)		(0.0511)
Dependent Variable Mean	0.0241	0.0241	0.0289	0.0289	0.0377	0.0377	0.0292	0.0292
Adjusted R-squared	0.0619	0.0620	0.0521	0.0521	0.0634	0.0634	0.0498	0.0500
Observations	49,598	49,598	59,056	59,056	47,310	47,310	53,818	53,818

Notes: This table reports regression results examining the effect of minimum wage changes on the probability an individual reports being a union member. The samples are from the CPS ORG and consist of all 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 16–21, columns 3 and 4 include individuals ages 22–29, columns 5 and 6 include individuals ages 30–50 with a completed high school or less education, and columns 7 and 8 include individuals ages 30–50 with some education beyond high school. Data on state minimum wages come from the Department of Labor, the quarterly all transactions state house price index comes from the FHFA, and data on state quarterly income per capita comes from the BEA. All specifications include month, year, month–year, state, age, education, and 2-digit industry fixed effects. Standard errors are clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1

Table A4. Relationship Between Minimum Wage Increases and Union Membership Among Individuals Working in the Restaurant or Retail Industries, 2011-2019 Two Stage Regression No Demographic Controls in First Stage State-Time Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	Ages 16–21		Ages 22–29		Ages 30–50 & High School or Less		Ages 30–50 & Greater than High School	
Effective Minimum Wage	-0.0022*	-0.0040***	-0.0009	-0.0001	0.0006	0.0007	-0.0012	0.0025
	(0.0012)	(0.0015)	(0.0014)	(0.0015)	(0.0015)	(0.0018)	(0.0023)	(0.0018)
House Price Index Divided by 1000		0.0709		-0.0576		0.0331		-0.0791
		(0.0442)		(0.0349)		(0.0560)		(0.0700)
Ln(Income per Capita)		-0.0140		0.0437		-0.0526		-0.0580
		(0.0414)		(0.0443)		(0.0552)		(0.0565)
Dependent Variable Mean	0.0241	0.0241	0.0289	0.0289	0.0377	0.0377	0.0292	0.0292
Adjusted R-squared	0.0135	0.0135	0.0137	0.0137	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

Notes: This table reports regression results examining the effect of minimum wage changes on the probability an individual reports being a union member. The samples are from the CPS ORG and consist of all 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 16–21, columns 3 and 4 include individuals ages 22–29, columns 5 and 6 include individuals ages 30–50 with a completed high school or less education, and columns 7 and 8 include individuals ages 30–50 with some education beyond high school.. The regressions in this table control for the continuation of any pre-treatment, state-specific trends through a two-stage procedure. On a data set restricted to pre-treatment observations, we first regress the union indicator on a set of state dummies and state dummies interacted with a continuous time variable. Based on this initial regression, we generate predicted values that can be described as projecting forward the state-specific trends that were estimated using pre-treatment data, We then add the predicted value from this "first-stage" regression as a control to our main regression specification. Data on state minimum wages come from the Department of Labor, the quarterly all transactions state house price index comes from the FHFA, and data on state quarterly income per capita comes from the BEA. 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

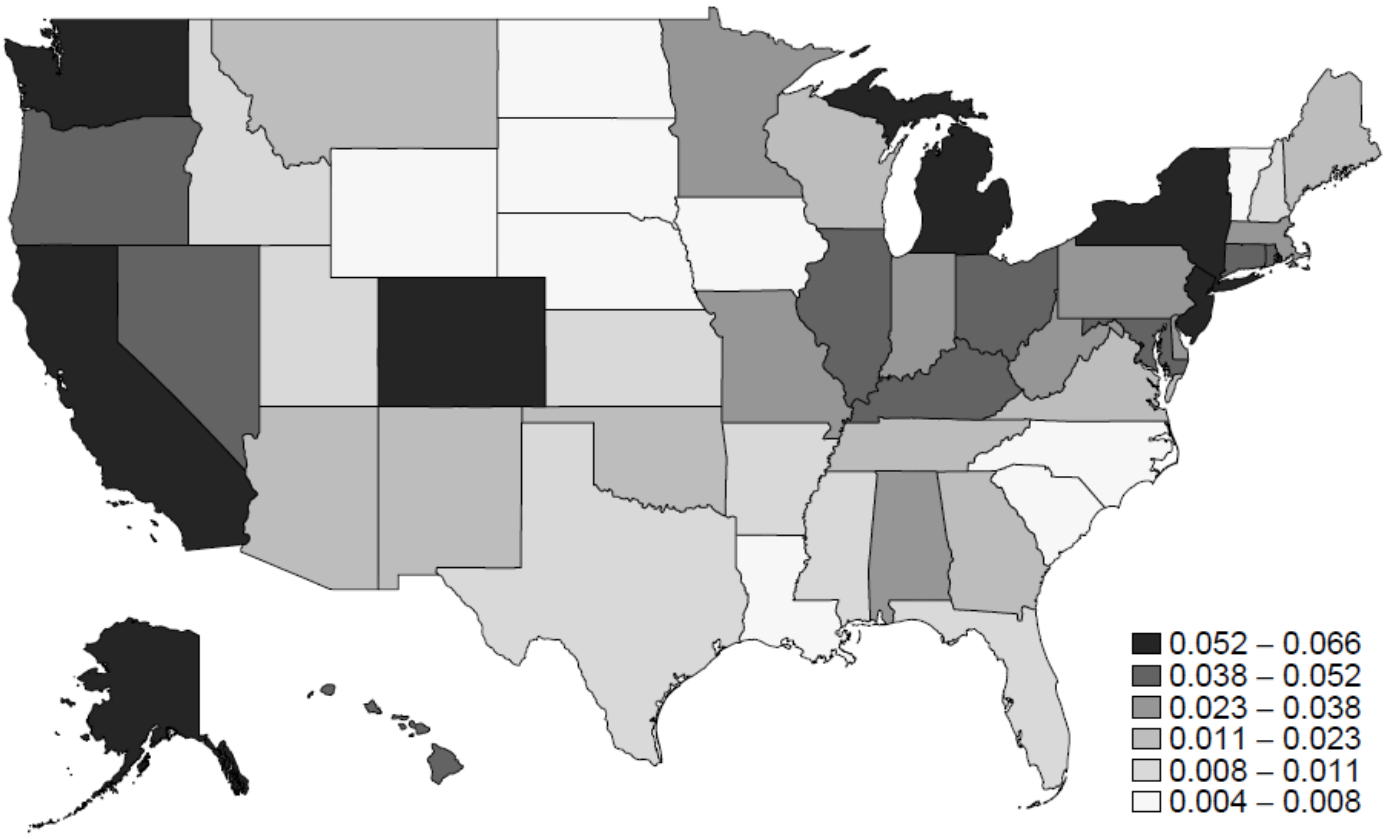

Figure A1. Average Union Membership Shares from 2010-2019 Among Workers Employed in Food-service and Retail Industries by State. This figure displays the average share of workers ages 16-65 employed in food-service and retail industries that are union members by state from 2010-2019 from the CPS ORG. The membership shares range from 0.41 percent in South Dakota to 6.60 percent in Washington DC. Average shares are calculated using individual weights from the CPS ORG.