Knowledge About Future Job Loss and Implications for Unemployment Insurance

Nathaniel Hendren

Harvard and NBER

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Why is there not a robust private market for unemployment/job loss insurance?

- Like health, life, disability, car, home, pet health, iPhone water damage, etc...
- Why doesn’t Aetna have an unemployment insurance division?

Large literature studying “optimal” government provision of UI

- Absence of private market not micro-founded
  - If a private market doesn’t exist, doesn’t that mean no one’s willing to pay for UI?
  - Does providing a microfoundation change the formula for optimal benefits?
Overview of the Paper

- Part 1: Private Information is the reason the private market doesn’t exist
  - Use information contained in subjective probability elicitation (Hendren 2013)
  - Quantify cost of adverse selection if contracts were offered:
    - 70% markup (Non-parametric lower bound)
    - 300% markup (Semi-parametric point estimate)

- Part 2: Implications for optimal UI policy
  - In response to potential job loss, individuals reduce consumption and increase spousal labor supply
  - Causal effect of event on marginal utilities (i.e. Baily formula) no longer sufficient
  - Want insurance against information, not just event
  - Provide new methods to identify ex-ante value of insurance
  - Exploit ex-ante response to information
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  • Provide new methods to identify ex-ante value of insurance
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1. Private Information as Micro-Foundation for Market Non-Existence

2. Optimal UI
Setting and Data

- Use data from Health and Retirement Study (1993-2013)
  - Survey asks subjective probability elicitations, $Z$
  - "What is percent chance (0-100) that you will lose your job in the next 12 months?"
Histogram of Subjective Probability Elicitations

Subjective Probability Elicitation

Density

0 0.05 0.1 0.15 0.2 0.25

0 20 40 60 80 100
Elicitations as Noisy Measures of Beliefs

- $Z$ may not express an agents’ true beliefs ($Z \neq P$)

Sets of controls simulate different underwriting strategies:
- Start with controls for demographics + job characteristics
  - Demographics (gender, age quadratic, census division, year)
  - Job characteristics (tenure quadratic, occupation dummies, industry dummies, log wage quadratic)
- Add additional controls for health, unemployment history, etc.

Bin $Z$ into groups, $c_j$, (0, 1-10, ...)

Define $U$ as indicator for unemployment in next 12 months.

Does $Z$ predict $U$ conditional on $X$?

Regress $U$ on $X$ and bins to construct:

$$P(Z) = \Pr\{U | X, Z\} = bX + \hat{\beta}_j z_j 1\{Z \in c_j\}$$
Z may not express an agents’ true beliefs ($Z \neq P$)

Use information in joint distribution of elicitation and event

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Regress $U$ on $X$ and bins to construct:

$$P(Z) = Pr\{U | X, Z\} = bX + \hat{\beta}_j z_j 1\{Z \geq c_j\}$$
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    - Add additional controls for health, unemployment history, etc.
- Bin $Z$ into groups, $\chi_j$, (0, 1-10, ...)
  - Regress $U$ on $X$ and bins to construct:

$$P_Z = \Pr \{ U|X, Z \} = \beta X + \sum_j \zeta_j 1 \{ Z \in \chi_j \}$$
Predictive Content of Elicitations about Future Unemployment

Coefficients on Z categories in $\Pr\{U|Z,X\}$
Paper considers general model of unemployment risk
  When can one provide insurance that pays $1 if $U$ occurs?
Paper considers general model of unemployment risk

- When can one provide insurance that pays $1 if $U$ occurs?

Key statistic: Pooled price ratio, $T(P)$

- How much of a markup would you have to be willing to pay to cover the pooled cost of worse risks?
Paper considers general model of unemployment risk

When can one provide insurance that pays $1 if $U$ occurs?

Key statistic: Pooled price ratio, $T(P)$

How much of a markup would you have to be willing to pay to cover the pooled cost of worse risks?

Can use distribution of predicted values to provide non-parametric lower bound on this markup

Without any assumptions about elicitation error
Need elicitation to be not more informative than true beliefs
Need true beliefs (not elicitation) to be unbiased
Lower Bounds for $E[T(P)]^{-1}$ using Alternative Controls
Lower Bounds for $E[T(P)]^{-1}$ by Industry
Lower Bounds for $E[T(P)]-1$ by Occupation
Lower Bounds for $E[T(P)]^{-1}$ by Age
Lower Bounds on $E[T(P)] - 1$ using Alternative $U$ Definitions
Lower Bounds for $E[T(P)]^{-1}$ for Low Risk Sub-samples

- Working Last Wave
- Not Working Last Wave
- 5+ Years Job Tenure
- No UI claim in past 4 years
## Minimum Pooled Price Ratio

<table>
<thead>
<tr>
<th>Specification</th>
<th>Baseline (1)</th>
<th>Alternative Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inf T(p) - 1</td>
<td>3.360</td>
<td>5.301</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.203)</td>
<td>(0.655)</td>
</tr>
</tbody>
</table>

**Controls**
- Demographics: X
- Job Characteristics: X
- Health Characteristics: X

<table>
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<tr>
<th>Num of Obs.</th>
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<th>26,640</th>
<th>22,831</th>
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<td>Num of HHs</td>
<td>3,467</td>
<td>3,467</td>
<td>3,180</td>
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</table>
## Minimum Pooled Price Ratio

<table>
<thead>
<tr>
<th>Specification</th>
<th>Sub-Samples</th>
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<tbody>
<tr>
<td></td>
<td>Age &lt;= 55</td>
<td>Age &gt; 55</td>
<td>Below</td>
<td>Above</td>
<td>Tenure &gt; 5 yrs</td>
<td>Tenure &lt;= 5 yrs</td>
</tr>
<tr>
<td>Inf T(p) - 1</td>
<td>3.325</td>
<td>3.442</td>
<td>4.217</td>
<td>3.223</td>
<td>4.736</td>
<td>3.739</td>
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<tr>
<td>s.e.</td>
<td>(0.306)</td>
<td>(0.279)</td>
<td>(0.417)</td>
<td>(0.268)</td>
<td>(0.392)</td>
<td>(0.336)</td>
</tr>
<tr>
<td>Controls</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Demographics</td>
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<tr>
<td>Job Characteristics</td>
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<td>17,850</td>
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<td>3,231</td>
<td>2,916</td>
<td>2,259</td>
<td>2,952</td>
<td>2,437</td>
</tr>
</tbody>
</table>
Comparison of inf $T(p)$ to Other Markets

![Graph showing the comparison of inf $T(p)$ to other markets like Life, Disability, LTC, and Unemployment.]
1 Private Information as Micro-Foundation for Market Non-Existence

2 Optimal UI
What is the utilitarian-optimal level of benefits?
Implications for Optimal UI

- What is the utilitarian-optimal level of benefits?
- Baily-Chetty formula starting point:

\[
\frac{u'(c_u) - v'(c_e)}{v'(c_e)} = FE
\]

- Effect of unemployment on marginal utilities of income characterizes WTP for insurance
- Compare to total costs, inclusive of fiscal externality
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- If individuals learn before the event, can partially mitigate impact (e.g. \( v' = u' \))
  - Causal effect of event on marginal utilities, i.e. \( u'(c_u) - v'(c_e) \), not sufficient
  - Conflates uncertainty realization with event realization

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Implications for Optimal UI

- What is the utilitarian-optimal level of benefits?
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\[ \frac{u' (c_u) - v' (c_e)}{v' (c_e)} = FE \]

- Effect of unemployment on marginal utilities of income characterizes WTP for insurance
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- If individuals learn before the event, can partially mitigate impact (e.g. \( v' = u' \))
  - Causal effect of event on marginal utilities, i.e. \( u' (c_u) - v' (c_e) \), not sufficient
  - Conflates uncertainty realization with event realization
    - Raises both theoretical and empirical issues
Implications for Theory

- Let $p$ denote probability of unemployment
- Optimality formula:

$$W = E \left[ \frac{p}{E[p]} u'(c_u(p)) \right] - E \left[ \frac{1-p}{E[1-p]} v'(c_e(p)) \right] = FE$$

where $W$ is the ex-ante markup individuals are willing to pay
- $FE$ remains the aggregate fiscal externality from increasing benefits
- Causal effect of $U$ on marginal utilities works for those with $p = E[p]$
  - Differs from canonical formula if marginal utilities of income vary with $p$
    - Higher if high $p \rightarrow$ high marginal utilities (in either state)
Empirical issues

- Common to look at 1-year consumption changes to measure
  \[
  \frac{u' - v'}{v'} \approx \sigma \frac{\Delta c}{c}
  \]
- Euler equation

\[
v' \left( c_{pre} (p) \right) = pu' \left( c_u (p) \right) + (1 - p) v' \left( c_e (p) \right)
\]
Empirical issues

- Common to look at 1-year consumption changes to measure
  \[ \frac{\nu' - \nu'}{\nu'} \approx \sigma \frac{\Delta c}{c} \]
- Euler equation
  \[ \nu' (c_{pre} (p)) = pu' (c_u (p)) + (1 - p) \nu' (c_e (p)) \]

- What is the value of insurance to those who learned \( p \) ex-ante?
Consider welfare experiment:

\[ W^{ex-ante} = \frac{v'(c_{pre}(1)) - v'(c_{pre}(0))}{v'(c_{pre}(0))} \]

\[ \approx \frac{\frac{d}{dp} v'}{v'} \approx \frac{d \log (v')}{dp} \]

Note \( W^{ex-ante} \approx W \) if ex-post consumption response is small

- Captures welfare impact on those not captured in previous literature
The Value of Insurance to the Informed

- Consider welfare experiment:

\[ W_{\text{ex-ante}} = \frac{v'(c_{\text{pre}}(0)) - v'(c_{\text{pre}}(0))}{v'(c_{\text{pre}}(0))} \]

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Note \( W_{\text{ex-ante}} \approx W \) if ex-post consumption response is small

- Captures welfare impact on those not captured in previous literature

- Consumption

\[ \frac{d\log(v')}{dp} \approx \sigma_v \frac{d\log(c_{\text{pre}})}{dp} \]
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- Captures welfare impact on those not captured in previous literature

Consumption

\[ \frac{d\log(v')}{dp} \approx \sigma_v \frac{d\log(c_{pre})}{dp} \]

Spousal extensive margin labor supply

\[ \frac{d\log(v')}{dp} \approx \frac{1}{\epsilon^{semi}} \frac{d[LFP^{Spouse}]}{dp} \]
Sample of households who stay married in $t-1$ and $t$

Focus on labor market entry

Define an indicator for a spouse not in labor force last period and in labor force this period

- On average, about 4% of spouses go from not working to working
- Paper also looks at exit
  - Evidence of correlated shocks on exit
  - Suggests current approach may under-state response if opportunity set held fixed
Relationship between Potential Job Loss and Spousal Labor Supply

Subjective Probability Elicitation

Pr\{Spouse Enters Workforce\} vs. Subjective Probability Elicitation

- 0
- 1-10
- 11-40
- 41-50
- 51-100
## Welfare Calculation: Spousal Labor Supply Response

<table>
<thead>
<tr>
<th>Specification:</th>
<th>Baseline</th>
<th>U=0</th>
<th>HH FE</th>
<th>Ind FE</th>
<th>2yr Lag (&quot;Placebo&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Elicitation (Z)</em></td>
<td>0.0273**</td>
<td>0.0270**</td>
<td>0.0267*</td>
<td>0.0312</td>
<td>0.00792</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.0112)</td>
<td>(0.0116)</td>
<td>(0.0146)</td>
<td>(0.0230)</td>
<td>(0.0102)</td>
</tr>
<tr>
<td><em>Mean Dep Var</em></td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
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<td><em>Num of Obs.</em></td>
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<td>10726</td>
<td>11049</td>
<td>11049</td>
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<tr>
<td><em>Num of HHs</em></td>
<td>2214</td>
<td>2194</td>
<td>2214</td>
<td>2214</td>
<td>2214</td>
</tr>
</tbody>
</table>
Assume $\epsilon^{semi} = 0.5$
Assume $e^{semi} = 0.5$

Need to correct for measurement error in $Z$

\[
\frac{dLFP}{dP} = \frac{dLFP}{dZ} \frac{var(Z)}{var(P)}
\]

Again, use information in the joint distribution of $Z$ and $L$

\[
var(P) \approx cov(L, Z)
\]
## Welfare Calculation: Spousal Labor Supply Response

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<tr>
<td><strong>Estimation of ( dL/dZ )</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>(0.0102)</td>
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<td><strong>Welfare Calculation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total/Signal Var</td>
<td>11.00</td>
<td>11.00</td>
<td>11.00</td>
<td>11.00</td>
<td>11.00</td>
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<tr>
<td>bootstrap s.e.</td>
<td>(1.41)</td>
<td>(1.37)</td>
<td>(1.32)</td>
<td>(1.32)</td>
<td>(1.32)</td>
</tr>
<tr>
<td>Implied WTP (( \varepsilon_{semi} = 0.5 ))</td>
<td>0.6**</td>
<td>0.59**</td>
<td>0.59**</td>
<td>0.69*</td>
<td></td>
</tr>
<tr>
<td>bootstrap s.e.</td>
<td>(0.26)</td>
<td>(0.26)</td>
<td>(0.29)</td>
<td>(0.39)</td>
<td></td>
</tr>
</tbody>
</table>

| Mean Dep Var     | 0.04  | 0.04  | 0.04  | 0.04  | 0.04  |
| Num of Obs.      | 11049 | 10726 | 11049 | 11049 | 11049 |
| Num of HHs       | 2214  | 2194  | 2214  | 2214  | 2214  |
Does consumption respond to learning about unemployment?
Consumption Behavior

- Does consumption respond to learning about unemployment?
- Problem: Don’t observe consumption and elicitation at same time in HRS
Consumption Behavior

- Does consumption respond to learning about unemployment?
- Problem: Don’t observe consumption and elicitation at same time in HRS
- Solution: 2-sample IV
  - Evolution of beliefs in HRS
  - Evolution of food consumption in PSID (Gruber 1997, Stephens (2001), Chetty and Szeidl (2007), ...)

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Follow data construction in Gruber (1997) and Chetty and Szeidl (2007)

- Restrict to heads of household
- Measure food expenditure as in + out + stamps

Define consumption growth $g_t = \log(c_t) - \log(c_{t-1})$

- Regress $g_{t-1}$ on $U_t$ + controls (age cubic, year dummies)
- Restrict the sample to those not unemployed in $t - 2$ and $t - 1$
Impact of Unemployment on Consumption Growth
Employed in t-2 and t-1 Sample

Coefficient on Unemployment Indicator

Lead/Lag Relative to Unemployment Measurement

Coeff 5 / 95% CI
### Impact of Future Job Loss on Consumption

<table>
<thead>
<tr>
<th>Specification</th>
<th>Full Sample</th>
<th>Employed t-2 and t-1</th>
<th>Controls for Needs</th>
<th>Fixed Effects</th>
<th>Over 40 Sample</th>
<th>(2) With Outliers</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td><strong>Impact of Unemployment on log(c_{t-2}) - log(c_{t-1})</strong></td>
<td>-0.0336***</td>
<td>-0.0250***</td>
<td>-0.0264***</td>
<td>-0.0243*</td>
<td>-0.0262*</td>
<td>-0.0231*</td>
</tr>
<tr>
<td>Unemp</td>
<td>(0.00570)</td>
<td>(0.00942)</td>
<td>(0.0102)</td>
<td>(0.0133)</td>
<td>(0.0157)</td>
<td>(0.0121)</td>
</tr>
<tr>
<td>s.e.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Specification Details</td>
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</tr>
<tr>
<td>Sample Employed in t-2 and t-1</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Controls for change in log needs (t-2 vs t-1)</td>
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<td>X</td>
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<td>Individual Fixed Effects</td>
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<td>8869</td>
<td>4772</td>
<td>10156</td>
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</table>
Reduced form

\[ \Delta_{RF} = 0.025 \]

Need "first stage"

First stage: How much do people learn in year \( t - 2 \) vs \( t - 1 \)?

\[ \Delta_{\text{First Stage}} = E[P_{t-1,t} | U_t = 1] - E[P_{t-1,t} | U_t = 0] \]

Knowledge in \( t - 1 \) about \( t \)

\[ - E[P_{t-2,t} | U_t = 1] + E[P_{t-2,t} | U_t = 0] \]

Knowledge in \( t - 2 \) about \( t \)

Assume measurement error in \( Z \) uncorrelated with \( U \)

\[ E[Z | U] = E[P | U] \]

Natural for \( E[Z_{t-1} | U_t] \)

Likely attenuated for \( E[Z_{t-2} | U_t] \) because \( Z_t \) elicits information about \( U_{t+1} \), not \( U_{t+2} \)
$E[Z|U=1] - E[Z|U=0]$  
by Year of Unemployment Measurement

![Graph showing the difference in expected values of $Z$ for $U=1$ and $U=0$ over years relative to elicitation measurement.](image-url)
## "2-Sample IV" Welfare Calculation

<table>
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<tr>
<th>Specification:</th>
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<th>Employed t-2 and t-1</th>
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<td></td>
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<td>(6)</td>
</tr>
<tr>
<td><strong>Impact of Unemployment on log(c_{t-2})-log(c_{t-1})</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemp</td>
<td>-0.0336***</td>
<td>-0.0250***</td>
<td>-0.0264***</td>
<td>-0.0243*</td>
<td>-0.0262*</td>
<td>-0.0231*</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.00570)</td>
<td>(0.00942)</td>
<td>(0.0102)</td>
<td>(0.0133)</td>
<td>(0.0157)</td>
<td>(0.0121)</td>
</tr>
<tr>
<td><strong>Specification Details</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Employed in t-2 and t-1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Controls for change in log needs (t-2 vs t-1)</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Individual Fixed Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num of HHs</td>
<td>11055</td>
<td>10042</td>
<td>8869</td>
<td>8869</td>
<td>4772</td>
<td>10156</td>
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</tbody>
</table>

### Split-Sample IV Welfare Calculation

<table>
<thead>
<tr>
<th>$\Delta_{\text{First Stage}}$</th>
<th>0.100</th>
<th>0.100</th>
<th>0.100</th>
<th>0.100</th>
<th>0.100</th>
<th>0.100</th>
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</thead>
<tbody>
<tr>
<td>bootstrap s.e.</td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.017)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$d[\log(c_{\text{pre}(p)})]/dp$ (2-sample 2SLS)</th>
<th>0.35***</th>
<th>0.26***</th>
<th>0.28***</th>
<th>0.26**</th>
<th>0.27*</th>
<th>0.24**</th>
</tr>
</thead>
<tbody>
<tr>
<td>s.e.</td>
<td>(0.06)</td>
<td>(0.09)</td>
<td>(0.10)</td>
<td>(0.13)</td>
<td>(0.16)</td>
<td>(0.12)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$W_{\text{ex-ante}}$ ($\sigma = 2$)</th>
<th>0.7***</th>
<th>0.52***</th>
<th>0.55***</th>
<th>0.53**</th>
<th>0.54*</th>
<th>0.48**</th>
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</thead>
<tbody>
<tr>
<td>s.e.</td>
<td>(0.11)</td>
<td>(0.19)</td>
<td>(0.20)</td>
<td>(0.27)</td>
<td>(0.31)</td>
<td>(0.24)</td>
</tr>
</tbody>
</table>
Conclusion

- Private information explains absence of private UI market
  - Lower bounds on markups in excess of 50% across subsamples
    - Point estimates around 300%
- People respond to knowledge about future unemployment
  - Individuals respond to potential job loss by decreasing consumption and increasing spousal labor supply
- Response to information provides method to estimate WTP for social insurance
  - WTP of 50-60% with $\sigma = 2$ and $\epsilon^{semi} = 0.5$
  - Suggests non-trivial value of social insurance for set who learned ex-ante
Appendix
Ex-Post Consumption Approach

- Test #1: Do $c_u$ and $c_e$ vary with $p$?
- Use consumption mail survey in HRS conducted in year after main survey
  - 10%(!) sub-sample
  - Regress ex-post consumption $\log(c)$ on ex-ante $Z$
    - Recall: $Z$ has large focal point bias at zero
  - Controls for wages, census division, year, age, gender, marital status, and unemployment status
Relationship between Potential Job Loss and Consumption

Household Consumption per Capita

Subjective Probability Elicitation

0-10

11-40

41-50

51-100
Relationship between Potential Job Loss and Consumption
Leads and Lags of Per Capita Consumption

Coeff on Subj. Prob. Elic.
### Consumption vs. Potential Job Loss (Z)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Baseline (1)</th>
<th>HH Cons (2)</th>
<th>Sample Z &gt; 0 (3)</th>
<th>Sample U = 0 (4)</th>
<th>Non-Durable Consumption (5)</th>
<th>No Controls (6)</th>
<th>No 1{Z=0} Control (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elicitation (Z)</td>
<td>-0.160**</td>
<td>-0.110*</td>
<td>-0.171**</td>
<td>-0.162**</td>
<td>-0.162**</td>
<td>-0.345***</td>
<td>-0.0401</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.0781)</td>
<td>(0.0596)</td>
<td>(0.0777)</td>
<td>(0.0783)</td>
<td>(0.0789)</td>
<td>(0.0798)</td>
<td>(0.0659)</td>
</tr>
<tr>
<td>Elicitation * Unemp (Z*U)</td>
<td>-0.137</td>
<td>-0.421**</td>
<td>-0.0771</td>
<td>-0.257</td>
<td>-0.0000475</td>
<td>-0.460**</td>
<td></td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.268)</td>
<td>(0.207)</td>
<td>(0.268)</td>
<td>(0.303)</td>
<td>(0.296)</td>
<td>(0.218)</td>
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</tr>
<tr>
<td>Eliciation of 0 (1{Z=0})</td>
<td>-0.0893***</td>
<td>-0.0587**</td>
<td>-0.0904***</td>
<td>-0.120***</td>
<td>-0.160***</td>
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<td></td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.0334)</td>
<td>(0.0279)</td>
<td>(0.0334)</td>
<td>(0.0356)</td>
<td>(0.0365)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eliciation of 0 * Unemp (1{Z=0})*U</td>
<td>0.338</td>
<td>0.161</td>
<td></td>
<td>0.307</td>
<td>0.191</td>
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</tr>
<tr>
<td>s.e.</td>
<td>(0.222)</td>
<td>(0.180)</td>
<td></td>
<td>(0.220)</td>
<td>(0.239)</td>
<td></td>
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</tr>
<tr>
<td>Unemp (U)</td>
<td>-0.0845</td>
<td>0.0862</td>
<td>-0.120</td>
<td>0</td>
<td>-0.0936</td>
<td>-0.181</td>
<td>0.118</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.165)</td>
<td>(0.128)</td>
<td>(0.164)</td>
<td>(.)</td>
<td>(0.164)</td>
<td>(0.187)</td>
<td>(0.120)</td>
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<tr>
<td>Num of Obs.</td>
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<td>2,798</td>
<td>1,503</td>
<td>2,798</td>
<td>2,798</td>
<td>2,798</td>
<td>2,798</td>
</tr>
<tr>
<td>Num of HHs</td>
<td>862</td>
<td>862</td>
<td>579</td>
<td>862</td>
<td>862</td>
<td>862</td>
<td>862</td>
</tr>
</tbody>
</table>
#1 Ex-Post Consumption Approach: Translating to Welfare

- Two assumptions enable estimation of $W$:
  - Euler equation
    \[ v' (c_{pre} (p)) = pu' (c_u (p)) + (1 - p) v' (c_e (p)) \]
  - Minimal consumption impact of not losing your job: $E [c_e] \approx E [c_{pre}]$ (o.w. lower bound)
- Then:
  \[ W = \sigma \text{cov} \left( \frac{-p}{\bar{p}}, \frac{c_e (p)}{\bar{c}_e} \right) \approx \sigma \frac{\text{var} (Z)}{\text{Pr} \{L\}} \frac{\text{cov} (-Z, \log (c_e))}{\text{var} (Z)} \]
## Welfare Calculation: Consumption vs. Potential Job Loss

<table>
<thead>
<tr>
<th>Specification</th>
<th>Baseline</th>
<th>HH Cons</th>
<th>Sample U = 0</th>
<th>Non-Dur Cons</th>
<th>No 1 {Z=0} Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elicitation (Z)</td>
<td>-0.160**</td>
<td>-0.110*</td>
<td>-0.162**</td>
<td>-0.162**</td>
<td>-0.0401</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.0781)</td>
<td>(0.0596)</td>
<td>(0.0783)</td>
<td>(0.0789)</td>
<td>(0.0659)</td>
</tr>
</tbody>
</table>

### Welfare Calculation

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Baseline</th>
<th>HH Cons</th>
<th>Sample U = 0</th>
<th>Non-Dur Cons</th>
<th>No 1 {Z=0} Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaling Factor (Var(Z</td>
<td>X) / Pr{L})</td>
<td>1.53</td>
<td>1.53</td>
<td>1.40</td>
<td>1.53</td>
</tr>
<tr>
<td>bootstrap s.e.</td>
<td>(0.15)</td>
<td>(0.15)</td>
<td>(0.15)</td>
<td>(0.14)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Cov(p/E[p],log(c))</td>
<td>0.25**</td>
<td>0.17*</td>
<td>0.23**</td>
<td>0.25**</td>
<td>0.06</td>
</tr>
<tr>
<td>bootstrap s.e.</td>
<td>(0.12)</td>
<td>(0.09)</td>
<td>(0.11)</td>
<td>(0.12)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Implied WTP (CRRA = 2)</td>
<td>0.49**</td>
<td>0.34*</td>
<td>0.45**</td>
<td>0.5**</td>
<td>0.12</td>
</tr>
<tr>
<td>bootstrap s.e.</td>
<td>(0.23)</td>
<td>(0.19)</td>
<td>(0.23)</td>
<td>(0.23)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>Mean Dep Var</td>
<td>9.86</td>
<td>10.58</td>
<td>9.87</td>
<td>9.18</td>
<td>9.86</td>
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<td>2,696</td>
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<tr>
<td>Num of HHs</td>
<td>862</td>
<td>862</td>
<td>843</td>
<td>862</td>
<td>862</td>
</tr>
</tbody>
</table>
Predictive Content of Elicitations about Future Unemployment

Distribution of $\Pr\{U|Z,X\} - \Pr\{U|X\}$
Lower Bounds on $E[T(P)] - 1$ using Alternative $U$ Definitions
Lower Bounds on $E[T(P)]^{-1}$ by Year
Lower Bounds on $E[T(P)]-1$ by Census Division
Lower Bounds for $E[T(P)]-1$ using Alternative Controls

With Individual Fixed Effects
Impact of Unemployment on Log Household Income

Coefficient on Unemployment Indicator

Lead/Lag Relative to Unemployment Measurement

Impact of Unemployment on Log Household Income

Coefficient on Unemployment Indicator

Lead/Lag Relative to Unemployment Measurement

Coeff 5 / 95% CI