

VanHeuvelen, Tom; Brady, David

Article — Published Version

Labor Unions and American Poverty

ILR Review

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WZB Berlin Social Science Center

Suggested Citation: VanHeuvelen, Tom; Brady, David (2022) : Labor Unions and American Poverty, ILR Review, ISSN 2162-271X, Sage, Thousand Oaks, CA, Vol. 75, Iss. 4, pp. 891-917, <https://doi.org/10.1177/00197939211014855>

This Version is available at:

<https://hdl.handle.net/10419/240906>

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LABOR UNIONS AND AMERICAN POVERTY

TOM VANHEUVELEN AND DAVID BRADY*

American poverty research largely neglects labor unions. The authors use individual-level panel data, incorporate both household union membership and state-level union density, and analyze both working poverty and working-aged poverty (among households led by 18- to 64-year-olds). They estimate three-way fixed effects (person, year, and state) and fixed-effects individual slopes models on the Panel Study of Income Dynamics (PSID), 1976–2015. They exploit the higher quality income data in the Cross-National Equivalent File—an extension of the PSID—to measure relative (<50% of median in current year) and anchored (<50% of median in 1976) poverty. Both union membership and state union density have statistically and substantively significant negative relationships with relative and anchored working and working-aged poverty. Household union membership and state union density significantly negatively interact, augmenting the poverty-reducing effects of each. Higher state union density spills over to reduce poverty among non-union households, and there is no evidence that higher state union density worsens poverty for non-union households or undermines employment.

By and large, American poverty research neglects labor unions. Prominent public intellectual books on poverty fail to discuss unions (e.g., Wilson 1996). High-profile edited volumes on poverty (e.g., Jencks and Peterson 1991; Danziger and Haveman 2001) and O'Connor's (2001) influential history of American poverty scholarship do not mention unions. Other prominent volumes contain only token mentions (e.g., Cancian and Danziger 2009). For instance, Blank, Danziger, and Schoeni (2006: 374) mention unions only in regards to unemployment insurance. To the best of our knowledge, there have been no studies of how unions influence

*TOM VANHEUVELEN ( <https://orcid.org/0000-0002-7504-8186>) is an Assistant Professor at the University of Minnesota. DAVID BRADY is a Professor in the School of Public Policy at the University of California, Riverside, and is a Fellow at the WZB Berlin Social Science Center.

For helpful comments, we thank Michaela Curran, Matthew Mahutga, UCR's Political Economy Working Paper Group, and the faculty and students at University of Illinois School of Labor and Employment Relations. Data and replication files are available through the OpenICPSR PSID Repository (workspace number: openicpsr-137301). The authors are listed reverse alphabetically, each contributed equally. An Online Appendix is available at <http://journals.sagepub.com/doi/suppl/10.1177/00197939211014855>. For additional information, please address correspondence to tvanheuv@umn.edu or dbrady@ucr.edu.

KEYWORDS: unionization, poverty, labor union, longitudinal, working poverty

American poverty in *Journal of Labor Economics*, *Journal of Human Resources*, *Industrial and Labor Relations Review*, *Industrial Relations*, or the “top five” Economics journals. Most *Annual Review* essays on American poverty in anthropology (Morgen and Maskovsky 2003) and sociology (Small and Newman 2001; Desmond and Western 2018) have zero mentions of unions.¹

The neglect of labor unions in American poverty research is surprising, perhaps, because extensive literatures demonstrate the critical role they play for outcomes closely related to poverty, such as wages, working conditions, and equality. Scholars have long studied how labor unions are a key power resource that provides workers influence in the workplace, mobilizes voters, and allies with Leftist political parties to institutionalize egalitarianism (Korpi 1983; Huber and Stephens 2001). Indeed, a few recent studies provide evidence that unionization is associated with lower poverty (Plasman and Rycx 2001; Zuberi 2006; Lohmann 2009; Brady, Baker, and Finnigan 2013; Crettaz 2013; Rosenfeld and Laird 2016; Lohmann and Marx 2018). Still, a striking disconnect remains between the American poverty literature and research investigating union effects.

The present study explicitly builds on the few recent and relevant studies while addressing their limitations. To the best of our knowledge, this is the first study on unions and poverty to use individual-level panel data. Unlike prior research, we examine both household union membership and state-level union density (henceforth “state union density”), and both working poverty and working-aged poverty (among households led by 18- to 64-year-olds). With the Panel Study of Income Dynamics (PSID) for 1976–2015, we estimate three-way fixed effects (person, year, and state) and fixed-effects individual slopes models (Wooldridge 2010). We exploit the Cross-National Equivalent File’s—an extension of the PSID—higher quality income data to measure relative (<50% of median in current year) and anchored (<50% of median in 1976, adjusted for inflation) working and working-aged poverty. We investigate three primary research questions: 1) Does household union membership influence working and working-aged poverty? 2) Net of household union membership, does state union density influence working and working-aged poverty? 3) By testing the interaction between union membership and state union density, do the effects augment each other and do the benefits of state union density spill over to non-union households?

The Case for Labor Unions

At the household and state levels as well as through their interactions, it is plausible that unions reduce poverty. Extensive literatures link union

¹No essay on poverty in the United States has appeared in the *Annual Review of Economics*, and we are not aware of any piece in the *Journal of Economic Literature* on unions and poverty. On balance, Lichter (1997), Newman and Massengill (2006), and O’Connor (2000) have a few brief mentions of unionization. But, none of these devote substantial attention to unionization as a principal cause of poverty. Brady (2019) is the exception and identifies unions as a key measure of power resources.

membership to higher wages and greater equality (Kalleberg, Wallace, and Althaus 1981; Freeman and Medoff 1984; Card 1996; Rosenfeld and Kleykamp 2012; Rosenfeld 2014; Rosenfeld, Denice, and Laird 2016; Kristal and Cohen 2017). Many studies have demonstrated that union members receive a wage premium compared to nearly identical non-members. Union wage premia even exist for less-skilled workers (Eren 2009), those without a high school education (Maxwell 2007), and those in precarious employment (Gomez and Lamb 2019). Union membership benefits also exist for a wide variety of low-wage workers (Waddoups 2001; Appelbaum, Berg, Frost, and Preuss 2003; Batt, Hunter, and Wilk 2003; Erickcek, Houseman, and Kalleberg 2003; Firpo, Fortin, and Lemieux 2009). Because wages are the dominant source of income for most working-aged households, union wage premia suggest household union membership will reduce poverty.²

Regarding state union density, evidence suggests a contextual effect of firm- and industry-level unionization on poverty. Many studies have shown that highly unionized contexts benefit both union members and non-members (Kahn and Curme 1987; Leicht, Wallace, and Grant 1993; Neumark and Wachter 1995; VanHeuvelen 2018). Such contextual effects are attributable to a combination of threat and moral economy processes, resulting in spillover effects onto non-union workers within a firm and industry and into nearby non-union firms and industries.

Beyond the firm and industry, country-level union density similarly reduces poverty. Power resources theory describes unions as key class-based collective political actors shaping the distribution of economic resources (Korpi 1983; Huber and Stephens 2001; Brady 2019). Unions bond the working class and poor together, politically mobilize workers in elections, exert pressure in workplaces and on governments, and ultimately result in a more egalitarian income distribution. Accordingly, studies have demonstrated that countries with higher unionization have significantly lower working poverty (Zuberi 2006; Lohmann 2009; Crettaz 2013; Rosenfeld and Laird 2016; Lohmann and Marx 2018). Although largely neglected by American poverty research, this comparative literature shows that labor unions are a key collective political actor driving lower poverty across rich democracies (Plasman and Rycx 2001).

Similar to comparative analyses of rich democracies, US states can be compared as polities where struggles and settlements occur over redistribution and inequality (Jacobs and Dirlam 2016; Bucci 2018). Indeed, in an era of decentralized federalism, state polities could be increasingly important in shaping poverty (DiGrazia and Dixon 2019; Hertel-Fernandez 2019). Consistent with this account, Rosenfeld and Laird (2016) provided descriptive correlations showing that states with higher density have lower working and overall poverty. Brady and colleagues (2013) examined the relationship between state union density and working poverty from 1991 to 2010. Using

²In our PSID sample, 89% of “pre-fisc” total household income comes from labor income.

multilevel models of individuals nested in states in 2010 and two-way fixed-effects models of individuals nested in state-years (1991–2010), they found that state union density reduces working poverty. They also found that state union density has larger effects than states' economic performance and social policies, with effects comparable to standard individual-level predictors of working poverty such as education and single motherhood.

Beyond the distinct effects of household union membership and state union density, these two aspects should interact to augment the poverty-reducing effects of each. Unions are a key component of a broader and integrated complex of labor market institutions that govern and equalize wages, constrain employers from paying very low wages, and protect workers' job security and physical safety (Blau and Kahn 2002; Koeniger, Leonardi, and Nunziata 2007; Doellgast, Holtgrewe, and Deery 2009; Gautié and Schmidt 2009; Giesselmann 2014; Bucci 2018). In the United States, which lacks centralized wage bargaining and corporatist governance, unions are one of the few and most crucial labor market institutions (Rosenfeld 2014; Jacobs and Dirlam 2016; Bucci 2018). To the extent that unions are an essential part of a broader institutional complex shaping equality, the presence of both household union membership and state union density should provide a particularly favorable situation for working families. Moreover, as state union density reflects and amplifies an egalitarian institutional context, it should spill over to reduce the poverty of non-union and non-working households.

The Case for Skepticism

Despite the arguments above, at least four reasons suggest why unions might fail to reduce poverty. First, union density is so low that unions may have become ineffective, even irrelevant (DiGrazia and Dixon 2019; Hertel-Fernandez 2019). As Rosenfeld (2014: 30) explained, "The private sector in this country is now nearly union-free, to a degree not seen in a century." The United States—and especially some states—exhibits cross-nationally and historically exceptionally low union density (Rosenfeld 2014). Union density has declined more rapidly among the less skilled, who are most vulnerable to poverty (Blank 2009). For such reasons, Autor (2011: 14) argued: "It appears unlikely their [unions'] role is paramount. . . . [Unions'] impact is largely confined to manufacturing and public sector employment, neither of which comprises a sufficiently large share of the aggregate economy." Low union density also results in less variation across states than exists across rich democracies (Hirsch and Macpherson 2003; Visser 2011). In turn, there could be insufficient interstate heterogeneity in union density to explain variation in poverty. Moreover, low and relatively invariant state union density suggests that, although unions could theoretically affect US poverty, other factors, such as economic performance and individual characteristics, are likely to have far greater influence (Blank et al. 2006;

Autor 2011). In total, analyses of recent data might reveal little to no relationship between labor unions and poverty.

Second, large underlying differences exist between those selecting into unions and those not selecting into unions. Selection likely reflects unobserved advantageous characteristics of union members, such as ambition and social skills (Card, Lemieux, and Riddell 2004; Borjas 2015; VanHeuvelen 2018). Such unobserved characteristics are likely associated with poverty for reasons independent of union membership. This unobserved heterogeneity and related selection bias are plausibly even more notable among the less skilled and those below or near the poverty line. Previous studies on unions and poverty have relied on cross-sectional data (e.g., Lohmann 2009; Brady et al. 2013), however. Therefore, panel data with techniques to net out unobserved individual characteristics might reveal no robust union effect.

Third, even if unions benefit union households, there might be no beneficial spillover effects for non-union households. Many studies argue that unions only benefit workers in select industries or sectors where unions are strong (Autor 2011). Those at the bottom of the income distribution are unlikely to be unionized and may not benefit from state spillover effects. While Brady and colleagues (2013) showed state union density reduces household-level working poverty, they mostly could not control for household union membership and therefore could not establish such spillover effects for non-union households.³ Rather than a contextual spillover effect, it is unclear if poverty-reducing effects of state union density are simply due to compositional differences across states. Further, Brady and colleagues (2013) found that the effects of state union density are much stronger for working households closer to the median and insignificant for those in deep poverty. Therefore, any benefits of unions may be narrowly restricted to employed and less-poor union households. To accurately assess potential spillover effects for non-union households, panel data with both household and state union information, for working and non-working households, is needed.

Fourth, unions could even have adverse spillover effects, thereby worsening poverty of non-members and disadvantaged groups. Directly, unions and the policies they advocate for might only create rents for protected insiders, and may even worsen the labor market for the truly disadvantaged (for a discussion, see Rosenfeld and Kleykamp 2012). Some researchers theorize that unions have a crowding effect, in which union wage gains lead to cuts in the quantity of union jobs (Kahn 1978; Neumark and Wachter 1995). Crowding then increases the supply of non-member workers, depressing wages of non-members. While Brady and colleagues (2013)

³They use Luxembourg Income Study (LIS) data from the March Current Population Survey (CPS), but the LIS removes union membership data. Although Brady and colleagues (2013) conducted sensitivity analyses with the underlying CPS data from the smaller outgoing rotation group including union information, they can only approximate the higher quality LIS income measures.

analyzed working households only, a comprehensive test for direct adverse spillover effects must include non-working households.

Indirectly, by raising wages among the employed, unions could increase labor costs, cause labor market rigidity, and discourage hiring (Blau and Kahn 2002; Magnani and Prentice 2010). Similar to well-known arguments about adverse effects of minimum wages, higher wages and labor costs could force firms to reduce employment (Kahn and Morimune 1977; Walsworth 2010). Such reduced employment would worsen poverty because employment is the most salient individual-level predictor of poverty (Rainwater and Smeeding 2004; Brady, Finnigan, and Hübgen 2017; Brady 2019). Therefore, it is essential to include non-working households in the sample and to test for state union density effects on employment as well.

To recapitulate, previous research on unions suggests that the beneficial impacts on workers in the middle and bottom of the distribution should also apply for poverty. Direct mechanisms of union household residence and contextual effects of state union density might each have distinct negative associations with poverty, and these effects might even interact. However, there are several reasons to remain skeptical. Any poverty differences may be attributable to variation in observed or unobserved characteristics across individuals or across states. Meanwhile, restricting focus to employed workers might miss negative spillover effects in which individuals are crowded out of gainful employment.

Data and Methods

We use individual-level data from the PSID and the Cross-National Equivalent File (CNEF), which we merge with state-level data (described below). This data set has critical advantages over the LIS-CPS data used by Brady and colleagues (2013). Primarily, the CPS is cross-sectional,⁴ meaning they could not control for the unobserved characteristics that select individuals into unions. Furthermore, they only examined from 1990 to 2010. By contrast, our study using the PSID spans a longer and more varying time period.

The CNEF, which is a supplement to the PSID, provides higher quality standardized measures of income incorporating taxes, tax credits, and transfers (Frick et al. 2007). The PSID is the longest-running panel survey in the United States, with the initial survey wave administered in 1968. With weights, the economic characteristics of the PSID—including wages and inequality, and all but the most extreme high and low family incomes—are similar to the data used to construct official poverty statistics, the CPS (Gouskova and Schoeni 2007; Heathcote, Perri, and Violante 2010; VanHeuvelen 2018).

⁴Although the CPS outgoing rotation group can be treated as longitudinal, respondents are in the panel for only one year, an insufficient time span for our purposes.

We use the PSID-CNEF waves 1976 and 1979 to 2015 because 1976 and 1979 were the first PSID waves with information on spouse's union membership. The analyses end with 2015 as it is the final year of available CNEF data, which we need for the income measures. Our data use three PSID samples: the Survey Research Center, the Survey of Economic Opportunity, and the 1997 Immigrant samples. We drop the 1990 Latino sample (VanHeuvelen 2018).

Individuals, the unit of analysis, are nested in households, which are nested in states and years. We construct two samples corresponding to working households and working-aged households: 1) individuals in households with at least one employed working-aged adult (18–64 years) and 2) individuals in households with a working-aged adult household head. We include the 50 US states and the District of Columbia, which is treated as a state.

Dependent Variable

Following the overwhelming majority of international poverty research (Rainwater and Smeeding 2004; Brady et al. 2013; Smeeding 2016; Brady et al. 2017), we operationalize *poverty* as those residing in households with less than 50% of the median equivalized disposable household income (reference = not poor). Thus, poverty is a household-level variable. A household pools its expenses and resources, so if the household is poor, all members are poor. We measure household income with the CNEF household “post-fisc” income variable. Unlike the official US poverty measure (OPM), our measure of income comprehensively incorporates taxes and tax credits (e.g., the Earned Income Tax Credit) and cash and near-cash (e.g., the Supplemental Nutritional Assistance Program) transfers.⁵ Thus, we intentionally avoid the OPM because of its well-documented and serious validity and reliability problems (Rainwater and Smeeding 2004; Brady et al. 2013; Smeeding 2016). Following prevailing international standards on income measurement (Duncan and Petersen 2001; Rainwater and Smeeding 2004; Brady et al. 2013; Brady et al. 2017), we equalize income for household size by dividing by the square root of household members. The poverty threshold is calculated yearly using all individuals regardless of the household head's age or the employment status of any household member. The sample is reduced to employed or working-aged households only after calculating the threshold.

Using the current year's median, we analyze this standard *relative poverty* measure described above. This measure is the most widely accepted definition in the international poverty literature. We supplement that measure with *anchored poverty*. Anchored poverty sets the threshold for poverty in the first year of analysis (1976) and uses that threshold across years, adjusting

⁵The CNEF employs the National Bureau of Economic Research's TAXSIM model.

only for inflation (Chen and Corak 2008; Brady et al. 2013; Smeeding 2016). Anchored poverty is a well-established approximation of “absolute” poverty as it applies the same threshold over time, even when medians rise and fall. Whereas relative poverty is less responsive to the business cycle and economic development, anchored poverty should mechanically decline as the typical household experiences rising affluence since 1976.

Household and State Union Measures

We measure labor unions at the household and state levels. First, *union household membership* is a binary measure of living in a union household or not, where either or both the household head and spouse are union members.⁶ Second, we measure *state-level union density* among non-agricultural workers age 16 and older, collected from the CPS by Hirsch and Macpherson (2003).⁷ Union membership for household heads is available from 1970 onward; however, spouses were asked about union membership only in 1976 and from 1979 onward. Fortunately, union membership in the PSID tracks closely to union membership in the CPS (VanHeuvelen 2018). Online Appendix Figure A.1 displays the variation in state union density over time.

Other Independent Variables

We adjust for a standard set of variables that may confound the association between unions and poverty (Rainwater and Smeeding 2004; Blank et al. 2006; Lohmann 2009; Brady et al. 2013; Brady et al. 2017). We include two sets of controls, based on our samples of working households and working-aged households. For working households, we identify the household lead earner, defined as the highest earner, with ties broken by age (i.e., not necessarily the head). Household age distribution includes lead’s *age* (under 25, 25–34, 35–54, and 55 or older), the *number of household members under 18*, the *number of household members over 64*, and a binary measure of whether the household contains a *child under age 5*. With a couple as the reference, we include binary measures for *single mother*, *single father*, *female-head no child*, and *male-head no child* households. With *white* as the reference, we include indicators for *Black* and *other* lead earners.⁸ With less than high school degree as the reference, we include binary measures for whether the lead

⁶Union information for other household members is not available. Heads and spouses make up more than 90% of employed individuals in our sample. Although our measure probably slightly underestimates union households, we are skeptical that our main results are significantly biased by this limitation.

⁷An alternative measure, state union coverage, produces similar results. This outcome is expected because of the similar levels and trends of membership and coverage over this period.

⁸While race and education are usually time-invariant among employed adults, lead earners can vary across surveys, and individuals can transition across households. Thus, race and education as household properties have some time variation for individuals. For the working-aged sample, heads also vary over time.

earner has a *high school degree, some college, college degree, and graduate education*. Following VanHeuvelen's (2018) harmonization of Census industry codes in the PSID, we include dummies for 18 industries of the lead earner. Further, we include indicators for 13 occupations of the lead earner.

For working-aged households, we assign household characteristics based on the head rather than the lead earner because approximately 8% of sample households have no one employed. This approach applies to age, race, and education. We omit the industry and occupation indicators and instead include indicators of whether *no one is employed* in the household and *multiple earners* in the household (reference = one earner) (Brady et al. 2017). The working-aged poverty models retain the controls for age distribution and family structure.

For both samples, we adjust for several state characteristics: 1) *GDP per capita, in thousands of real 2000 dollars*, 2) *employment rate of the population*, 3) *GDP growth*, and 4) the *natural log of population*. Data are collected from the US Bureau of Economic Analysis (2020). Descriptive statistics are included in Online Appendix Tables A.1 and A.2.

Estimation Techniques

We begin by estimating three-way fixed-effects linear probability regression models:

$$(1) \quad y_{ist} = \text{UnionHH}'_{ist}\beta + \text{UnionSt}'_{st}\beta + \mathbf{x}'_{ist}\boldsymbol{\beta} + \text{year}'_t\boldsymbol{\gamma} + \text{state}'_s\boldsymbol{\pi} + \alpha_{1i} + \epsilon_{ist}$$

Individuals, i , are nested in states, s , which are nested in years, t . The outcome y indicates whether an individual is poor in survey wave t .⁹ Individual fixed effects, α_{1i} , remove time-invariant unobserved person-level heterogeneity, while year contrasts, $\boldsymbol{\gamma}$, remove shared period-specific shocks, and state fixed effects, $\boldsymbol{\pi}$, remove time-invariant state-level characteristics and transform state-level variables to within-state deviations. The variable \mathbf{x} is the set of observed household- and state-level characteristics included beyond household union membership ($\text{UnionHH}'_{ist}\boldsymbol{\beta}$) and state union density ($\text{UnionSt}'_{st}\boldsymbol{\beta}$).¹⁰

Compared to previous research, these models provide a more rigorous test of the association between unions and poverty. Most critically, individual fixed effects remove time-invariant individual unobserved heterogeneity, which addresses concerns of selection into unions discussed above. Thus, our main results indicate the association between change in union membership, at both the household and state levels, and the change in the probability of an individuals' poverty status.

⁹Because we are primarily interested in average marginal effects, we use linear probability models, which provide similar results to average marginal effects from logistic regression models. We also estimated conditional logistic regression models and found similar results.

¹⁰We use robust standard errors clustered at the individual level.

State fixed effects allow us to better identify the influence of state union density on poverty by measuring within-state deviations. There are many reasons why states with high union density, such as California, differ from states with low union density, such as Mississippi. We can more directly test the influence of union density by measuring its change within states after netting out stable unobserved between-state characteristics. Moreover, including both household and state union measures more rigorously assesses whether previous findings relied on compositional differences in states' union membership.

We next estimate linear probability regression models interacting with household union membership and state union density, which allows us to formally assess whether state union density effects are concentrated among union households, whether state union density effects spill over to non-union households, and whether household union membership and state union density augment each other's effects.

Although three-way fixed-effects models improve upon previous research and address many of the reasons for skepticism discussed above, they nevertheless have limitations. Such models rely on certain strong assumptions that might be unreasonable when applied to the study of unions and poverty. Thus, to scrutinize the robustness of our main results, we consider an extension of a fixed-effects method that allows for the relaxation of these assumptions.

We estimate fixed-effects individual slopes (FEIS) linear probability regression models. These models, popularized and detailed by Wooldridge (2010: 377–81), can be written as:

$$(2) \quad y_{it} = \alpha_{2i} \text{year}_{it} + \mathbf{x}'_{it} \boldsymbol{\beta} + \text{state}'_{st} \boldsymbol{\pi} + \text{period}'_t \boldsymbol{\varphi} + \alpha_{1i} + \epsilon_{it}$$

The difference between Equations (1) and (2) is the treatment of time. Year contrasts are replaced with an individual-specific linear year coefficient.¹¹ FEIS models adjust not only for time-invariant individual-level heterogeneity in the probability of working poverty but also individual-specific time trajectories in the probability of working poverty (Ludwig and Brüderl 2018). To partially account for broadly shared poverty trends, we include a categorical variable, *period_t*, which measures period contrasts in the business cycle.¹² Additional details of the FEIS are included in the Online Appendix.

Results

Descriptive Patterns

We present descriptive statistics of key variables in Table 1. Across the entire sample, approximately 10.1% of person-years fall into anchored poverty, and 16.1% fall into relative working poverty. As expected, we observe

¹¹For coefficients of interest, FEIS is equivalent to including time-by-individual interactions in the regression model.

¹²Because of fewer observations in earlier years, we combine 1976–1992 (1), 1993–1999 (2), 2000–2007 (3), and 2008–2015 (4).

Table 1. Descriptive Statistics

	Mean	Household			State union density		
		Non-union	Union	Difference	Low	High	Difference
Relative poverty, all	0.164	0.189	0.051	-0.138*	0.200	0.129	-0.071*
Relative poverty, working	0.130	0.149	0.049	-0.100*	0.158	0.099	-0.059*
Anchored poverty, all	0.131	0.152	0.036	-0.116*	0.155	0.111	-0.043*
Anchored poverty, working	0.098	0.113	0.034	-0.079*	0.114	0.082	-0.031*
Union membership	0.160						
State union density	16.00						

Source: Panel Study of Income Dynamics (PSID), 1976–2015.

Notes: “Low” and “High” state union density are defined as state-years in the bottom and top third of the distribution of state union density among the whole sample.

* $p < 0.001$, two-tailed test.

substantively and statistically significant differences in poverty rates across union and non-union households, as well as between states with high and low union density rates, defined as those in the top or bottom third of the entire sample’s state union density rates. Across working and working-aged relative and anchored poverty, we observe that union households have poverty rates between 9 (anchored working-aged) and 15 (relative working-aged) percentage points lower than non-union households, with unionized households consistently having poverty rates of only 3 to 4%. Similarly, highly unionized state-years have poverty rates between 3 (anchored-all) and 7 (relative-all) percentage points lower than state-years with lower union density.

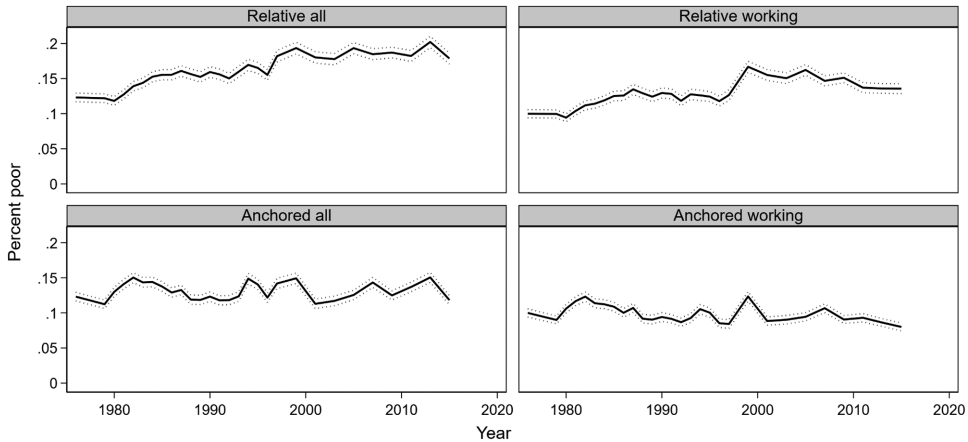
Figure 1 shows trends in poverty. Figure 2 shows trends separately by household union membership and state union density. Figure 3 visualizes the differences across groups from Figure 2. Although many patterns in these figures are notable, we highlight three.

First, we observe consistent differences in poverty rates, of 5 to 10 percentage points, between union and non-union households over time. Poverty rates among union households remain at low values across time, meaning that non-union households largely drive changes in poverty over time.

Second, we observe consistently lower working-aged poverty rates among states with high union density. Anchored and relative working-aged poverty are consistently about 5 percentage points lower in highly unionized states.

Third, we observe convergence across states of working relative and anchored poverty rates in recent years, driven primarily by working poverty rates in low union density states converging with the low poverty rates in high union density states. This result partly reflects convergence in union density across states between 1976 and 2015 and the modest decline in working poverty in the United States since the 1990s (Brady et al. 2013). For relative working poverty, the difference between states shrinks from approximately 15 percentage points in 1980 to approximately 3 percentage

Figure 1. Poverty over Time



Data source: Panel Study of Income Dynamics (PSID), 1976–2015.

Notes: Dotted lines are 95% confidence intervals.

points in the most recent waves. For anchored working poverty, we see no significant difference in the last year of data, 2015. However, this last point is an exception to the otherwise consistent set of findings. At least descriptively, unionized households and states have lower rates of each dimension of poverty.

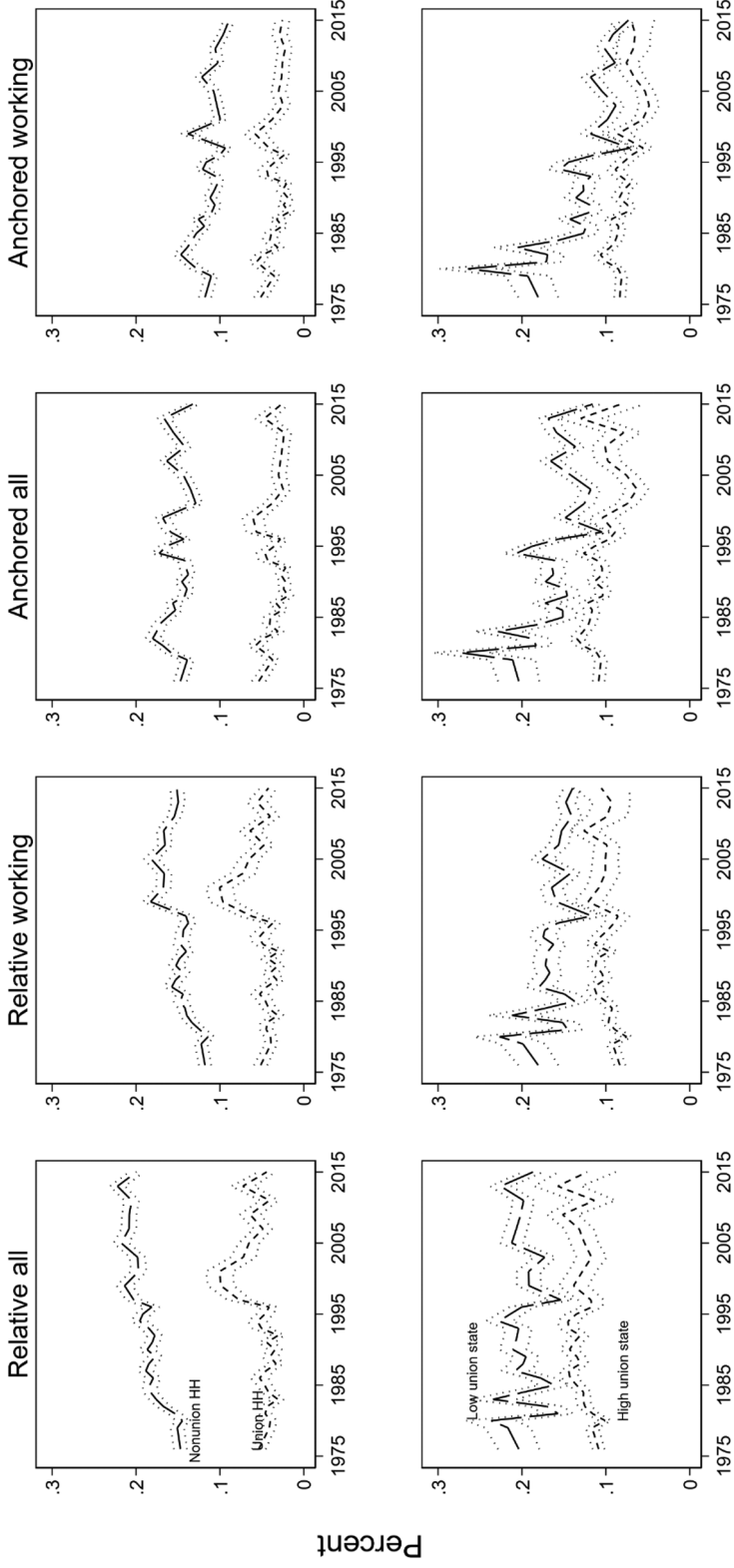
Of course, differences in poverty could result from compositional differences of states and households, as well as unobserved characteristics of individuals resulting in unequal sorting across union dimensions. We therefore turn to fixed-effects regression models to assess the robustness of the association between labor unions and poverty.

Regression Analyses

Table 2 presents results from three-way fixed-effects regression models. For both relative and anchored poverty and both working and working-aged households, we present three models. The first includes only our two union measures and individual, state, and year fixed effects. The second adds individual-, household-, and state-level controls. The third includes an interaction between household and state union density.

Across Table 2, several conclusions can be drawn. First, residence in a union household clearly and significantly reduces all poverty outcomes. These coefficients are robust across all eight of the first two models. While adding controls in the second models lowers the magnitude of coefficients, we find that union household membership reduces the probability of poverty by between 0.04 and 0.06 compared to non-union households ($p < 0.001$ in all models with controls, two-tailed tests). Critically, all models include individual fixed effects. Results thus do not reflect differences in

Figure 2. Poverty over Time, by Household and State Union Density

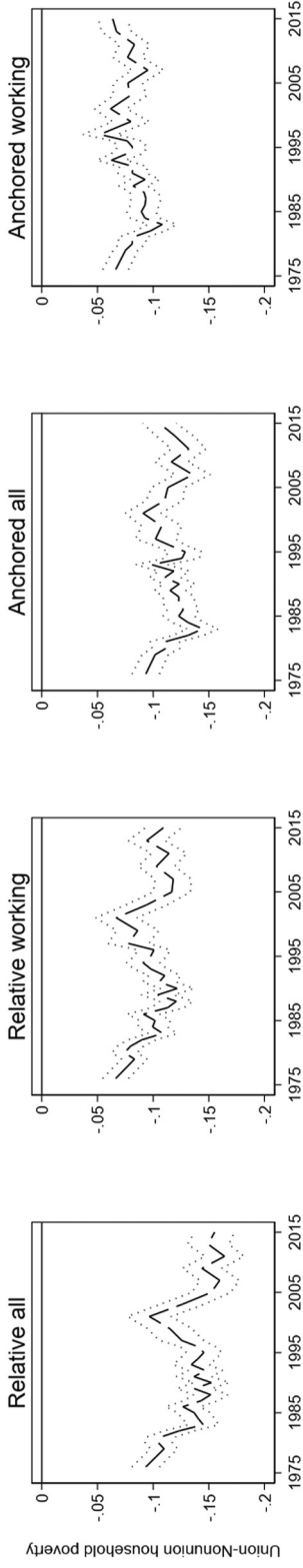


Data source: Panel Study of Income Dynamics (PSID), 1976–2015.

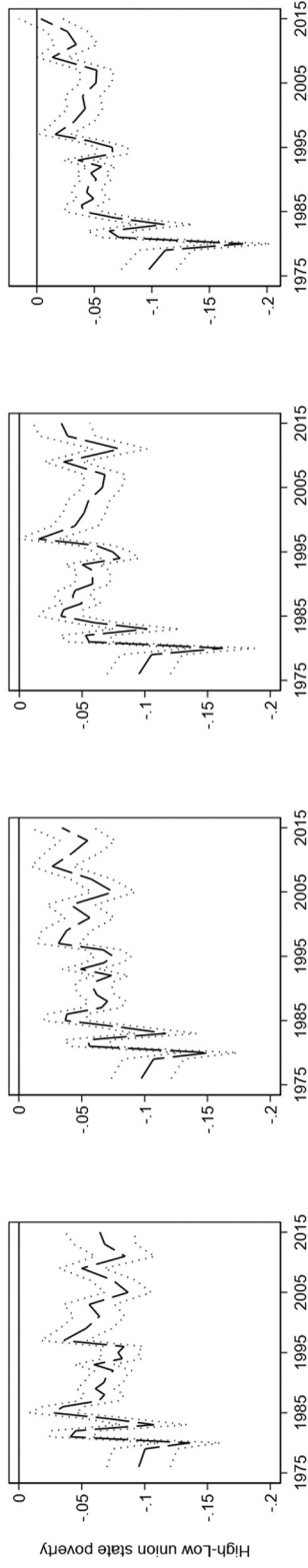
Notes: Dotted lines are 95% confidence intervals. “Low” and “High” state union density are defined as state-years in the bottom and top third of the distribution of state union density among the whole sample.

Figure 3. Difference in Poverty across Household and State Union Density

Union households



State unionization



Data source: Panel Study of Income Dynamics (PSID), 1976–2015.

Notes: Dotted lines are 95% confidence intervals. “Low” and “High” state union density are defined as state-years in the bottom and top third of the distribution of state union density among the whole sample.

Table 2. Fixed-Effects Linear Probability Models, Poverty on Unions and Controls

	<i>Relative poverty</i>			<i>Anchored poverty</i>		
	<i>Working-aged households^a</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
Union household	-0.100*** (0.003)	-0.059*** (0.003)	-0.051*** (0.007)	-0.087*** (0.003)	-0.049*** (0.003)	-0.024*** (0.006)
State union density	-0.001 (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.001 (0.001)	-0.002** (0.001)	-0.001* (0.001)
Household × State union density			-0.001 (0.001)			-0.001*** (0.001)
	<i>Working poverty households^b</i>					
	(7)	(8)	(9)	(10)	(11)	(12)
Union household	-0.066*** (0.003)	-0.041*** (0.003)	-0.028*** (0.007)	-0.052*** (0.003)	-0.031*** (0.002)	-0.009 (0.006)
State union density	-0.002** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.001+ (0.001)	-0.002*** (0.001)	-0.002** (0.001)
Household × State union density			-0.001* (0.001)			-0.001*** (0.001)
Controls?	No	Yes	Yes	No	Yes	Yes

Notes: Robust clustered standard errors in parentheses. All models include individual, year, and state fixed effects. Standard errors clustered at individual level. Working-aged sample controls include household head age, number of household members under age 18, number of household members over age 64, whether the household contains a child under age 5, household composition, household head race, household head education, whether none, one, or two or more household members are employed. Working poverty sample controls include lead earner age, number of household members under age 18, number of household members over age 64, whether the household contains a child under age 5, household composition, lead earner race, lead earner education, lead earner industry, lead earner occupation. All models include state controls: GDP per capita, employment rate per population, GDP growth, and natural log of population.

^aSamples: 381,112.

^bSamples: 324,391.

+ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

the probability of poverty across union and non-union households, but rather change in the probability of poverty for an individual when a household changes its union membership. Associations are thus net of time-invariant characteristics that differ between union and non-union households.

Second, we find significant and negative associations between state union density and all four poverty outcomes. For three of four outcomes, state union density becomes statistically significant only when control variables are included. Nevertheless, declines in state union density, or the inverse of presented coefficients, correspond with an increase in the probability of all four poverty outcomes ($p < 0.01$). Because the models include state fixed effects, coefficients represent the association between working poverty and change in state union density within states over time. Notably, results are net of household union membership. Thus, these state-level results do not simply reflect individual compositional differences in the PSID across times

Table 3. Fixed-Effects Individual Slopes Linear Probability Models, Poverty on Unions and Controls

	<i>Relative poverty</i>			<i>Anchored poverty</i>		
	<i>Working-aged^a</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
Union household	-0.093*** (0.004)	-0.056*** (0.003)	-0.035*** (0.008)	-0.080*** (0.003)	-0.045*** (0.003)	-0.014* (0.007)
State union density	-0.002** (0.001)	-0.002*** (0.001)	-0.002** (0.001)	-0.001 ⁺ (0.001)	-0.002*** (0.001)	-0.002** (0.001)
Household × State union density			-0.001* (0.001)			-0.001*** (0.001)
	<i>Working poverty^b</i>					
	(7)	(8)	(9)	(10)	(11)	(12)
Union household	-0.063*** (0.003)	-0.037*** (0.003)	-0.024*** (0.007)	-0.048*** (0.003)	-0.027*** (0.003)	-0.011 ⁺ (0.006)
State union density	-0.001** (0.001)	-0.002** (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.001* (0.000)	-0.001* (0.000)
Household × State union density			-0.001* (0.001)			-0.001** (0.000)
Controls?	No	Yes	Yes	No	Yes	Yes

Notes: Robust clustered standard errors in parentheses. See Table 2 for discussion of controls.

^aSamples: 379,076.

^bSamples: 321,654.

⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

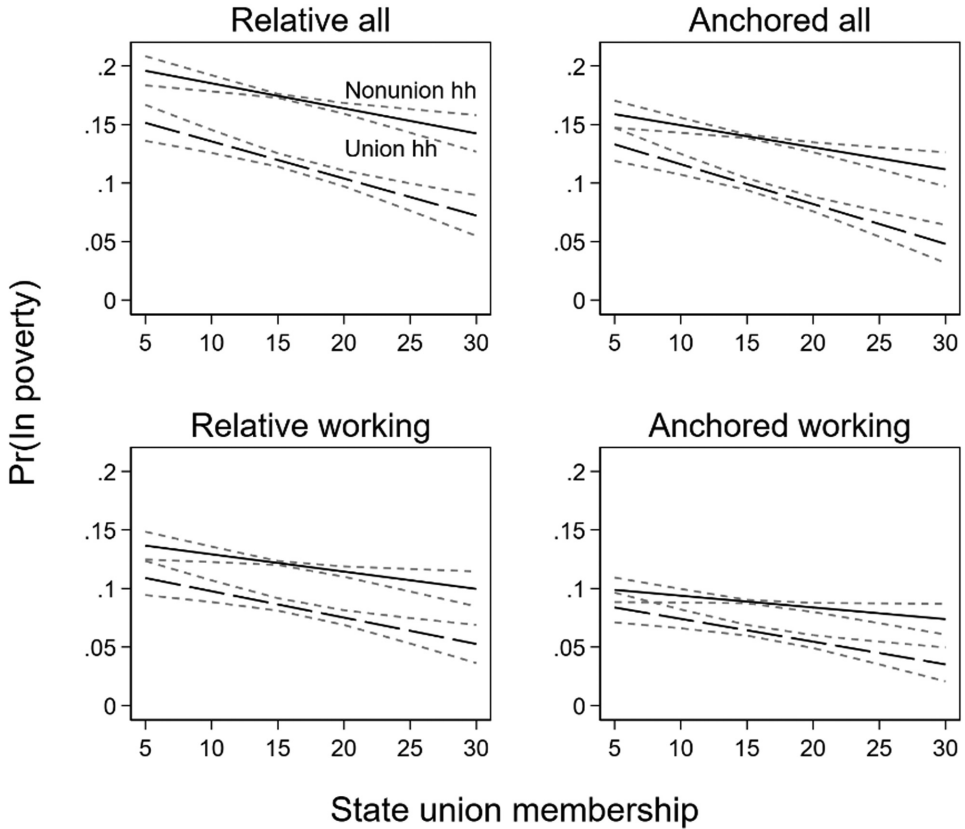
and places. Rather, this is a state-level effect of union density net of household membership.

Third, the interaction effects between household and state union density are statistically significant for three of four outcomes (relative working-aged is the exception). Results mostly suggest that state union density and household membership augment the effects of each other. Moreover, the main effect of state union density is significantly negative in all four models. Overall, results suggest that state union density reduces poverty for non-union households. In addition, there is no evidence that state union density has adverse spillover effects, as negative associations are found for both working and working-aged poverty.

Although the models in Table 2 improve on previous studies of unionization and poverty, they nevertheless rely on potentially strict assumptions for fixed effects. We relax these assumptions by fitting FEIS models, as presented in Table 3. Model sequencing remains the same as in Table 2.

Our first two conclusions, that household membership and state union density independently reduce poverty, are clearly replicated in FEIS models. Losing household union membership increases the probability of poverty for all four outcomes, and the decline of state union density increases the risk of all as well. Thus, both state and household union effects are

Figure 4. Predicted Poverty Levels by State and Household Union Density



Data source: Panel Study of Income Dynamics (PSID), 1976–2015.

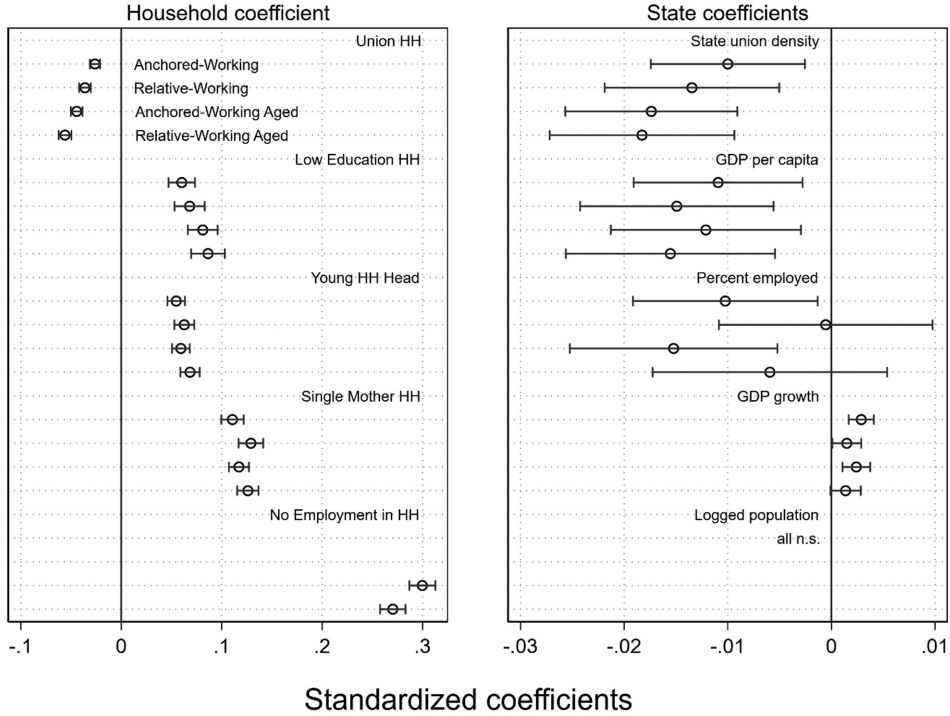
Notes: Predictions from models 3, 6, 9, and 12 in Table 3. Dotted lines are 95% confidence intervals.

detectable net of not only stable individual characteristics but also idiosyncratic individual poverty trajectories over time.

When we include individual slopes, we detect even more clearly consistent, significant interactions between household and state union density. Across all poverty outcomes, state union density has a significant and negative association for non-union households with a steeper impact for union households. As shown in Figures 2 and 3, union and non-union households have substantially dissimilar trajectories in poverty over time, as have states with different union densities. It is uncertain whether assuming uniform time trajectories is appropriate. Partly for this reason, we can more clearly detect variation of union effects across states and household membership when we relax this assumption.

Figure 4 plots the predicted probabilities of our four poverty dimensions across union and non-union households, and across state union density (based on Table 3). The dashed line for union households clearly shows that living in a union household has its most protective benefits when one

Figure 5. Household and Standardized State-Level Associations with Poverty, Fixed-Effects Individual Slopes Models



Notes: Bars indicate 95% confidence intervals. Coefficients based on models 2, 5, 8, and 11 in Table 3.

also lives in a state with high union density, with the probability of poverty ranging between 0.03 and 0.07 among high union density state-years. Similarly, non-union households benefit from higher state union density. We observe lower predicted probabilities of poverty among non-union households among high union density states across all poverty outcomes.¹³

Figure 5 displays the marginal effects of household union membership across levels of state unionization. The marginal effects of poverty decline between 2 and 5 percentage points from low to high state unionization. For example, union households have approximately 0.02 lower probability of being in anchored poverty compared to non-union households among low unionized states, and have approximately 0.06 lower probability among the highest unionized states. The interaction reveals that there is more similarity in the risk of poverty between union and non-union households among less unionized states. This between-group equality comes at the cost of an overall higher risk of poverty, however. Although there is a greater between-group difference between union and non-union households in highly

¹³We show household marginal effects in Online Appendix Figure A.2.

unionized contexts, this inequality occurs within a context of an overall lower risk of experiencing poverty in the first place.

Before proceeding, it is important to clarify how the magnitude of state union density and household union membership compares to our other predictors of poverty. Figure 5 presents x-standardized coefficients of all state-level variables in our second models of Table 3: union density, GDP per capita, employment, GDP growth, and logged population.¹⁴ It also compares household union membership against the individual-level coefficients for the “big four” risk factors of poverty (Brady et al. 2017): single motherhood, low education (i.e., less than high school), unemployment, and young household head/lead earner (age 25 or younger).

Focusing first on state-level effects, Figure 5 shows that state union density has a comparable magnitude to GDP per capita. GDP per capita tracks rising economic development and affluence, and hence gauges long-term economic growth. Both state-level characteristics have significant and negative effects: The decline of union membership associates with higher poverty, whereas rising GDP per capita associates with lower poverty. The absolute magnitudes of the two variables are similar. A standard deviation increase in state union density decreases poverty by between 0.01 and 0.018, whereas a standard deviation increase in GDP per capita decreases poverty by between 0.011 and 0.016. Put differently, state union density has about the same influence on poverty change as does long-term state economic growth. Further, state union density has larger and more robust standardized coefficients than employment rates, GDP growth (i.e., short-term economic growth), and logged population.

Next, focusing on household-level effects, union membership consistently has effects smaller than the big four risks. For working poverty, household union membership effects are between 25% and 50% the magnitude of other household variables; for working-aged poverty, union effects are between 15% and 75% the magnitude of other key household explanations. It is reasonable that household changes in employment or single motherhood status have substantively larger effects on poverty than household union membership. It is notable, however, that the magnitudes of household union membership effects are almost as large as the contrast of lacking a high school degree, compared to having a college degree, or having a young household lead earner or young household head. Altogether, the results in Figure 5 suggest that while unions alone are insufficient to explain poverty trajectories, the decline of unions is a substantively significant contributor to American poverty trajectories.

Supplementary Analyses

Thus far, we have presented evidence that both household union membership and state union density reduce poverty. Recall, however, that

¹⁴We present a table of standardized coefficients in Online Appendix Table A.4.

employment is consistently found to be the most important predictor of working (Brady et al. 2013) and working-aged poverty (Rainwater and Smeeding 2004; Brady et al. 2017). Being an employed household or having multiple earners (e.g., note effects of unemployment in Figure 5) have much larger effects on poverty than do unions, raising concerns that unions might have adverse spillover effects for those outside, or marginally attached to, the labor market. As we explained, researchers have long been concerned that higher state union density leads to fewer employment opportunities or lower wages for non-members. It is therefore valuable to assess whether state union density undermines employment.

First, if state union density did more harm than good at the bottom of the labor market, we would find a positive effect on the poverty of non-members among higher union density states. However, Figure 4 shows state union density reduces all four poverty outcomes among non-union households. Thus, there is no evidence of adverse spillover effects from state union density for the poverty of non-union households. Second, perhaps controlling for employment attenuates (or is a post-treatment control for) the coefficient of state union density and conceals the adverse spillover effects. Models 1, 4, 7, and 10 of Tables 2 and 3, however, show the effects of state union density before controlling for employment. Although the coefficients for state union density are less robustly significant before controls are added, no “reduced form” model shows a positive coefficient for poverty. Third, that the coefficients for state union density are consistently negative among both working and working-aged households undermines claims of adverse spillover effects. Even if state union density worsens the employment of some households, the net effect across the sample is to reduce poverty.

Going further, we test if state union density undermines being employed among working-aged households or having multiple earners among employed households. These models mimic the fixed-effects models in Table 2. Results (included in the Online Appendix) show that across model specifications, state union density is not significantly associated with whether a household is employed among the sample of working-aged households. In fact, state union density’s coefficient is positively signed when controls are included. Similarly, state union density is not significantly associated with whether a household has multiple earners among the sample of working households. In total, we find no evidence of adverse spillover effects on non-union households or those marginally attached to the labor market.

Beyond spillover effects, we considered several potential concerns regarding modeling decisions. First, we consider how our results were sensitive to various clustering strategies. Although clustering at the incorrect level could deflate standard errors, each approach has strengths and weaknesses. While some researchers suggest clustering at the highest level possible, others argue that it is better to cluster at the level of data collection or treatment (Abadie, Athey, Imbens, and Wooldridge 2017). We replicated our main

results while clustering at the household and state levels. State-level clustering reveals slightly weaker and modestly less robust coefficients for state union density in the fixed-effects models. However, even when clustering at the state level, state union density FEIS coefficients remain largely unchanged. Thus, overall, our decision to cluster at the individual level does not appear to change our conclusions.

Second, cross-level interactions with state-level within-unit deviations might be biased without special consideration. Giesselmann and Schmidt-Catran (2019) showed that such interactions in standard fixed-effects models can be problematic, as they still retain a partial mix of between-unit and within-unit effects. Thus, our interaction results may not appropriately identify the more robust results stemming from within-state union density changes. Following their advice, we interacted household union membership with state and year fixed effects. We also replicated our interaction models after including an additional interaction between household union membership and individual fixed effects. These specifications did not alter our main results, which we interpret as evidence that the results are not unduly rooted in misspecification of within-unit deviations.

Conclusion

This study investigates the relationship between labor unions and poverty. We measure unions as household union membership, state union density, and their interaction. Distinctively, we assess the spillover effects of state union density on non-union households. We analyze individual-level panel data from the PSID between 1976 and 2015 using three-way fixed effects and FEIS models. To the best of our knowledge, this is the first study of the consequences for labor unions on poverty that uses individual-level panel data. Because we use the CNEF's "post-fisc" income measures, our study also has more valid and reliable measures of poverty than studies based on the OPM. Relatedly, we verify our results across both working and working-aged poverty, and both relative and anchored measures.

We ask three research questions. First, does household union membership influence working and working-aged poverty? The descriptive evidence shows that all four dimensions of poverty are significantly lower in union versus non-union households. These results are not wholly based in characteristics that vary between union and non-union households. We find robust evidence that entering a union household has a consistent negative effect on the probability of all forms of poverty. Although the magnitudes are smaller than those of the big four risk factors of poverty (Brady et al. 2017), household union membership has substantively meaningful effects.

Second, net of household characteristics, does state union density influence working and working-aged poverty? We show poverty is significantly lower in states with high union density. Although not quite as robust as household union membership, we find significant associations in 21 of 24

reported models. Furthermore, state union density has a significant negative coefficient in all eight fixed-effects and FEIS models for the four dimensions of poverty when including individual- and state-level controls. These results demonstrate that state union density has a poverty-reducing contextual effect net of the compositional effects of states' union membership. The coefficients for state union density are also substantively meaningful compared to standard predictors of poverty. State union density has coefficients comparable to those of GDP per capita (i.e., affluence and long-term economic development), and only state union density and GDP per capita have consistent associations across poverty dimensions.

Perhaps more salient is that state union density reduces poverty for *both* union and non-union households. Hence, state union density has a poverty-reducing contextual spillover effect for non-union households specifically. Higher state union density reduces poverty even for those who are not members and for the working-aged population as a whole. Because we analyze the working-aged and not just working households, these results are particularly relevant for the argument that state union density has a contextual spillover anti-poverty effect.

Third, do any poverty-reducing effects of household union membership and state union density significantly interact to offset or augment one another? The interactions discussed above show not only that state union density has effects for both union and non-union households but also that household union membership is particularly beneficial in a context of high state union density. There are distinct, non-redundant effects to both household union memberships and state union density. Although high state union density benefits non-union households, union households are particularly unlikely to be poor in states with high union density.

This study also provides evidence that undermines each major reason for skepticism about labor unions. Even though unions are exceptionally weak in the contemporary United States, we continue to find significant effects. This is the case even though our analyses includes three recent time points (2011, 2013, 2015) of very low union density—all after the last time point (i.e., 2010) observed by Brady and colleagues (2013). Further, this study exploits panel data to remove the stable unobserved characteristics that select people into union membership. Along with a rich set of time-varying controls, the use of fixed effects and FEIS models should reduce concerns about unobserved heterogeneity and selection. Further, we find beneficial spillover effects for non-union households and the broader working-aged population. Finally, analyses yield no evidence of adverse spillover effects for the bottom of the income distribution, especially those marginally attached to the labor market. Higher state union densities do not appear to marginalize people into unemployment, fewer workers per household, or poverty. Beyond these points, we underline that the present study advances beyond past research's focus on state union density and working poverty. By examining both household union membership and working-aged poverty,

this study substantially deepens and expands the evidentiary base for arguing that unions reduce poverty.

Initially, it may seem counterintuitive that household and state union measures have such robust associations with poverty, given the relative stability of poverty rates during the period of our study compared to steep union decline. This seeming contradiction is best understood through a cross-national comparison, in which the United States has an unusually high poverty rate compared to other high-income countries (Brady et al. 2017). The decline of labor unions and their protective social, political, and economic consequences has allowed for US poverty rates to remain stable at a high level despite four decades of economic growth, rising educational attainment, female labor force participation and multi-earner households, declining rates of young heads of households, and several other poverty-reducing trends (Brady et al. 2017). A counterfactual world in which US labor union membership caught up to Western Europe, rather than the experienced inverse, would potentially have pushed American relative poverty much nearer to Western European levels.

Our study has limitations that can motivate future research. Although we demonstrate that state union density has broad effects on poverty reduction, meaningful heterogeneity may be present across subgroups. Given that labor union membership tends to stabilize marital patterns (Schneider and Reich 2014), does union density have similar effects across single- and two-parent households? Our focus on individual trajectories may not fully account for the substantial geographical reorganization of industrial location over the time period of study. Manufacturing employment shifted from the Northeast to the South over the period of our study. To what extent do the poverty-reducing effects of union density track with state-level shifts in industrial composition (i.e., net of household-level industry and occupation of employment, which we control for)? Further, how does union density affect poverty among senior and child populations specifically, two groups at especially high risks of poverty? While all these questions are beyond the scope of the current article, they would help further establish when, and how, union density reduces poverty.

Future research should also interrogate the causal ordering. For example, we cannot fully disentangle whether labor unions themselves reduce poverty or whether labor unions are associated with good jobs available to those in the middle and bottom of the income distribution. Also, unions might reduce employment churn and downward pressures on wages in years spent unemployed, or union membership might follow after attainment of high-wage employment when one can pay union dues. Labor unions could be closely associated with establishing the social conditions necessary for quality employment in spaces other than the top of the labor market, but more research should test if unions have the direct effect on poverty that our results suggest. Although these mechanisms are critical for developing a precise theoretical understanding of how labor unions

alleviate poverty, our study still demonstrates that declining labor unions in the US have clear practical implications for poverty.

Although Brady and colleagues (2013) provided evidence that part of union density's effect on poverty works through the mechanism of social policy, we are forced to leave that question to future research. In contrast to Brady and colleagues' time period of 1991 to 2010, it is more difficult to compare social policy generosity across state-years in our longer and more recent time period (1976 to 2015). While their analysis of Aid to Families with Dependent Children/Temporary Assistance for Needy Families plus Supplemental Nutrition Assistance Program (AFDC/TANF+SNAP) and unemployment insurance (UI) maximum benefit levels is informative, updated analyses would require greater consideration of coverage, eligibility, and access. Future research could ideally examine the decline of welfare programs that were previously more prominent, such as General Assistance, as well as the emergence of higher state minimum wages, earned income tax credits, and the expansion of Medicaid through the Affordable Care Act (as well as the shift from programs such as TANF to SNAP and Supplemental Security Income (SSI)).

We conclude by encouraging American poverty researchers to incorporate labor unions into the study of poverty. As shown in the introduction, the neglect of labor unions in American poverty research is pervasive. This situation is unfortunate because the omission of unions from analyses of poverty could arguably be a substantial omitted variable bias. Even if the focus of an analysis is far from unions, we conjecture that unions should still be accounted for in models of poverty. To the extent studies are interested in causes of poverty that are in any way related to labor unions (e.g., employment), it is essential for American poverty scholars to incorporate labor unions into their analyses. The omission is even more unfortunate given growing interest in political theories of poverty generally (Brady 2019), and given the extensive related literatures on unions and wages, jobs, and social equality. Scholars are increasingly recognizing that poverty is the result of politics, and that power resources and institutions exert tremendous influence on poverty. Unions are one of the most important power resources and institutions and are pivotal to the politics of social policies. Moreover, it is well understood that declining unionization is substantially shaped by politics at the federal, state, and local levels (Rosenfeld 2014; DiGrazia and Dixon 2019; Hertel-Fernandez 2019). Therefore, to understand poverty, we must understand unionization as a key aspect of the politics of poverty and as a key aspect of the broader political processes that ultimately shape the distribution of economic resources in society.

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