

## UNEMPLOYMENT INSURANCE AND WORKER MOBILITY

Ryan Nunn, Laura Kawano and Ben Klemens

February 8, 2018

### ABSTRACT

Unemployment insurance (UI) helps workers to smooth their consumption after employment loss, but also diminishes their incentive to quickly find new jobs. While both of these considerations have been extensively studied, little or no attention has been paid to possible implications of UI for worker migration. In principle, UI could either reduce or increase worker interstate mobility. If recipients are sufficiently discouraged from seeking re-employment, migration would diminish as workers became less likely to move in search of new jobs. On the other hand, if UI allows recipients to conduct a more ambitious job search, it could lead to more migration and better matches between workers and firms, with important implications for labor productivity. Our analysis provides preliminary evidence that the latter occurs. Moreover, a provision of U.S. extended benefits that penalizes some interstate moves appears to have a small negative effect on worker migration.

## INTRODUCTION

After an involuntary job loss, unemployed individuals suffer large and persistent negative impacts on their earnings (e.g., Jacobson et al. (1993), Couch and Placzek (2010)). The unemployment insurance (UI) program offsets a significant proportion of income losses and helps to facilitate consumption smoothing after these negative shocks (Dynarski and Gruber (1997), Stephens (2001)).<sup>1</sup> However, because UI is only paid to the unemployed—i.e., re-employment causes a worker to become ineligible—moral hazard is an important policy concern. In particular, UI may discourage the eligible unemployed from searching for a job or accepting job offers. Indeed, a large literature has established that more generous UI systems are associated with prolonged unemployment spells.<sup>2</sup>

In this paper, we focus on another, more subtle, expression of this potential moral hazard that has not yet been examined: the effect of UI on recipients' geographic mobility. The theoretical relationship between UI generosity and geographic mobility is ambiguous. On the one hand, UI may reduce the probability of job-related interstate moves through a general reduction in job search. On the other hand, UI may encourage an unemployed individual to hold out for higher-quality employment which may be disproportionately far from the worker's initial location. In addition, UI could help finance interstate moves that would otherwise be infeasible. Thus, the impact of UI on geographic mobility is an empirical question.

The nature of the relationship between UI benefits and mobility has several important policy implications. First, this relationship informs the interpretation of the previous empirical evidence that more generous UI benefits lengthens unemployment spells. In other words, there is an important economic distinction between a) lengthened spells merely reflecting delayed job search and b) lengthened spells reflecting more ambitious search. Second, this relationship between UI and mobility has direct implications for the longer-run earnings profiles of the unemployed and labor market dynamism. The general decline in worker mobility has raised important questions about the role played by U.S. labor market institutions. Lastly, this question has broader public policy relevance for the optimal design of the UI system, particularly inasmuch as UI finances have been under tremendous strain in recent years. In 2011, states owed \$40 billion to the Unemployment Trust Fund (Ratner 2011). UI benefits are ultimately paid with experience-rated taxes remitted by employers, though full responsibility for extended benefit payments was temporarily assumed by the federal government through 2013. Understanding the mobility, earnings, and employment implications of UI is therefore necessary for forming predictions about the future financial health of the UI system and the optimality of taxation that funds UI benefits.

To explore the relationship between unemployment insurance and worker mobility, we use population-based administrative tax records that provide fine-grained information about the interstate mobility patterns of the unemployed, as well as their earnings and UI receipt. We collect information returns that state unemployment agencies file with the IRS on UI payments to identify all individuals who have received a UI payment between 1999 and 2015. For each UI recipient, we identify her state of residence in the year of UI receipt based on her tax filing address or the address to which her W-2 statements were sent. We similarly identify her state(s) of residence in the surrounding years. For an important component of our analysis, we collapse these data to construct counts of origin-destination state pairs over time. We then estimate

the relationship between these migration rates between states and the UI benefit generosity of destination and origin states.

In addition to descriptive analysis that helps illuminate the circumstances of movers and stayers, we examine the causal impact of changes in the maximum duration of UI benefits. To identify any mobility effects, we exploit two sources of variation. First, the availability of extended benefits during our time period depends discontinuously on a known function of state unemployment rates. At a given moment in time, worker eligibility for benefits therefore varies across states that feature similar labor market conditions.

Second, we use differences in the rules governing the portability of different types of extended UI benefits. Under standard UI, each state sets its own eligibility rules and benefit amounts, within federal guidelines. In addition to standard UI, a state can trigger two different programs during periods with weak labor markets: (1) Emergency Unemployment Compensation (EUC), a temporary provision that was enacted in response to the Great Recession; and (2) the Extended Benefits (EB) program, a permanent fixture of the UI system. Both of these programs are based on some function of state unemployment rates, and provide unemployed individuals additional weeks of benefits after exhausting their standard UI. Standard UI and EUC benefits are tied only to a worker's initial state of employment: she can move to another state in search of employment and continue to receive the UI benefits to which she was originally eligible. In contrast, an individual's EB eligibility is tied to the EB status of both her origin and destination states. If an individual receiving EB moves to another state with EB status, then her benefits would remain the same. If, however, that individual instead moves to a state without EB status, then these benefits cease after two weeks.

The EB-specific effect is interesting insofar as it may be a design flaw in the Extended Benefit program. In times of high national unemployment, when EB is active, states are especially likely to vary in the strength of their labor markets. For example, the standard deviation of state unemployment rates in 2007 was 0.98; in 2009, it had risen to 1.99. In 2009, states that never were eligible for EB had a mean unemployment rate of 6.5 percent, while states that were eligible at some point during the year had a mean unemployment rate of 9.2 percent. Migration from high- to low-unemployment states can hasten labor market recoveries. Fixing this EB feature may remove an unnecessary impediment to geographic mobility. Consistent with this concern, we find that EB—relative to other forms of UI that do not restrict portability—is associated with diminished worker mobility.

More important than the effect of this EB design choice is whether standard UI and EUC tend to promote or reduce worker mobility. A negative result would serve as evidence that UI either causes recipients to decrease their search effort or to conduct their search in their original locations, while a positive result would indicate that UI reciprocity promotes a wider-ranging employment search, perhaps by relaxing liquidity constraints. A positive result would therefore suggest that UI contributes to better matches. Indeed, we find preliminary evidence that more generous UI durations are associated with higher rates of worker mobility.

Our paper is related to the literature that examines the impacts of taxes on interstate migration. The non-portability of EB across certain state pairs acts as an implicit tax on certain moves following a job loss, whereas differences in UI

benefit generosity generate variation in the implicit subsidy for prolonged job searches with potentially better post-unemployment job match quality. The empirical evidence on the impacts of taxes on geographic mobility is focused on the rich. For example, Bakija and Slemrod (2004) find a small impact of higher state tax rates on the migration of the rich, and Moretti and Wilson (2014) examine the effects of state subsidies for biotech employers, such as increasing R&D tax credits, on the migration of star scientists. There is also recent work that examines international mobility. Kleven et al. (2013) find very high elasticities for football players in European clubs while Akcigit et al. (2015) find significant, though somewhat smaller, elasticities for inventors. In contrast to this literature, we study a much larger population further down the income distribution whose mobility responses may substantially differ from those of the rich. Making use of a much larger dataset than is typically available, we are able to explore the interaction between a core labor market institution and the mobility behavior of workers generally. We are unaware of any earlier empirical analyses of the impact of UI on mobility.

## BACKGROUND

The experience of varying UI policy (including during and after the Great Recession) presents an opportunity to learn more the effects of UI on different outcomes, including aggregate unemployment but also wages, migration, and match quality between workers and firms. Most research has focused on unemployment effects, whether in aggregate or for individual workers.

This body of work has tended to uncover small positive effects on unemployment. In individual-level analysis, Meyer (1990), Krueger and Meyer (2002), and Schmieder et al. (2012b) generally find that more generous UI extends unemployment spells. Many researchers, including Rothstein (2011) and Farber and Valletta (2015), have found only small increases in the national unemployment rate as a consequence of increased UI generosity during the Great Recession. Moreover, some of the increased unemployment reflects a socially desirable outcome, to the extent that it follows from reductions in the rate at which workers exit the labor force after job loss. Due to UI search requirements, some workers remain in the labor force who would have left in the absence of UI, consequently raising their chances of re-employment.

Still, the finding of small unemployment impacts of UI duration may be surprising, given that UI benefits make non-employment less costly, particularly early in an unemployment spell while many weeks of UI benefits remain. Other researchers, including notably Hagedorn et al. (2013), have argued that increases in maximum UI duration raised unemployment substantially during the Great Recession and its aftermath. They contend that generous UI raises workers' wage demands, which in turn discourages firms from posting vacancies, finally resulting in higher equilibrium unemployment. In their view, other researchers inappropriately control for macroeconomic conditions, in effect assuming that UI generosity has no impact on unemployment through the labor demand channel.

Whatever the correct empirical estimate of UI's impact on unemployment, it must be considered together with its social benefits, the most important of which is consumption smoothing. Chetty (2008) provides one widely used accounting of the social costs and benefits of the UI system.

Data limitations have sometimes precluded investigation of other UI effects that lie outside the conventional analysis. But a number of papers have investigated tenure and wages in jobs that immediately follow spells of UI receipt. Estimates have ranged widely, from positive effects of UI generosity on match quality—Acemoglu and Shimer (2000), Centeno (2004), van Ours and Vodopivec (2008), and Nekoei and Weber (2015)—to zero or negative Card et al. (2007) and Schmieder et al. (2012a).

One important omission from this segment of the literature is analysis of the migration effects of UI. This analysis would have two major benefits: first, it would contribute to understanding of the match quality impact of UI, and consequently on the optimal design of the program. If UI leads to better matches between workers and firms, then this must be factored into the calculus of the appropriate level of benefit generosity.

Second, it would shed light on a broader set of questions related to worker mobility, questions that have recently become more pressing as labor market dynamism declines. Davis and Haltiwanger (2014) and Molloy et al. (2016) and others have documented the long-run decline in the rates at which workers switch jobs and locations. This work has led many to ask how relevant institutions, and particularly labor market institutions, can be structured to support mobility.

## DESCRIPTION OF POLICY VARIATION AND DATA

### *UI Policy Schedules*

Unemployment insurance was first introduced in the United States over the 1932 to 1937 period. Financed by taxes remitted by employers, UI benefits replace a specified fraction of an eligible worker's previous earnings—up to a cap—for a specified number of weeks or until the worker finds employment, whichever comes first. Eligibility is essentially restricted to workers who have been fired without cause, and who seek new employment during the term of UI receipt. In recent years, most states allow for up to 26 weeks of benefits—what we will refer to as “standard” benefits.

Standard benefits are the first major social insurance program that becomes available after a worker is laid off. To be eligible for benefits, workers must have reached certain state-specific thresholds of earnings and employment over a base period that is typically twelve months long. In general, workers must have lost employment through no fault of their own (e.g., a quit or firing with cause would usually not qualify).

In addition to standard UI, two programs were available to some workers in some states over the 2008-2013 period. The first was a temporary policy, enacted in response to the Great Recession, called “Emergency Unemployment Compensation” (EUC). This program was entirely federally-funded and its duration depended discontinuously on current state unemployment rates, with benefits sometimes reaching 47 weeks duration (following immediately after standard UI benefits).<sup>3</sup>

The second program is a permanent fixture of the UI system, and its costs are typically borne both by states and the federal government. This “Extended Benefits” (EB) program uses a more complicated function of the history of state

unemployment rates, in addition to the current unemployment rate, but benefit duration always ranges from 13-20 weeks, and (for any given worker) follows directly after both standard UI and EUC payments are exhausted. <sup>4</sup>

Crucially, while EUC and EB provided benefits that were identical in weekly benefit amount, they differed in their treatment of interstate migrants. With EUC, those who permanently relocate to a new state can continue to claim benefits to which they would have been entitled in their state of origin. For EUC purposes, migration after a UI-eligible separation is irrelevant. By contrast, EB rules only permit workers to receive more than two weeks of benefits if both their origin and destination state have “triggered on” EB benefits. For example, in the case when a worker moves from an EB state with 20 weeks to an EB state with 13 weeks, he would receive the full 20 weeks of benefits; conversely, a mover from a 13 to a 20 week state would receive 13. But if a worker moves to a state with no EB eligibility, benefits cease after two weeks. Additionally, if either the state of origin or destination discontinues EB status, then EB benefits paid to the worker will cease.

The average weeks of benefits (across states) provided under EB and EUC, as well as the number of states providing EUC and EB, are given for the most recent business cycle in figure 1. A few salient details should be noted. First, EUC is typically more generous than EB, and persisted longer throughout the recovery than did EB. In particular, EB was deactivated in almost all states at a time when EUC remained fairly generous, with EUC only expiring more than a year after this occurred. Second, there was a substantial number of states that never activated EB benefits; by contrast, EUC benefits were available in all states for much of the period. Third, EUC generosity varied considerably during a time when EB generosity was roughly constant (mid-2009 through early 2010).

To give a sense of the timeline for the rollout (and cancellation) of EB availability, as well as the EUC schedule midway through the economic recovery, see figures 2 and 3, respectively. Two important features of the EUC schedule are: a) the wide variation in maximum weeks of benefits, and b) the benefit discontinuities at particular state unemployment rate thresholds. In January 2010, workers in all states were eligible for at least 34 weeks of EUC, while those in states with unemployment rates at or above 6 percent were eligible for 47 weeks, and those in states with unemployment rates at or above 8.5 percent were eligible for fully 53 weeks.

At the same moment when the UI duration schedule was as shown in figure 3, state unemployment rates were widely dispersed, giving rise to UI maximum durations that consequently varied widely across states. Figure 4 depicts this variation, showing that maximum durations were substantially higher in the Pacific West, Midwest, and Southeast than in the rest of the country.

### ***Administrative Tax Records***

The analysis in this paper is conducted using data from population-based, administrative tax records. We first identify all UI recipients between 1999 and 2015 based on information returns filed by state unemployment agencies with the IRS, the Form 1099-G. We identify individual-tax year observations of UI receipt over this period. To maintain a manageable dataset, we take a 1 percent random sample of these observations. We then link these unemployed individuals to their tax returns. We collect the following filing unit-level income information: wage and salary income, UI compensation, adjusted

gross income, and total income. We additionally collect the limited demographic characteristics that are available on a tax return: marital status, the number of children claimed, and filing address. We supplement these tax returns with information returns reported by third-parties to the IRS. These information returns are the Form W-2, which reports wage and salary income, and Form 1099-G, which reports non-employee compensation. This information on labor earnings is available at the individual level, and does not require filing a tax return, so we are able to track individuals' labor market outcomes even if they fall below the filing threshold. For each individual, we construct a panel of these tax records spanning three years prior to UI receipt through three years after the year of UI receipt. This panel also includes information on UI received in any of these years.

We impute each individual's state of residence in each tax year based on their filing address on her tax return. For non-filers, we first use the mailing address on their W-2s which should correspond to their home address. Because an individual may receive a W-2 at different addresses, perhaps due to moving in the middle of the year, we use the state that is associated with the highest portion of total wage and salary income. If an individual receives no W-2s, we use a similar methodology for non-employee compensation to determine a state of residence. For some of our analysis, we collapse these data to annual state-pair observations on gross migration for years 2007 through 2010. For the state-pair fixed effects, order matters (i.e., California to Texas is distinct from Texas to California).

Although tax return data have been seldom used for studying the unemployed, they are well suited for examining the relationship between UI and geographic mobility. First, Kawano and LaLumia (2017) show that UI reported on a Form 1099-G capture roughly 95 percent of total UI payments. By contrast, Meyer et al. (2009) find that only about 70 percent of UI payments are captured in survey data. Moreover, survey data typically does not provide the sample sizes required for fine-grained analyses of UI recipient migration between particular states. For example, in the Survey of Income and Program Participation, there were only two UI recipients who moved from Missouri to Illinois in 2010-11, while there were 988 such individuals in our data.

Second, geographic moves across state lines are easily tracked for all of these UI recipients across years. Information on residency can be obtained even if an individual does not file a tax return. Measuring mobility in survey data would require that unemployed individuals appear in consecutive surveys over time, or that there are explicit questions about mobility. Lastly, the population-based administrative files provide large samples on relatively infrequent phenomena that would be sparse in survey data.

## ESTIMATION

### ***Determinants of the Migration Decision and Characteristics of Migration Destinations***

We begin by exploring the decision to migrate, and the individual and macroeconomic determinants of the migration decision. The first specification is a logistic regression of interstate migration status on the change in total income, the number of children, and the unemployment rates in the state of residency for the current year and the next year. Recall that the sample consists of individuals who received UI income in year  $t$ , along with observations for those individuals in

years  $t-3$  and  $t$ , regardless of whether UI income was received in those years. The specification that we estimate is given by:

$$\text{Logit}(M_{i,t}) = \beta_0 + \Delta \ln(\text{Inc})_{i,t} \cdot \beta_I + X_{i,t} \cdot \beta_X + u_{s,t}^O \cdot \beta_{ORIG} + u_{s,t}^D \cdot \beta_{DEST} + \epsilon_{i,t},$$

where  $M_{i,t}$  is equal to 0 or 1 when a worker does not move across states or does move across states, respectively,  $X$  is the number of children,  $\Delta \ln(\text{Inc})_{i,t}$  is the change in log total income from year  $t$  to year  $t+1$ ,  $u_{s,t}^O$  is the unemployment rate in the worker's state of origin and  $u_{s,t}^D$  is the unemployment rate in a worker's destination state (which may or may not be the same state).

The coefficients obtained from this specification do not have a causal interpretation. Nonetheless, they are informative about the factors that are associated with the decision to migrate. For example, controlling for number of children and changes in total income, do individuals tend to migrate away from places with more slack labor markets and towards places with tighter labor markets, as one might expect? The coefficients of interest are  $\beta_{ORIG}$  and  $\beta_{DEST}$ , which give the associations between state unemployment rates in the origin and destination states, respectively, and the propensity to migrate.

A related approach explores the role of maximum UI receipt duration as well as labor market conditions in the propensity to migrate, restricting the sample to years  $t$  and  $t+1$  (with year  $t$  observations consisting only of those who received UI in that year). We estimate the following:

$$\text{Logit}(M_{i,t}) = \beta_0 + \Delta \ln(\text{Inc})_{i,t} \cdot \beta_I + X_{i,t} \cdot \beta_X + u_{s,t}^O \cdot \beta_{ORIG} + u_{s,t}^D \cdot \beta_{DEST} + \text{TotalUI}_{s,t}^O \cdot \beta_{UI} + \gamma_t + \epsilon_{i,t},$$

where  $\gamma_t$  are year fixed effects and  $\text{TotalUI}_{s,t}^O$  is the maximum UI benefit available in the origin state in year  $t$ . The estimate of  $\beta_{UI}$  does not have a causal interpretation, but it does provide an initial indication of whether UI maximum duration is associated with interstate migration ( $\beta_{UI}$ ), conditional on state labor market conditions as well as nation-wide factors specific to a given year.

Next, we estimate a linear regression that provides additional information about the labor markets in migration destinations. Conditional on having moved across states (but not on UI reciprocity), is UI reciprocity in the origin state associated with a higher or lower unemployment rate in the destination state? In other words, do current UI recipients systematically move to locations with different labor markets than people who are not currently receiving UI? The regression is given by:

$$u_{s,t}^D = \Delta \ln(\text{Inc})_{i,t} \cdot \beta_I + X \cdot \beta_X + u_{s,t}^O \cdot \beta_O + \mathbf{1}(UI_{i,t}^O > 0) \cdot \beta_{UI} + \epsilon_{i,t},$$

The parameter  $\beta_{UI}$  gives the percentage point increase in destination unemployment rate associated with individual UI reciprocity in the origin state, restricting the sample to interstate movers.



## UI Generosity and the Decision to Migrate

Here, we explain the identification strategy for recovering estimates of the effect that UI generosity (as measured by maximum duration) has on the probability of worker interstate migration.

Our baseline specification is a regression with the following form:

$$\ln(M_t^{O \rightarrow D}) = TotalUI_t^O \cdot \beta_1 + EB_t^O \cdot \mathbf{1}(EB_t^D = 0) \cdot \beta_2 + \mathbf{1}(EB_t^D = 0) \cdot \beta_3 + f(u_t^O, u_t^D) + \alpha^{O \rightarrow D} + \gamma_t + \epsilon_t^{O \rightarrow D},$$

where  $M_t^{O \rightarrow D}$  is the gross migration rate between an origin state (O) and a destination state (D),  $\alpha^{O \rightarrow D}$  are state-pair fixed effects,  $\gamma_t$  are year fixed effects,  $f(\cdot)$  is alternatively a linear function of origin and destination unemployment rates, or a quadratic in those rates, i.e.,

$$f(u_O, u_D) = v_1 u_O + v_2 u_D + v_3 u_O^2 + v_4 u_D^2, \text{ and } \epsilon_t \text{ is a white noise disturbance.}$$

Starting with these regressions, we use data that is collapsed to the state-pair year level. We therefore conflate state pairs that have many workers traveling between them (e.g., California and Texas) with state pairs that have few workers moving between them (e.g., Hawaii and Alabama). In the latter case, a small degree of noise in the data translates to large percent swings in migration rates. As such, we weight the regressions by baseline (i.e., 2007-2008) state-pair migrant counts.

The inclusion of state-pair and year fixed effects removes potentially endogenous variation in the rate of migration across states and over time; it also increases the precision of our estimates. For instance, migration is particularly common between California and Texas, and this time-invariant migration propensity may be correlated with the generosity of UI available in a state (although this should not be the case after inclusion of state unemployment rates, as discussed below). Similarly, the impact of time-varying macroeconomic conditions at the national level can be removed with year fixed effects.

The parameter  $\beta_1$  measures the impact of any extended benefits on gross mobility. If extended unemployment benefits primarily serve as further disincentives for job search, then we would expect that  $\beta_1 < 0$ . Alternatively,  $\beta_1$  could be positive if the income from UI helps to finance interstate moves and a more extensive job search.

The state-pair and year fixed effects are likely not sufficient for  $\beta_1$  to have a causal interpretation. In the ideal experiment, the maximum number of UI weeks would be randomly assigned to states and we would estimate the causal impact of UI on gross migration by comparing the change in gross migration across treated and untreated states. Of course, EB and EUC statuses are not randomly assigned, but instead are triggered by changes in a state's unemployment rate. Thus, the simple comparison of changes in gross migration patterns will be biased by differential trends across treated and untreated states.

To estimate the effect of UI policy on mobility, we implicitly assume that gross migration between states in the absence of EB and EUC is a time-invariant, smooth function of both origin and destination state unemployment rates. EUC benefit duration, by contrast, depends discontinuously on the origin state unemployment rate only (this is not an

assumption we impose, but rather is defined by statute). EB benefit duration, though somewhat more complicated, is also a discontinuous function of unemployment rates in the origin state. The function  $f(u_t^O, u_t^D)$  is used to capture the background labor market conditions that affect migration in the absence of EUC or EB.

Crucially, both EUC and EB benefits are not chosen by states but are set according to a known federal schedule. We therefore assume that labor market conditions directly related to mobility—i.e., not through maximum UI weeks available—are not correlated with the EB and EUC schedules, conditional on origin and destination state unemployment rates. This assumption would be violated if, for instance, workers were discontinuously more or less likely to migrate as their states' unemployment rate approached statutory threshold values in the UI schedule.

As discussed, one important distinction between the EUC and EB programs is their distinct treatments of workers who move between states: EB allows for no more than two weeks of remaining benefits to be received by workers who move to states that are not “triggered on” to EB. Because the distinction is only relevant to situations in which a worker moves from a state with EB benefits to a state without EB benefits, we interact EB duration with a dummy for movement to a state that offers no EB weeks.

The parameter  $\beta_2$  therefore estimates the additional disincentive to move from EB to non-EB states because of the non-portability of benefits across state lines. Of course, this particular feature of the EB system or the allocation of EB states may not be salient to unemployed individuals. If this is the case, then  $\beta_2$  provides a weighted average of the disincentive effects, where the weights reflect the heterogeneity of understanding in the population.

## RESULTS

Tables 1 and 2 provide summary statistics for the unemployment insurance mobility data derived from our sample of administrative tax records. In table 1, we show unconditional mobility rates (mean, median, and standard deviation) by state pair “type”. State pairs are categorized as follows: a) both states offer the minimum level of extended benefits, b) both states offer levels above the minimum, c) the origin state offers more than the minimum but the destination state does not, and d) the destination state offers more than the minimum but the origin state does not. This is meant to give a rough idea of how UI recipients were migrating during our sample. Perhaps surprisingly, migration rates are actually lowest between origin states with the minimum EB durations (indicating stronger local labor markets) and destination states that with EB durations above the minimum. Conversely, the migration rate is highest for the opposite pairing. These unconditional statistics underscore the need for a more careful analysis that controls for time-varying labor market conditions and time-invariant state-pair characteristics.

In table 2, we show both the number of total UI recipients and the mobility of recipients across states. The 2007 levels give a sense of the level of mobility prior to extended benefits going into effect. As expected, the average number of UI recipients in a state increases during the Great Recession. However, the average mobility rate is fairly stable over this period.

We now explore the earnings and UI income information available for various combinations of UI recipients and non-recipients who stay or move across state lines. Figure 5 presents annual changes in wage and salary income for combinations of UI recipient and interstate migration statuses. These changes are measured within individual workers, but make no other adjustments.

The macroeconomic events of the 2000-12 period are clearly evident in all four series. In addition, UI claimants experienced lower earnings growth than did non-recipients. More surprisingly, the earnings growth experienced by non-recipients who changed states was substantially more procyclical than that of non-recipient stayers. In other words, movers benefited from earnings gains during economic recoveries but experienced large losses during downturns; by contrast, stayers experienced steady, relatively low earnings growth interrupted only by the worst year of the Great Recession.

Of particular interest to the current analysis is the comparison between UI recipients who moved and recipients who did not. The former group experienced larger losses in earnings throughout the period. This analysis suggests differences in the composition of the groups; it may be that those UI recipients who cross state lines are disproportionately likely to be long-term unemployed or are disadvantaged in some other manner.

Figure 6 shows analogous results for annual changes in UI income. The two series display the average year-to-year change in total UI dollars received by an individual, conditioning on whether or not that individual moved across states over the course of the year. For example, among taxpayers who did not move from 2001–2002, average UI income rose by about \$225; among taxpayers who did move that year, average UI income rose by about \$725. Note that this plot includes those who may have had zero unemployment compensation in either year of the two-year comparison.

Next, we provide evidence regarding the determinants of migration decisions and the labor market characteristics of migration destinations. The first column of table 3 indicates that—perhaps unsurprisingly—a higher unemployment rate in the origin (destination) state is significantly associated with higher (lower) migration rates. The migration decisions of those currently receiving unemployment insurance benefits are even more powerfully linked to state unemployment rates, with coefficients on origin and destination unemployment more than three times higher than for the full sample. However, the maximum weeks of UI duration are not significantly related to migration propensity in this specification (which does not have a causal interpretation).

Restricting consideration to interstate movers, the origin-state unemployment rate is significantly negatively related to the destination-state unemployment rate. On average, migrants from high unemployment states are somewhat more likely to move to low unemployment states.

Transitioning from descriptive results, we now report estimates from the baseline state-pair specification, as well as some additional specifications intended as robustness checks. Specifically, our baseline specification includes only the levels of unemployment rates in the origin and destination states; we show that including quadratic terms does not qualitatively change our results. Likewise, including state and year-specific maximum weekly benefit amounts, as well as their interaction with available UI weeks, does not qualitatively change the results.<sup>5</sup>

Table 4 shows results of these regressions, with standard errors reported in parentheses. The primary coefficient of interest is  $\beta_1$ , which can be interpreted in terms of percent deviations from a state pair's average migration rate. Consequently, our baseline specification indicates that a one-week increase in origin state UI raises the probability of moving to another state by 0.24 percent. The cumulative migration effect of 52 weeks of UI is therefore a 12.3 percent increase in the probability of movement to another state. Put another way, in terms of a standard deviation of UI duration—22 weeks in our sample—the effect is a 5.2 percent increase in the probability of migration. The sign of this estimate is what one would expect if higher UI duration generosity facilitates a more ambitious job search, with a higher likelihood of interstate moves.

Also of interest is the significant negative coefficient on  $\beta_2$ , the interaction of origin state EB benefits and the absence of EB benefits in a destination state. This negative sign is consistent with (at least some) workers understanding that their benefits will be eliminated should they move from a state that grants EB to one that currently does not. The magnitude of  $\beta_2$  is such that the overall migration benefit of an EB week is nearly zero, by contrast with the substantial positive impact of a week of EUC benefits. When the EB interaction is omitted, the estimate of  $\beta_1$  is little changed (not shown).

## CONCLUSION

This study speaks generally to the impacts of the UI system on worker mobility. Recently, researchers have been concerned that US worker mobility has been declining as labor markets become less flexible (Davis and Haltiwanger 2014). This mobility decline can have large negative consequences for job match quality and wages. Consequently, it is important to understand whether UI is a contributing or mitigating factor in this development. This determination has important implications for the optimal design of UI, including taxes that support the UI Trust Fund.

Unemployment insurance has been the subject of a number of reform discussions in recent years, making it especially important to fully understand the effects of the program. The Obama Administration had proposed to reconfigure all of federal UI into a mandatory, automatic program that would be triggered by increases in state unemployment rates and would not require Congress to pass special legislation immediately after a recession begins. Under such a reform, it would be desirable to ensure that worker benefits are fully portable across states (i.e., to retain the structure of EUC rather than EB).

More importantly, a robust debate is in progress regarding the benefits and costs of UI, with implications for the optimal generosity and duration of benefits. Understanding the migration effects of UI duration is an important piece of the puzzle, both for optimal UI design and for the design of the overall system of countercyclical fiscal policy. The extent to which the particular features of the EB program disincentivize interstate moves is also an important consideration. In times of high national unemployment when EB is active, states are especially likely to vary in the strength of their labor markets. Migration from high- to low-unemployment states can hasten labor market recoveries. Understanding the limitations of the potential non-portability of EB may suggest removing an unnecessary impediment to geographic mobility.

A comprehensive cost-benefit analysis of the UI system requires a detailed examination of the earnings changes associated with job searches that occur with more generous UI benefits and with interstate moves. This will allow a more severe test of the conjecture that UI is contributing to broader job search and better worker-firm matches. We will tackle this important topic in future work.

TABLE 1

## State Migration Rates by Extended Benefits Status



		Mean	Median	Standard Deviation
$M^{O \rightarrow D}$	O = 0, D = 0	0.065%	0.025%	0.15%
	O = 1, D = 0	0.044%	0.015%	0.17%
	O = 0, D = 1	0.077%	0.035%	0.14%
	O = 1, D = 1	0.067%	0.027%	0.15%

**Source:** Authors' calculations based on administrative tax records.

**Note:** the table reports summary statistics on inter-state mobility rates for the sample between the year that an individual receives UI and the following year. These statistics are based on individuals who receive UI between 2007 and 2010. In each row, we indicate whether the origin state (O) is triggered on to EB (1) or not (0), and similarly whether the destination state (D) is triggered on to EB or not.

TABLE 2

Number of UI Recipients and Migration Rate  
2007-10

		Mean	Median	Standard Deviation
UI recipients	2007	238,206	151,138	286,335
	2008	297,201	196,541	357,350
	2009	452,901	291,246	514,911
	2010	428,710	282,109	504,673
$M^{O \rightarrow D}$	2007	0.065%	0.026%	0.15%
	2008	0.065%	0.026%	0.15%
	2009	0.067%	0.027%	0.15%
	2010	0.062%	0.025%	0.14%

**Source:** Authors' calculations based on administrative tax records.

**TABLE 3**

**Determinants of Mobility Decisions**



	M	M	u^D
<i>unempl rate</i> <sup>O</sup>	0.130***	0.502***	-0.0353***
	-0.009	-0.0242	-0.001
<i>unempl rate</i> <sup>D</sup>	-0.195***	-0.635***	
	-0.01	-0.02323	
TotalUI <sup>O</sup>		-0.00427	
		-0.00307	
1(UI <sup>O</sup> >0)			0.00143
			-0.025
Year FE	No	Yes	No
Sample	Full	UI recipients	Interstate Movers

**Source:** Administrative records and authors' calculations.

**Note:** Each regression includes the change in log total income and number of dependents claimed on tax return. The estimation sample includes individuals in the year that they receive UI (t), and the change in log total income is measure between years t and t+1.

TABLE 4

UI Mobility Results



	1	2	3
$TotalUI_t^0$	0.00236*** (0.00003)	0.00281*** (0.00003)	0.00188*** (0.00005)
$EB_t^0 \cdot 1(EB_t^D = 0)$	-0.00194*** (0.00007)	-0.00292*** (0.00007)	-0.00285*** (0.00007)
State-pair FE	Yes	Yes	Yes
Quadratic u/e rates	No	Yes	Yes
Max benefit \$	No	No	Yes

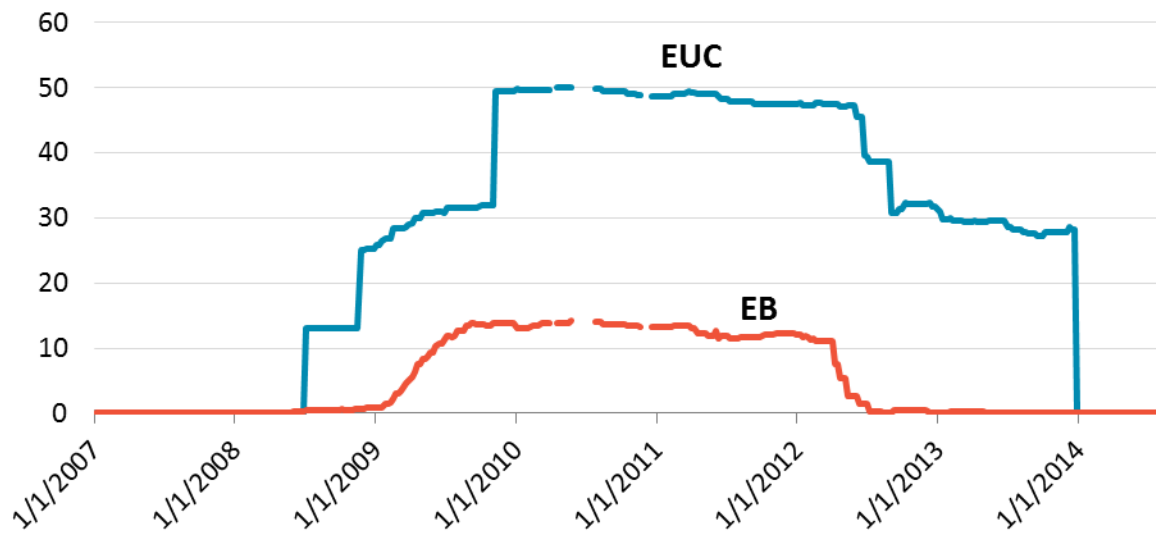
Source: Authors' calculations based on administrative tax records.

Note: Each regression is based off of data that are collapsed in to origin state—destination state pairs. The regressions also include UI policy information from the Department of Labor and Andrew Figura (personal communication), as well as Kawano and LaLumia (2017).

FIGURE 1

Mean Weeks of Additional Benefits

2007-14



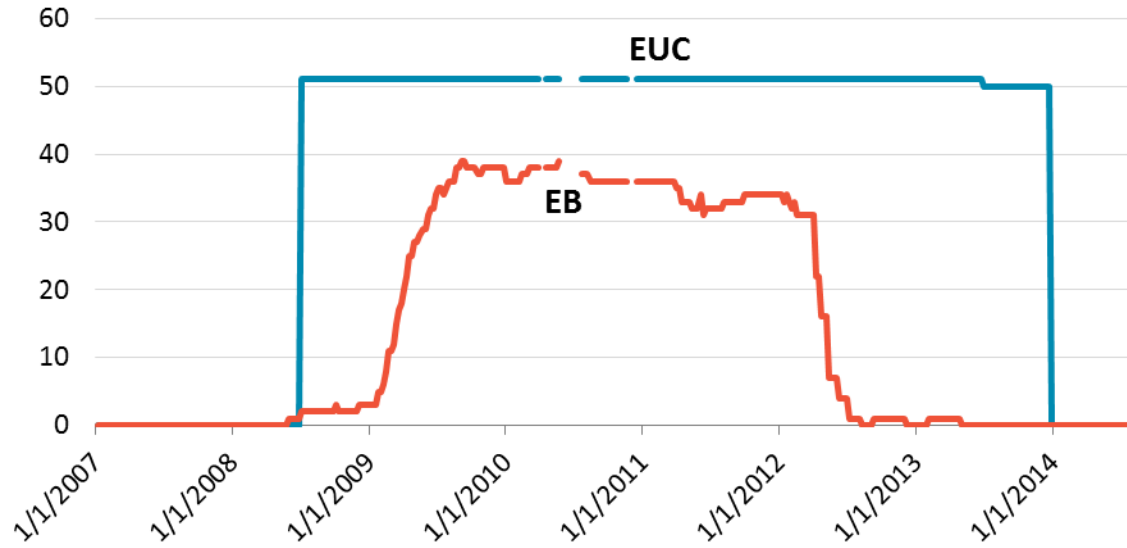
Source: Department of Labor and Andrew Figura; authors' calculations.



**FIGURE 2**

**Number of States with Extended Benefits**

2007-14



Source: Department of Labor and Andrew Figura (personal communication); authors' calculations.

**FIGURE 3**

**EUC Schedule**

January, 2010

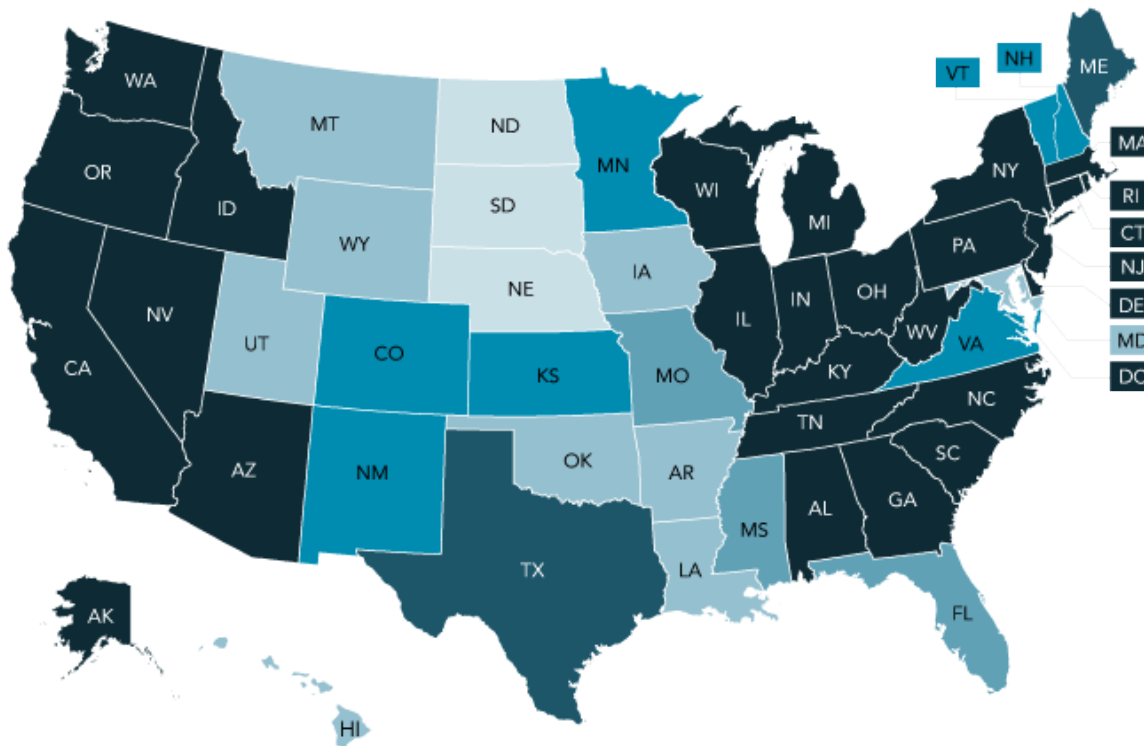


*Maximum EUC duration*



Source: Department of Labor and authors' calculations.

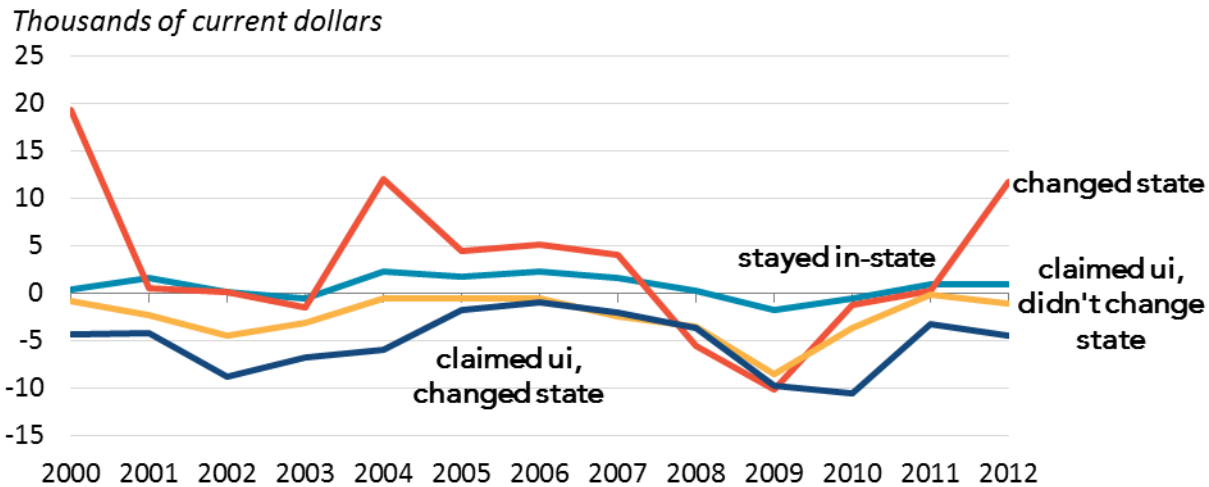
**FIGURE 4**  
**Number of Weeks of Additional Benefits**  
 January 2010



**Source:** Department of Labor and Andrew Figura (personal communication); authors' calculations.

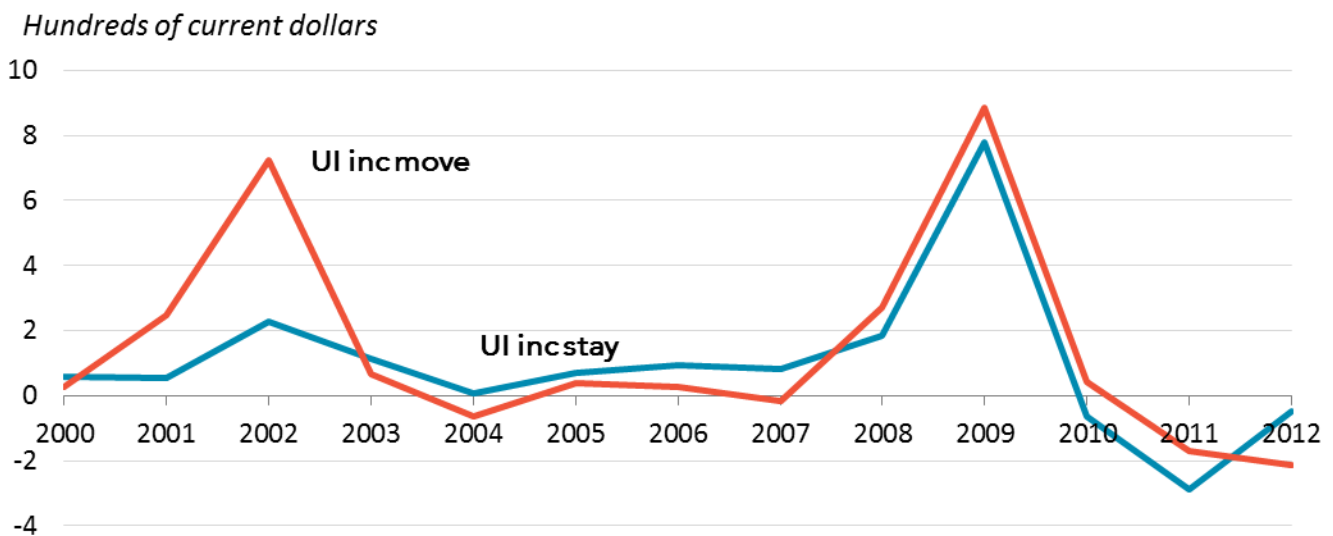


**FIGURE 5**  
Earnings Growth by UI Reciprocity and Interstate Migration Status



**Source:** Continuous Work History Sample of the Statistics of Income; authors' calculations.  
**Note:** series show average annual earnings changes within person from year t-1 to year t.

**FIGURE 6**  
UI Income Growth by Interstate Migration Status  
2000-12



**Source:** Continuous Work History Sample of the Statistics of Income; authors' calculations  
**Notes:** series show average annual income changes within person from year t-1 to year t.

## NOTES

- <sup>1</sup> For example, Kawano and LaLumia (2017) find that between 1999 and 2012, UI compensates for approximately half of the annual wage income losses during unemployment.
- <sup>2</sup> See Atkinson (1987) and Krueger and Meyer (2002) for reviews of the empirical work on the relationship between the generosity of UI programs and unemployment durations.
- <sup>3</sup> In its last incarnation prior to expiring in 2014, EUC provided 14 weeks of benefits in all states, an additional 14 weeks in states with a three-month unemployment rate of 6 percent or more, an additional nine weeks in states with a three-month unemployment rate of at least 7 percent, and an additional ten weeks in states with a three-month unemployment rate of at least 9 percent. These categories were known as “tiers”. If a state were to discontinue a particular EUC tier (e.g., after a sufficient fall in unemployment), current recipients in that tier would be allowed to finish receiving all benefit weeks under the expired tier.
- <sup>4</sup> Under the baseline EB program, states provide 13 benefit weeks if the average insured unemployment rate (the ratio of workers claiming standard UI benefits to workers eligible for standard UI) is 5 percent or higher over the previous 13 weeks and at least 120 percent of the average insured unemployment rate over at least one of the 13 week periods starting one year and two years previously. However, these conditions are not typically in effect. In addition to the previous criterion, states may choose to implement one, two, or none of the following optional “triggers”. First, a state with at least a 6 percent insured unemployment rate may provide 13 weeks of benefits, whether or not this rate is higher than rates in previous years. Second, a state with a total unemployment rate, as measured in Local Area Unemployment Statistics data, of at least 6.5 percent (8 percent) and 110 percent of the total unemployment rate prevailing in at least one of two “lookback” periods (one and two years prior) will pay 13 (20) weeks of benefits. This last condition was much more commonly used to trigger a state on for EB during the Great Recession and subsequent recovery. Note that benefits do not “stack” if a state meets multiple trigger conditions; total EB weeks are constrained to be between 13 and 20. See Whittaker and Isaacs (2013) for more detail.
- <sup>5</sup> Thanks to Laura Kawano and Sara LaLumia for the data on UI benefit amounts.

## REFERENCES

- Kawano, L. and S. LaLumia (2017): "How income changes during unemployment: evidence from tax return data," *Journal of Human Resources*.
- Kleven, H., C. Landais, and E. Saez (2013): "Taxation and international migration of superstars: evidence from the European football market," *American Economic Review*, 103, no. 5, 1892–924.
- Krueger, A. and B. Meyer (2002): *Handbook of Public Economics*, chap. Labor supply effects of social insurance.
- Meyer, B. (1990): "Unemployment insurance and unemployment spells," *Econometrica*, 58, no. 4.
- Meyer, B., W. Mok, and J. Sullivan (2009): "The under-reporting of transfers in household surveys: its nature and consequences," *NBER Working Paper*, 15181.
- Molloy, R., C. Smith, R. Trezzi, and A. Wozniak (2016): "Understanding declining fluidity in the U.S. labor market," *Brookings Papers on Economic Activity*, Spring 2016.
- Moretti, E. and D. Wilson (2014): "State incentives for innovation, star scientists and jobs: evidence from biotech," *Journal of Urban Economics*, 79, 20–38.
- Nekoei, A. and A. Weber (2015): "Does extending unemployment benefit improve job quality?" *IZA Discussion Paper*, 9034.
- Ratner, D. (2011): "Unemployment insurance experience rating and labor market dynamics," *Working Paper*.
- Rothstein, J. (2011): "Unemployment insurance and job search in the Great Recession," *Brookings Papers on Economic Activity*, Fall 2011.
- Schmieder, J., T. von Wachter, and S. Bender (2012a): "The effect of unemployment benefits and nonemployment durations on wages," *American Economic Review*, 106, no. 3.
- (2012b): "The long-term effects of UI extensions on employment," *American Economic Review*, 102, no. 3.
- Stephens, M. (2001): "The long-run consumption effects of earnings shocks," *The Review of Economics and Statistics*, 83, no. 1, 28–36.
- van Ours, J. and M. Vodopivec (2008): "Does reducing unemployment insurance generosity reduce job match quality," *Journal of Public Economics*, 92, no. 3-4.
- Whittaker, J. and K. Isaacs (2013): "Extending unemployment compensation benefits during recessions," *CRS Report*, RL34340.

## ABOUT THE AUTHORS

Ryan Nunn is a fellow in Economic Studies and policy director for the Hamilton Project at the Brookings Institution.

Laura Kawano is a Research Affiliate at the Office of Tax Policy Research at the University of Michigan.

Ben Klemens is a Senior Statistician at the US Department of Treasury Office of Tax Analysis.

This publication relies on the analytical capability that was made possible in part by a grant from the Laura and John Arnold Foundation.

The views expressed are those of the authors and should not be attributed the Urban-Brookings Tax Policy Center, the Urban Institute, the Brookings Institution, their trustees, or their funders. The views in this paper should also not be interpreted as reflecting the views of the US Treasury Department or of any person associated with the US Treasury. Department. Funders do not determine research findings or the insights and recommendations of our experts. Further information on Urban's funding principles is available at <http://www.urban.org/aboutus/our-funding/funding-principles>; further information on Brookings' donor guidelines is available at <http://www.brookings.edu/support-brookings/donor-guidelines>.

Copyright © 2017. Tax Policy Center. Permission is granted for reproduction of this file, with attribution to the Urban-Brookings Tax Policy Center.



The Tax Policy Center is a joint venture of the  
Urban Institute and Brookings Institution.



**BROOKINGS**

For more information, visit [taxpolicycenter.org](http://taxpolicycenter.org)  
or email [info@taxpolicycenter.org](mailto:info@taxpolicycenter.org)