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Labor Unions and American Poverty

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Supplemental Online Appendix

Labor Unions and American Poverty

Tom VanHeuvelen and David Brady

Data

A strength of the PSID is that median household income closely resembles levels calculated using the CPS (Gouskova and Schoeni 2007). Household income percentiles above the 5th and below the 95th were very similar between the PSID and March Current Population Survey (CPS) since 1968. Therefore, the assignment of poverty status based on a PSID respondent's household income relative to the median PSID household income should largely mirror assignment based on the CPS. For our purposes, discrepancies above the 95th percentile are immaterial. While incomes below the 5th percentile differed, they would not differ significantly enough to lead us to misclassify poor households as non-poor.

The PSID stopped measuring household taxation in 1992. The CNEF employs the National Bureau of Economic Research's TAXSIM model. Tax burdens are estimated for each tax unit and then summed to the household level. Payroll taxes of the head and partner are added together along with federal and state income taxes to arrive at a total household tax burden (Butrica and Burkhauser 1997). Household income is thus the total of labor earnings, asset flows, private transfers, public transfers, and social security pensions minus total household taxes.

In the 1976 and 1979 waves, 268 of the 12,235 household units had a spouse who *was* a union member and a head who was *not* a union member. While these households make up only

2% of the households in these waves, they represent 11% of the union households. We replicated the main results for state-level union membership without consideration of household union membership using all waves from 1970 onward and drew the same conclusions.

Official Poverty Measurement (OPM)

We intentionally avoid the U.S. OPM because of its well documented and serious validity and reliability problems (Brady et al. 2013; Rainwater and Smeeding 2004; Smeeding 2016). Partly because it was established with little scientific basis more than 50 years ago, the OPM thresholds are widely understood to be too low. As noted above, the OPM's definition of income ignores taxes and tax credits, and inconsistently counts transfers. For example, Old Age Survivor's Insurance and Temporary Assistance for Needy Families (TANF) benefits count as income. However, SNAP, housing subsidies and childcare vouchers do not. Since the 1990s, the EITC has grown into the largest assistance program for families with children and the Child Tax Credit has grown substantially in recent years. Yet, both are ignored by the OPM. In recent years, SNAP and EITC are each more than four times larger than TANF. Therefore, over-time comparisons based on the OPM, especially for the working poor, are flawed. The OPM also neglects states' taxes and transfers, which compounds reliability and validity problems. By contrast, the definition of income used here incorporates federal and state taxes and transfers. Because the CNEF measure comprehensively includes income sources, transfers, and taxes – unlike the OPM – it is inappropriate to use the OPM threshold with this measure of income.

Additional Discussion of the Fixed Effects Individual Slopes (FEIS) Model

Standard fixed-effects models assume that time trends are uniformly shared across respondents.¹ If this is not the case—for example, if the probabilities of an individual’s poverty and union membership both covary with time—then results from fixed-effects models are biased. FEIS models estimate the association between poverty and unionization, net not only of individual-level time-invariant differences in the probability of poverty, but also the idiosyncratic set of trajectories of poverty status experienced within the PSID sample.

Fixed-effects models rely on the assumption of strict exogeneity: no contemporaneous correlation of regressors and the error term, ϵ , and no correlation of regressors with past and future values of regressors and ϵ . In standard fixed-effects models, the requirement for strict exogeneity is $E(\epsilon_{it} | \mathbf{x}_i, \alpha_{1i}, \text{year}_i) = 0$: net of observed covariates, individual fixed-effects, and shared trajectories over time, errors are expected to be zero. Put differently, there should be no non-random heterogeneity of time trends, which would be part of the error term. If there exists some set of correlated time trends between dependent and independent variables, this assumption may not hold, and fixed-effects results might be biased. FEIS models provide a less stringent requirement for strict exogeneity: $E(\epsilon_{it} | \mathbf{x}_i, \alpha_i, \text{bcycle}_i) = 0$: net of observed characteristics, individual fixed-effects, individual time trajectories, and shared time contrasts across business cycles, errors are expected to be zero.²

¹ Also, fixed-effects models assume parallel trends across groups: equivalent trajectories in the probability of poverty between union and non-union members. Prior research shows that unions select on worker competency characteristics observable to employers but not researchers (Card et al. 2004). If this is the case, and if such characteristics are related to poverty trajectories, it is likely that changes in the probability of poverty over time are unequal across union and non-union groups. Similarly, unions might discriminate in granting access to groups facing distinct risk sets of poverty, such as people of color (Rosenfeld and Kleykamp 2012). If this is the case, then union and non-union groups would be selected based on varying poverty trajectories that exist across groups, and the assumption of parallel trends may not hold.

² FEIS models are “data hungry” (Ludwig and Brüderl 2018), as a model with a single linear term for time drop all individuals with two or fewer observations. Thus, models cannot fully include the whole set

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of year contrasts we include in FE models. We include the period contrasts in an attempt to allow our FEIS models to resemble our treatment of time in the FE models.

Figure A.1. Variation in State Unionization over Time

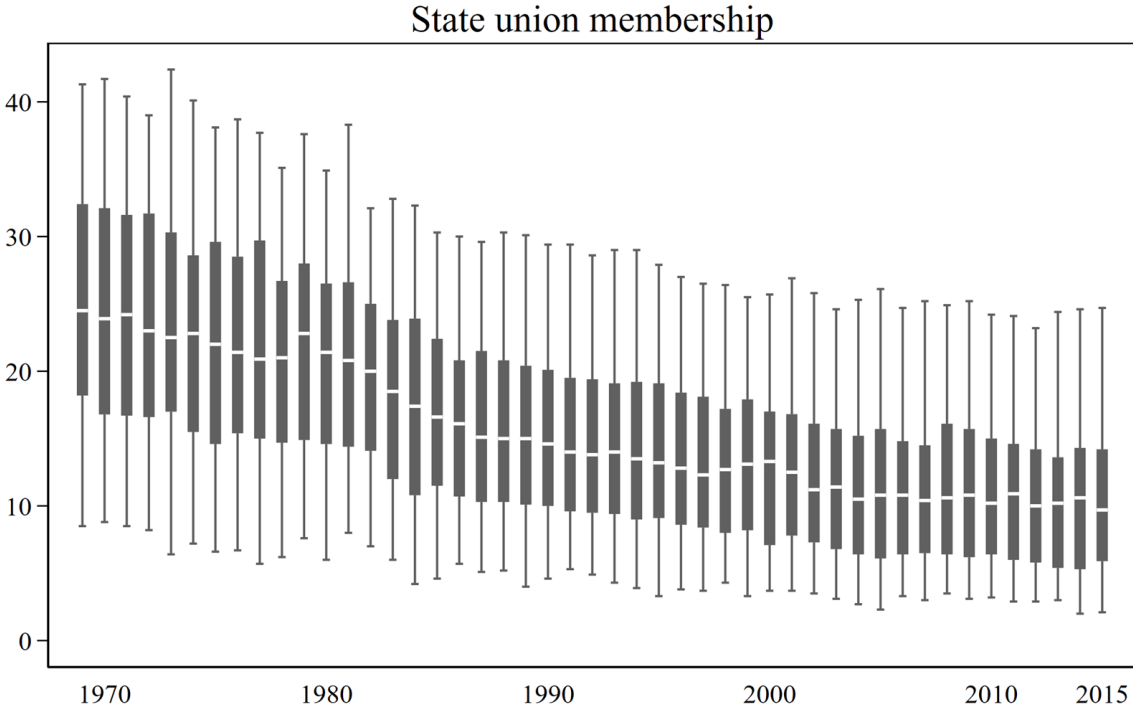


Table A.1. Descriptive Statistics for Working-Aged Poverty Controls

	Mean	Std. Dev.	Min	Max
Household head education				
Less than high school	0.173		0	1
High school	0.355		0	1
Some college	0.217		0	1
College	0.166		0	1
More than college	0.089		0	1
Household head age				
Under 25	0.046		0	1
25-34	0.252		0	1
35-54	0.544		0	1
55 or older	0.158		0	1
Household head race				
White	0.799		0	1
Black	0.140		0	1
Other	0.061		0	1
Household employment				
One employed	0.359		0	1
None employed	0.058		0	1
Two or more employed	0.583		0	1
Household composition				
Single mother	0.107		0	1
Single father	0.042		0	1
Female head, no children	0.075		0	1
Male head, no children	0.226		0	1
Other	0.551		0	1
Number of household members under five	0.222	0.415	0	1
Number of household members over 65	0.021	0.143	0	1
State characteristics				
GDP per capita (thousands of dollars)	31.536	7.438	17.455	135.729
Percent population employed	0.547	0.060	0.371	1.373
GDP growth	0.008	0.036	-0.307	0.255
Logged population	15.831	0.841	12.882	17.478

Table A.2. Descriptive Statistics for Working Poverty Controls

	Mean	Std. Dev.	Min	Max
Lead earner employment status				
Not employed	0.088		0	1
Employed	0.912		0	1
Lead earner race				
White	0.820		0	1
Black	0.117		0	1
Other	0.063		0	1
Lead earner education				
Less than high school	0.150		0	1
High school	0.360		0	1
Some college	0.222		0	1
College	0.170		0	1
More than college	0.098		0	1
Lead earner age				
Under 25	0.036		0	1
25-34	0.239		0	1
35-54	0.563		0	1
55 or older	0.162		0	1
Lead earner occupation				
Management	0.182		0	1
Professional specialty	0.142		0	1
Technicians and related support	0.035		0	1
Sales	0.071		0	1
Administrative support	0.092		0	1
Service occupations	0.103		0	1
Farming, forestry, fishing	0.037		0	1
Mechanics and repairers	0.061		0	1
Construction	0.052		0	1
Precision production	0.045		0	1
Machine operators	0.076		0	1
Transportation	0.092		0	1
Military	0.012		0	1
Lead earner industry				
Agriculture forestries fisheries	0.038		0	1
Mining	0.008		0	1
Construction	0.088		0	1
Non-durable manufacturing	0.076		0	1
Durable manufacturing	0.107		0	1
Transportation manufacturing	0.033		0	1

Table A.2. Continued

	Mean	Std. Dev.	Min	Max
Transportation	0.058		0	1
Communications	0.018		0	1
Utilities and sanitation	0.021		0	1
Wholesale trade	0.035		0	1
Retail trade	0.098		0	1
Finance, insurance, and real estate	0.051		0	1
Business services	0.035		0	1
Repair services	0.018		0	1
Personal services	0.027		0	1
Entertainment and recreation	0.010		0	1
Professional and related services	0.183		0	1
Retail grocery	0.026		0	1
Public employment	0.070		0	1
Household composition				
Single mother	0.085		0	1
Single father	0.030		0	1
Female head, no children	0.069		0	1
Male head, no children	0.231		0	1
Other	0.586		0	1
Number of household members under five	0.218	0.413	0	1
Number of household members over 65	0.017	0.128	0	1
Multiple earners in household	0.653	0.476	0	1
State characteristics				
GDP per capita (thousands of dollars)	31.657	7.364	17.455	135.729
Percent population employed	0.549	0.058	0.371	1.373
GDP growth	0.008	0.036	-0.307	0.255
Logged population	15.827	0.843	12.882	17.478

Table A.3. Fixed Effects Linear Probability Models of Employment

	Household Employed Among Working-Aged?	Household Employed Among Working-Aged	Multiple Earners Among Employed Households Sample	Multiple Earners Among Employed Households Sample
State unionization	-.0004 (.0005)	.0003 (.0005)	-.002 (.001)	-.0001 (.001)
Individual- & State-level controls included?	No	Yes	No	Yes
N	385,701	379,883	354,581	349,211

Robust clustered standard errors in parentheses

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

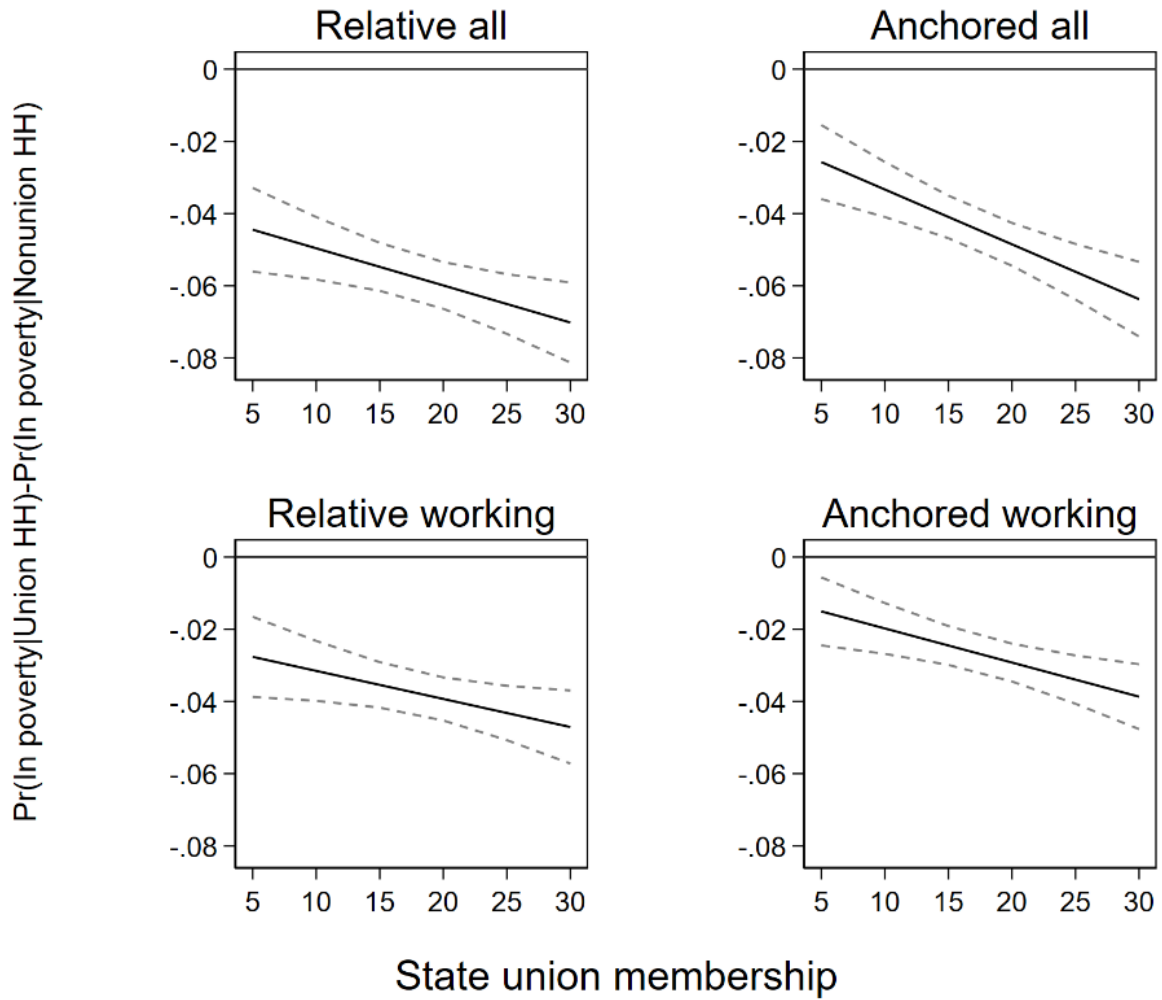
Table A.4. Table of Standardized Coefficients for Figure 4. Household and Standardized State-Level Associations with Poverty, Fixed-Effects Individual Slopes Models

	Working aged		Working	
	(1) Relative	(2) Anchored	(3) Relative	(4) Anchored
Household-level effects				
Union household	-0.056*** (0.003)	-0.045*** (0.003)	-0.037*** (0.003)	-0.027*** (0.003)
Single mother household	0.126*** (0.005)	0.117*** (0.005)	0.129*** (0.006)	0.110*** (0.006)
Young household head	0.072*** (0.006)	0.059*** (0.005)	0.078*** (0.007)	0.065*** (0.006)
Low educated	0.085*** (0.008)	0.079*** (0.008)	0.064*** (0.008)	0.057*** (0.007)
Unemployed household	0.271*** (0.006)	0.300*** (0.007)		
Standardized state-level effects				
State unionization	-0.018*** (0.005)	-0.017*** (0.004)	-0.014** (0.004)	-0.010** (0.004)
GDP per capita (thousands of dollars)	-0.016** (0.005)	-0.012** (0.005)	-0.015** (0.005)	-0.011** (0.004)
Percent employed	-0.006 (0.006)	-0.015** (0.005)	-0.001 (0.005)	-0.010* (0.005)
GDP growth	0.001 (0.001)	0.002*** (0.001)	0.002* (0.001)	0.003*** (0.001)
Logged population	-0.044 (0.025)	0.020 (0.023)	-0.041 (0.023)	0.019 (0.020)
N	379,076	379,076	321,654	321,654

Notes: Robust clustered standard errors in parentheses. Based on second models in Table 3.

* p<0.05, ** p<0.01, ***p<0.001

Figure A.2. Marginal Effect of Household Union Membership by State Unionization



Data source: PSID 1976–2015.

Notes: Predictions from models 3, 6, 9, and 12 in Table 3.