Knowledge of Future Job Loss and Implications for Unemployment Insurance

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Private Markets for Job Loss / Unemployment

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  - Why doesn't Aetna sell UI?

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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 sell UI?
- 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 how we should think about optimal benefits?

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    - Provide "2-sample IV" corrections to account for realized information
- Willingness to pay below cost of adverse selection
- Characterize optimal UI
  - Previous approaches miss the ex-ante value of social insurance
    - Insurance against learning you might lose your job
    - Exploit ex-ante responses to measure this value

Outline

Binary Insurance Model

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  - Other actions, a

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  - Other actions, a
  - Maximize:

$$\max_{p, c_e, c_u, a \in \Omega(\theta)} \left\{ (1-p)\, v\left(c_e\right) + pu\left(c_u\right) + \Psi\left(p, a; \theta\right) \right\}$$

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- When can private markets profitably provide positive benefits, b, financed by premiums, τ?

No Trade Condition

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- No profitable trade is feasible whenever

$$\frac{u'\left(c_u\left(p\right)\right)}{v'\left(c_e\left(p\right)\right)} \leq T\left(p\right) \quad \forall p$$

where

$$T\left(p\right) = \frac{E\left[P|P \geq p\right]}{E\left[1-P|P \geq p\right]}\frac{1-p}{p}$$

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  is the "pooled price ratio" in Hendren (2013)
- Generalizes no trade condition in Hendren (2013) to allow for moral hazard
  - Market existence is independent of moral hazard problem (Shavell, 1979)

Estimand: Minimum Pooled Price Ratio

- Two measures of $T(p)$:

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    - Relevant if insurers know $T(p)$
  - Average pooled price ratio, $E[T(P)]$
    - Average pooled price ratio provides measure of frictions imposed on insurance company that needs to experiment to open up the market
- Will estimate lower bounds for $E[T(P)]$ using fewer assumptions than $\inf T(p)$

Setting and Data

- Difficult to identify presence of private information for UI
  - Standard approach uses revealed preference (Chiappori and Salanie, 2000; Finkelstein and Poterba, 2002; Einav et. al., 2010)

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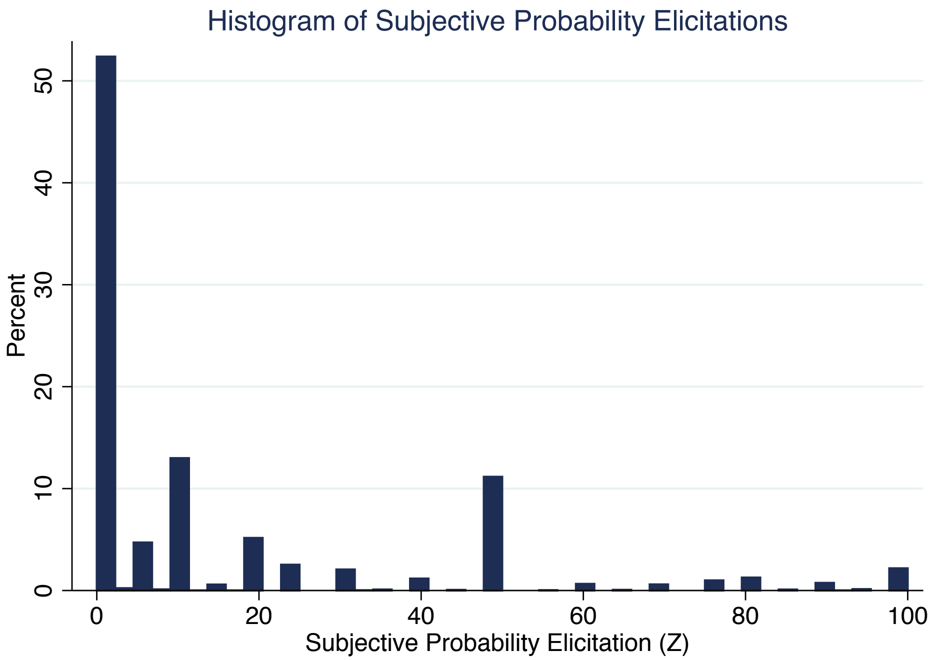
- Use data from Health and Retirement Study (1993-2013)
  - Survey asks subjective probability elicitations, Z
    - *"What is percent chance (0-100) that you will lose your job in the next 12 months?"*



Histogram of Subjective Probability Elicitations
Percent
0
10
20
30
40
50
0
20
40
60
80
100
Subjective Probability Elicitation (Z)

Elicitations as Noisy Measures of Beliefs

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  - 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.

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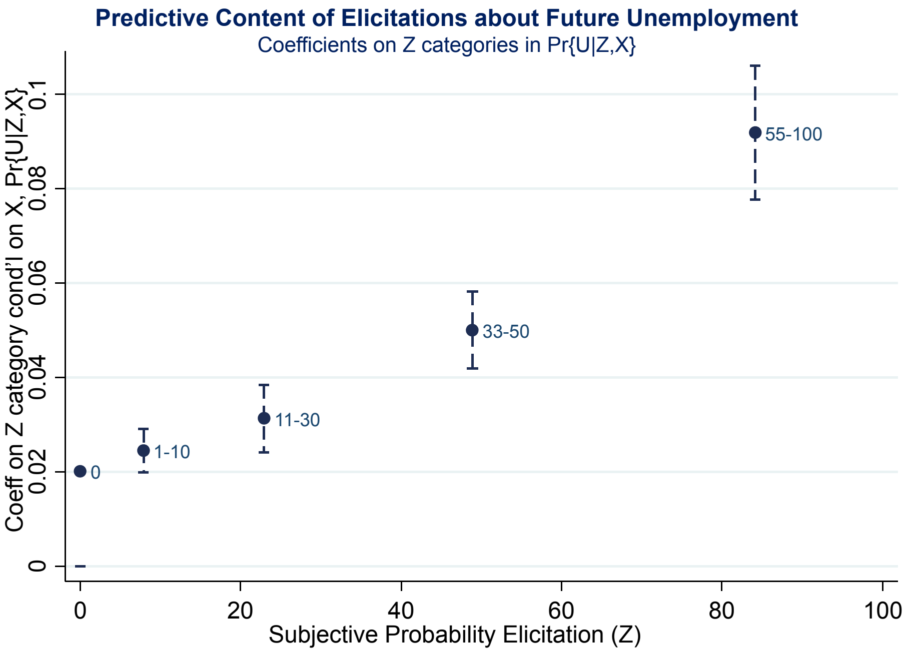
    - Add additional controls for health, unemployment history, etc.
- Bin Z into groups, χ_j, (0, 1-10, ...)
  - Regress U on X and bins to construct:

$$P_Z = \Pr\{U|X,Z\} = \beta X + \sum_j \zeta_j 1\{Z \in \chi_j\}$$


Predictive Content of Elicitations about Future Unemployment
Coefficients on Z categories in Pr{U|Z,X}
Coeff on Z category cond'l on X, Pr{U|Z,X}
0
0.02
0.04
0.06
0.08
0.1
0
1-10
11-30
33-50
55-100
0
20
40
60
80
100
Subjective Probability Elicitation (Z)

Relate to True Beliefs

- Let $P_Z = \Pr\{U|Z, X\}$
  - P_Z is related to distribution of true beliefs, P

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  1. Elicitations not more informative than true beliefs

$$\Pr\{U|Z,X,P\} = \Pr\{U|X,P\}$$

Relate to True Beliefs

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- Two assumptions:
  1. Elicitations not more informative than true beliefs

$$\Pr\{U|Z,X,P\} = \Pr\{U|X,P\}$$

  2. True beliefs (not elicitations) are unbiased

$$\Pr\{U|X,P\} = P$$

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- Let $P_Z = \Pr\{U|Z, X\}$
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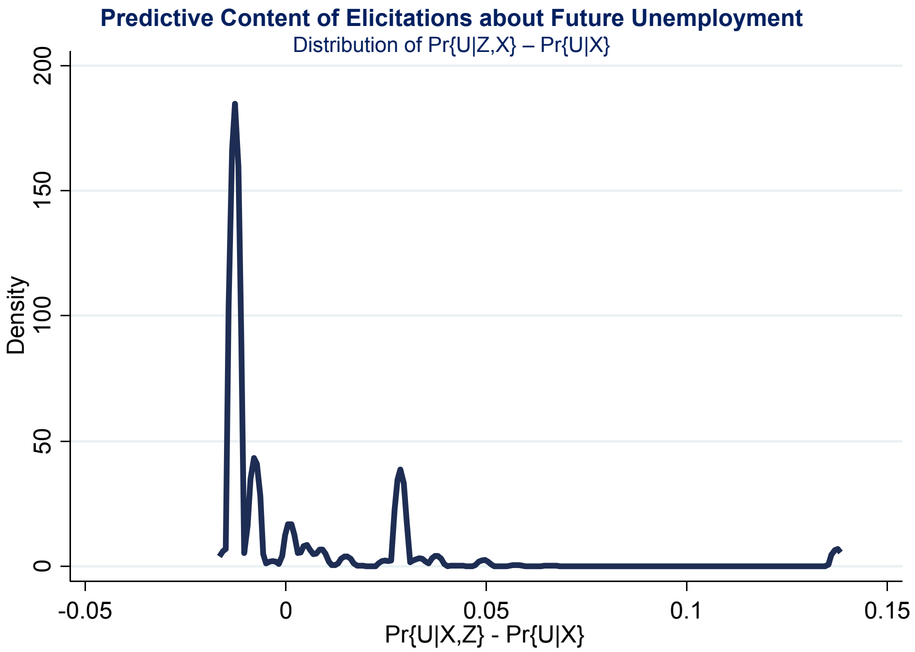
- Two assumptions:
  1. Elicitations not more informative than true beliefs
$$\Pr\{U|Z, X, P\} = \Pr\{U|X, P\}$$
  2. True beliefs (not elicitations) are unbiased
$$\Pr\{U|X, P\} = P$$
- Assumptions 1+2 imply:
$$P_Z = E[P|X, Z]$$


Predictive Content of Elicitations about Future Unemployment
Distribution of Pr{U|Z,X} – Pr{U|X}
Density
0
50
100
150
200
-0.05
0
0.05
0.1
0.15
Pr{U|X,Z} - Pr{U|X}

Lower Bound on $E\left[T\left(p\right)\right]$

- Can use distribution of predicted values to provide non-parametric lower bound on $E\left[T\left(P\right)\right]$

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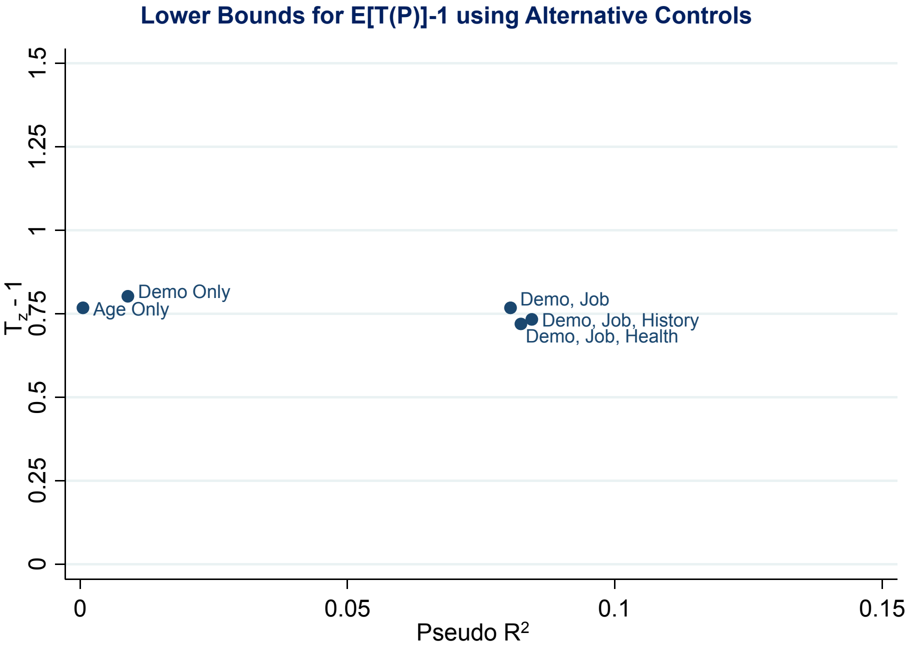
- Can use distribution of predicted values to provide non-parametric lower bound on $E\left[T\left(P\right)\right]$
- Define

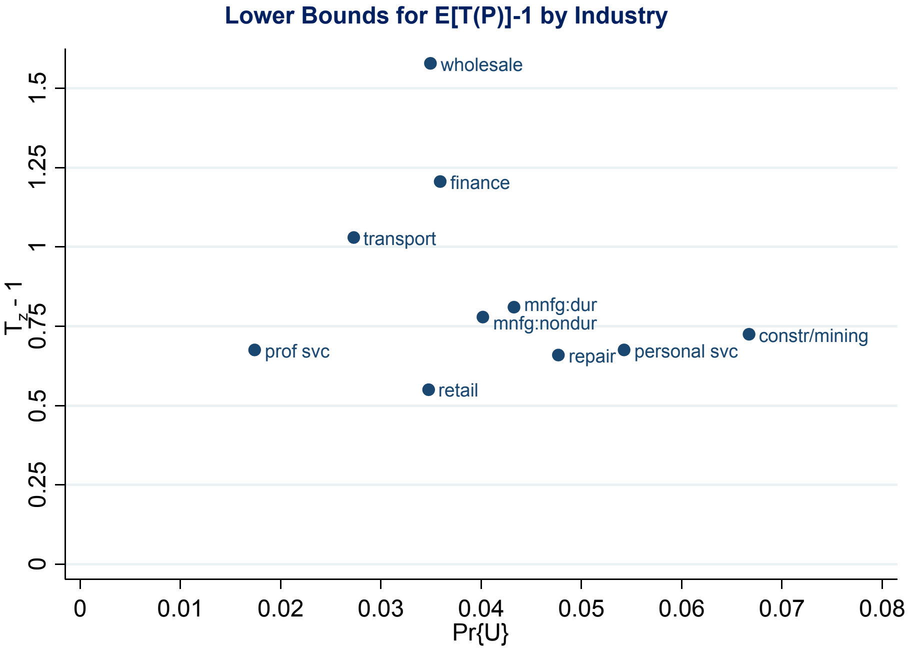
$$T_Z\left(p\right) = 1 + \frac{E\left[P_Z - p | P_Z \geq p\right]}{\Pr\left\{U\right\}}$$

Lower Bound on $E[T(p)]$

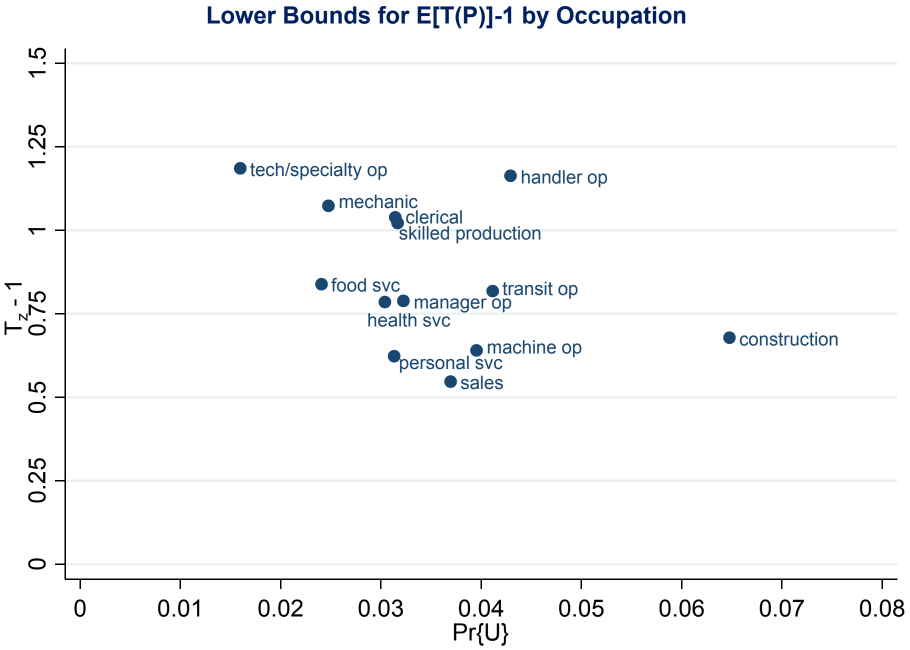
- Can use distribution of predicted values to provide non-parametric lower bound on $E[T(P)]$
- Define
$$T_Z(p) = 1 + \frac{E[P_Z - p | P_Z \geq p]}{\Pr\{U\}}$$
- **Proposition 1:** Assumptions 1 and 2 imply:
$$E[T_Z(P_Z)] \leq E[T(P)]$$

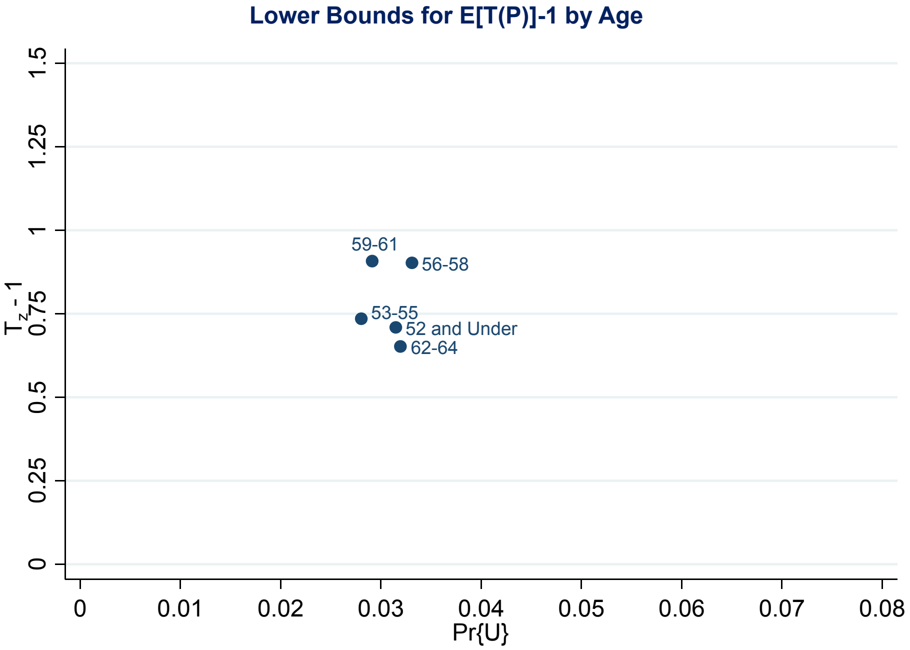


Lower Bounds for E[T(P)]-1 using Alternative Controls
T_z - 1
Pseudo R²
Demo Only
Age Only
Demo, Job
Demo, Job, History
Demo, Job, Health
0
0.25
0.5
0.75
1
1.25
1.5
0
0.05
0.1
0.15

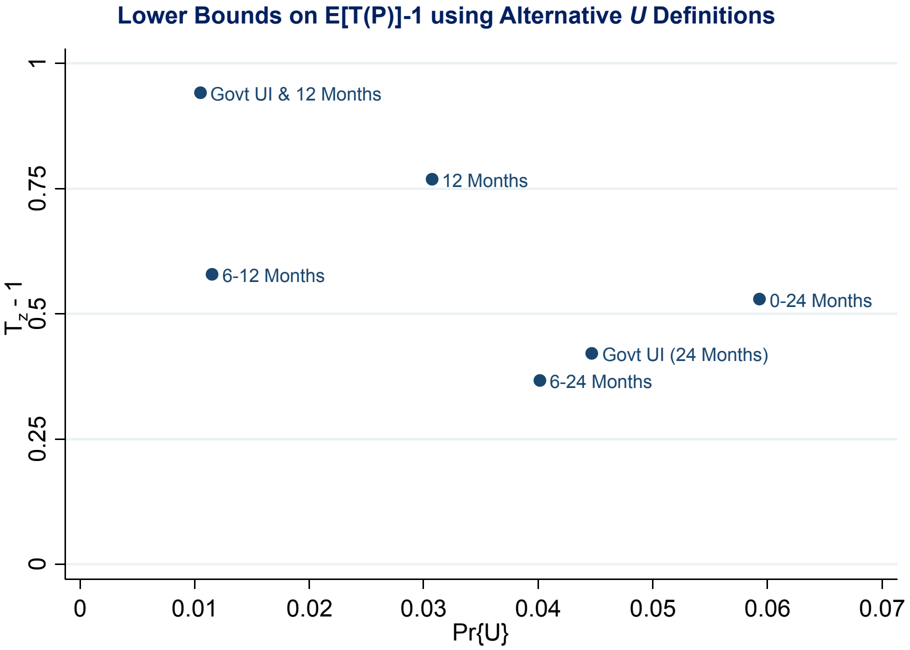


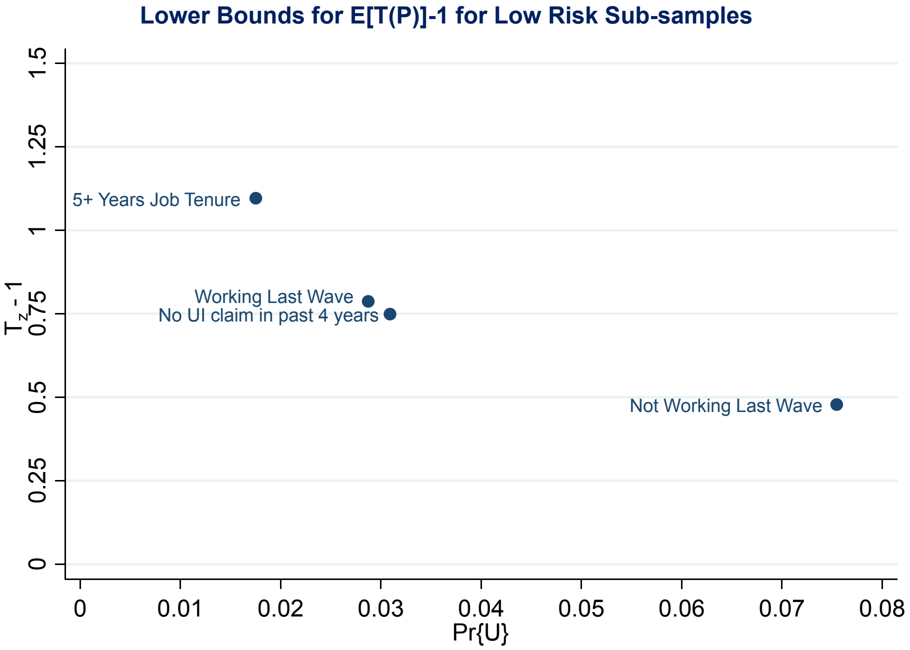
Lower Bounds for E[T(P)]-1 by Industry
wholesale
finance
transport
mnfg:dur
mnfg:nondur
constr/mining
prof svc
repair
personal svc
retail
0
0.25
0.5
0.75
1
1.25
1.5
$T_z - 1$
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Pr{U}


Lower Bounds for E[T(P)]-1 by Occupation
$T_z - 1$
Pr{U}
0
0.25
0.5
0.75
1
1.25
1.5
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
tech/specialty op
handler op
mechanic
clerical
skilled production
food svc
transit op
manager op
health svc
construction
machine op
personal svc
sales



Lower Bounds for E[T(P)]-1 by Age
59-61
56-58
53-55
52 and Under
62-64
T_z - 1
0
0.25
0.5
0.75
1
1.25
1.5
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Pr{U}


Lower Bounds on E[T(P)]-1 using Alternative U Definitions
Govt UI & 12 Months
12 Months
6-12 Months
0-24 Months
Govt UI (24 Months)
6-24 Months
T_z - 1
Pr{U}
0
0.25
0.5
0.75
1
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07


Lower Bounds for E[T(P)]-1 for Low Risk Sub-samples
5+ Years Job Tenure
Working Last Wave
No UI claim in past 4 years
Not Working Last Wave
$T_z - 1$
Pr{U}
0
0.25
0.5
0.75
1
1.25
1.5
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08

Estimation of $\inf T(p)$

- Add parametric assumption to $f_{Z|P}(Z|P) = f_{Z|P}(Z|P;\eta)$ to reduce dimensionality

Estimation of inf $T(p)$

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  - Approach discussed in detail in Hendren (2013)

Estimation of inf $T(p)$

- Add parametric assumption to $f_{Z|P}(Z|P) = f_{Z|P}(Z|P;\eta)$ to reduce dimensionality
  - Approach discussed in detail in Hendren (2013)
  - Expand observed density (cond'l on $X = x$)

$$\begin{aligned}
f_{Z,U}(Z,U) &= \int f_{Z,U}(Z,U|p)\, f_P(p)\, dp \\
&= \int \Pr\{U=1|Z,P=p\}^U (1-\Pr\{U=1|Z,P=p\} \\
&\quad *f_{Z|P}(Z|P=p;\eta)\, f_P(p)\, dp \\
&= \int p^U (1-p)^{1-U} \underbrace{f_{Z|P}(Z|P;\eta)}_{Parametric} \underbrace{f_P(p)}_{Flexible} dp
\end{aligned}$$

Estimation of inf $T(p)$

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&\quad *f_{Z|P}(Z|P=p;\eta)\, f_P(p)\, dp \\
&= \int p^U (1-p)^{1-U} \underbrace{f_{Z|P}(Z|P;\eta)}_{Parametric} \underbrace{f_P(p)}_{Flexible} dp
\end{aligned}$$

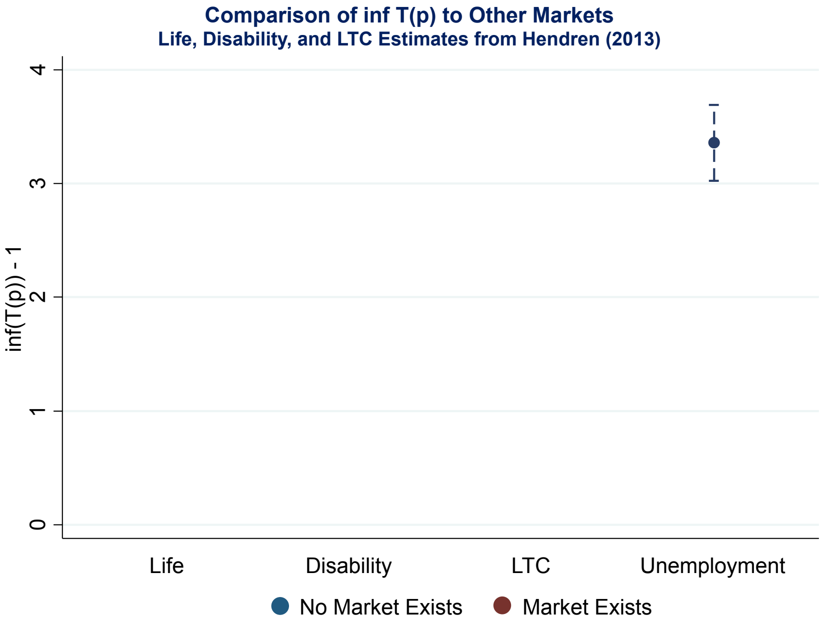
- Approximate $f_p(p)$ using point-mass and $f_{Z|P}$ using normal + ordered probit (as in Hendren 2013)
- Construct $T(p)$ and its minimum (excluding top point mass)

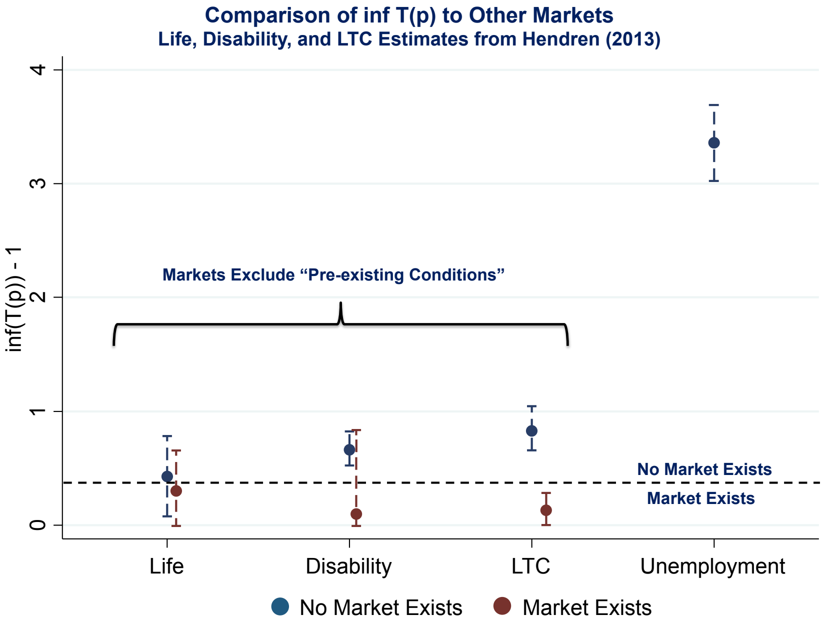
Minimum Pooled Price Ratio

Specification	Baseline	Alternative Controls	
		Demo	Health
	(1)	(2)	(3)
Inf T(p) - 1	**3.360**	**5.301**	**3.228**
s.e.	**(0.203)**	**(0.655)**	**(0.268)**
Controls			
Demographics	X	X	X
Job Characteristics	X		X
Health Characteristics			X
Num of Obs.	26,640	26,640	22,831
Num of HHs	3,467	3,467	3,180

Minimum Pooled Price Ratio

Specification	Age <= 55	Age > 55	Below Median Wage	Above Median Wage	Tenure > 5 yrs	Tenure <= 5 yrs
	Sub-Samples					
Inf T(p) - 1	**3.325**	**3.442**	**4.217**	**3.223**	**4.736**	**3.739**
s.e.	**(0.306)**	**(0.279)**	**(0.417)**	**(0.268)**	**(0.392)**	**(0.336)**
Controls						
Demographics	X	X	X	X	X	X
Job Characteristics	X	X	X	X	X	X
Num of Obs.	11,134	15,506	13,320	13,320	17,850	8,790
Num of HHs	2,255	3,231	2,916	2,259	2,952	2,437


Comparison of inf T(p) to Other Markets
Life, Disability, and LTC Estimates from Hendren (2013)
inf(T(p)) - 1
0
1
2
3
4
Life
Disability
LTC
Unemployment
No Market Exists
Market Exists


Comparison of inf T(p) to Other Markets
Life, Disability, and LTC Estimates from Hendren (2013)
inf(T(p)) - 1
0
1
2
3
4
Markets Exclude “Pre-existing Conditions”
No Market Exists
Market Exists
Life
Disability
LTC
Unemployment
No Market Exists
Market Exists

Willingness to Pay

- How much of a markup are individuals willing to pay, $\frac{u'(c_u(p))}{v'(c_e(p))}$?

Willingness to Pay

- How much of a markup are individuals willing to pay, $\frac{u'(c_u(p))}{v'(c_e(p))}$?
- Follow previous literature (Baily 1978, Chetty 2006,...) by assuming:

$$\frac{u'\left(c_u\left(p\right)\right)}{v'\left(c_e\left(p\right)\right)} \approx 1 + \sigma \frac{\Delta c}{c}\left(p\right)$$

where

$$\frac{\Delta c}{c}\left(p\right) = \frac{c_e\left(p\right) - c_u\left(p\right)}{c_e\left(p\right)} \approx log\left(c_e\left(p\right)\right) - log\left(c_u\left(p\right)\right)$$

Willingness to Pay

- How much of a markup are individuals willing to pay, $\frac{u'(c_u(p))}{v'(c_e(p))}$?
- Follow previous literature (Baily 1978, Chetty 2006,...) by assuming:

$$\frac{u'(c_u(p))}{v'(c_e(p))} \approx 1 + \sigma \frac{\Delta c}{c}(p)$$

where

$$\frac{\Delta c}{c}(p) = \frac{c_e(p) - c_u(p)}{c_e(p)} \approx log(c_e(p)) - log(c_u(p))$$

- $\sigma = \frac{u''c}{u'}$ is the coeff of relative risk aversion
- Assumes no state dependence: $u = v$
- "$\approx$" denotes:
  - 2nd order Taylor approximation ($u''' \approx 0$)
  - $log(1+x) \approx x$

First Differences in Consumption

- Start by estimating the average causal effect: $E\left[\frac{\Delta c}{c}\right]$

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$$\Delta^{FD} = E\left[log\left(c_t\right) - log\left(c_{t-1}\right) \middle| U_t = 1\right] - E\left[log\left(c_t\right) - log\left(c_{t-1}\right) \middle| U_t = 0\right]$$

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- Use food expenditure in PSID
  - Following Gruber (1997) and Chetty and Szeidl (2007)
  - Previous literature finds $\Delta^{FD} \approx 6 - 10\%$

Food Expenditure Drop Upon Unemployment

Specification:	Employed	Controls for Needs	Job Loss
Impact on $log(c_{t-1})$-$log(c_t)$			
Unemp	-0.0753***	-0.0720***	-0.0509***
s.e.	(0.00857)	(0.00891)	(0.00772)
Specification Details			
Sample Employed in t-1	X	X	X
Controls for change in log needs		X	X

Identification concerns

- If individuals learn about unemployment, lagged consumption may respond to future unemployment

$$\Delta^{FD} = \underbrace{E\left[log\left(c_e\right) - log\left(c_u\right)\right]}_{\text{Causal Effect}} - \underbrace{\left(E\left[log\left(c_{pre}\right)|U=0\right] - E\left[log\left(c_{pre}\right)|U=1\right]\right)}_{\text{Bias from ex-ante response}}$$

  - Can be biased from correlated income shocks or savings responses

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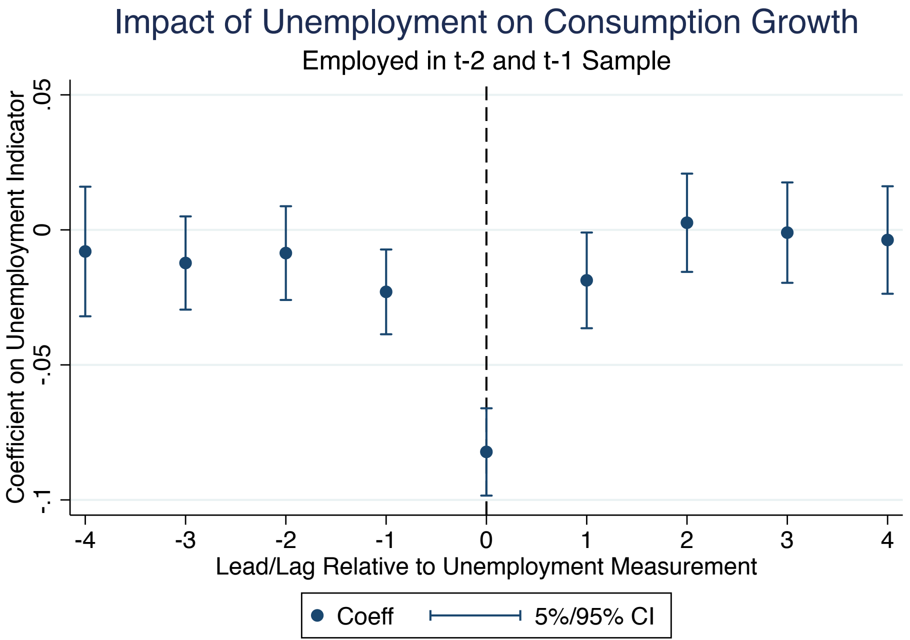
  - Can be biased from correlated income shocks or savings responses
  - Event study using leads/lags:
    - Regress $g_t = \log\left(c_t\right) - \log\left(c_{t-1}\right)$ on U_{t+j}
    - Control for age cubic and year dummies


Impact of Unemployment on Consumption Growth
Employed in t-2 and t-1 Sample
Coefficient on Unemployment Indicator
.05
0
-.05
-.1
-4
-3
-2
-1
0
1
2
3
4
Lead/Lag Relative to Unemployment Measurement
Coeff
5%/95% CI

Impact of Future Job Loss on Consumption

Specification:	Employed	Controls for Needs	Job Loss
Impact of Unemployment on $log(c_{t-2})-log(c_{t-1})$			
Unemp	-0.0230**	-0.0232**	-0.0182**
s.e.	(0.00954)	(0.0101)	(0.00854)
Specification Details			
Sample Employed in t-2 and t-1	X	X	X
Controls for change in log needs (t-2 vs t-1)		X	X

IV Solution: Scale by Information Revealed

- How to recover causal effect from Δ^{FD}? Inc Change

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- Two assumptions:

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  1. Euler equation holds

$$v'\left(c_{pre}\left(p\right)\right) = pu'\left(c_u\left(p\right)\right) + \left(1-p\right)v'\left(c_e\left(p\right)\right)$$

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- **Proposition:** Suppose (1) and (2) hold. Then,
$$E\left[log\left(c_e\left(p\right)\right) - log\left(c_u\left(p\right)\right)\right] = \frac{\Delta^{FD}}{1-\left(E\left[P|U=1\right]-E\left[P|U=0\right]\right)}$$

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  - Scale by information revealed between $t-1$ and t
  $$\frac{var\left(P\right)}{var\left(U\right)} = E\left[P|U=1\right] - E\left[P|U=0\right]$$

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- Don't observe beliefs in PSID
    - Use HRS to obtain $E\left[P|U=1\right] - E\left[P|U=0\right]$

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    - Biased if measurement error is correlated with U

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    - Biased if measurement error is correlated with U
  - Yields $E[Z|U=1] - E[Z|U=0] \approx 0.20$
    - Implies $1 - (E[P|U=1] - E[P|U=0]) \approx 0.8$

Impact of Job Loss on Consumption

Specification:	Employed	Controls for Needs	Job Loss
Impact on $log(c_{t-1})-log(c_t)$			
Unemp	-0.0753***	-0.0720***	-0.0509***
s.e.	(0.00857)	(0.00891)	(0.00772)
First Stage Impact on P	0.803***	0.803***	0.803***
s.e.	(0.0123)	(0.0123)	(0.0123)
IV Impact of U on $\log(c_t)$	-0.094***	-0.09***	-0.063***
s.e.	(0.0107)	(0.0111)	(0.0096)
Markup WTP for UI ($\sigma = 2$)	18.7%	17.9%	12.7%

Summary

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$$\begin{aligned} \frac{u'}{v'} - 1 &\leq \inf T(p) - 1 \\ [15\%, 50\%] &\leq 300\% \end{aligned}$$

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  - Gruber (1997): Consumption drop would increase 2-3x
  - Suggests private market would likely not arise even if government stopped providing UI

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- What if government decreased UI benefits?
  - Gruber (1997): Consumption drop would increase 2-3x
  - Suggests private market would likely not arise even if government stopped providing UI
- Does this change the calculus for optimal UI policy?

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

where W^{Social} is the markup individuals are willing to pay before learning p

  - FE is the aggregate fiscal externality from increasing benefits

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  where W^{Social} is the markup individuals are willing to pay before learning p
  - FE is the aggregate fiscal externality from increasing benefits
- Recovers Baily-Chetty formula if $p = E\left[p\right]$
  - Causal effect of unemployment would be sufficient
- More generally, insurance moves resources across people with different ex-ante beliefs p

Ex-Ante WTP

- Consider welfare experiment:

$$\begin{aligned} W^{ex-ante} &= \frac{v'\left(c_{pre}\left(1\right)\right) - v'\left(c_{pre}\left(0\right)\right)}{v'\left(c_{pre}\left(0\right)\right)} \\ &\approx \frac{\frac{d}{dp}v'}{v'} \approx \frac{dlog\left(v'\right)}{dp} \end{aligned}$$

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$$\approx \frac{\frac{d}{dp}v'}{v'} \approx \frac{dlog\left(v'\right)}{dp}$$

- Suppose Assumptions 1 + 2 hold. Then:

$$W^{Social} \approx \underbrace{\frac{var\left(P\right)}{var\left(U\right)} W^{Ex-ante}}_{\text{Ex-ante Value}} + \underbrace{\left(1 - \frac{var\left(P\right)}{var\left(U\right)}\right) W^{Ex-post}}_{\sigma\Delta^{FD}\text{ (Gruber (1997))}}$$

  - Social value of insurance includes ex-ante value

2-Sample Estimation

- Paper provides two methods to estimate $W^{Ex-ante}$

$$W^{Ex-ante} = \frac{dlog\left(v'\right)}{dp} \approx \sigma \frac{dlog\left(c_{pre}\right)}{dp} \approx \frac{1}{\epsilon^{semi}} \frac{dLFP^{Spouse}}{dp}$$

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- Estimate $\frac{dlog\left(c_{pre}\right)}{dp}$ using 2-Sample IV:

$$\frac{dlog\left(c_{pre}\right)}{dp} = \frac{\Delta^{FD}_{-1}}{\Delta^{P}_{-1}}$$

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- $\Delta_{-1}^{FD} \approx 2.5\%$ is the lagged first difference estimate

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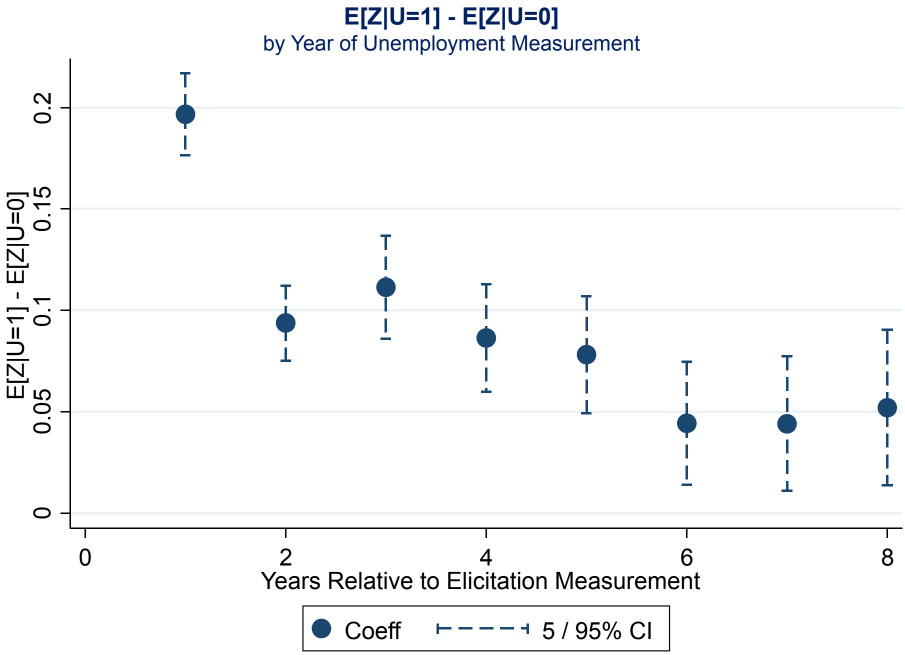
  - Allows θ to move both c and p (e.g. income shocks)
- $\Delta_{-1}^{FD} \approx 2.5\%$ is the lagged first difference estimate
- Δ_{-1}^{P} is lagged first difference in beliefs

$$\Delta_{-1}^{P} = E\left[P|U_t = 1\right] - E\left[P|U_t = 0\right] - \left(E\left[P_{-1}|U_t = 1\right] - E\left[P_{-1}|U_t = 0\right]\right)$$

  - Approximate Δ_{-1}^{P} by regressing Z_t on U_{t+j}


E[Z|U=1] - E[Z|U=0]
by Year of Unemployment Measurement
E[Z|U=1] - E[Z|U=0]
0
0.05
0.1
0.15
0.2
0
2
4
6
8
Years Relative to Elicitation Measurement
Coeff
5 / 95% CI

Impact of Future Job Loss on Consumption

Specification:	Employed	Controls for Needs	Job Loss
Impact of Unemployment on log(c_{t-2})-log(c_{t-1})			
Unemp	-0.0230**	-0.0232**	-0.0182**
s.e.	(0.00954)	(0.0101)	(0.00854)
2-Sample IV Welfare Calculation			
Coefficient on U ("First Stage")	0.103	0.103	0.103
s.e.	(0.012)	(0.012)	(0.012)
Consumption Drop Equivalent	0.22***	0.23**	0.18**
s.e.	(0.093)	(0.098)	(0.083)
Implied WTP (CRRA = 2)	0.45***	0.45**	0.35**
s.e.	(0.185)	(0.195)	(0.166)

Summary of Ex-Ante WTP

- Paper also provides evidence based on ex-ante spousal labor supply responses ▸ Spousal Labor Supply

$$W^{Ex-ante} = \frac{dlog\left(v'\right)}{dp} \approx \frac{1}{\epsilon^{semi}} \frac{d\left[LFP^{Spouse}\right]}{dp}$$

  - Suggests WTP of 50-60%

Social WTP for UI

Ex-ante Valuation Method:	Consumption Drop			Labor Supply
	(1)	(2)	(3)	(4)
Social WTP, W^{social}	**23.8%**	**11.9%**	**35.7%**	**27.3%**
Only using Δ^{FD} (Gruber 1997)	**15.1%**	**7.5%**	**22.6%**	**15.1%**
% Not Captured	**36.8%**	**36.8%**	**36.8%**	**44.7%**
Insurance against p, $W^{ex\text{-}ante}$	44.5%	22.3%	66.8%	62.0%
Weight, E[P|U=1] - E[P|U=0]	0.197	0.197	0.197	0.197
Insurance against U (given p), $W^{ex\text{-}post}$	18.7%	9.4%	28.1%	18.7%
Weight, 1 - (E[P|U=1] - E[P|U=0])	0.803	0.803	0.803	0.803
Specification Details				
CRRA, σ	2	1	3	2
Spouse L.S. Semi-Elasticity, ε^{semi}	-	-	-	0.5

Conclusion

- Private information explains absence of private UI market
  - Growing evidence that private information shapes the existence of insurance markets
- Knowledge of future job loss biases WTP estimates
  - Ex-ante consumption and spousal labor supply responses
- Re-scale private WTP (25% higher)
- Add ex-ante insurance value to social WTP (40% higher)
  - Larger than 25% because $W^{Ex-ante} > W^{Ex-post}$
    - UI partially insures against learning you might lose your job

5 Appendix

A Second Implementation: Spousal Labor Supply

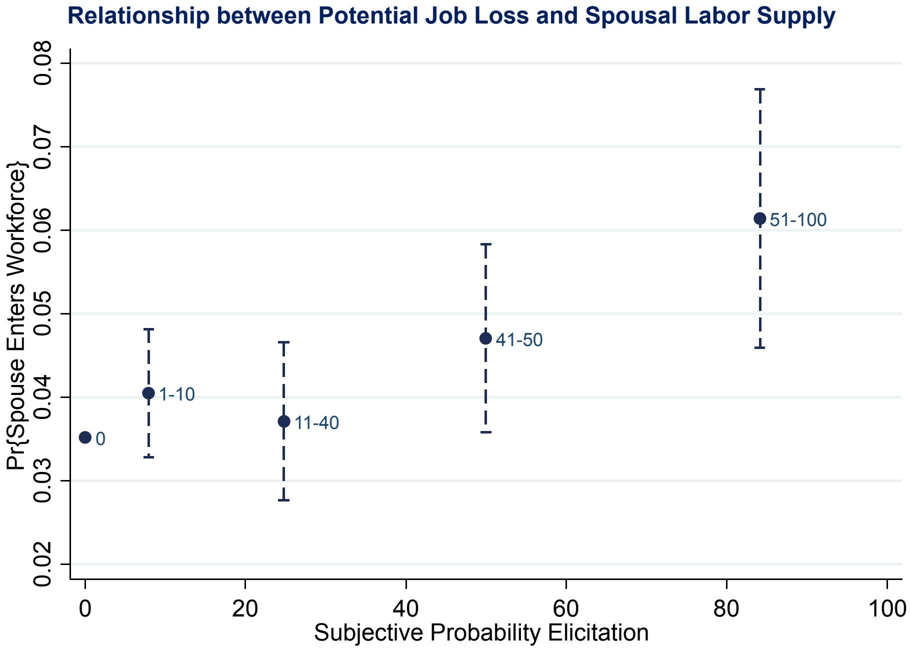
- Further evidence of ex-ante responses?
  - Spousal labor supply
    - If lower preferences for consumption, then spousal labor supply should decrease
- Also provides new quantification of WTP
  - Assume disutility of labor entry additively separable:

$$W^{Ex-ante} = \frac{dlog\left(v'\right)}{dp} \approx \frac{1}{\epsilon^{semi}} \frac{d\left[LFP^{Spouse}\right]}{dp}$$

Return

Spousal Labor Supply Response

- Observe elicitations and spousal labor supply jointly in HRS
- 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 Return



Relationship between Potential Job Loss and Spousal Labor Supply
Pr{Spouse Enters Workforce}
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
1-10
11-40
41-50
51-100
0
20
40
60
80
100
Subjective Probability Elicitation

Welfare Calculation: Spousal Labor Supply Response

Specification:	Baseline	U=0	HH FE	Ind FE	2yr Lag ("Placebo")
Estimation of dL/dZ					
Elicitation (Z)	0.0273**	0.0270**	0.0267*	0.0312	0.00792
s.e.	(0.0112)	(0.0116)	(0.0146)	(0.0230)	(0.0102)
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

Translating to Welfare

- Assume $\epsilon^{semi} = 0.5$
- Need to correct for measurement error in Z

$$\frac{dLFP}{dP} = \frac{dLFP}{dZ}\frac{var\left(Z\right)}{var\left(P\right)}$$

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

$$var\left(P\right) \approx cov\left(L, Z\right)$$

  - So,

$$\frac{dlog\left(v'\right)}{dp} \approx \frac{1}{\epsilon^{semi}}\frac{d\left[LFP^{Spouse}\right]}{dp} = \frac{1}{\epsilon^{semi}}\frac{dLFP}{dZ}\frac{var\left(Z\right)}{var\left(P\right)}$$

Return

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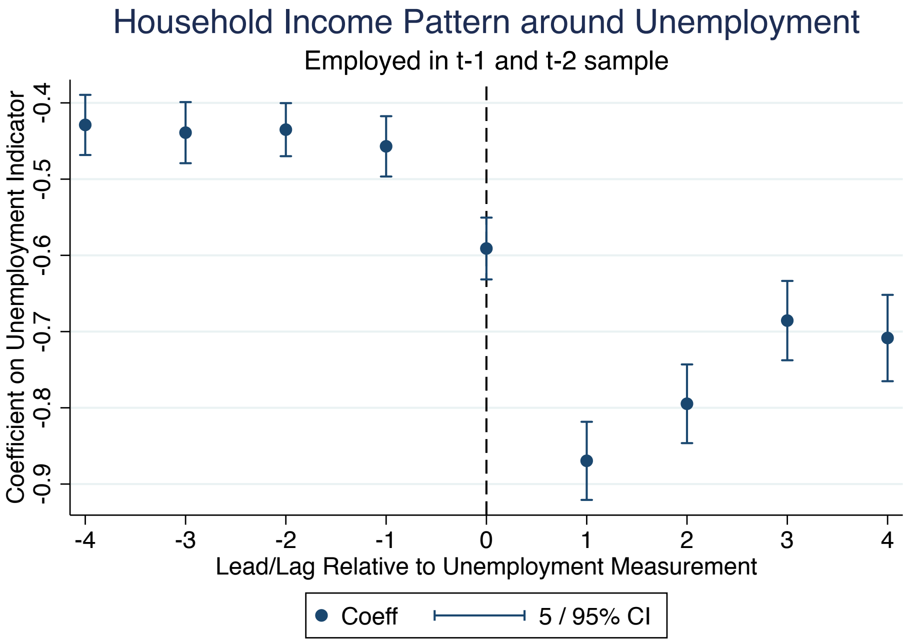
s.e.	(0.0112)	(0.0116)	(0.0146)	(0.0230)	(0.0102)
Welfare Calculation					
Total/Signal Var	11.00	11.00	11.00	11.00	
bootstrap s.e.	(1.41)	(1.37)	(1.32)	(1.32)	
Implied WTP ($\varepsilon^{semi} = 0.5$)	0.6**	0.59**	0.59**	0.69*	
bootstrap s.e.	(0.26)	(0.26)	(0.29)	(0.39)	
Mean Dep Var	0.04	0.04	0.04	0.04	0.04
Num of Obs.	11049	10726	11049	11049	11049
Num of HHs	2214	2194	2214	2214	2214

Assumptions

- Recovers causal effect under two assumptions:
  1. Euler equation holds
  $$v'\left(c_{pre}\left(p\right)\right) = pu'\left(c_u\left(p\right)\right) + \left(1-p\right)v'\left(c_e\left(p\right)\right)$$
  2. Heterogeneity in p may be correlated with c_u and c_e, but not differentially ($\frac{dlog(c_u)}{dp} \approx \frac{dlog(c_e)}{dp}$) Return

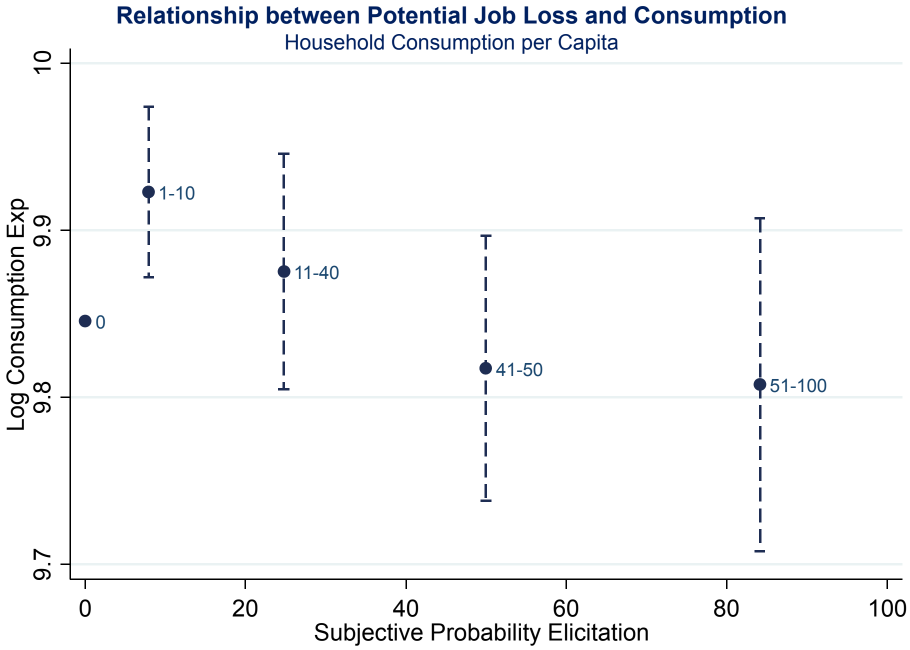

Household Income Pattern around Unemployment
Employed in t-1 and t-2 sample
Coefficient on Unemployment Indicator
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
-4
-3
-2
-1
0
1
2
3
4
Lead/Lag Relative to Unemployment Measurement
Coeff
5 / 95% CI

Return

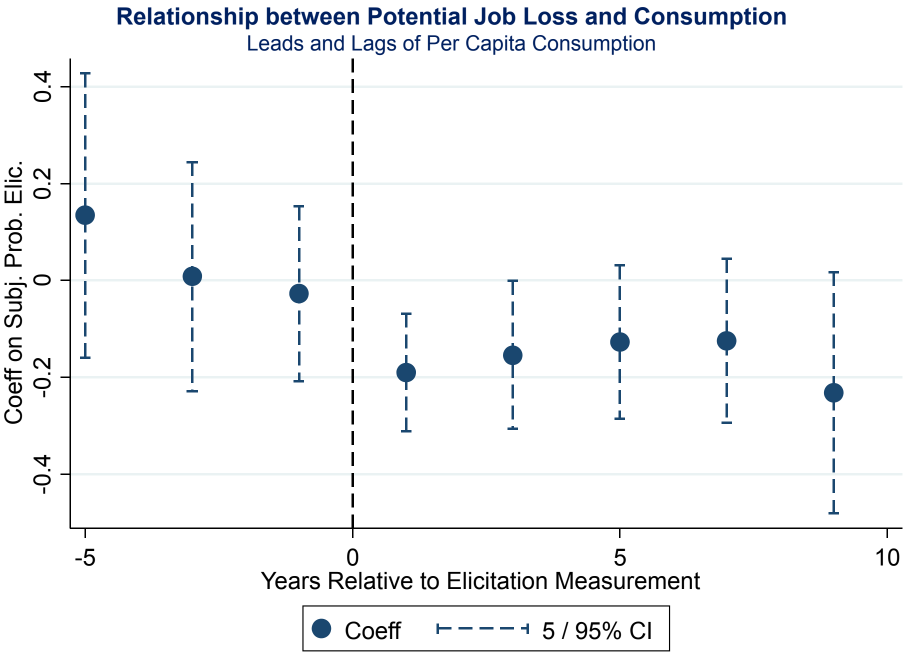
- **Return** Return

Ex-Post Consumption Impact

- 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
Log Consumption Exp
10
9.9
9.8
9.7
1-10
11-40
0
41-50
51-100
0
20
40
60
80
100
Subjective Probability Elicitation


Relationship between Potential Job Loss and Consumption
Leads and Lags of Per Capita Consumption
Coeff on Subj. Prob. Elic.
0.4
0.2
0
-0.2
-0.4
-5
0
5
10
Years Relative to Elicitation Measurement
Coeff
5 / 95% CI

Sample Summary Statistics

Variable	Panel 1: Baseline Sample mean	Panel 1: Baseline Sample std dev	Panel 2: Health Sample mean	Panel 2: Health Sample std dev	Panel 3: Married Sample mean	Panel 3: Married Sample std dev
Selected Observables (subset of X)						
Age	56.1	5.1	56.1	5.2	56.6	5.0
Male	0.40	0.49	0.41	0.49	0.44	0.50
Wage	36,057	143,883	37,523	154,993	38,138	55,722
Job Tenure (Years)	12.7	10.8	12.7	10.9	13.6	10.9
Unemployment Outcome (U)	0.031	0.173	0.032	0.175	0.029	0.168
Subjective Probability Elicitatio	15.7	24.8	15.7	24.6	14.8	24.0
Spousal Labor Supply						
Working for Pay					0.693	0.461
Fraction Entering					0.039	0.194
Sample Size						
Number of Observations	26,640		22,831		11,049	
Number of Households	3,467		3,180		2,214	

Summary Statistics (PSID Sample)

	mean	std dev
Variable		
Age	39.794	10.27
Male	0.808	0.39
Unemployment	0.059	0.24
Year	1985	7.62
Log Consumption	8.199	0.65
Log Expenditure Needs	8.124	0.32
Consumption growth (log(c_{t-2})-log(c_{t-1}))	0.049	0.360
Sample Size		
Number of Observations	80,984	
Number of Households	11,055	