Online Appendix for "Should Unemployment Insurance Vary With the Unemployment Rate? Theory and Evidence"

Kory Kroft
University of Toronto
and NBER

Matthew J. Notowidigdo
Northwestern University
and NBER

May 2015

1 Proofs

Proof of Proposition 1

Consider the effect of an incremental change in unemployment benefits on the value of starting period 0 without a job:

$$
\begin{aligned}
\frac{dJ_0}{db} &= (1-\lambda_0)\left\{\frac{\partial U_0}{\partial b} - \frac{\partial U_0}{\partial w}\frac{d\tau}{db}\right\} - \lambda_0 \frac{\partial V_0}{\partial w}\frac{d\tau}{db} \\
&= (1-\lambda_0)\frac{\partial U_0}{\partial b} - \frac{d\tau}{db}\left\{(1-\lambda_0)\frac{\partial U_0}{\partial w} + \lambda_0 \frac{\partial V_0}{\partial w}\right\} \\
&= (1-\lambda_0)\frac{\partial U_0}{\partial b} - \frac{d\tau}{db}\frac{dJ_0}{dw}
\end{aligned}
$$

where the last line follows from the definition of J_0. Next, consider the effect of an incremental change in unemployment benefits on the value of not finding a job at the beginning of period 0:

$$
\begin{aligned}
(1-\lambda_0)\frac{dU_0}{db} &= (1-\lambda_0)u'(c_0^u) + (1-\lambda_0)\sum_{t=1}^{B-1}\prod_{i=1}^{t}(1-\lambda_i)\, u'(c_t^u) \\
(1-\lambda_0)\frac{dU_0}{db} &= \sum_{t=0}^{B-1} S_t u'(c_t^u)
\end{aligned}
$$

where the last line follows from the definition of the survivor function $S_t \equiv \prod_{i=1}^{t}(1-\lambda_i)$.

Next, consider the effect of an incremental change in the wage:

$$\begin{aligned}\frac{dJ_0}{dw} &= \lambda_0 \frac{\partial V_0}{\partial w} + (1-\lambda_0)\frac{\partial U_0}{\partial w} \\ &= \sum_{t=0}^{T-1} f_t (T-t) u'(c_t^e)\end{aligned}$$

where $f_t = S_{t-1}\lambda_t$ is the probability that the unemployment spell lasts exactly t periods. Finally, differentiating the budget constraint with respect to b yields:

$$\frac{d\tau}{db} = \frac{D_B}{T-D}\left(1 + \varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)$$

To derive a money-metric expression for the marginal welfare gain of UI, we normalize $\frac{dJ_0}{db}$ by the welfare gain of increasing the wage by \$1, $\frac{dJ_0}{dw}$:

$$\begin{aligned}\frac{dW}{db} &= \frac{dJ_0}{db} \Big/ \frac{dJ_0}{dw} \\ &= \frac{(1-\lambda_0)\frac{\partial U_0}{\partial b}}{\frac{dJ_0}{dw}} - \frac{d\tau}{db} \\ &= \frac{(1-\lambda_0)\frac{\partial U_0}{\partial b}}{\frac{dJ_0}{dw}} - \frac{D_B}{T-D}\left(1 + \varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right) \\ &= \frac{D_B}{T-D}\left\{\frac{\frac{1-\lambda_0}{D_B}\frac{\partial U_0}{\partial b} - \frac{1}{T-D}\frac{dJ_0}{dw}}{\frac{1}{T-D}\frac{dJ_0}{dw}} - \left(\varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)\right\} \\ &= \frac{D_B}{T-D}\left\{\frac{\sum_{t=0}^{B-1}\frac{S_t}{D_B}u'(c_t^u) - \sum_{t=0}^{T-1}\frac{f_t(T-t)}{T-D}u'(c_t^e)}{\sum_{t=0}^{T-1}\frac{f_t(T-t)}{T-D}u'(c_t^e)} - \left(\varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)\right\}\end{aligned}$$

Note that the term $\sum_{t=0}^{T-1}\frac{f_t(T-t)}{T-D}u'(c_t^e)$ comes from the assumption that $r=\rho$. In this case, c_t^e is flat for $T-t$ periods. Substituting in the definitions of μ_t^u and μ_t^e yields the following:

$$\frac{dW}{db} = \frac{D_B}{T-D}\left\{\frac{\sum_{t=0}^{B-1}\mu_t^u u'(c_t^u) - \sum_{t=0}^{T-1}\mu_t^e u'(c_t^e)}{\sum_{t=0}^{T-1}\mu_t^e u'(c_t^e)} - \left(\varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)\right\}$$

This completes the proof.

Proof of Corollary 1

To construct the approximation formula, we begin with the term $\sum_{t=0}^{B-1}\mu_t^u u'(c_t^u)$. We take a second-order Taylor expansion of $u'()$ around $\overline{c_u} = \sum_{t=0}^{B-1}\mu_t c_t^u$:

$$u'(c_t^u) \approx u'(\overline{c_u}) + u''(\overline{c_u})(c_t^u - \overline{c_u}) + \frac{1}{2}u'''(\overline{c_u})(c_t^u - \overline{c_u})^2$$

Thus,

$$\begin{aligned}
\sum_{t=0}^{B-1}\mu_t u'(c_t^u) &\approx u'(\overline{c_u}) + u''(\overline{c_u})(c_t^u - \overline{c_u}) + \frac{1}{2}u'''(\overline{c_u})\sum_{t=0}^{B-1}\mu_t(c_t^u - \overline{c_u})^2 \\
&= u'(\overline{c_u})\left(1 + \frac{1}{2}\frac{u'''(\overline{c_u})}{u'(\overline{c_u})}\sum_{t=0}^{B-1}\mu_t(c_t^u - \overline{c_u})^2\right) \\
&= u'(\overline{c_u})\left(1 + \frac{1}{2}\left(-\frac{u''(\overline{c_u})}{u'(\overline{c_u})}\overline{c_u}\right)\left(-\frac{u'''(\overline{c_u})}{u''(\overline{c_u})}\overline{c_u}\right)\frac{\sum_{t=0}^{B-1}\mu_t(c_t^u - \overline{c_u})^2}{\overline{c_u}^2}\right) \\
&= u'(\overline{c_u})\left(1 + \frac{1}{2}\gamma\rho s_u^2\right)
\end{aligned}$$

where $\rho = -\frac{u'''(c)}{u''(c)}c$ is the coefficient of relative prudence, $\gamma = -\frac{u''(c)}{u'(c)}c$ is the coefficient of relative risk aversion, and $s_u = \frac{\left[\sum_{t=0}^{B-1}\mu_t(c_t^u - \overline{c_u})^2\right]^{1/2}}{\overline{c_u}}$ is a measure of the coefficient of variation in consumption. If $\rho = 0$, then the formula in Proposition 1 can be approximated as

$$\frac{dW}{db} \approx \frac{D_B}{T-D}\left\{\frac{u'(\overline{c_u}) - u'(\overline{c_e})}{u'(\overline{c_e})} - \left(\varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)\right\}$$

Next, assuming that $\varepsilon_{D_B,b} = \varepsilon_{D,b}$ and defining $u = \frac{D}{T}$, and then following the first-order approximation in Chetty (2006), produces the formula in equation (2) in the main text:

$$\frac{dW}{db} \approx \frac{D_B}{D}\frac{u}{1-u}\left\{\gamma\frac{\Delta c}{c} - \frac{\varepsilon_{D,b}}{1-u}\right\}$$

where $\frac{\Delta c}{c} = \frac{\overline{c_e} - \overline{c_u}}{\overline{c_e}}$.

Marginal Welfare Gain when $\rho \neq 0$

Using the results above, we may write the marginal welfare gain as:

$$\frac{dW}{db} = \frac{D_B}{T-D}\left\{\frac{u'(\overline{c_u})F - u'(\overline{c_e})}{u'(\overline{c_e})} - \left(\varepsilon_{D_B,b} + \varepsilon_{D,b}\frac{D}{T-D}\right)\right\}$$

where $F = 1 + \frac{1}{2}\gamma\rho s_u^2$. Next, using a Taylor series approximation, we may write:

$$\begin{aligned}
u'(\overline{c_u}) &\approx u'(\overline{c_e}) + u''(\overline{c_e})(\overline{c_u} - \overline{c_e}) + \frac{1}{2}u'''(\overline{c_e})(\overline{c_u} - \overline{c_e})^2 \\
u'(\overline{c_u}) - u'(\overline{c_e}) &\approx u''(\overline{c_e})(\overline{c_u} - \overline{c_e}) + \frac{1}{2}u'''(\overline{c_e})(\overline{c_u} - \overline{c_e})^2 \\
\frac{u'(\overline{c_u}) - u'(\overline{c_e})}{u'(\overline{c_e})} &\approx -\frac{u''(\overline{c_e})}{u'(\overline{c_e})}(\overline{c_e} - \overline{c_u}) + \frac{1}{2}\frac{u'''(\overline{c_e})}{u'(\overline{c_e})}(\overline{c_u} - \overline{c_e})^2 \\
\frac{u'(\overline{c_u}) - u'(\overline{c_e})}{u'(\overline{c_e})} &\approx -\frac{u''(\overline{c_e})}{u'(\overline{c_e})}\overline{c_e}\frac{\overline{c_e} - \overline{c_u}}{\overline{c_e}} + \frac{1}{2}\frac{u'''(\overline{c_e})}{u''(\overline{c_e})}\overline{c_e}\frac{u''(\overline{c_e})}{u'(\overline{c_e})}\overline{c_e}\left(\frac{\overline{c_u} - \overline{c_e}}{\overline{c_e}}\right)^2 \\
\frac{u'(\overline{c_u}) - u'(\overline{c_e})}{u'(\overline{c_e})} &\approx \gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right)
\end{aligned}$$

Thus,

$$\begin{aligned}
\frac{Fu'(\overline{c_u}) - Fu'(\overline{c_e})}{u'(\overline{c_e})} &\approx \gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right)F \\
\frac{Fu'(\overline{c_u})}{u'(\overline{c_e})} - F &\approx \gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right)F \\
\frac{u'(\overline{c_u})F - u'(\overline{c_e})}{u'(\overline{c_e})} &\approx \gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right)F + F - 1 \\
\frac{u'(\overline{c_u})F - u'(\overline{c_e})}{u'(\overline{c_e})} &\approx \left[\gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right) + 1\right]F - 1
\end{aligned}$$

Thus, using the approximation that the elasticities are equal:

$$\frac{dW}{db} = \frac{D_B}{D}\frac{u}{1-u}\left\{\left[\gamma\frac{\Delta c}{c}\left(1 + \frac{1}{2}\rho\frac{\Delta c}{c}\right) + 1\right]F - 1 - \frac{\varepsilon_{D,b}}{1-u}\right\}$$

When $F = 1$ and $\rho = 0$, the formula collapses to the expression given in Corollary 1.

Search Effort Comparative Static in DMP Model

In section 2 of the main text, we imposed particular cross-restrictions on the interaction between labor demand and search effort in the job-finding rate. Here, we introduce the textbook Pissarides model with search intensity.[1] Our objective is to motivate why we chose this particular functional form using a standard job search model with unemployed, vacancies and search effort.

We assume that the matching function is given by $m = m(eu, v)$, where e is the market average of search intensity of the unemployed. Individuals choose their own intensities by taking the other intensities as given. Let e_i be the intensity of search of worker i. We assume there is a Poisson process transferring workers from unemployment to employment at the rate $m(eu, v)/eu$. Thus, the transition probability of worker i is given by:

$$\lambda_i = e_i \frac{m(eu, v)}{eu}$$

Suppose that the matching function is CRS:

$$m(eu, v) = (eu)^{\alpha} (v)^{1-\alpha}$$

Then,

$$\begin{aligned}\lambda_i &= \frac{e_i (eu)^{\alpha} (v)^{1-\alpha}}{eu} \\ \lambda_i &= e_i \left(\frac{\theta}{e}\right)^{1-\alpha}\end{aligned}$$

where $\theta = v/u$. Thus, we can write $\lambda_i = \lambda(e_i; e, \theta)$. How does own search intensity affect the job-finding rate? Suppose that all else equal, individual i increases his search intensity. Then the effect on individual's i's job-finding probability is given by:

$$\frac{\partial \lambda_i}{\partial e_i} = \left(\frac{\theta}{e}\right)^{1-\alpha} > 0$$

Next consider how labor market conditions (market tightness) impact the return to search:

$$\frac{\partial^2 \lambda_i}{\partial e_i \partial \theta} = (1-\alpha)\left(\frac{\theta}{e}\right)^{-\alpha} \frac{1}{e} > 0$$

Thus, tougher labor market conditions (lower θ) make it harder to raise the job-finding rate through effort (lower $\frac{\partial \lambda_i}{\partial e_i}$).

[1] We refer the reader to chapter 5 in Pissarides (2000).

2 Correlation Between UI Benefits and Labor Market Conditions

An immediate concern with our identification assumption is that UI benefits may be correlated with unobserved labor market conditions. To shed light on this possibility, we formally explore the possibility of unobserved factors determining both UI benefits and unemployment durations. As our empirical strategy is essentially equivalent to estimating a difference-in-differences regression, we consider the case where the unemployment rate $u_{s,t}$ can only take two values: u_H and u_L, with $u_H > u_L$.[2] In this case, estimating equation (4) is equivalent to estimating the following two equations:

$$\log(D_{i,H,t}) = \beta_H \log(b_{s,t}) + v_H + \alpha_t + \alpha_s + e_{i,H,t} \quad \text{if } u_{s,t} = u_H \tag{1}$$

$$\log(D_{i,L,t}) = \beta_L \log(b_{s,t}) + v_L + \alpha_t + \alpha_s + e_{i,L,t} \quad \text{if } u_{s,t} = u_L \tag{2}$$

The coefficient β_2 on the interaction term $\log(b_{s,t}) \times \log(u_{s,t_0})$ in equation (4) is given by the difference between β_H and β_L. Each of these two equations is subject to a standard identification problem: each equation is a reduced form equation from a system of two equations, an equation determining durations and an equation determining UI benefits. Consider the following simplified two-equation system:

$$\begin{aligned} D_q &= \beta_q b + \xi_q \\ b &= \lambda_q \xi_q + \eta_q \end{aligned}$$

where $q = \{H, L\}$. The first equation describes the duration equation and the second equation describes the UI benefit equation. The variable ξ_q represents unobserved labor demand shocks which affect both UI benefits and unemployment durations, and η_q represents unobserved factors which shift UI benefits and are orthogonal to local labor market conditions. We can now ask what happens if one estimates (1) and (2) ignoring the endogeneity of benefits? It is straightforward to show that the estimated coefficient $\widehat{\beta}_q$ is given by the following:

$$\widehat{\beta}_q = \beta_q + \lambda_q$$

This illustrates the well-known identification problem that $\widehat{\beta}_q \neq \beta_q$ when $\lambda_q \neq 0$. Under the assumption that $\lambda_q = 0$, it is easy to see that β_H and β_L (and therefore $\beta_H - \beta_L$) can be consistently estimated. This assumption requires that all variation in benefits be driven by shocks that are uncorrelated with unobserved labor demand shocks. By contrast, if $\lambda_q \neq 0$, we need stronger assumptions for identification. Under the strong assumption that $\lambda_H = \lambda_L$, then $\widehat{\beta}_H - \widehat{\beta}_L = \beta_H - \beta_L$. Thus, while we cannot identify the main effect when $\lambda_H = \lambda_L \neq 0$, we will be able to consistently estimate the interaction term of interest.

A key remaining challenge arises when λ_q depends on q. For ease of exposition, consider the case where benefits are exogenous in good times, but are endogenous to local labor

[2] This discussion extends a similar discussion in Bertrand (2004).

demand conditions in bad times (e.g., $\lambda_L = 0$ and $\lambda_H > 0$). In this case, $\widehat{\beta}_H - \widehat{\beta}_L = \beta_H - \beta_L + \lambda_H$. This illustrates that this particular type of policy endogeneity works against the findings in our baseline specification. Intuitively, if variation in benefits is plausibly exogenous during good times, then we will consistently estimate the duration elasticity in good times; however, if variation in benefits is correlated with unobserved labor market conditions during bad times, then this will cause upward bias in the magnitude of the duration elasticity during bad times (e.g., $\widehat{\beta}_H = \beta_H + \lambda_H > \beta_H$). To the extent that the magnitude of the duration elasticity is significantly *smaller* during bad times, we conclude that policy endogeneity likely causes us to understate the magnitude of the interaction term.

3 Background on UI Program in the U.S.

Description of the UI Program as of Jan. 1, 2002

Eligibility

Eligibility and benefits under the U.S. unemployment insurance program are determined based on earnings or hours/weeks of work during a base period. Typically, this base period is the first four out of five completed calendar quarters that precede the filing of a claim.

1/2013In order to be eligible for unemployment insurance benefits, applicants must meet minimum earnings or hours/weeks of work requirements that vary considerably by state. All of the states use one of four criteria to assess eligibility:

1) Applicants must meet a minimum earnings threshold in their highest earnings quarter in the base period and have total base period earnings that are a multiple of this amount (typically 1.5 times).

2) The applicant's weekly benefit amount is calculated but they are only eligible for this benefit if their total base period earnings were at least as high as a minimum multiple of this weekly benefit amount (generally 40 times) and typically these earnings have to spread over at least two quarters in the base period.

3) The applicant must meet a flat total wage requirement during the base period.

4) The applicant must have worked a minimum number of hours at a minimum hourly wage.

The first two methods are the most common and only 11 states make use of the third or fourth methods. There is substantial variability in the base period wages necessary to qualify for the minimum benefit amount across states. For example, Connecticut and Nevada each require a minimum of $600 in base period earnings while Maine, North Carolina, and Florida each have minimum base period earnings amounts in excess of $3,000. There is similar variability in high quarter earnings requirements.

Weekly Benefit Amount

Nearly all states have an explicit minimum weekly benefit amount which is determined either by a state's UI eligibility requirements or by means of a schedule. The minimum weekly benefit by state ranges from no minimum in Vermont to $106 per week in Washington.

The weekly benefit amount is also subject to a maximum imposed by each state. The maximum weekly benefit by state ranges from a low of $190 in Alabama (when excluding Puerto Rico) to a high of $512 (excluding dependents allowances) in Massachusetts, although two thirds of U.S. states have benefit maxima falling within the range of $250 to $350 (also excluding dependents allowances). The level of earnings required to qualify for the maximum weekly benefit depends on how the benefit is calculated in a given state. For states that use the high earnings quarter method, total base period earnings might not need to be particularly high in order to qualify for the maximum weekly benefit (this could occur if the applicant worked a lot during the high earnings quarter but much less during the remaing three quarters). About 70% of the 33 states that make use of the high earnings quarter method require earnings of between $6,500 to $9,500 in the high quarter in order to qualify for the maximum benefit. Among the full set of states the total base period earnings required to qualify for the maximum weekly benefit can vary from $7,000 in Arizona to $31,900 in West Virginia. It should also be noted that most states set the maximum weekly benefit based on the average wage in the state (it is usually set at over 50% of the average wage) so the maximum benefit amountis typically updated as average wages change. Six states also set the minimum weekly benefit as a percentage of the average wage.

Weekly benefits that fall within this range typically replace approximately 50% of earnings based on either the highest earnings quarter, half year, or total earnings during the base period. More than half of the states calculate weekly benefits based on the highest earnings quarter since it is likely to be the best approximation of full-time earnings. The earnings in this quarter are then divided by the 13 weeks in the quarter and multiplied by the percentage of earnings that are to be replaced. There are significant differences in the weekly benefit schedules across states.

Twelve states offer weekly allowances for dependents in addition to the basic weekly benefit. This group includes Alaska, Iowa, Ohio Illinois, and a handful of the northeastern states. The allowances can be quite variable in size.

Waiting Period

Applicants for unemployment insurance benefits who are otherwise eligible must face a waiting period which is one week in duration in nearly all states (although many states specify conditions under which the waiting period can be waived).

Maximum Benefit Duration

Nine states have a uniform benefit duration of 26 weeks. The remaining states have benefit durations that can vary in length based on the applicant's earnings history during the base period. All but two of these variable duration states have a maximum benefit duration of 26 weeks and the remaining two have a maximum benefit duration of 30 weeks. In these states total benefits during the benefit year are capped at a percentage of the total base period earnings or based on the fraction of weeks worked during the base period. For recipients whose full duration benefits would exceed their benefit limit the duration is reduced accordingly. It should be noted that states that offer uniform 26 or 30 week durations are not necessarily more generous since higher base period earnings might be necessary in order to reach the minimum thresholds to be eligible for different levels of UI benefits in these states. Minimum benefit durations can be as short as 9 weeks in Arkansas, and 10 weeks in Idaho and Kansas. There is also substantial variability in the required base period earnings to qualify for the maximum benefit duration, ranging from $9,646 in Hawaii (when excluding Puerto Rico) to amounts in excess of $40,000 as in Massachusetts (although only in six states does this qualifying amount exceed $30,000)."

UI Financing

The UI program is funded through a combination of federal and state taxes. The federal government levies a 6.2% payroll tax payable by the employer on wages up to $7,000. The employer can then claim a 5.4% federal tax credit if they comply with state tax liabilities under the state's UI program in a timely manner. This results in an effective federal payroll tax of 0.8% on wages up to $7,000. This revenue is used by the federal government to cover the federal and state administrative costs of running the UI program, and to top up accounts used for providing the federal share of extended UI benefits during periods of high unemployment, for funding certain veteran employment and labour market programs, and for lending to states that are short on funds for their UI obligations. Any excess funds are then distributed to the states for use in their UI programs.

The state contribution rate is risk weighted and levied on employers. When UI account balances are favorable, the minimum contribution rates by state range from 0% to 2.4% (with most under 1%) while the maximum rates range from 5.4% to 10% (with roughly half of the states setting a maximum of 5.4%). When their UI account balances fall to less favorable levels, many states raise these rates. Furthermore, more than half of the states have expanded the taxable wage base beyond the federal government's $7,000 limit (in many cases well beyond this level). Lastly, Alaska, New Jersey, and Pennsylvania also levy a small payroll tax on employees.

Source: http://workforcesecurity.doleta.gov/unemploy/comparison2002.asp

Online Appendix Table OA.1

Additional Robustness to Controlling for Observed and Unobserved Trends

[Replacing Maximum UI Benefit Amount for Average UI Benefit Amount in Tables 3 and OA.3]

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Maximum UI Benefit Amount)	**(A)**	-0.384	-0.349	-0.359	-0.445	-0.487	-0.316	-0.498	-0.622
		(0.291)	(0.296)	(0.302)	(0.264)	(0.281)	(0.322)	(0.321)	(0.401)
		[0.186]	[0.239]	[0.235]	[0.091]	[0.083]	[0.327]	[0.121]	[0.121]
log(Maximum UI Benefit Amount) ×	**(B)**	**1.009**	**1.015**	**1.033**	**1.019**	**0.938**	**2.890**	**0.957**	**3.301**
log(State Unemployment Rate)		**(0.544)**	**(0.526)**	**(0.504)**	**(0.539)**	**(0.507)**	**(0.968)**	**(0.499)**	**(1.025)**
		[0.064]	**[0.054]**	**[0.040]**	**[0.059]**	**[0.064]**	**[0.003]**	**[0.055]**	**[0.001]**
Quadratic in State Unemployment Rate			✓						
Cubic in State Unemployment Rate				✓					
Region-specific linear time trends					✓				
State-specific linear time trends						✓			
State FEs x State Unemployment Rate							✓		✓
Year FEs x State Unemployment Rate								✓	✓
Post-estimation:									
High unemployment elasticity (u = 8.5%)		-0.118	-0.081	-0.087	-0.176	-0.239	0.447	-0.246	0.250
(A) + σ × **(B)**		(0.318)	(0.312)	(0.314)	(0.308)	(0.318)	(0.421)	(0.339)	(0.464)
		[0.712]	[0.795]	[0.783]	[0.567]	[0.452]	[0.289]	[0.469]	[0.590]
Low unemployment elasticity (u = 4.9%)		-0.650	-0.617	-0.632	-0.714	-0.734	-1.079	-0.751	-1.493
(A) - σ × **(B)**		(0.330)	(0.341)	(0.345)	(0.291)	(0.305)	(0.400)	(0.355)	(0.503)
		[0.049]	[0.071]	[0.067]	[0.014]	[0.016]	[0.007]	[0.035]	[0.003]

Notes: All columns report semiparametric (Cox proportional) hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. Number of unemployment spells = 4307. See Table 2 for more details on the baseline specification and Table 3 and Online Appendix Table OA.3 for analogous results using the Average UI Benefit Amount. The final two rows reports linear combinations of parameter estimates to produce the duration elasticity when the state unemployment rate is one standard deviation above/below the mean. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.2

Robustness to Using Variation Across Metropolitan Areas Within States

[Replacing Average UI Benefit With Maximum Benefit Level in Table 3]

		Average UI Benefit Amount			Statutory Maximum UI Benefit Amount		
		(1)	(2)	(3)	(4)	(5)	(6)
log(Average UI Benefit Amount)	**(A)**	-0.442	-0.877		-0.308	-0.513	
		(0.315)	(0.508)		(0.281)	(0.299)	
		[0.160]	[0.084]		[0.272]	[0.086]	
log(Average UI Benefit Amount) ×	**(B)**	**1.019**	**1.364**	**2.211**	**0.850**	**1.195**	**1.543**
log(Metropolitan Area Unemp. Rate)		**(0.470)**	**(0.538)**	**(1.027)**	**(0.560)**	**(0.596)**	**(0.909)**
		[0.030]	**[0.011]**	**[0.031]**	**[0.129]**	**[0.045]**	**[0.090]**
log(Metropolitan Area Unemp. Rate)		-0.040	0.056		-0.044	0.016	
		(0.098)	(0.095)		(0.110)	(0.110)	
		[0.687]	[0.557]		[0.691]	[0.881]	
Number of Unemployment Spells		4307	4307	3756	4307	4307	3756
Metropolitan Area FEs and Year FEs		✓	✓	✓	✓	✓	✓
State-specific linear time trends			✓			✓	
State × Year FEs				✓			✓
Post-estimation:							
High unemployment elasticity (u = 8.8%)		-0.111	-0.435		-0.032	-0.125	
(A) + σ × **(B)**		(0.351)	(0.564)		(0.339)	(0.389)	
		[0.751]	[0.441]		[0.924]	[0.748]	
Low unemployment elasticity (u = 4.6%)		-0.773	-1.321		-0.584	-0.901	
(A) - σ × **(B)**		(0.349)	(0.508)		(0.330)	(0.320)	
		[0.027]	[0.009]		[0.076]	[0.005]	

Notes: All columns report Cox proportional hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. Number of unemployment spells = 4307. See Table 2 for more details on the baseline specification. To preserve sample size, observations without MSA codes are grouped together within a state and assigned the state unemployment rate. The final two rows reports linear combinations of parameter estimates to produce the unemployment duration elasticity when the metropolitan area unemployment rate is one standard deviation above or below average. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.3
Additional Robustness Analysis Controlling for Observed and Unobserved Trends

		(1)	(2)	(3)	(4)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.533	-0.590	-0.430
		(0.332)	(0.499)	(0.352)	(0.540)
		[0.057]	[0.285]	[0.093]	[0.426]
log(Average UI Benefit Amount) ×	**(B)**	**1.346**	**2.795**	**1.336**	**2.628**
log(State Unemployment Rate)		**(0.457)**	**(1.364)**	**(0.460)**	**(1.394)**
		[0.003]	**[0.041]**	**[0.004]**	**[0.059]**
State FEs × State Unemployment Rate			✓		✓
Year FEs × State Unemployment Rate				✓	✓
Post-estimation:					
High unemployment elasticity (u = 8.5%)		-0.277	0.204	-0.238	0.264
(A) + σ × **(B)**		(0.364)	(0.624)	(0.353)	(0.621)
		[0.446]	[0.744]	[0.501]	[0.671]
Low unemployment elasticity (u = 4.9%)		-0.987	-1.271	-0.943	-1.123
(A) - σ × **(B)**		(0.343)	(0.607)	(0.390)	(0.683)
		[0.004]	[0.036]	[0.016]	[0.100]

Notes: All columns report Cox proportional hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. Number of unemployment spells = 4307. See Table 2 for more details on the baseline specification. The final two rows reports linear combinations of parameter estimates to produce the unemployment duration elasticity when the state unemployment rate is one standard deviation above or below the mean. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.4

Additional Robustness Tests: Alternative Combinations of Control Variables, Nonlinear Direct Effects of Average UI Benefits and State Unemployment Rate, Controlling for Extended Benefits, and Control Function Estimates

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.626	-0.353	-0.268	-0.651	-0.304	-0.607	-0.830	-1.022
		(0.332)	(0.331)	(0.193)	(0.205)	(0.455)	(0.600)	(0.263)	(0.394)	(0.571)
		[0.057]	[0.059]	[0.068]	[0.192]	[0.152]	[0.613]	[0.021]	[0.035]	[0.073]
log(Average UI Benefit Amount) ×	**(B)**	**1.346**	**1.351**	**0.975**	**0.829**	**1.340**	**1.427**	**1.554**	**1.307**	**1.174**
log(State Unemployment Rate)		**(0.457)**	**(0.460)**	**(0.590)**	**(0.573)**	**(0.517)**	**(0.484)**	**(0.481)**	**(0.780)**	**(0.674)**
		[0.003]	**[0.003]**	**[0.099]**	**[0.148]**	**[0.009]**	**[0.003]**	**[0.001]**	**[0.094]**	**[0.082]**
Stratified baseline hazard		✓					✓	✓	✓	✓
State, Year, Occupation, Industry FEs		✓	✓			✓	✓	✓	✓	✓
Age, Marital Dummy, Education, Wage Spline		✓	✓	✓		✓	✓	✓	✓	✓
Quadratic in State Unemp. Rate, Average UI WBA						✓	✓			
Cubic in State Unemp. Rate, Average UI WBA							✓			
Controls for potential duration and extended benefits								✓		
Use Simulated Avg. UI WBA instead of Avg. UI WBA									✓	
Instrument log(Avg. UI WBA) with log(Simulated Avg. UI WBA)										✓
Post-estimation:										
High unemployment elasticity (u = 8.5%)		-0.277	-0.269	-0.096	-0.049	-0.298	0.073	-0.197	-0.485	-0.718
(A) + σ × **(B)**		(0.364)	(0.364)	(0.261)	(0.269)	(0.451)	(0.618)	(0.305)	(0.393)	(0.596)
		[0.446]	[0.460]	[0.714]	[0.855]	[0.509]	[0.906]	[0.519]	[0.218]	[0.228]
Low unemployment elasticity (u = 4.9%)		-0.987	-0.982	-0.610	-0.487	-1.005	-0.680	-1.017	-1.175	-1.401
(A) - σ × **(B)**		(0.343)	(0.340)	(0.235)	(0.241)	(0.497)	(0.609)	(0.278)	(0.600)	(0.600)
		[0.004]	[0.004]	[0.009]	[0.043]	[0.043]	[0.264]	[0.000]	[0.050]	[0.020]

<u>Notes:</u> All columns report semiparametric (Cox proportional) hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. Number of unemployment spells = 4307. See Table 2 for more details on the baseline specification. Column (7) controls for maximum potential duration of benefits by setting log(Average UI WBA) to 0 for all weeks beyond the maximum number of weeks (where the maximum accounts for extended benefits programs). In column (8), the Simulated Average UI WBA is constructed following the simulated instrumental variables procedure in Currie and Gruber (1996), isolating variation in generosity due to changes in program parameters, holding composition of unemployed constant.. Column (9) reports results from a two-stage instrumental variables specification using log(Simulated Average UI WBA) as an instrument for log(Average UI WBA), where in the second stage a fifth-order polynomial in the first stage residuals is used as a control function. See main text for details on the simulated instrument. The final two rows report linear combinations of parameter estimates to produce the duration elasticity when the state unemployment rate is one standard deviation above/below the mean. Standard errors are clustered by state and are in parentheses and p-values are in brackets. In column (9), the standard errors are bootstrapped and based on 1000 replications, sampling states with replacement.

Online Appendix Table OA.5
Do Demographics Explain Why the Effect of UI Varies with the State Unemployment Rate?

Dependent variable: [Specification:]		Unemployment Duration [Cox Proportional Hazard Regression Model]								Take-up Indicator [OLS]
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.626	-0.634	-0.609	-0.632	-0.549	-0.527	-0.494	0.107
		(0.332)	(0.330)	(0.331)	(0.329)	(0.332)	(0.330)	(0.350)	(0.336)	(0.077)
		[0.057]	[0.058]	[0.056]	[0.064]	[0.057]	[0.096]	[0.132]	[0.141]	[0.173]
log(Average UI Benefit Amount) × log(State Unemployment Rate)	**(B)**	**1.346**	**1.337**	**1.340**	**1.333**	**1.356**	**1.359**	**1.315**	**1.348**	**-0.303**
		(0.457)	**(0.456)**	**(0.455)**	**(0.459)**	**(0.450)**	**(0.452)**	**(0.445)**	**(0.436)**	**(0.109)**
		[0.003]	**[0.003]**	**[0.003]**	**[0.004]**	**[0.003]**	**[0.003]**	**[0.003]**	**[0.002]**	**[0.008]**
log(State Unemployment Rate)		0.035	0.032	0.034	0.035	0.033	0.033	0.031	0.032	0.130
		(0.124)	(0.123)	(0.123)	(0.123)	(0.123)	(0.122)	(0.122)	(0.120)	(0.020)
		[0.779]	[0.795]	[0.781]	[0.774]	[0.788]	[0.784]	[0.801]	[0.793]	[0.000]
log(Average UI Benefit) × Age			0.009						0.010	
			(0.007)						(0.010)	
			[0.192]						[0.289]	
log(Average UI Benefit) × **1**{Married}				0.043					-0.035	
				(0.176)					(0.201)	
				[0.809]					[0.861]	
log(Average UI Benefit) × Years of Education					0.052				0.056	
					(0.026)				(0.027)	
					[0.047]				[0.039]	
log(Average UI Benefit) × log(Pre-unemployment Wage Income)						0.097			-0.006	
						(0.115)			(0.157)	
						[0.400]			[0.971]	
Number of Spells		4307	4307	4307	4307	4307	4307	4307	4307	16322
log(Avgerage UI Benefit) × Occupation FEs							✓		✓	
log(Avgerage UI Benefit) × Industry FEs								✓	✓	
Post-estimation:										
High unemployment elasticity (u = 8.5%) **(A)** + σ × **(B)**		-0.277	-0.273	-0.281	-0.257	-0.274	-0.191	-0.180	-0.139	0.023
		(0.364)	(0.362)	(0.362)	(0.362)	(0.363)	(0.355)	(0.368)	(0.351)	(0.071)
		[0.446]	[0.450]	[0.438]	[0.478]	[0.450]	[0.591]	[0.626]	[0.693]	[0.744]
Low unemployment elasticity (u = 4.9%) **(A)** - σ × **(B)**		-0.987	-0.979	-0.988	-0.961	-0.990	-0.908	-0.874	-0.850	0.191
		(0.343)	(0.341)	(0.343)	(0.340)	(0.342)	(0.347)	(0.371)	(0.360)	(0.093)
		[0.004]	[0.004]	[0.004]	[0.005]	[0.004]	[0.009]	[0.018]	[0.018]	[0.041]

Notes: Columns (1) through (8) report Cox proportional hazard model results from estimating equation (4) using individual-level unemployment spells from 1985-2000 SIPP. See Table 2 for more details on the baseline specification. Column (9) reports OLS estimates of take-up indicator variable on a broader sample of all individuals deemed eligible for UI. The final two rows report linear combinations of parameter estimates to produce the marginal effects when the state unemployment rate is one standard deviation above/below average. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.6
Measuring Selection on Observables Using Demographics as Dependent Variable

Dependent variable:	Age in Years	Marital Dummy	Years of Education	Log Annual Wage	Liquid Wealth ≥ Median	Liquid Wealth ≥ 75th Percentile
	(1)	(2)	(3)	(4)	(5)	(6)
log(State Unemployment Rate)	0.372	0.023	0.087	0.017	0.005	-0.002
	(0.326)	(0.015)	(0.112)	(0.016)	(0.017)	(0.013)
	[0.261]	[0.146]	[0.443]	[0.301]	[0.779]	[0.909]
R^2	0.029	0.027	0.025	0.036	0.031	0.034

Notes: All columns report OLS regressions of the dependent variable, and all columns include state fixed effects and year fixed effects. The baseline SIPP data set is collapsed to one observation per unemployment spell, leaving N = 4307 in all columns. Standard errors are clustered by state and are in parentheses and p-values are in brackets.

Online Appendix Table OA.7

Do Demographics Explain Why the Effect of UI Varies with the State Unemployment Rate?

[Replacing Max. UI Benefit Amount for Avg. UI Benefit Amount in Table OA.7]

Dependent variable: [Specification:]		Unemployment Duration [Cox Proportional Hazard Regression Model]							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(<u>Maximum</u> UI Benefit Amount)	**(A)**	-0.384	-0.385	-0.368	-0.379	-0.387	-0.380	-0.375	-0.357
		(0.291)	(0.290)	(0.301)	(0.287)	(0.289)	(0.280)	(0.289)	(0.296)
		[0.186]	[0.185]	[0.221]	[0.187]	[0.181]	[0.175]	[0.194]	[0.228]
log(<u>Maximum</u> UI Benefit Amount) ×	**(B)**	**1.009**	**1.004**	**1.022**	**0.978**	**1.011**	**0.999**	**0.950**	**0.951**
log(State Unemployment Rate)		**(0.544)**	**(0.543)**	**(0.546)**	**(0.539)**	**(0.539)**	**(0.540)**	**(0.532)**	**(0.519)**
		[0.064]	**[0.064]**	**[0.062]**	**[0.070]**	**[0.061]**	**[0.065]**	**[0.074]**	**[0.067]**
log(State Unemployment Rate)		0.020	0.020	0.020	0.024	0.018	0.021	0.017	0.023
		(0.135)	(0.135)	(0.136)	(0.135)	(0.135)	(0.136)	(0.136)	(0.139)
		[0.882]	[0.883]	[0.883]	[0.861]	[0.891]	[0.875]	[0.900]	[0.869]
log(<u>Maximum</u> UI Benefit) × Age			0.002						0.001
			(0.007)						(0.010)
			[0.831]						[0.898]
log(<u>Maximum</u> UI Benefit) × **1**{Married}				-0.097					-0.165
				(0.137)					(0.172)
				[0.478]					[0.338]
log(<u>Maximum</u> UI Benefit) ×					0.040				0.040
Years of Education					(0.038)				(0.037)
					[0.285]				[0.276]
log(<u>Maximum</u> UI Benefit) ×						0.071			0.023
log(pre-unemp. wage)						(0.098)			(0.117)
						[0.468]			[0.847]
Number of Spells		4307	4307	4307	4307	4307	4307	4307	4307
log(Max. UI Benefit) × Occupation FEs							✓		✓
log(Max. UI Benefit) × Industry FEs								✓	✓
Post-estimation:									
High unemployment elasticity (u = 8.5%)		-0.118	-0.119	-0.098	-0.121	-0.120	-0.117	-0.124	-0.106
(A) + σ × **(B)**		(0.318)	(0.317)	(0.327)	(0.318)	(0.316)	(0.306)	(0.315)	(0.316)
		[0.712]	[0.706]	[0.764]	[0.703]	[0.703]	[0.703]	[0.693]	[0.737]
Low unemployment elasticity (u = 4.9%)		-0.650	-0.650	-0.637	-0.637	-0.654	-0.644	-0.626	-0.608
(A) - σ × **(B)**		(0.330)	(0.331)	(0.340)	(0.323)	(0.329)	(0.323)	(0.327)	(0.336)
		[0.049]	[0.049]	[0.061]	[0.049]	[0.047]	[0.046]	[0.055]	[0.071]

<u>Notes:</u> Columns (1) through (8) report semiparametric (Cox proportional) hazard model results from estimating equation (4) using individual-level unemployment spells from 1985-2000 SIPP. See Table 2 for more details on the baseline specification. The final two rows report linear combinations of parameter estimates to produce the marginal effects when the state unemployment rate is one standard deviation above/below average. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.8
Additional Robustness Tests: Dropping Small States and Accounting for Measurement Error in State Unemployment Rate

		(1)	(2)	(3)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.548	-0.632
		(0.332)	(0.468)	(0.437)
		[0.057]	[0.242]	[0.086]
log(Average UI Benefit Amount) ×	**(B)**	**1.346**	**1.650**	**1.346**
log(State Unemployment Rate)		**(0.457)**	**(0.444)**	**(0.559)**
		[0.003]	**[0.000]**	**[0.058]**
N		4307	3583	4307
State, Year, Occupation, Industry Fes		✓	✓	✓
Restrict to largest 20 states in SIPP sample			✓	
Bootstrapped standard error and p-values accounting for sampling error in state unemployment rate.				✓
Post-estimation:				
High unemployment elasticity (u = 8.5%)		-0.277	-0.139	-0.277
(A) + σ × **(B)**		(0.364)	(0.486)	(0.498)
		[0.446]	[0.776]	[0.414]
Low unemployment elasticity (u = 4.9%)		-0.987	-0.957	-0.987
(A) - σ × **(B)**		(0.343)	(0.475)	(0.468)
		[0.004]	[0.044]	[0.032]

Notes: All columns report semiparametric (Cox proportional) hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. See Table 2 for more details on the baseline specification in column (1). Column (2) limits to the 20 largest states in the SIPP sample. Column (3) reports bootstrapped standard errors and p-values where states are resampled with replacement, and the unemployment rate for each state is drawn from sampling distribution based on the standard error of the state-specific unemployment rate estimate. The standard error estimate is not available for earlier years, so we use standard error estimate for each state unemployment rate in 2013 as estimated standard error for all state-years in our sample. The final two rows report linear combinations of parameter estimates to produce the duration elasticity when the state unemployment rate is one standard deviation above/below the mean. Standard errors are clustered by state and are in parentheses, and p-values are in brackets.

Online Appendix Table OA.9
How Does the Effect of Unemployment Insurance on
Unemployment Duration Vary with the Unemployment Rate?
[Extending Sample in Table 2 from 1985-2000 to 1985-2007]

Specification: Cox Proportional Hazard Regression Model

Sample period:		1985-2000	1985-2007
		(1)	(2)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.297
		(0.332)	(0.340)
		[0.057]	[0.382]
log(Average UI Benefit Amount) ×	**(B)**	**1.346**	**1.174**
log(State Unemployment Rate)		**(0.457)**	**(0.453)**
		[0.003]	**[0.010]**
log(State Unemployment Rate)		0.035	-0.078
		(0.124)	(0.107)
		[0.779]	[0.465]
Age		-0.017	-0.018
		(0.002)	(0.002)
		[0.000]	[0.000]
1{Married}		0.211	0.193
		(0.040)	(0.038)
		[0.000]	[0.000]
Years of Education		0.004	0.007
		(0.006)	(0.006)
		[0.498]	[0.252]
Number of Unemployment Spells		4307	5794
Post-estimation:			
High unemployment elasticity (u = 8.5%)		-0.277	0.002
(A) + σ × **(B)**		(0.364)	(0.379)
		[0.446]	[0.995]
Low unemployment elasticity (u = 4.9%)		-0.987	-0.596
(A) - σ × **(B)**		(0.343)	(0.338)
		[0.004]	[0.077]

Notes: All columns report semiparametric Cox proportional hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2007 SIPP. The Average UI Benefit Amount is the average weekly benefit paid to individuals claiming unemployment insurance in a given state-year. The Maximum UI Benefit Amount is the statutory weekly benefit amount paid to high wage earners in a given state-year. All specifications include state fixed effects, year fixed effects, industry and occupation fixed effects, a 10-knot linear spline in the log of the annual (pre-unemployment) wage income, and an indicator for being on the seam between interviews. All specifications also include year fixed effects interacted with the log of the UI benefit amount. All columns estimate nonparametric baseline hazards stratified by quartile of net liquid wealth. The final two rows report linear combinations of parameter estimates to produce the duration elasticity when the state unemployment rate is one standard deviation above/below the mean. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.10

Robustness to Controlling for Observed and Unobserved Trends

[Extending Sample from 1985-2000 to 1985-2007 in Table 3]

Specification: Cox Proportional Hazard Regression Model

		(1)	(2)	(3)	(4)	(5)
log(Average UI Benefit Amount)	**(A)**	-0.297	-0.263	-0.306	-0.219	-0.110
		(0.340)	(0.347)	(0.356)	(0.337)	(0.301)
		[0.382]	[0.450]	[0.391]	[0.517]	[0.714]
log(Average UI Benefit Amount) ×	**(B)**	**1.174**	**1.137**	**1.210**	**1.198**	**0.971**
log(State Unemployment Rate)		**(0.453)**	**(0.474)**	**(0.432)**	**(0.457)**	**(0.571)**
		[0.010]	**[0.016]**	**[0.005]**	**[0.009]**	**[0.089]**
State FEs and Year FEs		✓	✓	✓	✓	✓
Quadratic in State Unemployment Rate			✓			
Cubic in State Unemployment Rate				✓		
Region-specific linear time trends					✓	
State-specific linear time trends						✓
Post-estimation:						
High unemployment elasticity (u = 8.5%)		0.002	0.027	0.003	0.087	0.137
(A) + σ × **(B)**		(0.379)	(0.372)	(0.382)	(0.387)	(0.361)
		[0.995]	[0.941]	[0.994]	[0.823]	[0.703]
Low unemployment elasticity (u = 4.9%)		-0.596	-0.552	-0.614	-0.524	-0.357
(A) - σ × **(B)**		(0.338)	(0.364)	(0.363)	(0.324)	(0.305)
		[0.077]	[0.129]	[0.091]	[0.106]	[0.241]

Notes: All columns report Cox proportional hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2007 SIPP. Number of unemployment spells = 5794. See Table 2 for more details on the baseline specification. The final two rows reports linear combinations of parameter estimates to produce the unemployment duration elasticity when the state unemployment rate is one standard deviation above or below the mean. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.11
Robustness of Estimated Average Consumption Drop to Alternative Demographic Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Average Consumption Drop Upon Unemployment	-0.0690	-0.0687	-0.0693	-0.0689	-0.0685	-0.0682	-0.0686	-0.0688
[-0.10 = -10%]	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
The Effect of log(State Unemployment Rate) on the	-0.001	-0.002	0.000	0.004	-0.008	-0.007	-0.003	-0.004
Average Consumption Drop Upon Unemployment	(0.059)	(0.058)	(0.058)	(0.059)	(0.058)	(0.058)	(0.058)	(0.062)
	[0.985]	[0.970]	[1.000]	[0.945]	[0.898]	[0.900]	[0.960]	[0.945]
Control variables:								
Log(Pre-unemployment Wage)		0.034						-0.115
		(0.102)						(0.107)
		[0.739]						[0.290]
Age			-0.001					-0.001
			(0.001)					(0.001)
			[0.185]					[0.601]
Years of Education				0.011				0.012
				(0.003)				(0.004)
				[0.002]				[0.003]
Number of Kids					0.030			0.007
					(0.009)			(0.009)
					[0.001]			[0.406]
1{Married}						0.127		0.071
						(0.024)		(0.024)
						[0.000]		[0.005]
State and Year FEs	✓	✓	✓	✓	✓	✓	✓	✓
1{White}							✓	✓
1{Black}							✓	✓
R^2	0.049	0.049	0.050	0.052	0.055	0.061	0.051	0.114

Notes: N = 2003. All columns report results from estimating equation (5) using the same sample as in Table 6. Data are individual-level observations from 1968-1997 PSID. See Table 6 and main text for more details on the specification. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.12

How Does the Average Consumption Drop Upon Unemployment Vary with the Unemployment Rate?

[Extending Table 6 to Alternative Sample Periods and Alternative Sample Restrictions]

Sample period:	1968-1997 [Baseline years]			1968-1987 [Gruber sample period]			1968-2007			1968-2007		
Gender restriction:	Men and Women			Men and Women			Men and Women			Men Only		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(7)	(8)	(9)
Avg. Consumption Drop Upon Unemployment	-0.061	-0.061	-0.060	-0.061	-0.061	-0.061	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073
[-0.10 = -10%]	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
The Effect of log(State Unemployment Rate) on the	-0.065	-0.059	-0.104	-0.026	-0.041	-0.072	-0.058	-0.056	-0.066	0.014	0.030	0.012
Avg. Consumption Drop Upon Unemployment	(0.062)	(0.064)	(0.067)	(0.060)	(0.091)	(0.107)	(0.061)	(0.063)	(0.067)	(0.065)	(0.068)	(0.078)
	[0.299]	[0.359]	[0.126]	[0.671]	[0.657]	[0.500]	[0.346]	[0.377]	[0.329]	[0.832]	[0.665]	[0.876]
N	2610	2610	2610	1605	1605	1605	2978	2978	2978	2261	2261	2261
R^2	0.104	0.107	0.119	0.122	0.126	0.139	0.090	0.093	0.104	0.100	0.104	0.120
State and Year FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Region-specific linear trends		✓			✓			✓			✓	
State-specific linear trends			✓			✓			✓			✓
Post-estimation:												
Avg. consumption drop for high unemp. (u = 8.5%)	-0.080	-0.078	-0.090	-0.069	-0.073	-0.082	-0.090	-0.090	-0.093	-0.069	-0.064	-0.069
(A) + $\sigma \times$ **(B)**	(0.016)	(0.017)	(0.018)	(0.017)	(0.026)	(0.031)	(0.018)	(0.019)	(0.020)	(0.019)	(0.020)	(0.022)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.005]	[0.008]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]
Avg. consumption drop for low unemp. (u = 4.9%)	-0.042	-0.044	-0.029	-0.054	-0.050	-0.040	-0.056	-0.056	-0.054	-0.077	-0.082	-0.076
(A) - $\sigma \times$ **(B)**	(0.020)	(0.021)	(0.022)	(0.017)	(0.026)	(0.031)	(0.018)	(0.019)	(0.020)	(0.020)	(0.021)	(0.024)
	[0.038]	[0.036]	[0.183]	[0.002]	[0.057]	[0.188]	[0.002]	[0.002]	[0.006]	[0.000]	[0.000]	[0.001]

Notes: All columns report results from estimating equation (5) on alternative samples. Data are individual-level observations from various years of the PSID. See main text for more details on the specification. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.13
Does the Liquidity Effect of UI Vary with the Unemployment Rate?

		(1)	(2)	(3)	(4)	(5)
log(Average UI Benefit Amount)	**(A)**	-0.632	-0.966	-0.571		
		(0.332)	(0.601)	(0.327)		
		[0.057]	[0.108]	[0.081]		
log(Average UI Benefit Amount) ×	**(B)**	**1.346**	**1.635**	**1.480**	**1.541**	**1.559**
log(State Unemployment Rate)		**(0.457)**	**(0.735)**	**(0.457)**	**(0.482)**	**(0.627)**
		[0.003]	**[0.026]**	**[0.001]**	**[0.001]**	**[0.013]**
log(Average UI Benefit Amount) ×						-0.041
log(State Unemployment Rate) ×						(0.774)
1{1st and 2nd liquid wealth quartiles}						[0.958]
Number of Spells		4307	2170	4307	4307	4307
Above-median liquid wealth only			✓			
Occupation FEs × Liquid wealth quartile				✓	✓	✓
Industry FEs × Liquid wealth quartile				✓	✓	✓
log(Average UI WBA) × Liquid wealth quartile					✓	✓
Post-estimation:						
High unemployment elasticity (u = 8.5%)		-0.277	-0.535	-0.180		
(A) + σ × **(B)**		(0.364)	(0.619)	(0.364)		
		[0.446]	[0.387]	[0.621]		
Low unemployment elasticity (u = 4.9%)		-0.987	-1.398	-0.961		
(A) - σ × **(B)**		(0.343)	(0.644)	(0.333)		
		[0.004]	[0.030]	[0.004]		

Notes: All columns report Cox proportional hazard model results from estimating equation (4). Data are individual-level unemployment spells from 1985-2000 SIPP. See Table 2 for more details on the baseline specification. The final two rows report linear combinations of parameter estimates to produce the duration elasticity when the state unemployment rate is one standard deviation above/below average. Standard errors are shown in parentheses and are clustered by state, and p-values are shown in brackets.

Online Appendix Table OA.14

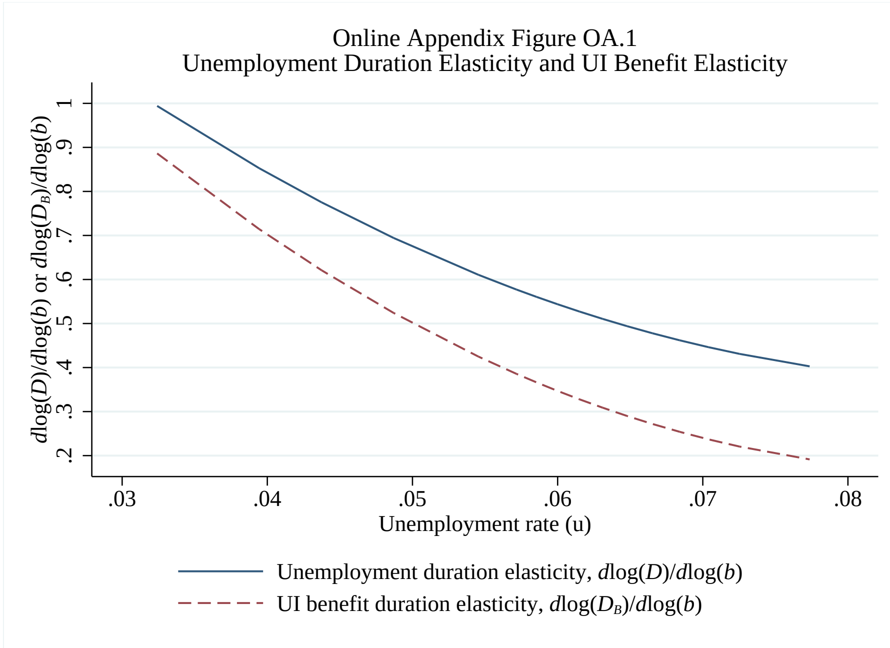
Alternative Calibrations of the Marginal Welfare Gain of UI

($dW/db \times \$10$) by Unemployment Rate

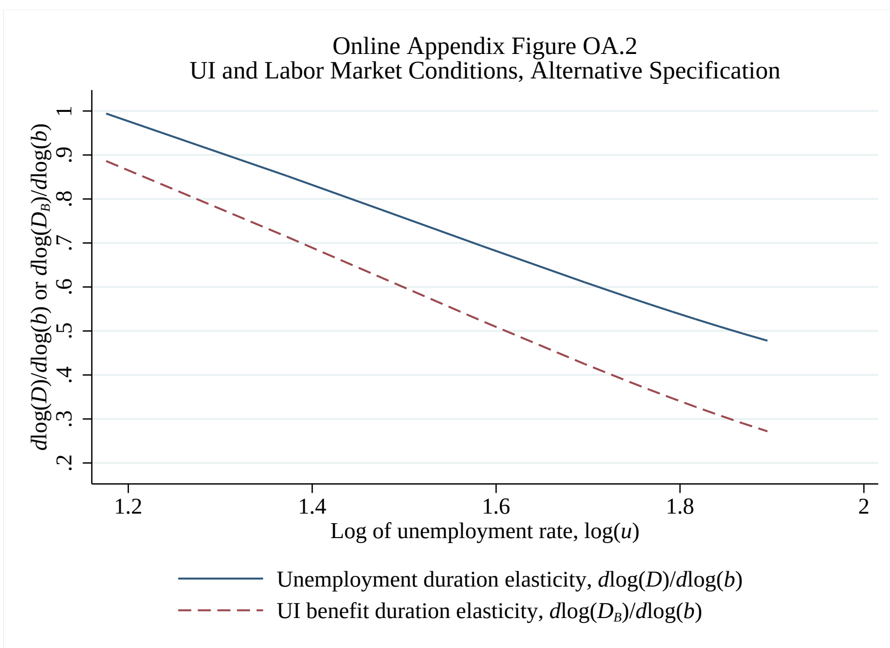
[Replace first-order approximation from Table 7 with second-order approximation]

Coefficient of Relative Risk Aversion, γ		Unemployment Rate and Implied Elasticity				
	u =	4.1%	5.4%	6.7%	8.0%	9.3%
	$\varepsilon_{D,b}$ =	1.293	0.922	0.632	0.393	0.191
	$\Delta c/c$ =	0.067	0.068	0.069	0.070	0.070
γ = 1		-\$0.49	-\$0.46	-\$0.39	-\$0.28	-\$0.12
γ = 2		-\$0.46	-\$0.42	-\$0.34	-\$0.21	-\$0.05
γ = 3		-\$0.43	-\$0.38	-\$0.29	-\$0.15	+\$0.03
γ = 4		-\$0.40	-\$0.34	-\$0.23	-\$0.08	+\$0.11
γ = 5		-\$0.36	-\$0.29	-\$0.17	-\$0.01	+\$0.20

Notes: Each cell reports the marginal welfare gain calculation according to the second-order approximation formula that extends equation (3), as described in footnote 8. This formula scales the consumption change by both the coefficient of relative risk aversion (in the first column) and the coefficient of relative prudence, which we assume is equal to 1 + γ. See Section 4 and Table 7 for more details on the computations.

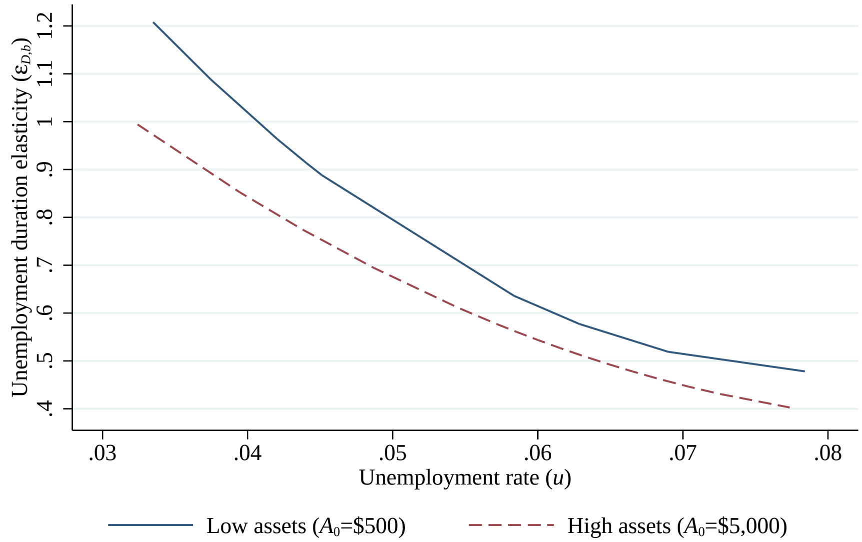


<u>Notes:</u> This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1. The y-axis shows the elasticity of the expected unemployment duration with respect to the UI benefit level (i.e., $\varepsilon_{D,b}$) as well as the elasticity of the expected UI benefit duration with respect to the UI benefit level (i.e., $\varepsilon_{D_B,b}$).



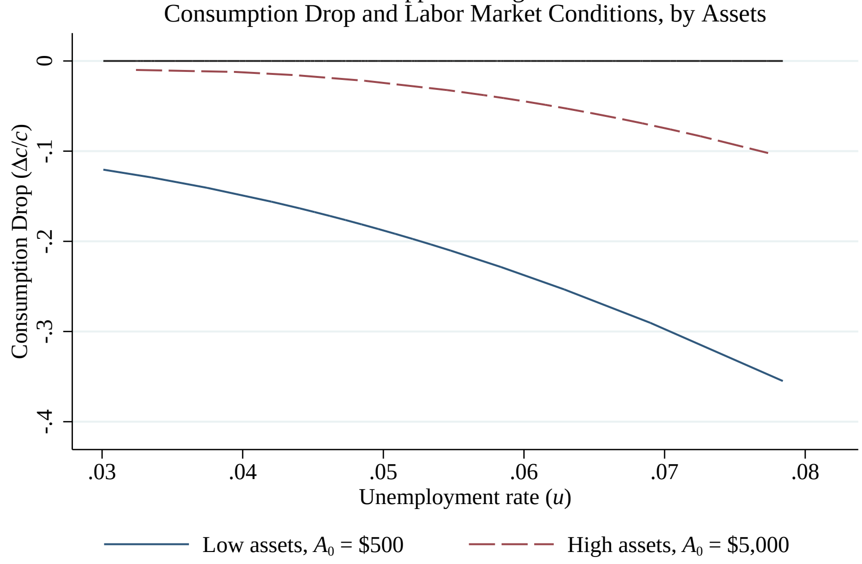
<u>Notes:</u> This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1. The y-axis shows the elasticity of the expected unemployment duration with respect to the UI benefit level (i.e., $\varepsilon_{D,b}$) as well as the elasticity of the expected UI benefit duration with respect to the UI benefit level (i.e., $\varepsilon_{D_B,b}$). The x-axis is the log of the unemployment rate ($\log(u)$) instead of u to show that both elasticities are approximately linear functions of $\log(u)$.

Online Appendix Figure OA.3
UI and Labor Market Conditions, by Assets

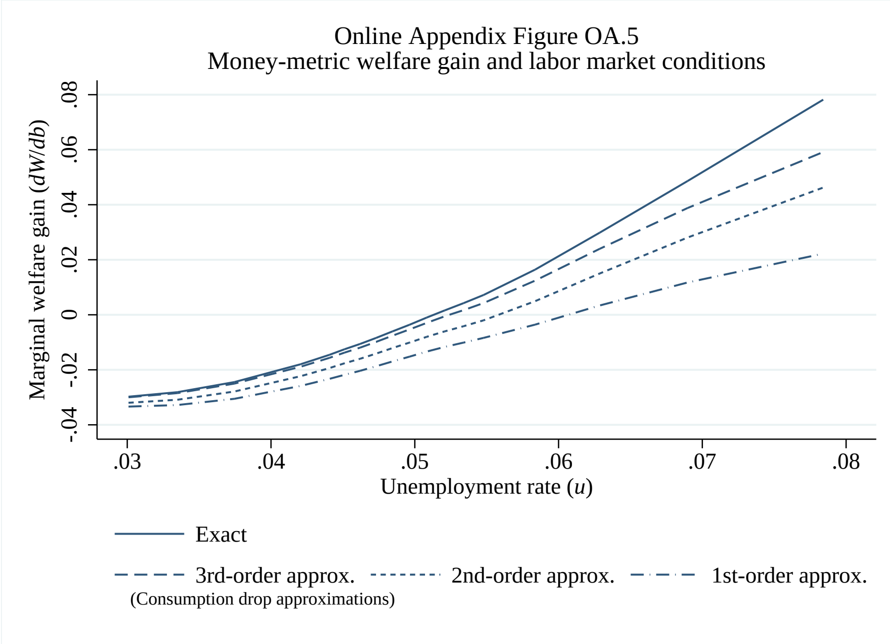


Notes: This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1 (except for the initial assets, A_0, which vary across the curves as indicated in the figure). The y-axis shows the elasticity of the expected unemployment duration with respect to the UI benefit level (i.e., $\varepsilon_{D,b}$).

Online Appendix Figure OA.4
Consumption Drop and Labor Market Conditions, by Assets

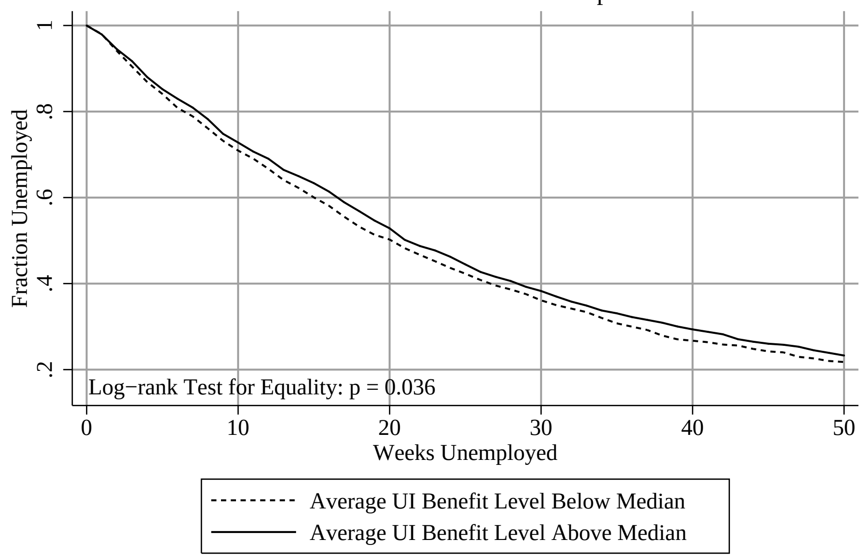


Notes: This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1. The y-axis shows the (weighted-average) consumption change between employment and unemployment (i.e., $\Delta c/c$).

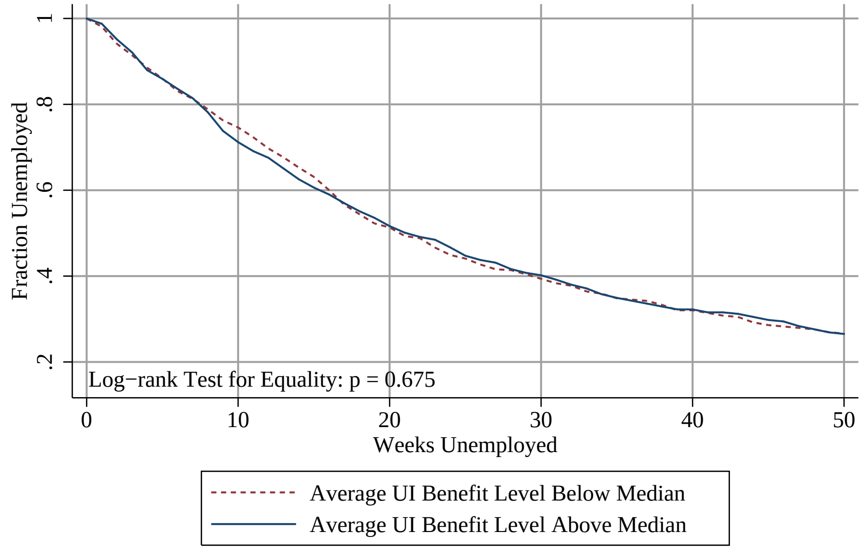


Notes: This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1. The y-axis shows the marginal welfare gain (dW/db) of increasing the UI benefit level by \$1 and the x-axis shows the unemployment rate. The solid line shows the exact numerical derivative (i.e., $(dJ_0/db)/(dJ_0/dw)$), while the dashed lines show alternative approximation formulas to equation (2) in the main text, as described in the Online Appendix.

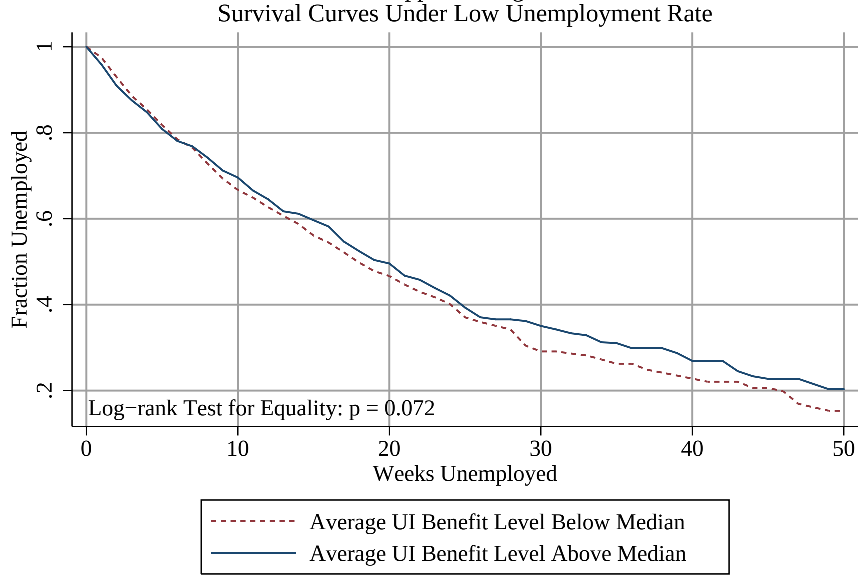
Online Appendix Figure OA.6
Survival Curves for Full Sample



Notes: Data are individual-level unemployment spells from the 1985-2000 SIPP. The figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in an individual's state is above or below the overall sample median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard.

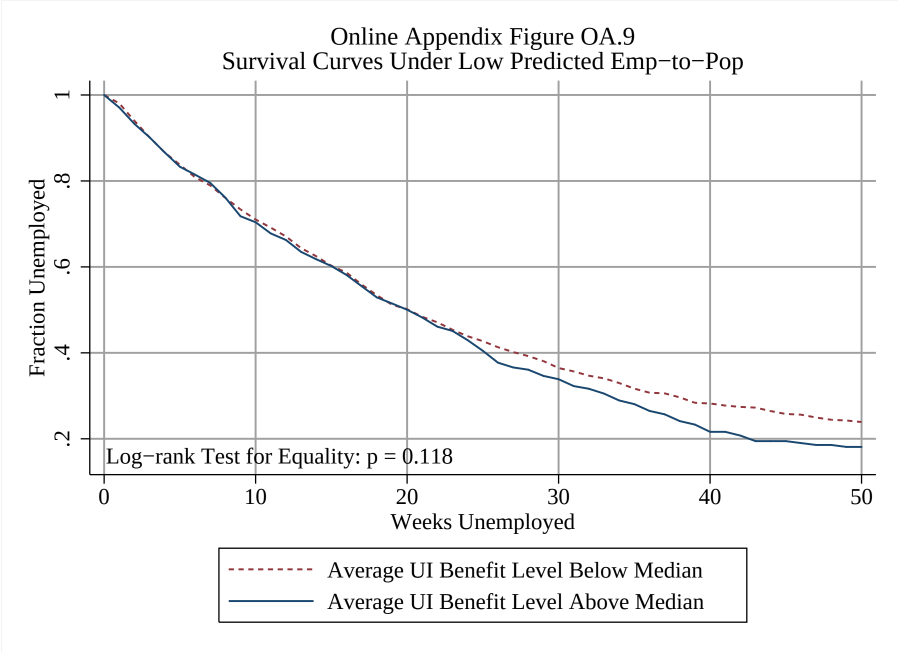


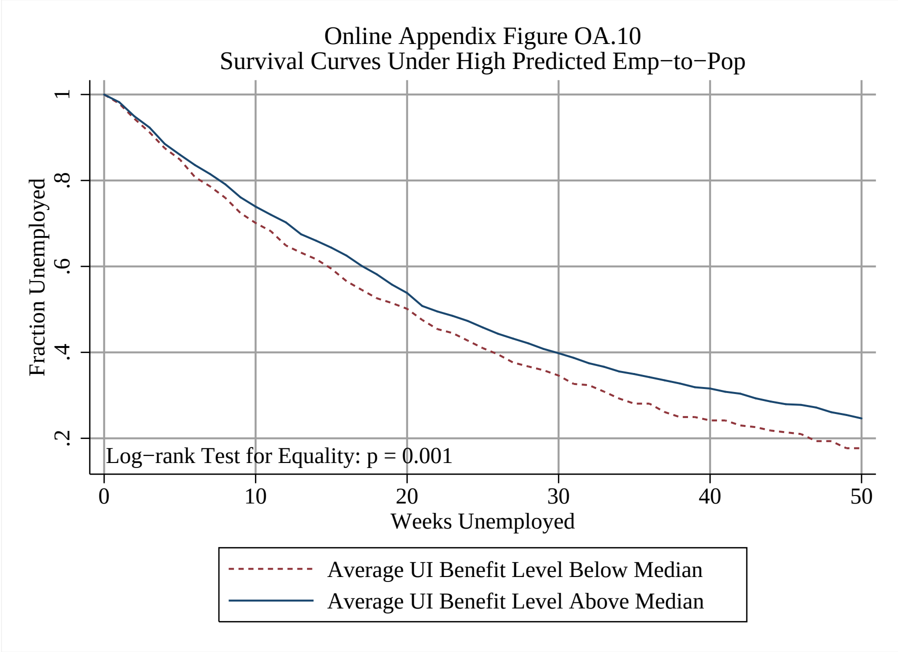
Online Appendix Figure OA.7
Survival Curves Under High Unemployment Rate



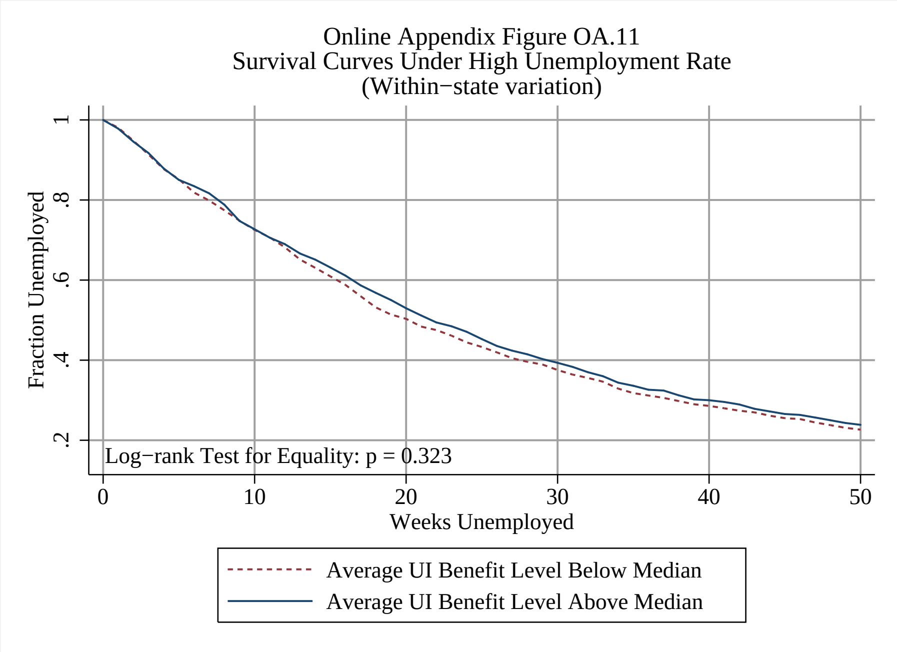
Online Appendix Figure OA.8
Survival Curves Under Low Unemployment Rate

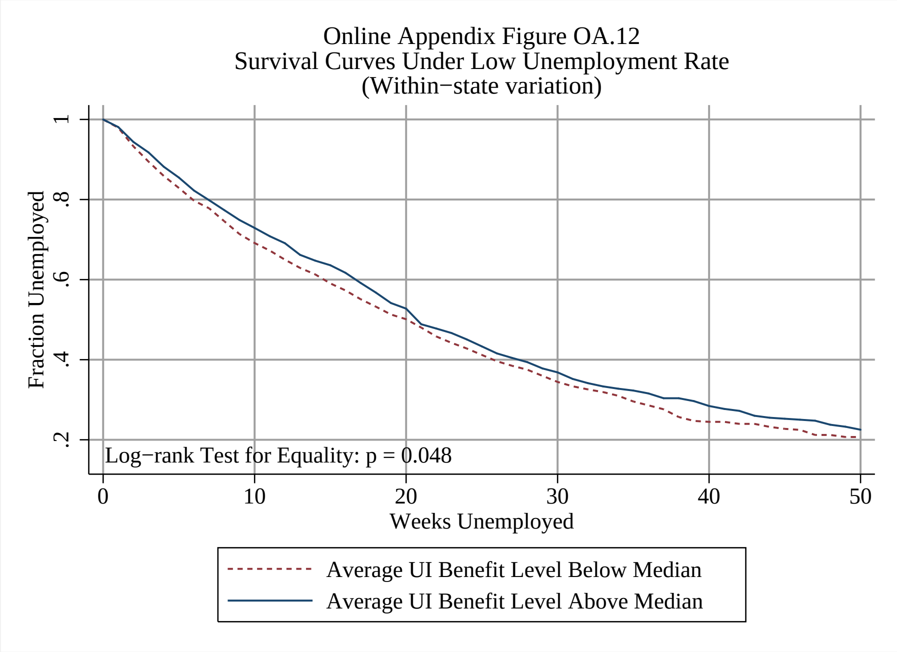
Notes: Data are individual-level unemployment spells from the 1985-2000 SIPP. In order to minimize liquidity effects, the sample is limited to individuals with net liquid wealth above the overall sample median. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard.





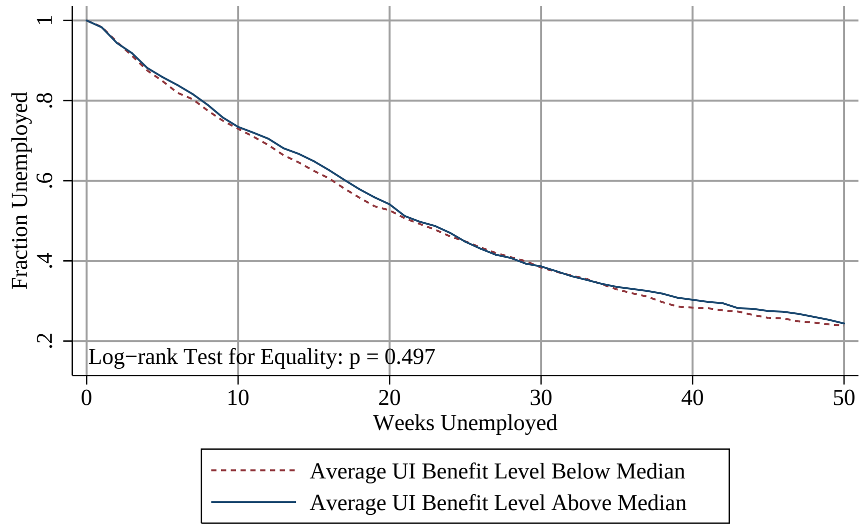
Notes: Data are individual-level unemployment spells from the 1985-2000 SIPP. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the overall sample median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard. The employment-to-population ratio is predicted following the procedure in Bartik (1991).



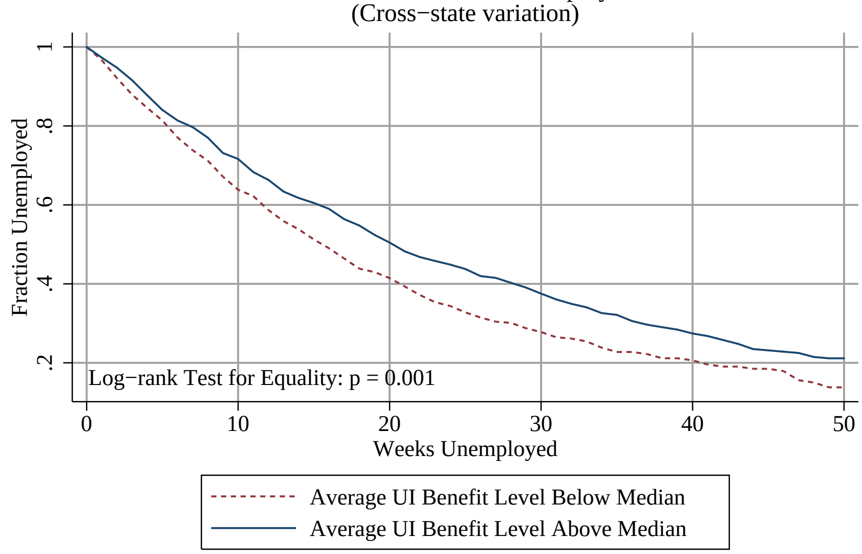


Notes: Data are individual-level unemployment spells from the 1985-2000 SIPP. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the overall sample median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard. The figures report results for sub-samples defined depending on whether the unemployment rate is above or below the median unemployment rate in the state during the sample period (i.e., "within-state variation").

Online Appendix Figure OA.13
Survival Curves Under High Unemployment Rate
(Cross−state variation)

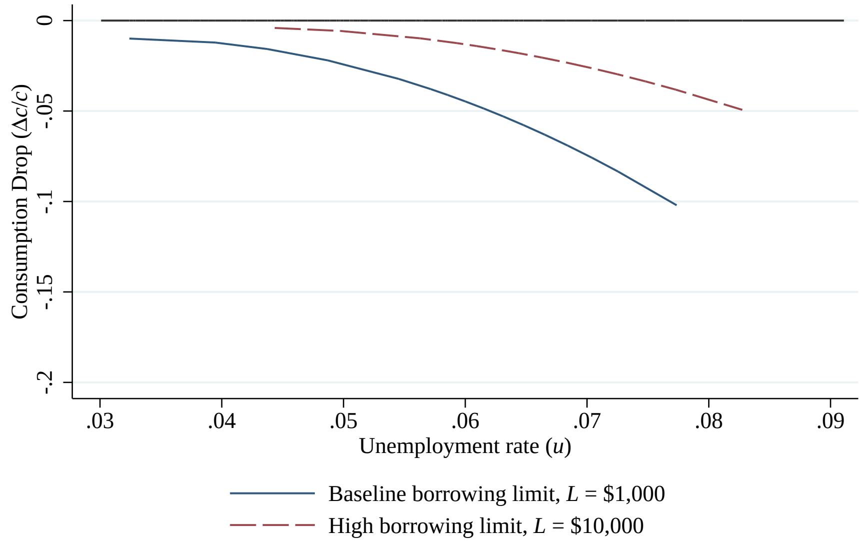


Online Appendix Figure OA.14
Survival Curves Under Low Unemployment Rate
(Cross−state variation)

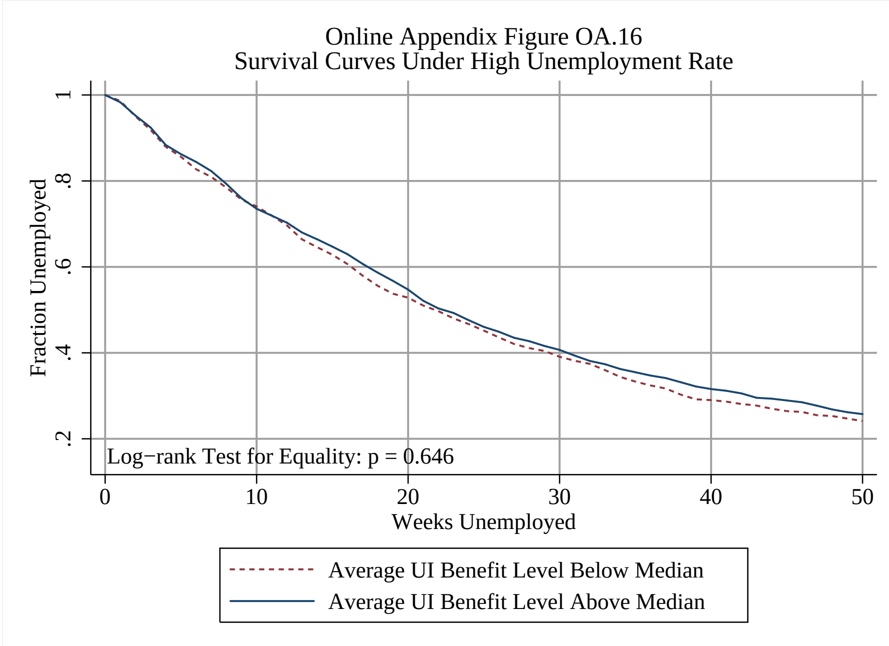


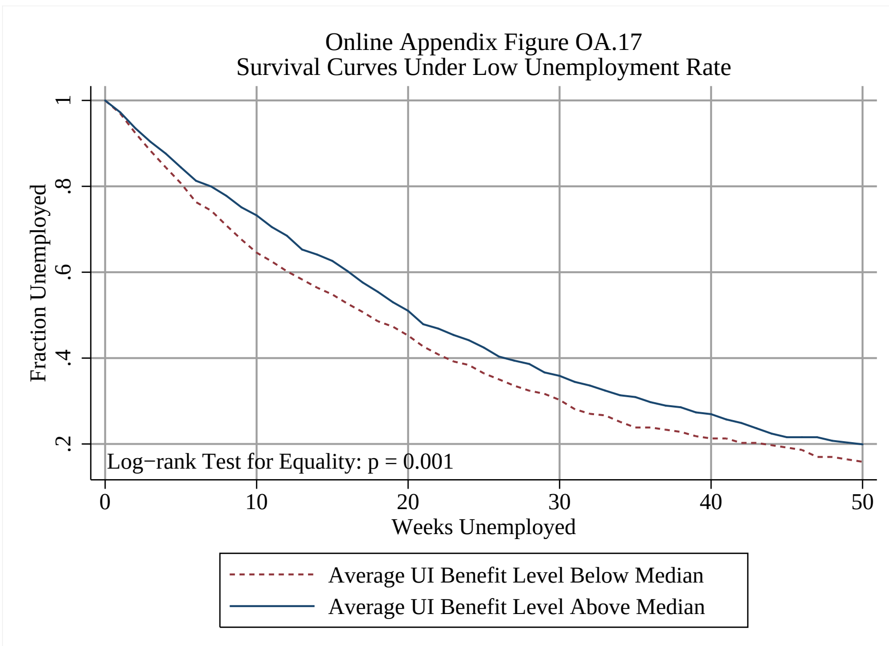
Notes: Data are individual-level unemployment spells from 1985-2000 SIPP. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard. The figures report results for sub-samples defined depending on whether the average unemployment rate in the state during the sample period is above or below the median across all states in the sample (i.e., "cross-state variation").

Online Appendix Figure OA.15
Consumption Drop and Borrowing Limit

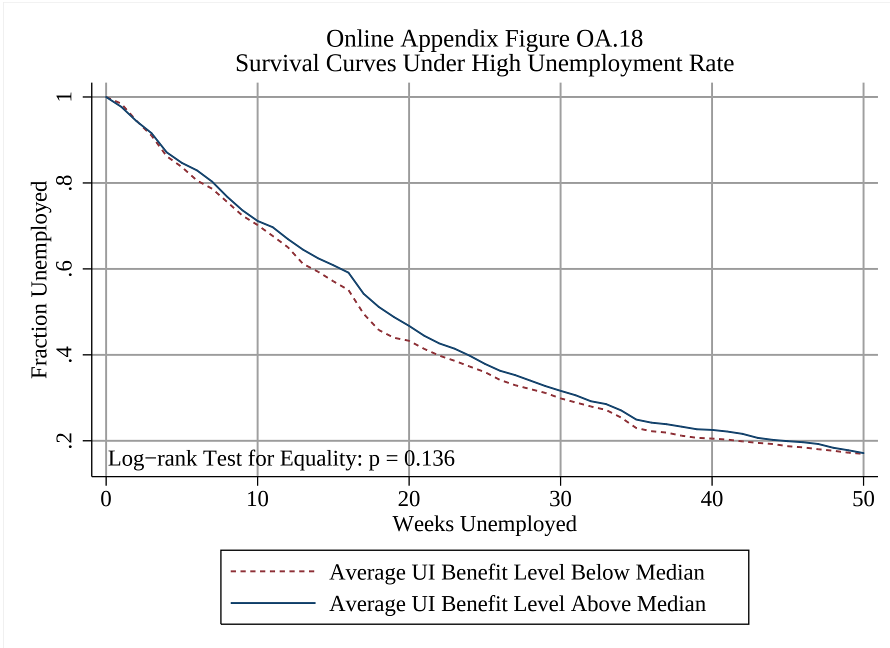


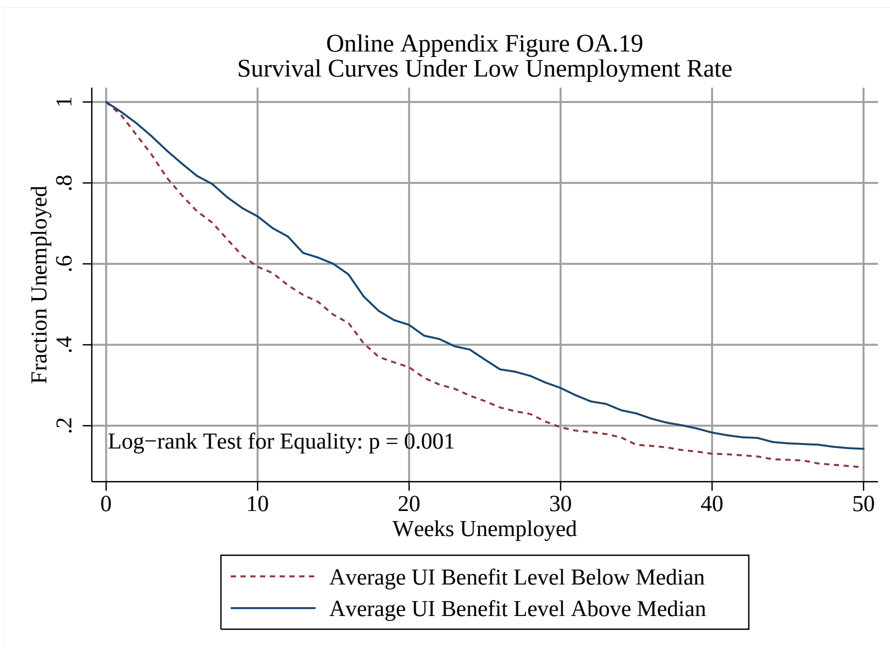
Notes: This figure is generated by calibrating the job search model in the main text with the parameters described in the notes to Figure 1. The y-axis shows the (weighted-average) consumption change between employment and unemployment (i.e., $\Delta c/c$) for different values of the exogenous borrowing limit.





Notes: Data are individual-level unemployment spells from the 1985-2000 SIPP, with the sample restricted to the largest 20 states in the SIPP data set. This sample restriction is intended to reduce measurement error in the measurement of labor market conditions. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard. The figures report results for sub-samples defined depending on whether the average unemployment rate in the state during the sample period is above or below the median across all states in the sample.





Notes: Data are individual-level unemployment spells from 1985-2007 SIPP, extending the baseline sample by 7 years. Each figure plots (Kaplan-Meier) survival curves for two groups of individuals based on whether or not Average UI Weekly Benefit Amount (WBA) in individual's state is above or below the median. The survival curves are adjusted following Chetty (2008), which parametrically adjusts for "seam effect" by fitting a Cox proportional hazard model with a seam dummy and then recovering the baseline hazard. The figures report results for sub-samples defined depending on whether the average unemployment rate in the state during the sample period is above or below the median across all states in the sample.