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Does State Unemployment Insurance Modernization Explain the Trajectories of Economic Security Among Working Households? Longitudinal Evidence from the 2008 Survey of Income and Program Participation

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Abstract

While research has paid substantial attention to the impact of the Great Recession on the economic well-being of working households and the uneven economic recovery among different sociodemographic groups, limited research is available on the association between state-level Unemployment Insurance (UI) protection and household-level economic recovery during the postrecessionary years. Using nationally representative panel data from the 2008 Survey of Income and Program Participation, this study examined the relationship between state UI modernization and the growth trajectory of economic security among American working households. After controlling for state-level and household-level covariates, the results of the multilevel growth modeling showed that, on average, the state enactment of UI modernization provisions was associated with a faster improvement rate of household economic security over a five-and-a-half-year period. The findings have implications for future studies concerning UI provisions and household economic security.

Keywords: Unemployment Insurance modernization, economic security, multilevel growth modeling, Survey of Income and Program Participation (SIPP), Great Recession

The Great Recession (2007–2009), which was the most prolonged economic downturn since the Great Depression in the 1930s, caused the unemployment and economic insecurity of many American workers (Grusky, Western and Wimer 2011; Hout, Levanon, and Cumberworth 2011; Smeeding, Thompson, Levanon, and Burak 2011). Massive unemployment challenged the capability of the American social safety net to protect the economic security of working households. Unemployment Insurance (UI), which is a federal-state social insurance program established in 1935 under the Social Security Act, is the "first line of defense" against income insecurity for American working families during economic downturns (Larson and Murray 1954, p.186). UI provides unemployment compensation for workers who lose their jobs by no fault of their own. A UI system enhances the economic well-being of working families via the following dual policy mechanisms: smoothing consumption and stabilizing the macroeconomy (Burtless and Gordon 2011; Fujita 2010; Gould-Werth and Shaefer 2013). To provide income support for unemployed workers and stimulate the economy, Congress passed the Unemployment Insurance Modernization Act (UIMA) as a part of the American Recovery and Reinvestment Act (ARRA) in 2009, which provided incentive funding that totaled $7 billion to states for reforming their UI programs (Shelton, Romig, and Whittaker 2009). However, only two-thirds of the states (including the District of Columbia) satisfied the full federal requirements of incentive funding (U.S. Department of Labor 2011), which generated differential UI policy treatments for working families across the United States.

While researchers have paid substantial attention to the impact of the Great Recession on the economic well-being of working households and the uneven economic recovery among different sociodemographic groups (Albelda 2013; Grusky et al. 2011; Hout et al. 2011; Hoynes, Miller, & Schaller 2012; Smeeding et al. 2011), researchers have not directly investigated UI protection and household-level economic recovery during the postrecessionary years using

nationally representative household panel data. This study makes a unique contribution to the UI literature by merging the 16-wave nationally representative Survey of Income and Program Participation (SIPP) panel data (2008–2013) with state-level data to perform a longitudinal analysis of the association between state UI modernization and the improvement in household economic security during and after the Great Recession. The findings show that working households could have experienced a lower level of economic security and a slower rate of economic improvement if states had not enacted UI modernization provisions. These findings have implications for future research concerning household economic well-being and future policy reforms to strengthen UI protection.

Literature Review

The Great Recession and the Economic Security of Working Households

By assessing the changes in the gross domestic product (GDP), the National Bureau of Economic Research (NBER) declared that the Great Recession began in December 2007 and ended in June 2009 (NBER 2010). Researchers have employed alternative measures to capture the economic recovery of working households, including changes in (un)employment rate, average earnings, median household income, and poverty rate at the aggregate national level. For example, the unemployment and poverty rates in postrecessionary years remained higher than their prerecession levels as of the end of 2016. The unemployment rate increased from 4.6% in 2007 to a peak of 9.6% in 2010 and remained at 4.9% in 2016 (U.S. Bureau of Labor Statistics 2018). The poverty rate for people aged 18 to 64 increased from 10.9% in 2007 to a peak of 13.8% in 2010 and remained at 11.6% in 2016 (Fontenot, Semega and Kollar 2018). These data suggest that many working households have struggled to satisfy their basic needs and re-establish stable household incomes. However, the NBER-declared economic recovery does not fully reflect the improvement in economic security experienced by working households because changes in labor

market outcomes and the corresponding changes in the economic well-being of households often lag behind GDP changes. Research using cross-sectional aggregate indicators is limited to direct inferences regarding the trajectories of individual households as they recovered their economic security.

Previous studies have suggested that the Great Recession unevenly impacted different demographic groups. For example, Hoynes, Miller, and Schaller (2012) used the Current Population Survey with state panel modeling and determined that the state-level unemployment rates of men, black and Hispanic workers, youth, and low-education workers were more responsive to economic recessions than those of women, whites, prime-aged workers and high-education workers. The cyclical variation across industries is the most common explanation for the differential responses to economic recessions across demographic groups; hard-hit demographic groups are more likely to work in highly cyclical industries, such as construction and manufacturing (Hoynes et al. 2012; Peterson 2012). Because these male-dominated industries were more sensitive to the downturns and suffered disproportionate job losses, "mancession" and "hecovery" became common narratives to describe the disadvantage of male workers during the Great Recession (Perterson 2016). Feminist scholars have highlighted the disguised gender inequalities in the discourses of "mancession" and "hecovery" by arguing that women's economic security suffered after the Great Recession due to recession-induced governmental budget deficits (Albelda 2013; Peterson 2012; Strolovitch 2013). Cutbacks to public social and health services disproportionately affected women and people of color, who are disproportionately employed in the public sector (Fukuda-Parr, Heintz, and Sequino 2013) and more likely to benefit from government programs (Albelda 2013). Thus, a full understanding of the economic security of American working households requires an analysis of an economic measure that considers household earned income, government transfers, and economic security

thresholds in the years following the Great Recession. In addition, an examination of how household economic recovery trajectories are related to sociodemographic, job characteristics and policy environments is important.

Currently, research has not examined the economic trajectories among working-age households after the Great Recession and how different recovery trajectories relate to state social policy choices by using nationally representative household panel data. Given that UI functions as "the first line of defense" for the economic security of working households (Larson and Murray 1954, p.186), this research focuses on examining the association between state UI modernization and the trajectory of household economic security during and after the Great Recession while considering household sociodemographic and job characteristics.

Unemployment Insurance and the Economic Security of Working Households

UI achieves the policy goal of ensuring the economic security of working households by the following dual mechanisms: smoothing consumption and stabilizing the macroeconomy ((Burtless and Gordon 2011; Fujita 2010; Gould-Werth and Shaefer 2013). Via the consumption-smoothing mechanism, the UI provides income support for workers to maintain their purchasing power and avoid economic hardship during unemployment spells. To be qualified for UI benefits, UI claimants are asked to continue to engage in job search or training activities. The cooperative workforce system helps unemployment workers return to the workforce or advance their job skills to attain better opportunities. On the other hand, via the economic stability mechanism, when UI beneficiaries immediately spend their UI benefits on goods and services, the economy is stimulated so that jobs are retained and created in communities (Fujita 2010; Burtless and Gordon 2011). By these two mechanisms, the economic security of working households is ensured regardless of their employment status.

Since the implementation of UI in 1935, eligibility restrictions have disproportionately excluded many nonwhite, nonindustrial, or female workers (e.g., agricultural workers and domestic workers) who do not have stable labor market attachments (Lieberman 1998; Lovell 2002). The definition of employment in covered work typically excludes workers who are self-employed freelancers or independent contractors (non-W2 employees) (McKay, Pollack and Fitzpayne 2018). Workers in the on-demand or gig economy are often misclassified as independent contractors rather than traditional employees (Berg 2015). In practice, UI laws require a covered unemployed worker to satisfy both monetary eligibility criteria and nonmonetary eligibility criteria to qualify for UI benefits (U.S. Department of Labor 2015). With respect to monetary eligibility criteria, the jobless worker must have earned at least a certain amount of money during a base period, which typically is the first four of the past five completed calendar quarters prior to unemployment. Regarding nonmonetary eligibility criteria, the worker must leave the labor force by no fault of his or her own (e.g., layoff or job site closure), must be available to work, and must be actively seeking employment (Shaefer 2010). Scholars have critiqued the UI system for not keeping pace with fundamental changes in the U.S. workforce, which has shifted from a primarily male, full-time workforce in the manufacturing sector toward a significantly female, part-time workforce in the service sector (Burtless 2008; Kalleberg 2011). The outdated monetary eligibility criteria largely exclude low-skilled, low-wage workers who are disproportionately part-timers (Lindner and Nichols 2012). Due to these monetary and nonmonetary restrictions, only 37% of unemployed workers collected unemployment benefits in 2007—the onset of the Great Recession (U.S. Department of Labor 2007).

In response to the changing workforce of the postindustrial economy and the increasing unemployment due to the Great Recession, the UIMA of 2009 provided $7 billion for states to reform their UI programs to provide more inclusive and adequate income support for

unemployed workers (U.S. Department of Labor 2009). Each state could qualify for a share of incentive funding by demonstrating that its UI law includes certain UI modernization provisions. To request the first one-third of the ARRA funding for UI modernization, a state was required to adopt an alternative base period (ABP), which shifts the window during which earnings requirements are examined. Thus, a worker could alternatively use wages in the most recent four completed calendar quarters if the worker failed to qualify for UI during the regular base period (Gould-Werth and Shaefer 2013). To obtain the remaining two-thirds of the state's share of the ARRA funding, a state was required to adopt two of the following four provisions: (1) part-time provision: permitting former part-time workers to receive UI benefits while seeking only part-time work; (2) alternative good reasons: allowing compelling family reasons for separating from employment, including domestic violence, spouse relocation, and caring for an ill or disabled family member; (3) training benefits: providing extended benefits to UI claimants who participate in qualifying training programs; or (4) dependent allowance: providing an allowance of at least $15 per dependent per week (U.S. Department of Labor 2009).

Even though the UIMA of 2009 was initiated at the national level, considerable variations in policy reforms existed across 50 states and the District of Columbia, including full reform in 34[1] states, partial reform in five states, and no reform in 12 states (U.S. Department of Labor 2011) (Table 1). Regarding the previously mentioned UI dual mechanisms, failure to fully implement UI modernization nationwide would undermine the effectiveness of UI in ensuring the economic security of American working households during and after the Great Recession (Figure 1).

(TABLE 1 HERE)

[1] The numbers of states in this paragraph and Table 1 include 50 states and the District of Columbia and exclude Puerto Rico and Virgin Islands.

(FIGURE 1 HERE)

Previous research has shown that the UI system has an important role in stabilizing macroeconomic performance in terms of the GDP or employment rate at the aggregate national and state levels (e.g., Vroman 2010a; Congressional Budget Office 2011). Research has also indicated that UI benefits significantly reduced national poverty rates among workers and households with different demographic characteristics (e.g., Vroman 2010b; Congressional Budget Office 2011). As previously argued, however, these aggregate indicators do not permit direct inferences regarding the household-level trajectories of economic security experienced by workers and their household members. In the aftermath of the Great Recession, substantial UI research has focused on the relationships between UI benefit duration and workers' labor market outcomes, such as the length of the unemployment spell, re-employment or labor force withdrawals (e.g., Howell and Azizoglu 2011; Rothstein 2011; Farber and Valletta 2013) at the individual level. Although studying the effect of UI benefits on workers' behavioral responses contributes to our understanding of individual workers' unemployment experiences, researchers often overlook UI's social protection function, i.e., providing economic security to working households using the dual mechanisms.

With a specific focus on UI modernization provisions, previous studies have documented large variations in states' policy provisions (e.g., Ben-Ishai, McHugh, and McKenna; Ben-Ishai, McHugh, and Ujvari 2015; Bivens, Smith, Wilson 2014; Chang, 2019; Vroman 2011); however, limited studies have applied nationally representative data to estimate the impact of state UI modernization on working households. The few exceptions include Stephan Lindner and Austin Nichols (2012), who used the SIPP panels from 1997 to 2007 to assess the potential impact of UI modernization on benefit eligibility among unemployed workers. These researchers discovered that the share of unemployed workers who are eligible for UI benefits would have increased

from 53.6% to 71.7% if all states had adopted the ABP, part-time provision, and alternative good reasons for job separation. A follow-up study examined the effect of UI modernization on eligibility between 2008 and 2013 and showed similar results (Callan, Linder, and Nichols 2015). Gould-Werth and Shaefer (2013) specifically examined whether adopting the ABP increases UI receipt among unemployed workers with different educational levels and part-time/full-time status. Using the cross-sectional Current Population Survey (CPS) data from 1986 to 2011, these authors observed a significant association between ABP adoption and UI receipt only among unemployed part-time workers with less than a high school degree.

However, these three studies investigated only partial UI modernization provisions and exclusively estimated the effect of UI modernization on increasing eligibility or receipt among individual workers. The policy impacts omitted from these approaches include (1) the consumption-smoothing effect of all UI modernization provisions on unemployed workers' households, in which members shared economic resources and (2) the economic stimulating effect on the entire population of working households who benefited from UI modernization. Research has shown that households in states with highly accessible UI programs, compared with their counterparts, experienced less significant household income losses during the Great Recession (2007–2009) (Bentele 2012). However, the extent to which states' enactments of UI modernization provisions explained the economic improvement of working households during the Great Recession and its aftermath remains unknown.

Research Questions and Hypotheses

The federal UI modernization incentive funding (2009–2011) created a policy environment for investigating the relationship between state-level UI modernization and household economic recovery. I exploited the temporal variation in the implementation of UI modernization across

states and the temporal variation in household-level economic security to investigate whether states' enactment of UI modernization explains the variation in household economic trajectories. My research questions and hypotheses are presented as follows.

(1) How did the level of economic security of American working-age households change from 2008 to 2013? Given that the study period covers the Great Recession and its subsequent recovery years, I anticipated a significant nonlinear time effect on household economic security (in terms of the household income-to-poverty level). I also hypothesized that the level and rate of change in household economic security varied among working-age households across states and that these variations can be explained by household-level and state-level factors.

(2) To what extent did the sex of the householders explain the various trajectories of economic security among working-age households after controlling for other household-level sociodemographic and job characteristics? The feminist mancession-and-hecovery hypothesis suggests that male-headed households had a higher level of economic security and experienced a rapid growth rate in economic security at the end of the study period. Given that males are overrepresented in highly cyclical industries, such as construction and manufacturing, and that females are overrepresented in social and health services, I anticipated that the effect of sex on household economic security trajectories could weaken after accounting for the job characteristics of the household heads.

(3) To what extent did the states' enactment of UI modernization provisions explain the various trajectories of economic security among working-age households after controlling for state-level and household-level covariates? I hypothesized that working-age households would have had a lower level and slower rate of improvement in economic security at the end of the study period if the states had not adopted UI modernization provisions after accounting for state-level and household-level covariates.

Methods

Dataset and Sample

I merged the 2008 SIPP data with state-level data from multiple governmental data sources. The 2008 SIPP selected a nationally representative sample of the noninstitutionalized resident population of the U.S. The survey interviewed the sampled households every 4 months from May 2008 to November 2013 for a total of 16 waves (US Census Bureau 2009). Respondents reported backward monthly data in each wave, which produced four household-month data records for each household per wave. The unit of analysis in this study is a household. I used a household to capture income resources shared by people who live together because SIPP's definition of a family excludes household members who have a nonmarital relationship with the family reference person. The SIPP is well suited for this study compared with the Annual Social Economic Supplement (ASEC) of the Current Population Survey (CPS) or the American Community Survey for several reasons. First, a longitudinal design enables researchers to study the trajectories of household economic security. Second, detailed questions about economic resources provide a best possible estimate of household economic well-being at the lower end of the income distribution. Third, the 2008 panel that addresses multiple monthly data points before, during, and after the implementation of UIMA enables researchers to estimate potential policy effects on household economic trajectories.

Given my focus on the total impact of UI modernization (via both mechanisms of smoothing consumption and stabilizing the macroeconomy) on workers and their household members, I defined my study population as working-age householders and their household members (referring to working households in the following content) regardless of their employment status and UI receipt during the study period. Using the unique id of each

householder, I linked their available monthly occasions from the 16 wave data. Using this sample prevented selection bias and enabled an examination of the potential UI modernization effect on working households in a realistic context (Lachin 2000). However, householders younger than 25 years were excluded because younger adults were primarily students and did not belong to the workforce (Davis and Bauman 2013). Householders aged 65 years or older were excluded because elderly adults were more likely to leave the workforce and retire during the Great Recession when job opportunities were limited (Coile and Levine 2011). Monthly observations of householders could be partially included in the sample if their ages fell between 25 years and 64 years. If a household member became a householder (either of the original household or a new household) in a given month, the new householder joined the sample. The sample included a total of 1,418,368 monthly occasions from 36,696 households in the 50 states and the District of Columbia.

Measures

I employed the household income-to-poverty level (referring to poverty level in the following content) in percentage to measure household economic security because use of a dichotomous poverty measure did not help me to gauge the similarity between a household's income and its poverty threshold. I took into account states' cost-of-living standards by applying the annual state regional price parities (U.S. Bureau of Economic Analysis 2014, 2015) to adjust states' poverty thresholds. A sensitivity test confirmed that this approach generated more conservative estimates. When calculating total household income, I only included household earned income and UI benefits and excluded other governmental income supports to reduce the potential confounding effects from other income support programs.

The time, sex of the householder, and state status of UI modernization are three primary predictors of household poverty level in this research. Time was measured by month to capture

the systematic changes in the household poverty level over a 67-month (five-and-a-half-year) period. I transformed the unit of time from a briefer unit (month) to a longer unit (year) to prevent the rounding errors of the small effects of month but retained the results of the unaffected tests (Singer and Willet 2003). The recoded time variable is scaled from -5.5 to 0 (from May 2008 to November 2013). The sex of the householder is a time-invariant dichotomous variable (female=1). The status of UI modernization in each state is a dichotomous and time-varying variable. I coded a state's status of UI modernization as 1 when its first post-ARRA UI modernization provision took effect in a given month after February 2009 (Table 1). A state that did not implement any reforms after the federal intervention was coded as 0 in the study period.

I controlled for several state macroeconomic and policy characteristics to adjust the estimated association between state UI modernization and household poverty level. (1) Macroeconomic status: State macroeconomic conditions affected the employment opportunities available for people in the state. Thus, I controlled for the states' monthly unemployment rate. (2) Industrial structure: A state industrial structure determines a state's economic base. Because the construction and manufacturing industries were hit hardest by the Great Recession (Hout et al. 2011), I controlled for state location quotients for construction and manufacturing in 2007—before the Great Recession made its impact. (3) State policy environment: Given that the state UI financing capacity affected the strength of the social protection of workers during and after the Great Recession (Chang, 2019), I controlled for the quarterly state UI recipiency rate and state UI trust fund reserve ratio (data retrieved from the Department of Labor, 2019). The reserve ratio measured a state's UI trust fund balance as a percentage of the total wages paid during the prior 12 months. I also controlled for the annual state TANF/SNAP maximum monthly benefit level for a 3-person household, state EITC maximum credit for a 3-dependent household, state minimum wage (data retrieved from the University of Kentucky Center for Poverty Research,

2019), and state government political ideology (developed by Berry et al. 2010) during the study period to prevent other state-level policy changes from confounding the effect of UI modernization on the household poverty level.

In addition to state-level covariates, I controlled for several household-level covariates and the measurement bias of the SIPP panel. The household-level covariates included age, race, educational attainment, marital status, urban/rural status, means-tested welfare recipiency, average weekly work hours, occupations of household heads, and number of other adults and children in the household. All household-level covariates were time-varying, with the exception of the race of the householders. I included a variable that distinguished the interview months (fourth month in each wave) from the noninterview months (first to third months in each wave) to account for potential measurement biases due to a four-month interview period of the SIPP design, during which respondents tend to report more accurate income in the interview month than in noninterview months (U.S. Census Bureau 2009) and fewer changes within a wave than between two waves (Moore 2008).

Multilevel Growth Modeling and Analytic Process

I employed multilevel growth modeling to examine the associations between state UI modernization and the systematic changes in the household poverty levels after Congress passed the UIMA. Several reasons made multilevel growth modeling an appropriate approach to assess the relationship. First, compared with conventional nonexperimental econometric models, such as the first difference and the difference-in-difference methods, empirical research shows that modeling outcome trajectories using multilevel modeling can capture more complex trajectories and produce a more accurate account of the intervention effects (Gordon and Heinrich 2004). Researchers also note that difference-in-difference studies have largely disregarded the time-series correlation, which generates a serious bias in estimating the standard error of the policy

effect and a potential false rejection of the null hypothesis of no effect (Bertrand, Duflo, and Mullainathan 2002). Second, the multilevel growth modeling controlled for group-related dependency by partitioning the variance into within-group components and between-group components. This practice yields testing predictors at each level and the cross-level interaction effects (Hoffman 2015). The current analyses considered three-level modeling—occasions nested in households that are nested in states—to examine the household economic trajectories from 2008 to 2013 and test whether household economic trajectories were associated with state UI modernization implementation. Third, multilevel growth modeling is flexible in terms of fitting unbalanced data because it employs all available information to generate estimates of growth trajectories regardless of the number of occasions that a household contributed to the dataset (Singer and Willett 2003). This feature is particularly useful for the SIPP panel data, in which the numbers of occasions extensively vary across households.

I performed a set of multilevel models in sequence using Stata/MP 15. First, I employed 1,418,368 monthly observations of 36,696 households and two empty mean models, i.e., two-level (time and household) empty mean model and three-level (time, household, and state) empty mean model that did not include any predictors, to test whether a three-level model was warranted. The deviance difference test confirmed that the model fit of the three-level model was a significant improvement over the two-level model (LR chi2=498.33, $p<.001$). This finding suggested that the analytic models should take into account state-level factors when estimating the household poverty level. Second, I build a series of three-level growth models (from an unconditional nonlinear growth model that only included the linear and quadratic time effects to several conditional nonlinear growth models that considered different sets of predictors and covariates) to answer the research questions (refer to detailed description in the results section).

The following equation shows the composite notation of the final conditional nonlinear growth model, in which *t* indicates time (level 1), *i* indicates household (level 2), and *j* indicates state (level 3). Given the time-varying nature of the UI modernization (UIM) status, this variable was state-mean centered to estimate the within-state effects and address the potential bias introduced by confounding state characteristics (Chaplin 2003; Hoffman and Stawski 2009; Wang and Maxwell 2015). This approach is equivalent to the Mundlak (1978) device, which is extensively adopted in the panel data econometrics literature to address the correlations between the endogenous regressors and the error terms by replacing the original state UIM variable with a state-mean centered UIM variable ($UIM_{tij} - \overline{UIM}_j$) and a state mean of UIM variable ($\overline{UIM}_j$). My model's estimates of state UI modernization (γ_{001}, γ_{101}, and γ_{201}) are not subject to the omitted state-level variable bias if the omitted variables are time-invariant. The interactions between the state-mean centered UIM variable ($UIM_{tij} - \overline{UIM}_j$) and the time variables capture the association between the state UIM status and the growth trajectory of the household poverty level (net of the underlying time trend in the household poverty level that influences households in all states similarly). The estimates determine whether the increase in the rate of growth of the household poverty level was dependent on the state UIM status. My model assumes that the rate of growth of the household poverty level would have been the same in the absence of UIM adoption (unobserved counterfactual). In the results section, I interpret the estimated coefficient of the state UIM status as the average counterfactual effect of the state UIM on the household poverty level at the end of the study period.

The composite notation of the final conditional growth model:

$$
\begin{aligned}
HPL_{t+1ij} = {} & (\gamma_{000} + \gamma_{100}TIME_{tij} + \gamma_{200}TIME_{tij}^2 + \gamma_{001}(UIM_{tij} - \overline{UIM}_j) + \gamma_{101}(UIM_{tij} - \overline{UIM}_j) * TIME_{tij} + \\
& \gamma_{201}(UIM_{tij} - \overline{UIM}_j) * TIME_{tij}^2 + \gamma_{002}\overline{UIM} + \gamma_{201}\overline{UIM}_j * TIME_{tij} + \gamma_{202}\overline{UIM}_j * TIME_{tij}^2 + \\
& \sum_{x=3}^{n} \gamma_{00x}[\text{State Cov.}]_{tij} + \sum_{x=3}^{n} \gamma_{10x}[\text{State Cov.}]_{tij} * TIME_{tij} + \sum_{x=3}^{n} \gamma_{10x}[\text{State Cov.}]_{tij} * TIME_{tij}^2 + \\
& \sum_{y=1}^{n} \gamma_{0y0}[\text{HH Cov.}]_{tij} + \sum_{y=1}^{n} \gamma_{1y0}[\text{HH Cov.}]_{tij} * TIME_{tij} + \sum_{y=1}^{n} \gamma_{2y0}[\text{HH Cov.}]_{tij} * TIME_{tij}^2 +
\end{aligned}
$$

$$\gamma_{300}\,\text{InterviewMon}_{tij}) + (u_{00j} + u_{10j}\,\text{TIME}_{tij} + u_{20ij}\text{TIME}_{tij}^2 + r_{0ij} + r_{1ij}\text{TIME}_{tij} + r_{2ij}\text{TIME}_{tij}^2)$$

Outcome:

- HPL_{t+1ij}: household poverty level at time $t+1$ of household i in state j

Fixed components:

- γ_{000}: the average level of HPL
- γ_{100} and γ_{200}: the rate of change and the changing rate of change in HPL
- γ_{001}: the fixed effect of state UI modernization on HPL
- γ_{101} and γ_{201}: the fixed effect of UI modernization on the rate of change and the changing rate of change in HPL
- $\sum_{x=2}^{n} \gamma_{00x}$: a set of the effects of state-level covariates on HPL
- $\sum_{y=1}^{n} \gamma_{0y0}$: a set of the effects of household-level covariates on HPL
- γ_{300}: the estimate of measurement bias on HPL

Random components:

- u_{00j}: state-specific residuals
- u_{10j}: state-specific residuals of the rate of change
- u_{20j}: state-specific residuals of the changing rate of change
- r_{0ij}: household-specific residuals
- r_{1ij}: household-specific residuals of the rate of change
- r_{2ij}: household-specific residuals of the changing rate of change
- e_{tij}: observation-specific residuals

All model parameters were estimated by the restricted maximum likelihood method, which is a method for testing hypotheses about variance components and estimating parameters that jointly maximize the likelihood (Singer and Willett 2003). I applied Wald test p-values to evaluate the fixed effects and performed a deviance difference test to evaluate random effects (Hoffman 2015). After determining the final model, I assessed assumptions of the normal distributions and the constant variance at each level in accordance with steps suggested by Tom Snijders and Roel Bosker (2012). These diagnostic results indicate that all assumptions of multilevel modeling are satisfied.

Results

Trajectory of Household Economic Security from May 2008 to November 2013

To answer the first research question regarding how the trajectory of household economic security (in terms of household poverty level) changed from 2008 to 2013, I tested the linear and quadratic time effects in an unconditional growth model that only includes time effects (Model 1 in Table 2). The coefficient of the linear term of time represents the average rate of change in the household poverty level at the end of the study period, and the coefficient of the quadratic term of time represents the average changing rate of change in the household poverty level during the study period. The findings from model 1 confirm hypothesis 1, which states that the average household economic trajectory was nonlinear given the significant quadratic time effect (Model 1, γ_{200}=1.86, p<.001). The estimated coefficients show that the average household poverty level was 319.84% of the federal poverty line (FPL) with an average linear rate of change of 2.77% per year in November 2013, which was the ending month of the study period (Column 1 in Table 2). However, this rate of change was not constant over time. The model predicts an accelerated rate of change of 3.72% of the FPL per year by taking the derivative of the coefficient for the quadratic term of time (Model 1, γ_{200}=1.86, p<.001). This model shows that the downward trajectory in the household poverty level hit its lowest level of 318.81% of the FPL and rebounded in March 2013. Despite the positive and accelerated rate of change in household poverty level at the end of the study period, the average household poverty level remained lower than its level at the beginning of the study period (360.83% of the FPL in May 2008). This finding reveals that American working households had not fully recovered from the Great Recession in the four-and-a-half years after June 2009, which is the NBER-declared end of the Great Recession (Figure 2).

(TABLE 2 HERE)

(FIGURE 2 HERE)

Building on a nonlinear unconditional growth model, I tested whether the average economic trajectory significantly varies across households in different states by specifying a set of random effects (variance component) at the household and state levels. The deviance difference tests showed that the model fit significantly improved by adding random time effects across households (LR chi2= 473846.48, p<.001), and the model fit further improved significantly by adding random time effects across states (LR chi2= 8.16, p<.05). These results indicate that the differences in the growth rate of the household poverty level can be explained by both household-level and state-level characteristics.

Sociodemographic Characteristics and Household Economic Security Trajectories

To address the second research question regarding the extent to which the sex of the householders explained the variation in the trajectories of economic security among working households, I tested a conditional nonlinear growth model that included sex as a predictor of the level and the change rate of the household poverty level (Model 2 in Table 2). To examine the adjusted sex effect on the household's economic security trajectory, I included a set of sociodemographic and job characteristics of the household heads as covariates in Model 3. The results of Model 2 indicate that the household poverty level significantly differed by sex (γ_{010}=-61.98, p<.001), while the male-female difference in the growth rate of the household poverty level did not reach the statistical significance threshold of $p < .05$, though it showed a theoretical direction as predicted by the feminist mancession-and-hecovery hypothesis (γ_{210}=-0.97, $p < .1$). After controlling for other sociodemographic and job characteristics of the household heads, the adjusted sex difference in the household poverty level remained significant but decreased (γ_{200}=-28.20, p<.001, Model 3 in Table 2). The estimates based on Model 3 show that a management or professional occupation, lower number of weekly work hours, college degree, younger age,

married household head, lower number of children in the household, higher number of other adults in the household, urban status, and nonwelfare recipiency status were significantly associated with a faster growth rate of household economic security. Household-level sociodemographic and job characteristics need to be simultaneously considered in a model when investigating the relationship between states' enactment of UI modernization and household economic security trajectories.

State UI Modernization and Household Economic Security Trajectories

This section presents the results that address research question 3 regarding the extent to which the states' enactment of UIM provisions explains household economic security trajectories after controlling for household-level and state-level covariates. Model 4 in Table 3 tests the association between state UIM and the household economic security trajectory after controlling for household-level covariates. The three coefficients of UIM in Model 4 (γ_{001}, γ_{101}, and γ_{201}) may be biased due to unobserved characteristics between UIM states and non-UIM states. Model 5 adjusts these estimates for state UIM by adopting the Mundlak device. Building upon Model 5, Model 6 further includes other state-level covariates to address the concern about other state-level time-varying confounders. The three coefficients of UIM in Model 6 (γ_{001}, γ_{101}, and γ_{201}) estimate the average counterfactual effects of state UIM on the level and rate of change in the household poverty level at the end of the study period. The magnitude of these effects increased after adjusting for the state-level covariates (Table 3).

The results confirm that state UIM was associated with both the level and the rate of change in the household poverty level. Columns 7-9 in Table 3 provide the estimates of Model 6, i.e., final conditional growth model. The first estimated coefficient of UI modernization (γ001) suggests that, on average, state UIM was associated with an 18.24% higher household poverty

level at the end of the study period. The second and third coefficient estimates of UIM (γ101 and γ201) suggest that, on average, state UIM was associated with a faster growth rate of 19.12% (14.46 + 2.33 × 2) of the PFL per year in November 2013 after controlling for all other variables in Model 6. A growth rate of 19.12% of the PFL can be transformed into an increase of approximately $376 in household monthly income for a household of four (two adults and two children) in 2013. These findings support hypothesis 3 that, on average, working households would have experienced not only a lower level of economic security but also a slower economic improvement rate at the end of 2013 if states had not enacted UIM, after accounting for state-level and household-level characteristics.

The subsample analysis of female-headed and male-headed households shows that the association between state UI modernization and the household economic security trajectory was larger among female-headed households than male-headed households (γ001: 19.73 v.s. 15.89; γ002: 15.11 v.s. 13.21; γ003: 2.36 v.s. 2.21). I further tested this male-female difference by adding the sex-UIM interaction to Model 6. The results showed that the male-female difference in the association between state UI modernization and the trajectories of household economic security did not reach a statistically significant level. This evidence was not strong enough to determine whether states' UI modernization mitigated or reinforced the male-female difference in the trajectories of household economic security.

(TABLE 3 HERE)

This research employed multiple monthly data points after the federal intervention of the UIMA. This longitudinal nature yields an analysis of short-term and long-term associations between state UIM and household economic security. Figure 3 presents the estimates of the final conditional growth model (Model 6) with three sets of coefficients conditioned in August 2011, October 2012, and November 2013, which represents the estimated effect at the end of the

federal UIMA intervention, the estimated effect at the midpoint between the end of the federal UIMA intervention and the end of the study period, and an estimated longer-term effect at the end of the study period. These estimates show that the average marginal effect did not reach statistical significance in August 2011 and October 2012. However, this effect reached a significant magnitude of 18.2% ($p<.05$) in November 2013. This increasing difference in the household poverty level was attributed to the different rates of change in the two estimated trajectories over time (Figure 4). This longitudinal evidence indicates that working households would have recovered from the Great Recession later if states had not enacted UIM provisions.

(FIGURE 3 & 4 HERE)

Discussion and Conclusion

This research contributes to the literature concerning household economic security, the Great Recession, and UI policy by examining whether state UI modernization was related to the household economic trajectory among American working households from the Great Recession throughout the ensuing years. The findings using the unconditional nonlinear growth model showed that the economic security of working households did not fully recover in the five-and-a-half years after the onset of the Great Recession. The Census poverty statistics indicate that the increasing family poverty rate accelerated from 9.8% in 2007 to the highest level of 11.8% in 2010, remained high at 11.8% in 2011 and 2012, and gradually decreased from 11.7% in 2013 to 9.0% in 2018 (U.S. Census Bureau, 2019). These official poverty rates mirrored my findings regarding the delayed recovery of the household poverty level after the official ending of the Great Recession.

My findings further indicate that the level and rate of improvement in the household poverty level significantly varied among households across states. By examining the household-level characteristics, I discovered that female-headed households experienced a significantly and

continuously lower level of economic security than the male-headed households during and after the Great Recession. This result supports feminist economists' critiques of the myth of the "mancession" narratives, which are built on a simplistic analysis of unemployment data and mask the persistent male-female gap in earnings, job quality, and underemployment rates (Fukuda-Parr et al. 2013; Peterson 2012, 2016). My findings also reveal that households with a single or never-married household head and households with a higher number of children were associated with a lower level of economic security and a slower rate of economic recovery during the study period, which suggests a sluggish economic recovery among single-parent households with children.

By examining the state-level policy environment, I discovered that working households would have experienced a lower level of economic security and a slower rate of economic improvement if states had not implemented UI modernization provisions after controlling for state-level and household-level covariates. Compared with previous UI research, this longitudinal evidence provides a more nuanced understanding of the relationship between states' enactment of UI modernization provisions and the economic recovery of working households over a five-and-a-half-year study period. First, the association between state UIM and the accelerated rate of change in household economic security can be attributed to the time lag between the passages of state UI reform laws and the actual times at which the reform laws were implemented. States had a grace period of 12 months to implement new UI laws after their UI modernization incentive funding was certified (Unemployment Insurance Program Letter 2009). For example, in Washington State, the State Legislature passed a UI law that expanded training benefits in 2011; however, this law did not take effect as a permanent law until July 2012 (Washington State Employment Security Department 2010). In California, the original Alternative Base Period Bill (ABx3-29) was passed and signed into law in March 2009 with an

implementation date of April 2011. However, the California State Legislature extended the implementation date to April 2012 due to the long process of updating the state UI database, upon which the implementation of the ABP depended (U.S. Department of Labor 2011). Second, once given the support of UI modernization provisions and workforce services, UI recipients may spend a longer time searching for a job that better matches their skills and expected salaries. Thus, household income significantly improves in the long term (Caliendo, Tatsiramos, and Uhlendorff 2013; Fujita 2010). Without the support of the state UI system and its corresponding workforce services during the prolonged economic downturn, unemployed workers may become discouraged and stop searching for a job. Consequently, jobless workers and their households continuously experienced economic insecurity. Third, the state UI system functions as an economic stimulus to the state economy by smoothing unemployed families' consumption and retaining and boosting jobs in communities (Mishel and Shierholz 2010). Therefore, working households in a state with UI modernization provisions benefited from the faster recovery of the state economy. The lagging state implementation of UI modernization provisions, unemployed workers' behavioral responses, and the dual UI policy mechanisms, i.e., consumption smoothing and economic stimulation, can explain the association between state UIM and the growth rate of households' economic security over time. Evidence from this study establishes an important relationship between state-level UI protection and household-level economic outcomes in a longer term that has not been previously examined.

This study has certain limitations. First, the time frame of the 2008 SIPP panel that ended in November 2013 limits this study to capturing patterns of economic trajectories in the recent years. A more complete longitudinal assessment of the association between state UI modernization and household economic trajectories would be achieved if the 2008 SIPP collected data over a longer period. Although SIPP researchers have adopted an approach to

merging two panels to expand the longitudinal time frame, the redesigned survey structure and data collection process of the new 2014 SIPP panel pose a potential challenge to conducting a cross-panel study (Citro and Scholz 2009). Alternatively, researchers who are interested in evaluating the effect of a long-term UI policy on household economic trajectories can pool the annual cross-sectional CPS ASEC Supplement data to construct state-level time series data and perform two-level (state-time) growth models. However, this approach would have the limitation of making a direct inference about the longitudinal economic trajectories experienced by individual working households.

Second, the current research design establishes the association between state UI modernization and household economic security trajectories; however, its findings cannot make a claim for causation. The association may be confounded by an unobservable state-level time-varying variable. For example, when states' policymakers made decisions about adopting UI modernization provisions, they may have considered other state income or work-support programs, such as food assistance, medical assistance, child care, and tax credits, which are available to working households that experience economic hardships. Although my model controlled for time-varying state TANF and SNAP maximum monthly benefit levels and state EITC maximum credit, the observed UI policy effects may be driven by other policy changes. I attempted to limit this bias by excluding other income supports when measuring household income resources. To assess the potential confounding effects of other social safety net programs, I conducted a sensitivity test of the final model by using a household income measure that considers other benefits (e.g., cash assistance and food assistance). I determined that the magnitude of the estimated associations is slightly larger but the key findings remain, which suggests that the potential confounding effects of other social safety net programs may not be large enough for changing the main results.

Another limitation of this research is that the coefficients of state UIM capture the effect of UIM provisions as a whole rather than the effect of individual UIM provisions (or their different combinations) on working households. This research focuses on establishing the association between the total UIM enactment and household economic security as a first step for future research to examine states' complex choices about UIM provisions and how these choices are related to household economic security. This research did not differentiate the effects of state UIM by the following two mechanisms: consumption smoothing and economic stimulation. Future research can use appropriate research designs and identify subpopulations of working households to examine the two mechanisms.

Despite the limitations, this study has implications for research concerning household economic security and UI protection. First, this research takes advantage of nationally representative panel data and makes a unique contribution by providing longitudinal evidence regarding the relationship between the state policy environment and the household-level economic trajectory. The findings of this research suggest that state-level policy choices are important for household long-term economic improvement in addition to individual and household characteristics. Future research that focuses on household economic well-being should address the state-level policy environment and further examine how it interacts with time effects to explain household economic well-being over time. Second, this research adopted multilevel growth modeling, which is an alternative to conventional econometric modeling, to evaluate policy changes. Multilevel growth modeling has the capacity to address time-series correlations and evaluate the effect of differential policy on the trajectories of outcomes across sociodemographic groups by modeling cross-level interaction effects. For example, a research design that models an interaction effect between sex and policy reform on economic trajectory

can address the core interest in the sociology of understanding the extent to which a policy mitigates or reinforces the existing male-female difference in economic well-being.

This study also has important policy implications on both the state level and federal level. States can improve the economic security of working households by adopting UI policy provisions, including the alternative base period, alternative acceptable reasons for leaving the job market, part-time provisions, extended benefits for displaced workers in training programs, and dependent allowances. Nevertheless, some states' resistance to reforming their UI programs generated unequal UI support for working households across states, which undermines the social protection of the UIMA of 2009. The findings of this study also suggest that state-level policy efforts may have a continuous impact on the economic well-being of working households in the long term. To strengthen the economic security of American working households, future federal UI reform can consider a policy design that enables the federal-state UI system to function more effectively in providing equal protection to working households across states, including a federal standard for 26 weeks of state regular UI benefits and a federal mandated alternative base period to determine the qualifying wage for UI eligibility.

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TABLE 1. UI Modernization - Approved Provisions and Incentive Payments

State	1/3 Approval	2/3 Approval				Amount	Effective mm/yyyy of the first post-ARRA provision
	Alternative Base Period	Part-Time Workers	Compelling Family Reasons	Training Extension	Dependents Allowance	(millions)	
Alabama						$0.0	
Alaska	X[1]		X[1]		X	$15.6	01/2010
Arizona						$0.0	
Arkansas	X[1]	X[1]	X[1]			$60.0	07/2009
California	X[1]	X	X[1]			$838.7	01/2011
Colorado	X[1]	X[1]	X[1]			$127.5	07/2009
Connecticut	X		X[1]		X	$87.8	04/2009
Delaware	X[1]	X[1]	X[1]			$21.9	01/2010
DC	X	X[1]		X[1]		$27.6	07/2010
Florida						$0.0	
Georgia	X	X[1]		X[1]		$220.3	04/2009
Hawaii	X	X[1]	X[1]			$30.5	07/2009
Idaho	X[1]	X[1]		X[1]		$32.3	10/2009
Illinois	X		X[1]		X[1]	$301.2	01/2010
Indiana						$0.0	
Iowa	X[1]	X[1]		X[1]		$70.8	07/2009
Kansas	X[1]	X[1]		X[1]		$69.0	01/2010
Kentucky						$0.0	
Louisiana						$0.0	
Maine	X	X		X[1]		$28.2	04/2009
Maryland	X[1]	X[1]		X[1]		$126.8	03/2011
Massachusetts	X			X[1]	X	$162.7	10/2009
Michigan	X					$69.4	
Minnesota	X[1]	X[1]	X[1]			$130.1	08/2009
Mississippi						$0.0	
Missouri						$0.0	
Montana	X[1]	X[1]		X[1]		$19.5	05/2009
Nebraska	X[1]	X[1]		X[1]		$43.6	08/2011
Nevada	X[1]	X[1]	X[1]			$76.9	04/2009
New Hampshire	X	X	X[1]			$31.4	09/2009
New Jersey	X	X		X[1]		$206.8	03/2009
New Mexico	X	X			X	$39.0	
New York	X	X[1]	X[1]			$412.7	03/2009
North Carolina	X	X[1]	X[1]			$205.1	10/2010
North Dakota						$0.0	
Ohio	X					$88.2	
Oklahoma	X[1]	X[1]	X[1]			$75.9	11/2009
Oregon	X[1]		X[1]	X[1]		$85.6	03/2009
Pennsylvania						$0.0	
Rhode Island	X		X[1]		X[1]	$23.5	01/2011
South Carolina	X[1]	X[1]	X[1]			$97.5	01/2011
South Dakota	X[1]	X[1]		X[1]		$17.6	07/2009
Tennessee	X[1]	X[1]			X[1]	$141.8	06/2010
Texas						$0.0	
Utah	X[1]					$20.3	01/2011
Vermont	X	X		X[1]		$13.9	08/2011
Virginia	X					$62.8	
Washington	X		X[1]	X[1]		$146.6	07/2012
West Virginia	X[1]					$11.1	04/2009
Wisconsin	X		X[1]	X[1]		$133.9	05/2009
Wyoming						$0.0	
Total	39	26	19	16	7	$4,417.2	

Note.—Adapted from "Unemployment Insurance modernization incentive payment state certifications," by U.S. Department of Labor, 2011(http://www.doleta.gov/recovery/). [1]State amended its UI statute, modified its regulation, or clarified its procedures under current law in order to meet requirements for UIM funding.

TABLE 2. Mutilevel Growth Models (Unconditionial Growth Model and Conditional Growth Models with Household-Level Covariates)

		Model 1	Model 2			Model 3		
Outcome: Household Poverty Level		level	level	rate of change	changing rate of change	level	rate of change	changing rate of change
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Predictors	Coefficients							
Year (the rate of change)	γ100	2.77	5.54*			22.97*		
		(1.89)	(2.70)			(11.02)		
Year^2 (the changing rate of change)	γ200	1.86***	2.38***			3.02		
		(0.29)	(0.42)			(1.72)		
Female	γ010, γ110, γ210		-61.98***	-4.86	-0.97	-28.20***	-3.13	-0.43
			(6.12)	(3.68)	(0.57)	(5.80)	(3.65)	(0.57)
Race-White	(reference)							
Race-Black	γ020, γ120, γ220					-89.53***	2.25	-0.02
						(8.41)	(5.36)	-0.83
Race-Hispanic	γ030, γ130, γ230					-76.85***	3.93	0.83
						(8.90)	(5.77)	(0.91)
Race-Others	γ040, γ140, γ240					-8.58	7.76	1.07
						(10.55)	(6.77)	(1.07)
Education- Less than High School Degr	(reference)							
Education-High School Degree	γ050, γ150, γ250					16.24	0.98	0.05
						(9.31)	(5.85)	(0.90)
Education-College +	γ060, γ160, γ260					73.97***	1.36	1.14
						(9.23)	(5.83)	(0.90)
Occupation - No	γ070, γ170, γ270					-70.33***	-10.25*	-1.53*
						(5.75)	(4.05)	(0.66)
Occupation - Professional	γ080, γ180, γ280					79.08***	8.50**	1.56**
						(5.20)	(3.53)	(0.57)
Occupation - Services	γ090, γ190, γ290					6.76	4.25	0.50
						(4.88)	(3.33)	(0.54)
Occupation - Construction & Productio	(reference)							
Weekly Work Hours	γ0100, γ1100, γ2100					1.26***	-0.34***	-0.06***
						(0.09)	(0.06)	(0.01)
Marital Status - Married	(reference)							
Marital Status - Separated/Divorced/Wid	γ0110, γ1110, γ2110					-55.81***	-7.71*	-2.65***
						(5.03)	(3.37)	(0.55)
Marital Status - Never Married	γ0120, γ1120, γ2120					-69.98***	-19.60***	-4.91***
						(5.86)	(3.95)	(0.64)
Age	γ0130, γ1130, γ2130					-1.40***	-0.49**	-0.03
						(0.26)	(0.16)	(0.02)
Number of Children < 18yrs	γ0140, γ1140, γ2140					-35.81***	-4.34***	-0.95***
						(1.86)	(1.23)	(0.19)
Number of Other Adults	γ0150, γ1150, γ2150					12.30***	3.20*	0.11
						(2.06)	(1.40)	(0.23)
Metro	γ0160, γ1160, γ2160					49.17***	14.06***	2.5***
						(6.09)	(3.81)	(0.60)
Welfare Recipiency (No)	γ0170, γ1170, γ2170					25.60***	5.12*	0.97**
						(2.83)	(2.05)	(0.34)
4th Month	γ300					-0.82**		
						(0.31)		
Constant	γ000	319.84***	352.75***			311.48***		
		(7.43)	(8.05)			(18.27)		
Model Fit - Deviance		18753988	18753667			18715532		

Note.— 1.All of the coefficients are conditioned at the end of the study period (November 2013).
* p < .05. ** p < .01. ***p < .001.

TABLE 3. Multilevel Growth Models (Conditional Growth Models with State-Level and Household-Level Covariates

		Model 4			Model 5			Model 6		
Outcome: Household Poverty Level		level	rate of change	changing rate of change	level	rate of change	changing rate of change	level	rate of change	changing rate of change
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Predictors	Coefficients									
Year (the rate of change)	γ100	31.93**			35.38**			27.99		
		(11.56)			(11.85)			(40.66)		
Year^2 (the changing rate of change)	γ200	4.72**			5.01**			3.94		
		(1.79)			(1.84)			(5.68)		
UIM	γ001, γ101, γ201	7.68	5.17*	0.70*	13.34*	7.88*	1.01*	18.24*	14.46***	2.33***
		(4.81)	(2.54)	(0.35)	(6.03)	(3.10)	(0.41)	(7.12)	(3.97)	(0.56)
State Mean of UIM	γ002, γ102, γ202				11.35	-1.46	0.15	13.22	11.52	2.51*
					(17.73)	(5.45)	(0.84)	(18.36)	(6.98)	(1.05)
State-level covariates										
Construction Industry Index	γ003, γ103, γ203							-28.15	12.37	1.94
								(32.49)	(13.48)	(2.01)
Manufactory Industry Index	γ004, γ104, γ204							-6.63	10.22	0.69
								(20.04)	(7.52)	(1.12)
Unemployment Rate	γ005, γ105, γ205							-2.35	2.63**	0.64***
								(1.67)	(0.85)	(0.12)
UI Recipiency Rate	γ006, γ106, γ206							-0.43	-0.04	-0.02
								(0.40)	(0.20)	-0.03
UI Trust Fund Balance	γ007, γ107, γ207							0.60	4.99*	0.66*
								-3.7	-2.2	-0.33
Government Political Ideology	γ008, γ108, γ208							0.26	-0.04	-0.01
								(0.17)	(0.09)	(0.01)
State Minimum Wage	γ009, γ109, γ209							-2.80	-2.80	-0.53
								(5.18)	(2.61)	(0.36)
TANF-SNAP Level	γ0010, γ1010, γ2010							0.00	-0.01	0.00
								(0.03)	(0.02)	0.00
EITC Level	γ0011, γ1011, γ2011							0.00	0.00	0.00
								(0.01)	0.00	0.00
Mundlak device		No			Yes			Yes		
State-level covariates		No			No			Yes		
Household-level covariates		Yes			Yes			Yes		
Model Fit - Deviance		18014760			18014742			17979913		

Note.—1. All of the coefficients are conditioned at the end of the study period (November 2013). 2. Coefficients of household-level covariates and the 4th month variable are estimated but not listed in this table due to the space limit. Full results are available from the author upon request.
* p < .05. ** p < .01. ***p < .001.

FIGURE 1. Dual policy mechanisms ensuring the economic security of working households.

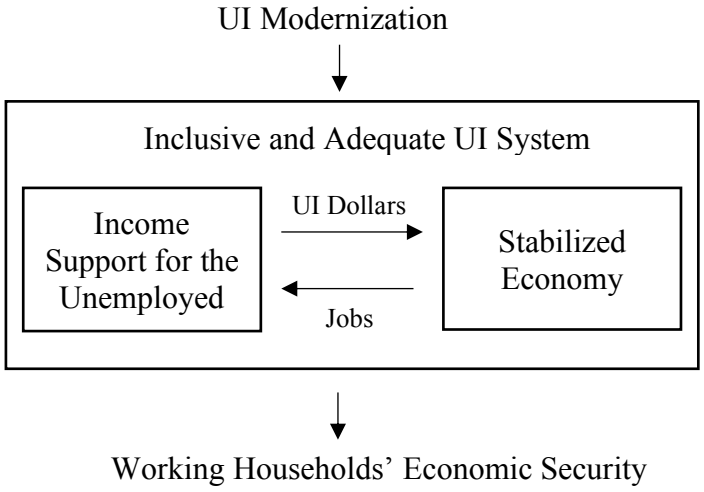
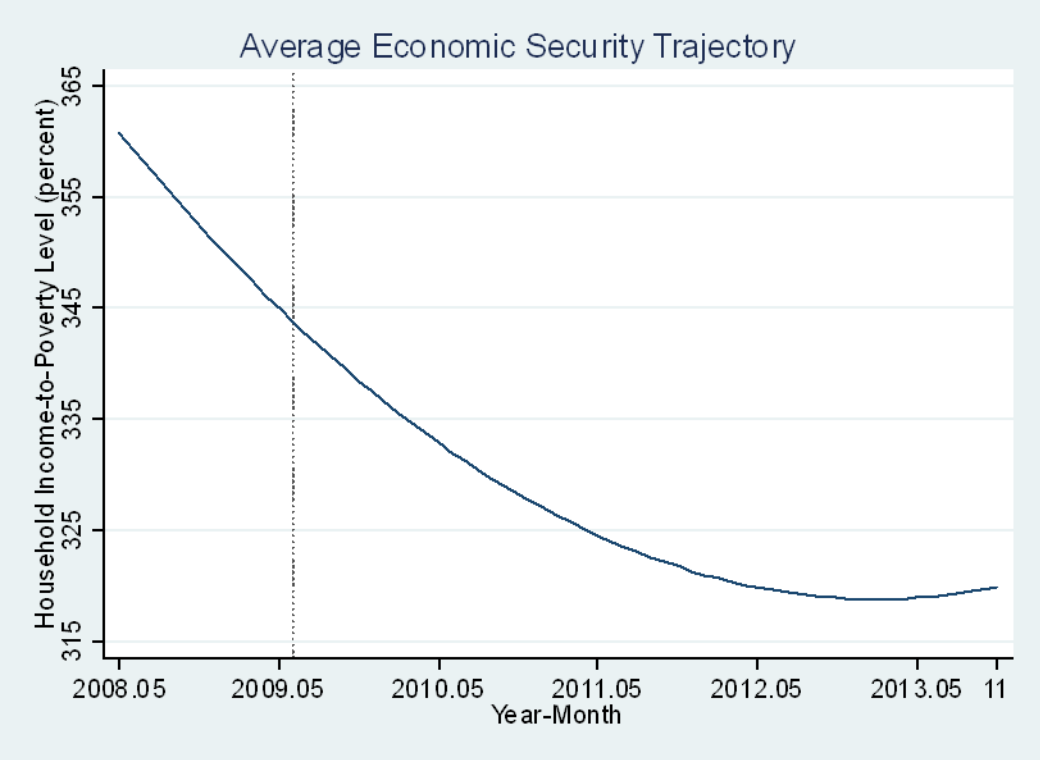
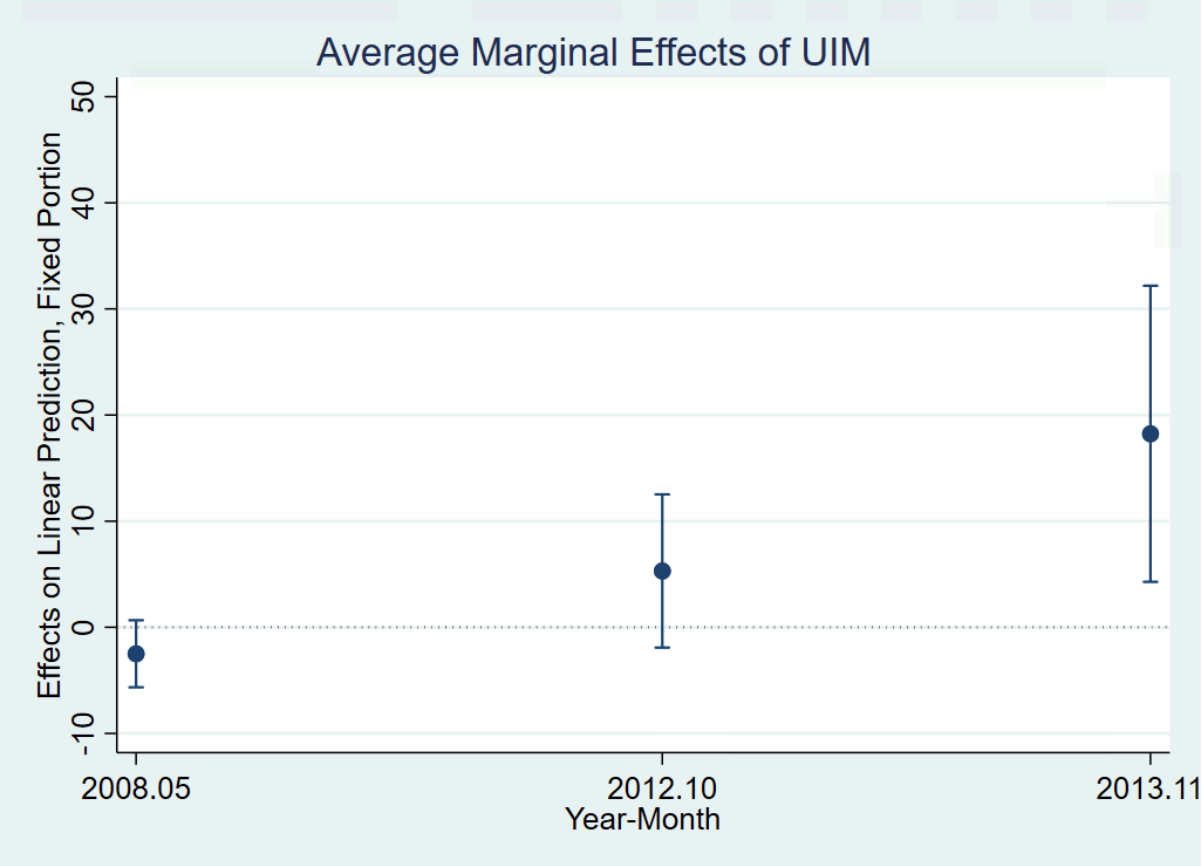


FIGURE 2. Average economic trajectory of working households.



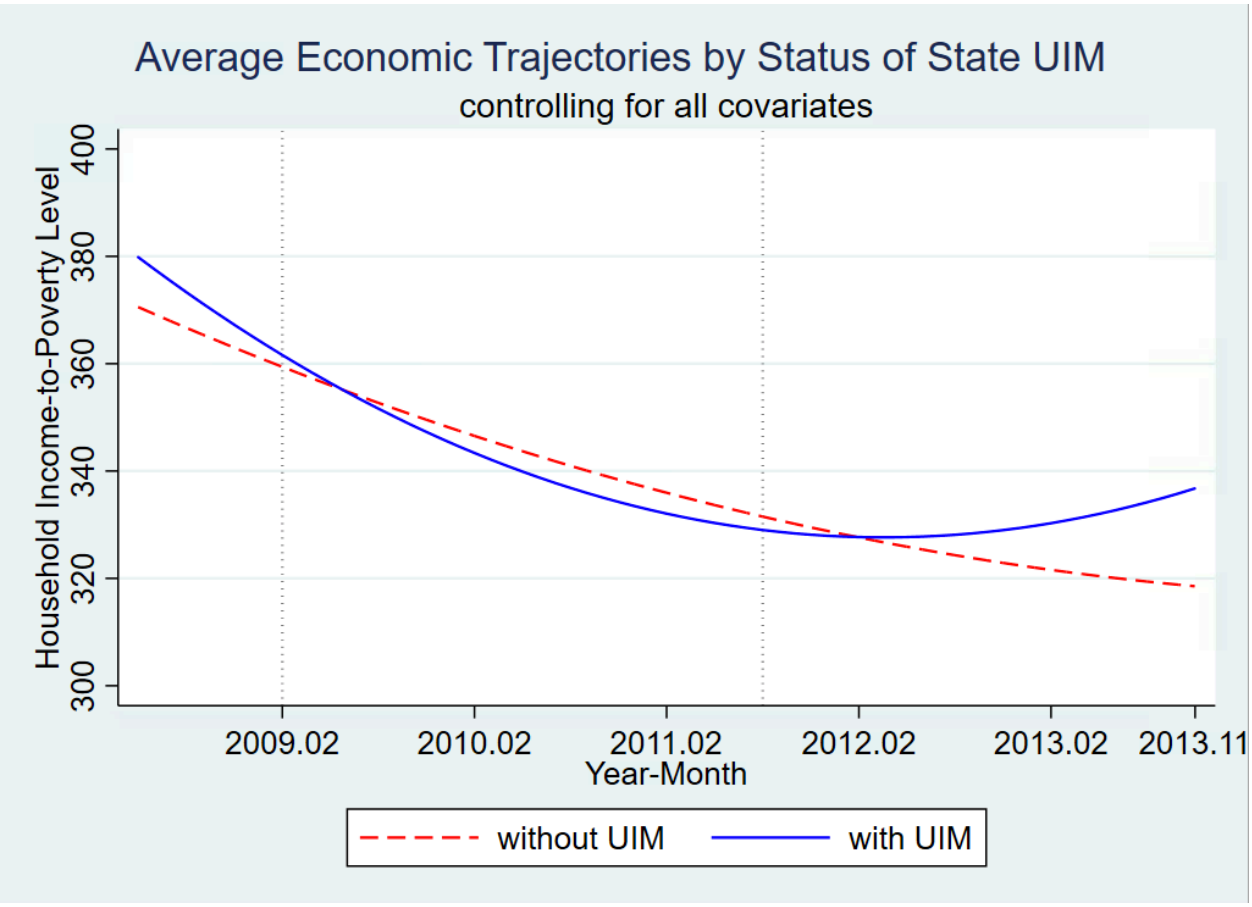
Note.— A vertical line is drawn in June 2009 to show when the Great Recession officially ended.

FIGURE 3. Average marginal effects of state UIM on the household poverty level at three time points.



Note.— This figure uses the estimates of Model 6 to compute the average marginal effect of state UIM on the household poverty level in August 2011, October 2012, and September 2013 after controlling for all other covariates. The error bars represent the 95% confidence intervals of the estimates.

FIGURE 4. Estimated economic trajectories of working households by state UI modernization status.



Note.— This figure uses the estimates of Model 6 to compute the effect of state UIM on the household economic security trajectories. The dotted red line is the counterfactual trajectory of state UIM after controlling for all other covariates and the total trend in the household poverty-level among households across all states. Two vertical lines are drawn in February 2009 and August 2011 to show when the federal UIMA began and ended.