The Value of Unemployment Insurance

Camille Landais (LSE) and Johannes Spinnewijn (LSE)

September, 2018

Motivation: Value of Insurance

- Key for social insurance design:
  - Large literature on labour supply responses = **cost** of social insurance
  - Much less work on corresponding **value** of social insurance
- Conceptually easy; value of transferring dollar from good to bad state
- *Challenge:* how to evaluate in practice - especially when social insurance is mandated?

Unemployment and Consumption Drops

- Large literature studies consumption response to income shock and tests for presence of (partial) insurance
- "Consumption-Based Implementation" (Baily-Chetty, Gruber '97)
  - Consumption response to U sufficient for value of UI
  - Overcomes challenge to observe means used to smooth consumption
  - But **conditional on knowing preferences**
- How well do consumption responses capture value of insurance?
  - Can we simply translate Δ consumption in Δ marginal utility?
  - Lack of smoothing: low value? or price high?
  - Huge debate $\Rightarrow$ **Unresolved**

This Paper:

We have a unique setting in Sweden:

1. **rich admin data** on income, wealth, unemployment, etc
2. **voluntary** UI coverage

We implement three alternative approaches in same setting/sample:

1. Revisit **CB approach** using admin data
   - Study different margins and heterogeneity in consumption responses
2. Propose novel **MPC approach**
   - State-specific MPCs reveal price of smoothing consumption
3. Implement **RP approach** based on UI choices
   - Study heterogeneity in valuations (conditional on unemployment risk)

This Paper: **Findings**

We have a unique setting in Sweden:

1. **rich admin data** on income, wealth, unemployment, etc
2. **voluntary** UI coverage

We implement three alternative approaches in same setting/sample:

1. Revisit **CB approach** using admin data
   - CB indicates low value of UI ($<$ MH costs)
2. Propose novel **MPC approach**
   - MPCs indicate high value of UI ($\gtrsim$ MH costs)
3. Implement **RP approach** based on UI choices
   - RP confirms high value of UI and reveals large dispersion

Related Literature

- Recent literature on value of UI:
  - CB approach using admin data *(Ganong and Noel '16, Gerard and Naritomi '18)* rather than surveyed consumption *(Browning and Crossley '01, Stephens '01)*
  - 'optimization methods' *(Chetty '08, Landais '15, Hendren '17)*
  - other social insurance settings *(Finkelstein et al. '15,'17, Low and Pistaferri '15, Cabral '16, Autor et al. '17, Fadlon and Nielsen '17)*
- Our new approaches relate to:
  - heterogeneity in MPCs *(e.g., Kreiner et al '16, Kekre '17, ...)*
  - RP vs. choice frictions *(e.g., Abaluck and Gruber '11, Handel '13, Handel and Kolstad '15, ...)*
- Building on own previous work:
  - use CB approach to study optimal dynamics of UI *(Kolsrud et al. '18)*
  - use UI choices to study adverse selection in UI *(Landais et al. '18)*

Outline

Context & Data

- Data from tax registers on all earnings/income, transfers/taxes, debt & assets (balance & transactions), some durables
  - Consumption as a residual expenditure measure (Kolsrud et al. '17)

$$consumption_t = income_t - \Delta assets_t$$

▸ Consistency with survey data ▸ Details

  - Sources of income variation (UI benefits, transfers, asset price shocks)
- Data on UI coverage choices [2002-2008] ▸ Institutional details
  - workers can opt for comprehensive coverage ($\sim$ 80% replacement rate)
  - alternative is a flat minimum benefit level
  - uniform price (subsidized): 4 out of 5 take comprehensive coverage
- Data on unemployment outcomes:
  - On unemployment spells & benefit receipt
  - On determinants of U risk ▸ Predicted Risk Model
  - On elicited unemployment risk (surveys)

Approach I: Consumption-Based Approach

CB Approach

MRS is determined by consumption drop and risk aversion:

$$\frac{u'_u(c_u)}{u'_e(c_e)} \cong 1 + \gamma \times \frac{c_e - c_u}{c_e}$$

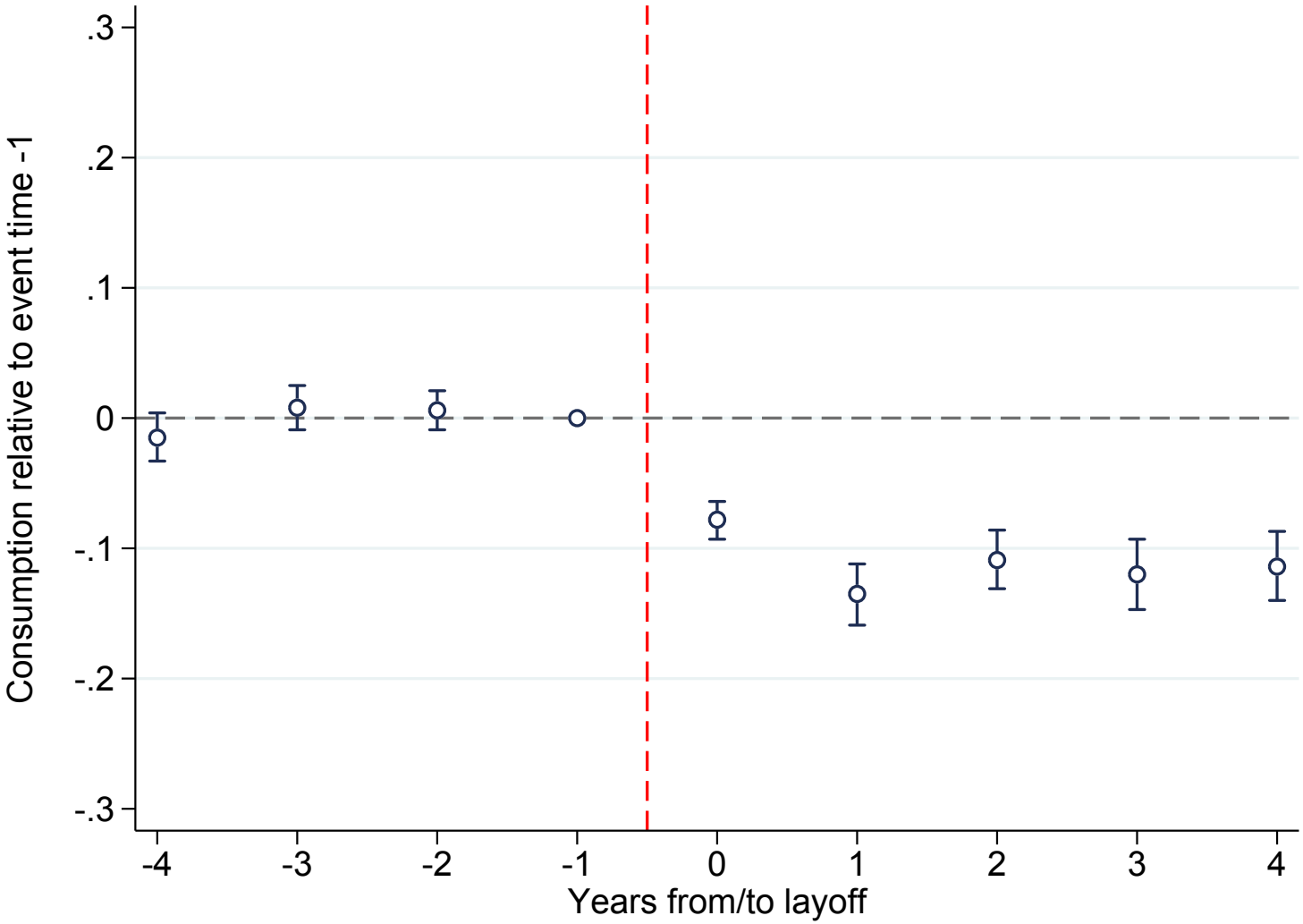
where $\gamma = c_e \cdot u''(c_e)/u'(c_e)$

- Approximation ignores state-dependent preferences and relies on Taylor expansion

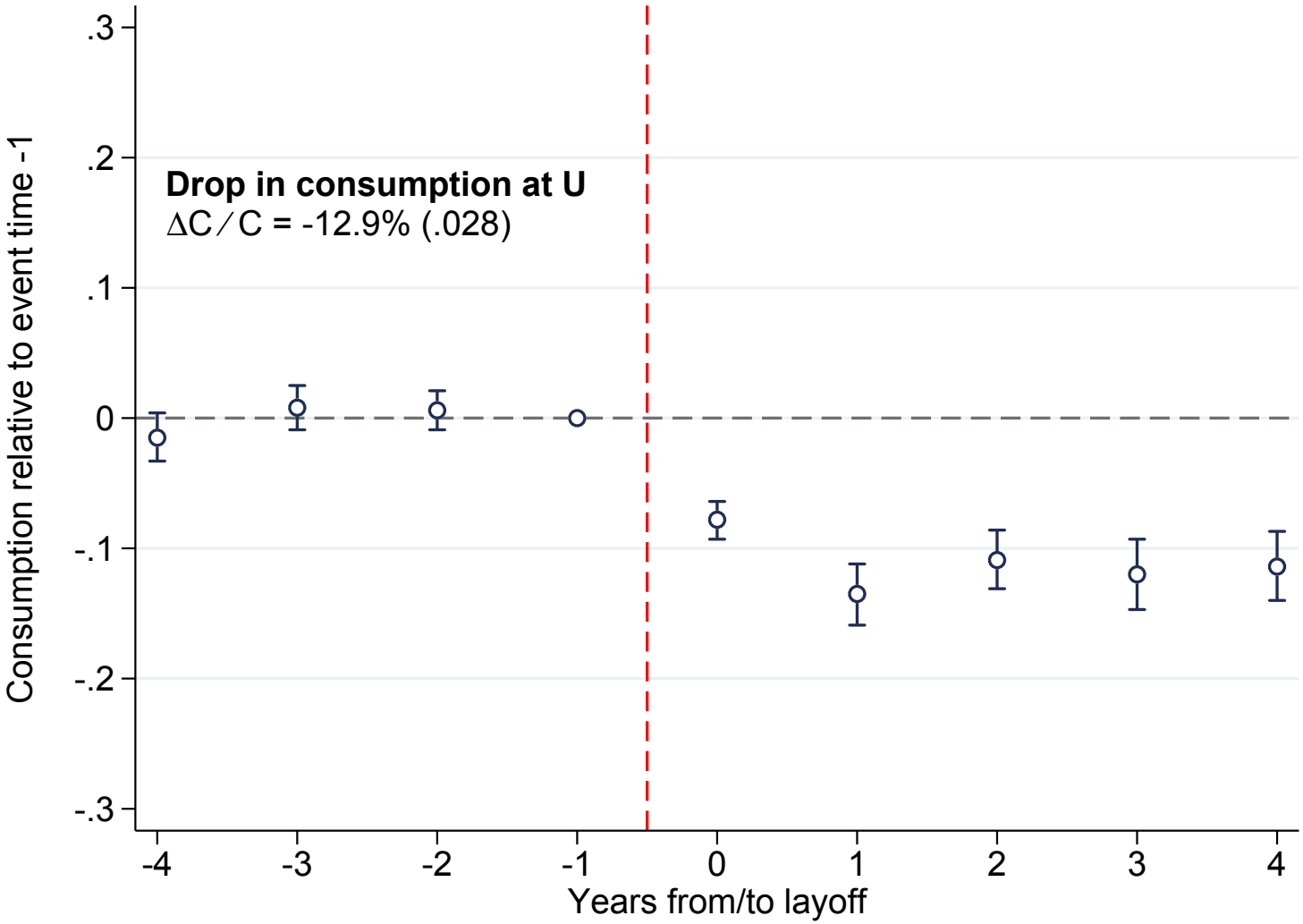
$$u'(c_u) \cong u'(c_e) + u''(c_e)[c_e - c_u]$$

- Remarkably easy to implement if preferences are known...

Yearly Consumption Relative to Year of Displacement

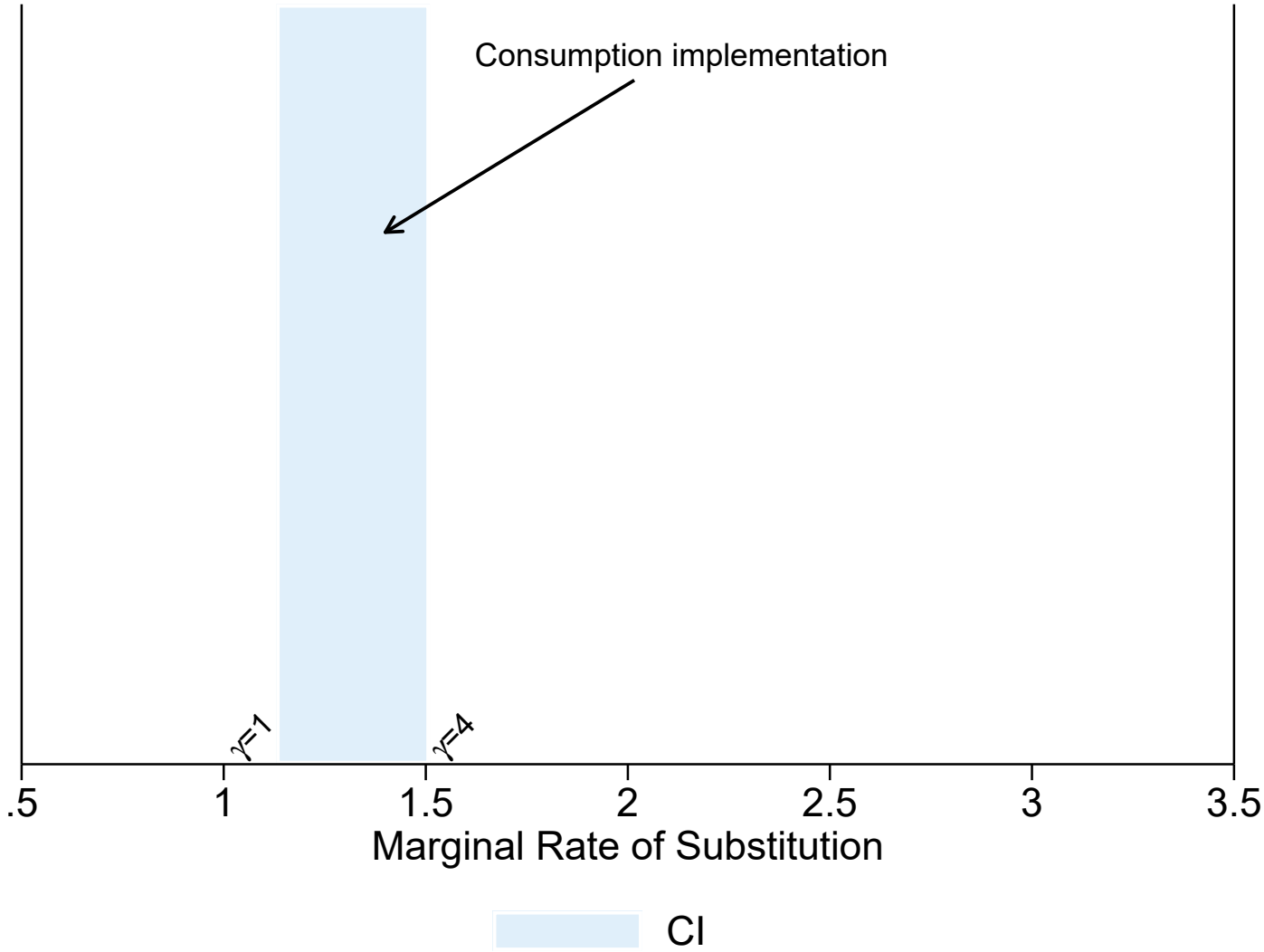


Yearly Consumption Relative to Year of Displacement



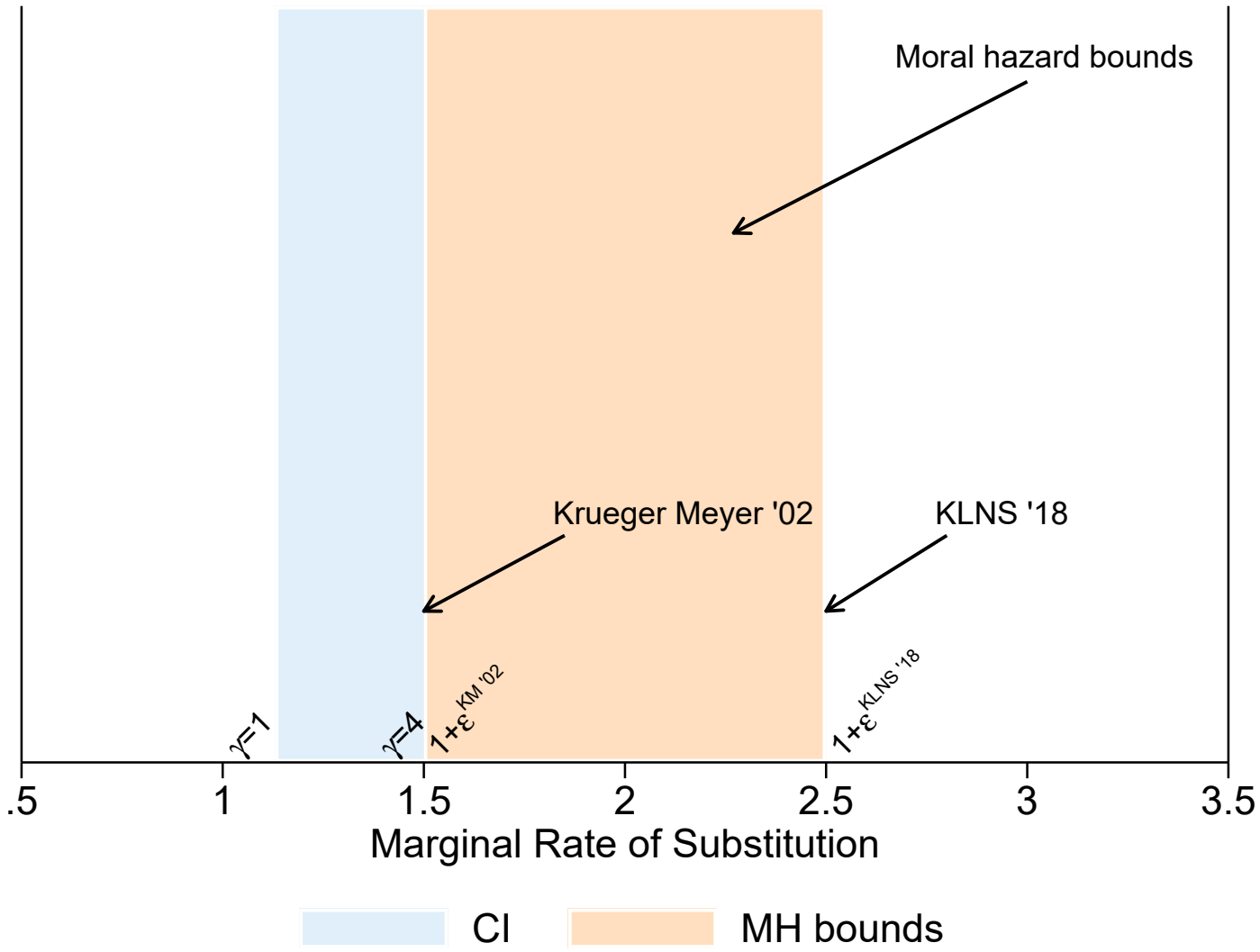
Comparing Value vs. Cost of UI

Baily-Chetty

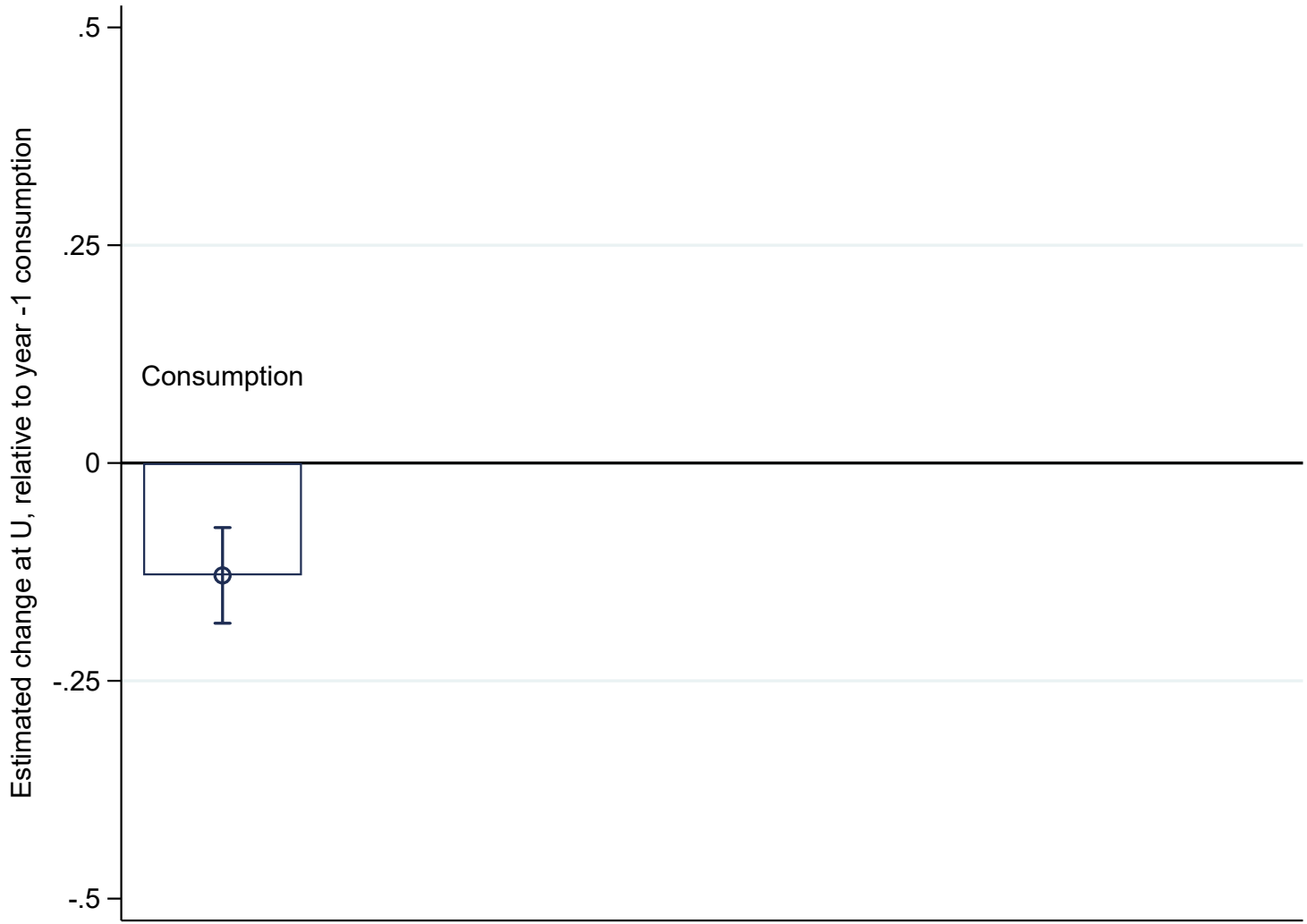


Comparing Value vs. Cost of UI

Baily-Chetty

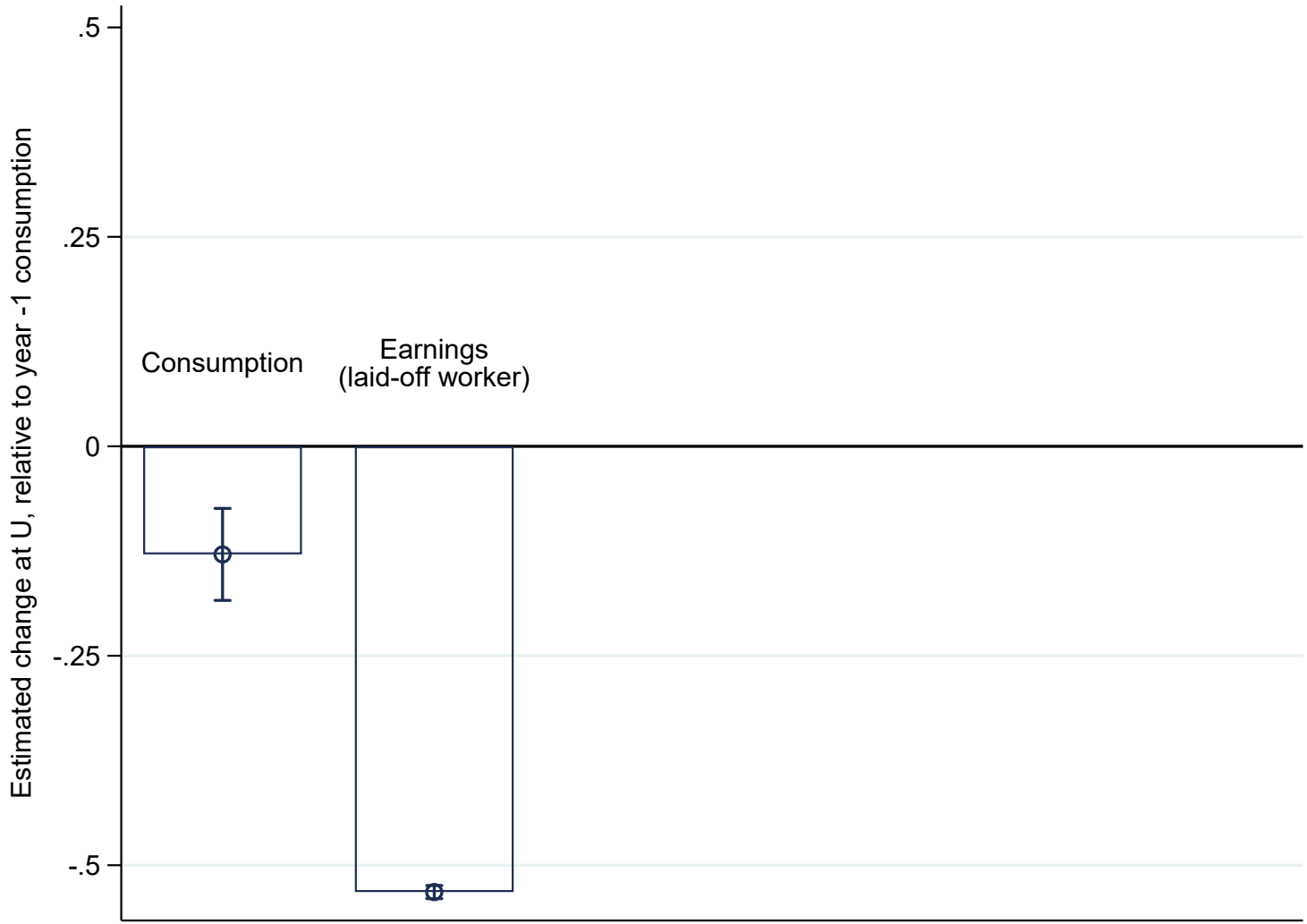


Decomposition of Cons. Responses: HH Consumption



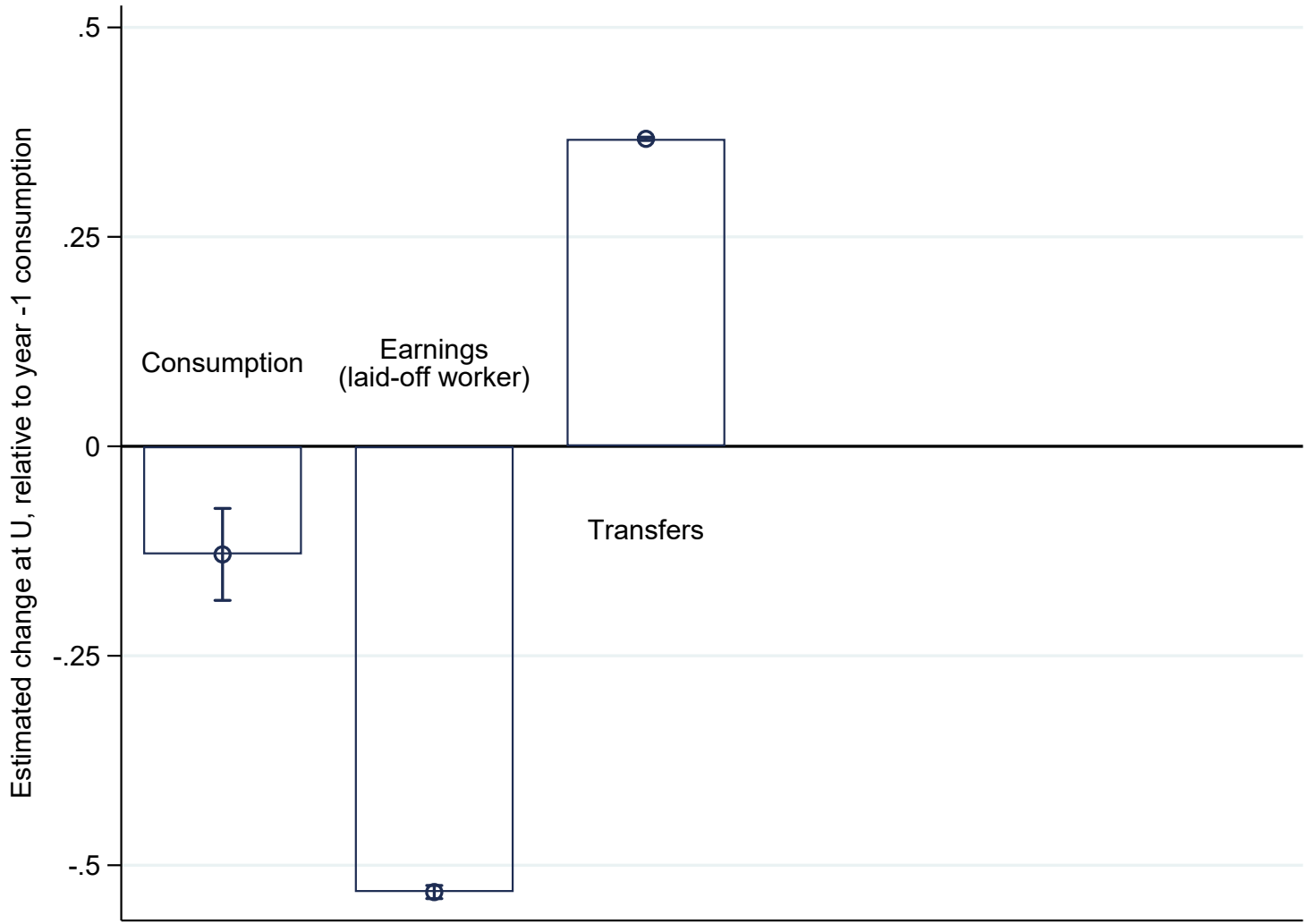
Details

Decomposition of Cons. Responses: Labor Income



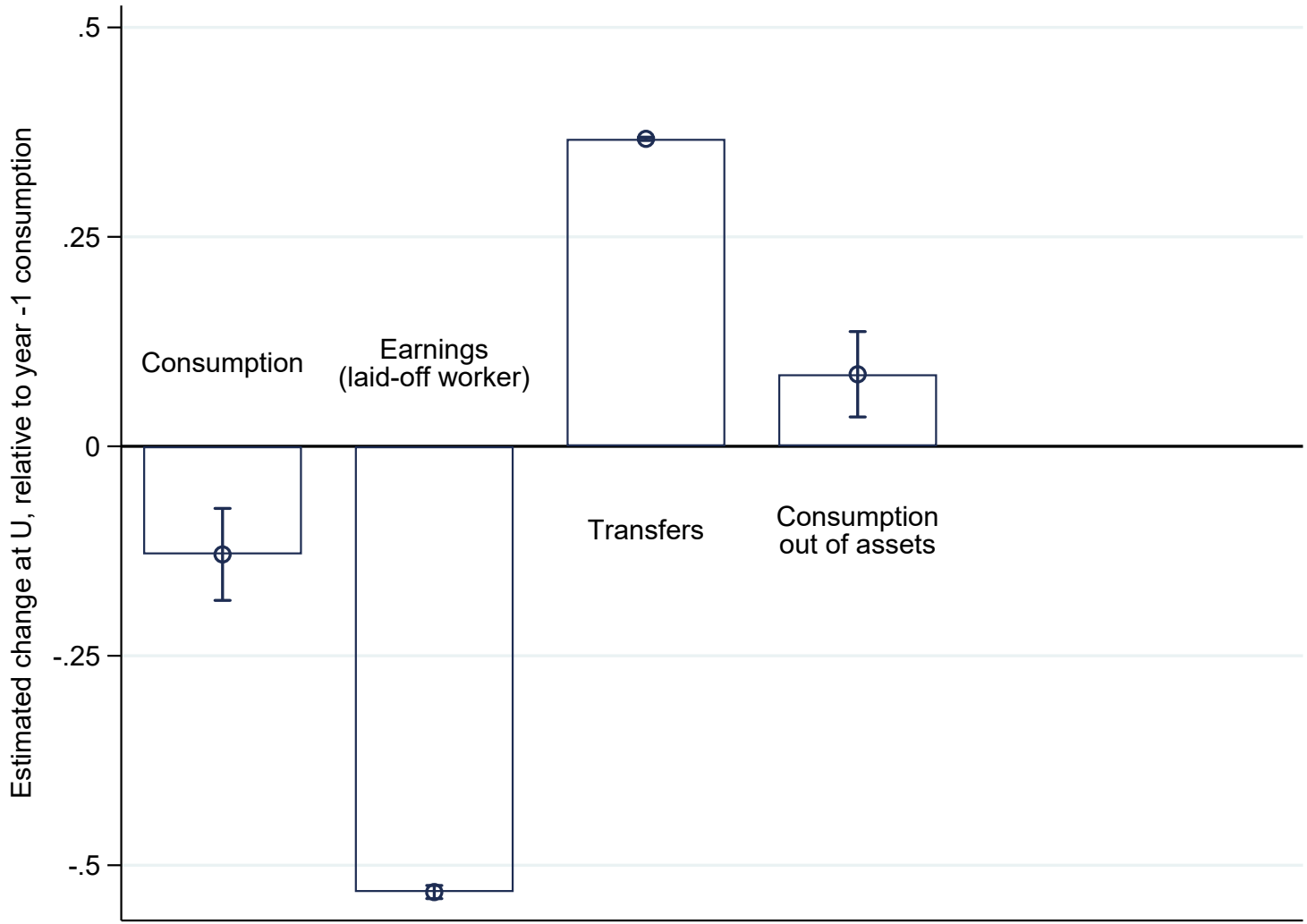
Details

Decomposition of Cons. Responses: Transfers



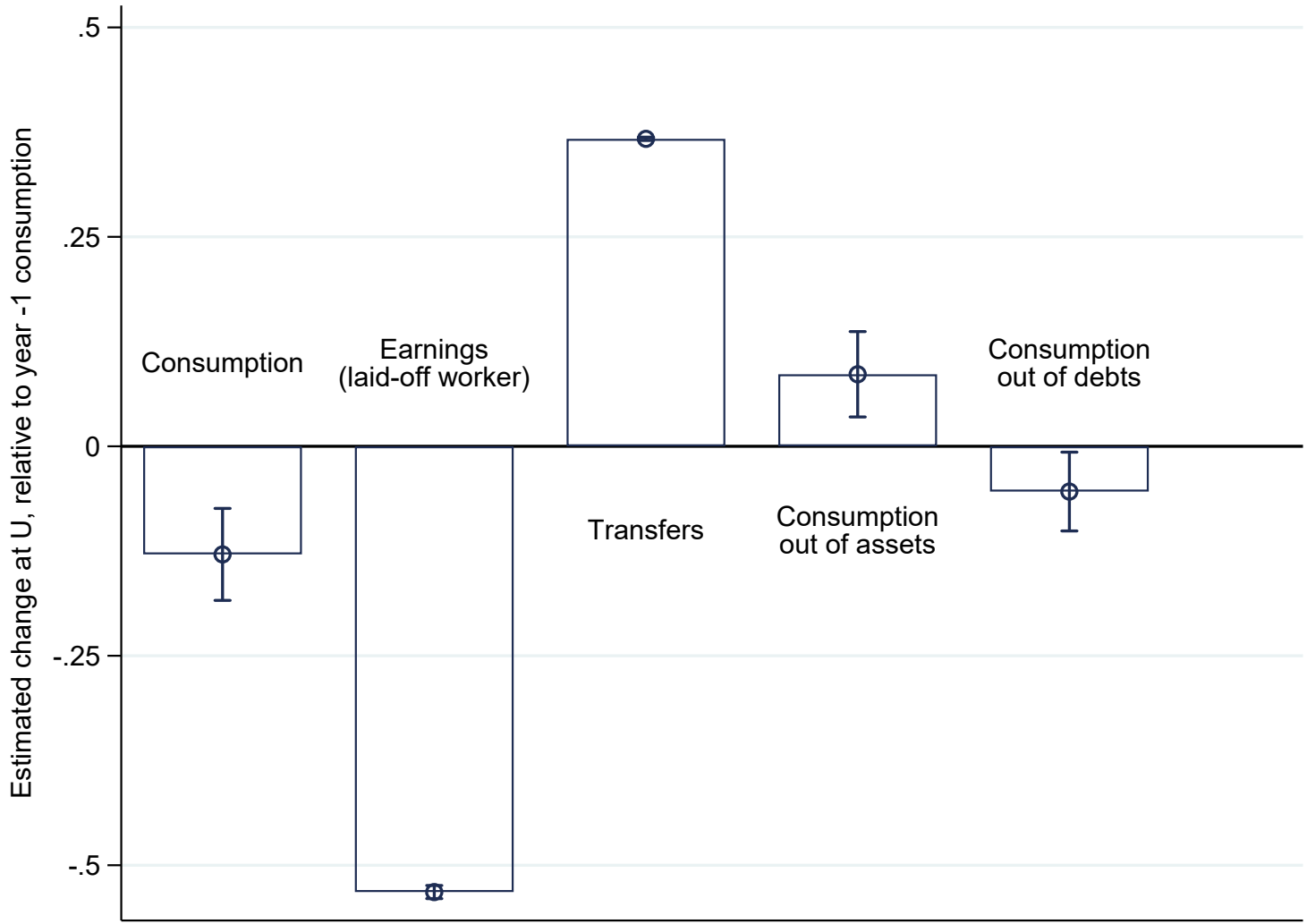
Details

Decomposition of Cons. Responses: -Δ Assets



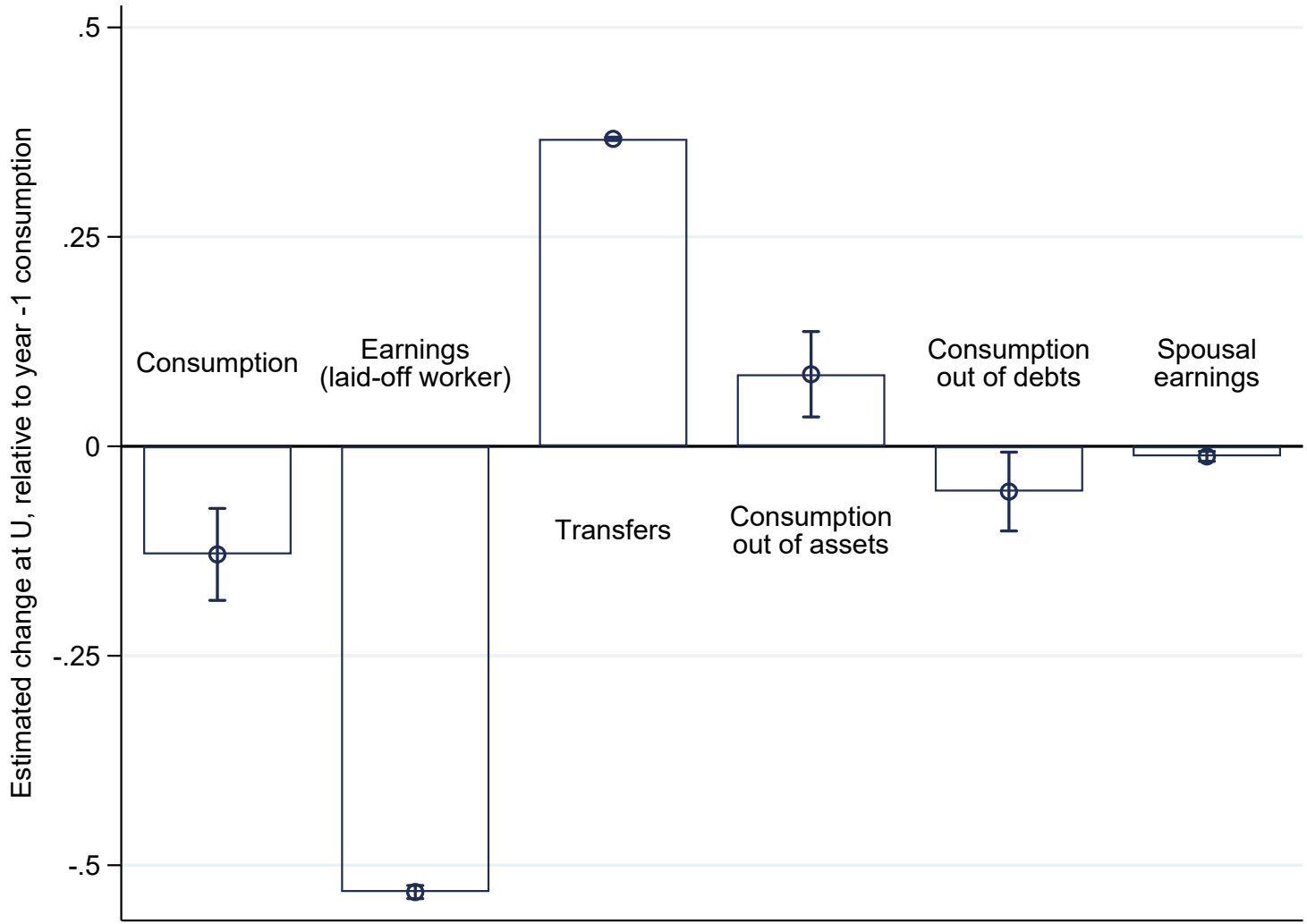
Details

Decomposition of Cons. Responses: Δ Debt



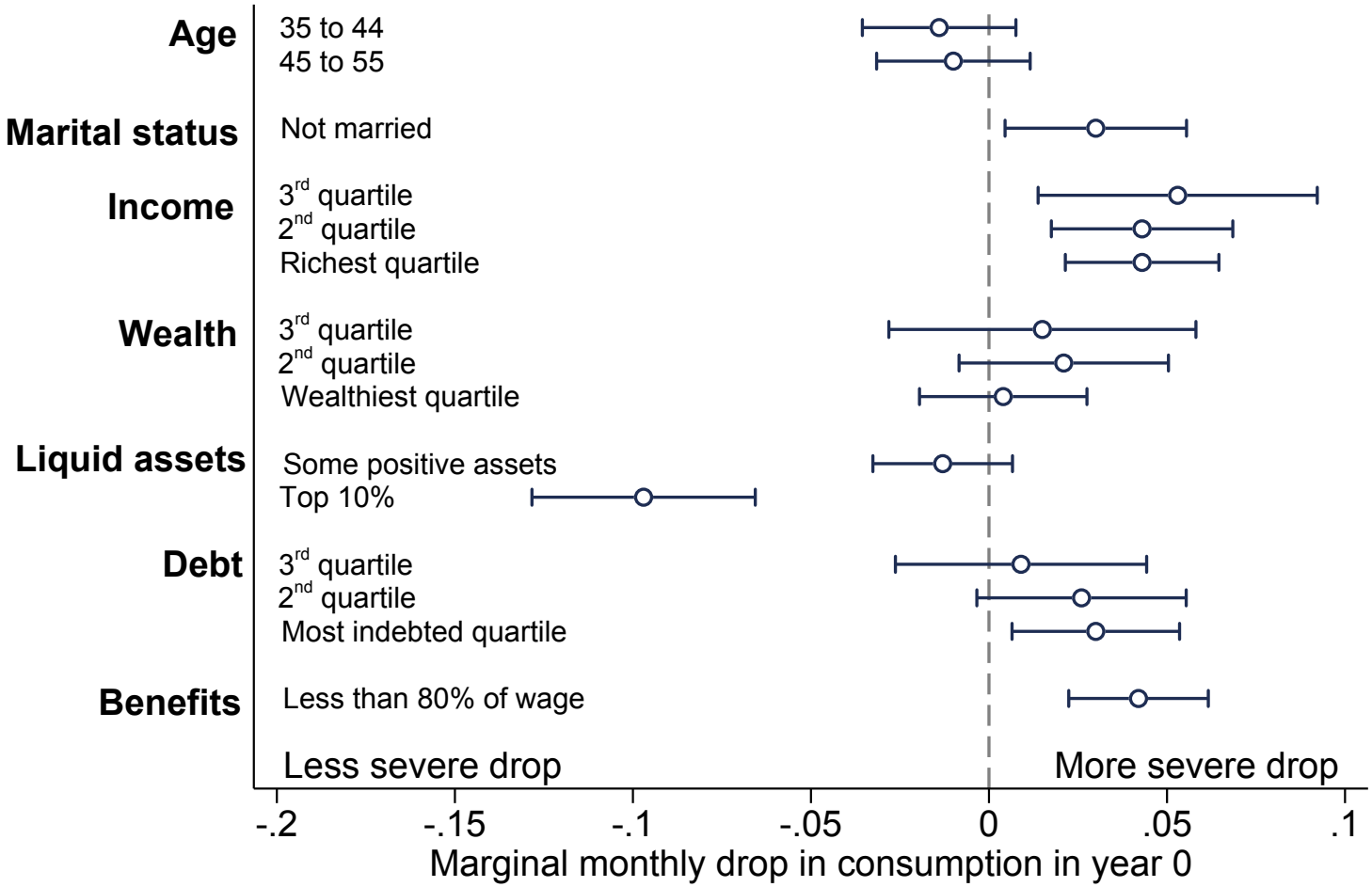
Details

Decomposition of Cons. Responses: Spousal Earnings



Details

Heterogeneity in Consumption Responses



Details

CB Approach: Discussion and Challenges

- Can we translate Δ consumption in Δ marginal utility?
  - Large ΔC relative to ΔY at displacement $\Rightarrow$ high p_u/p_e? or low γ?
  - Large ΔC for liquidity or debt-constrained $\Rightarrow$ high p_u/p_e?
- Other challenges:
  1. State-dependent Expenditures
  2. State dependent utility
  3. Anticipation (e.g. Hendren [2017, 2018])
  4. Heterogeneity (e.g. Andrews & Miller [2013])

CB Approach: Discussion and Challenges

- Can we translate Δ consumption in Δ marginal utility?
  - Large ΔC relative to ΔY at displacement $\Rightarrow$ high p_u/p_e? or low γ?
  - Large ΔC for liquidity or debt-constrained $\Rightarrow$ high p_u/p_e?

- Other challenges:
  1. State-dependent Expenditures

     Using consumption surveys, we find: Expenditure Categories
     - committed expenditures (e.g., rent) drop very little
     - durable good consumption (e.g., furniture) drops early on in the spell
     - employment-related, but also leisure expenditures drop substantially
     - increase in home production
  2. State dependent utility
  3. Anticipation (e.g. Hendren [2017, 2018])
  4. Heterogeneity (e.g. Andrews & Miller [2013])

CB Approach: Discussion and Challenges

- Can we translate Δ consumption in Δ marginal utility?
  - Large ΔC relative to ΔY at displacement $\Rightarrow$ high p_u/p_e? or low γ?
  - Large ΔC for liquidity or debt-constrained $\Rightarrow$ high p_u/p_e?
- Other challenges:
  1. State-dependent Expenditures
  2. State dependent utility
     - Complementarities btw C & L, reference-dependence, etc.

$$\frac{u'_u(c_u)}{u'_e(c_e)} \cong 1 + \gamma_e \times \frac{c_e - c_u}{c_e} + \theta$$

     - $\theta = \frac{u'_u(c_u) - u'_e(c_u)}{u'_e(c_e)}$
  3. Anticipation (e.g. Hendren [2017, 2018])
  4. Heterogeneity (e.g. Andrews & Miller [2013])

CB Approach: Discussion and Challenges

- Can we translate Δ consumption in Δ marginal utility?
  - Large ΔC relative to ΔY at displacement $\Rightarrow$ high p_u/p_e? or low γ?
  - Large ΔC for liquidity or debt-constrained $\Rightarrow$ high p_u/p_e?
- Other challenges:
  1. State-dependent Expenditures
  2. State dependent utility
  3. Anticipation (e.g. Hendren [2017, 2018])
     - Drop at U = drop conditional on U risk already revealed at U
     - Individuals who end up unemployed were also more risky
     - Anticipation reduces drop in C at U
     - **Solution:** Rescale changes in C at job loss by risk revealed
       Or rescale change in C before U by amount of risk revealed before U
       Implementation
  4. Heterogeneity (e.g. Andrews & Miller [2013])

CB Approach: Discussion and Challenges

- Can we translate Δ consumption in Δ marginal utility?
  - Large ΔC relative to ΔY at displacement $\Rightarrow$ high p_u/p_e? or low γ?
  - Large ΔC for liquidity or debt-constrained $\Rightarrow$ high p_u/p_e?
- Other challenges:
  1. State-dependent Expenditures
  2. State dependent utility
  3. Anticipation (e.g. Hendren [2017, 2018])
  4. Heterogeneity (e.g. Andrews & Miller [2013])
     - Heterogeneity in MRS important for policy design
     - Mapping btw heterogeneity in Δc & in MRS is tricky!
     - Need to account for $Cov(\gamma, \Delta c)$

Approach II: State-Specific MPC's

MPC approach

Under 'regularity conditions', MRS is bounded by:

$$\frac{u'_u(c_u)}{u'_e(c_e)} \geq \frac{MPC_u/(1-MPC_u)}{MPC_e/(1-MPC_e)}$$

with $MPC_s \equiv dc_s/dy_s$.

- **Idea:** smoothing behavior depends on state-specific price of increasing consumption, p_s:
  - intertemporal savings $\rightarrow p_s = R_s$
  - household labour supply $\rightarrow p_s = 1/w_s$
  - insurance $\rightarrow p_s =$ Arrow-Debreu price
- **Challenge:** what is p_u/p_e? what is binding margin of adjustment?

Details on Framework

Approach II: State-specific MPC's (cont'd)

- **Solution:** state-specific MPC_s reveals state-specific price p_s
  - MPC is higher when price of increasing consumption is higher

$$\frac{dc_s}{dy_s} = \frac{p_s \times \frac{\sigma_s^x}{\sigma_s^c}}{1 + p_s \times \frac{\sigma_s^x}{\sigma_s^c}}$$

  - Mitigated by curvature over consumption c vs. used resource x
- **'Trick':** rescaling of MPC_u vs. MPC_e
  - Takes out impact of relative curvature (e.g., CARA prefs)
  - Overcomes challenges to CB approach (e.g., work exps, home prodn)
- Builds on 'optimization approaches':
  - See Chetty 2008, Landais 2015, Hendren 2017
  - Choices (e.g., spousal labor, precautionary savings) reveal value of UI...
  - ... but requires the studied margin of adjustment to be binding

Further Details

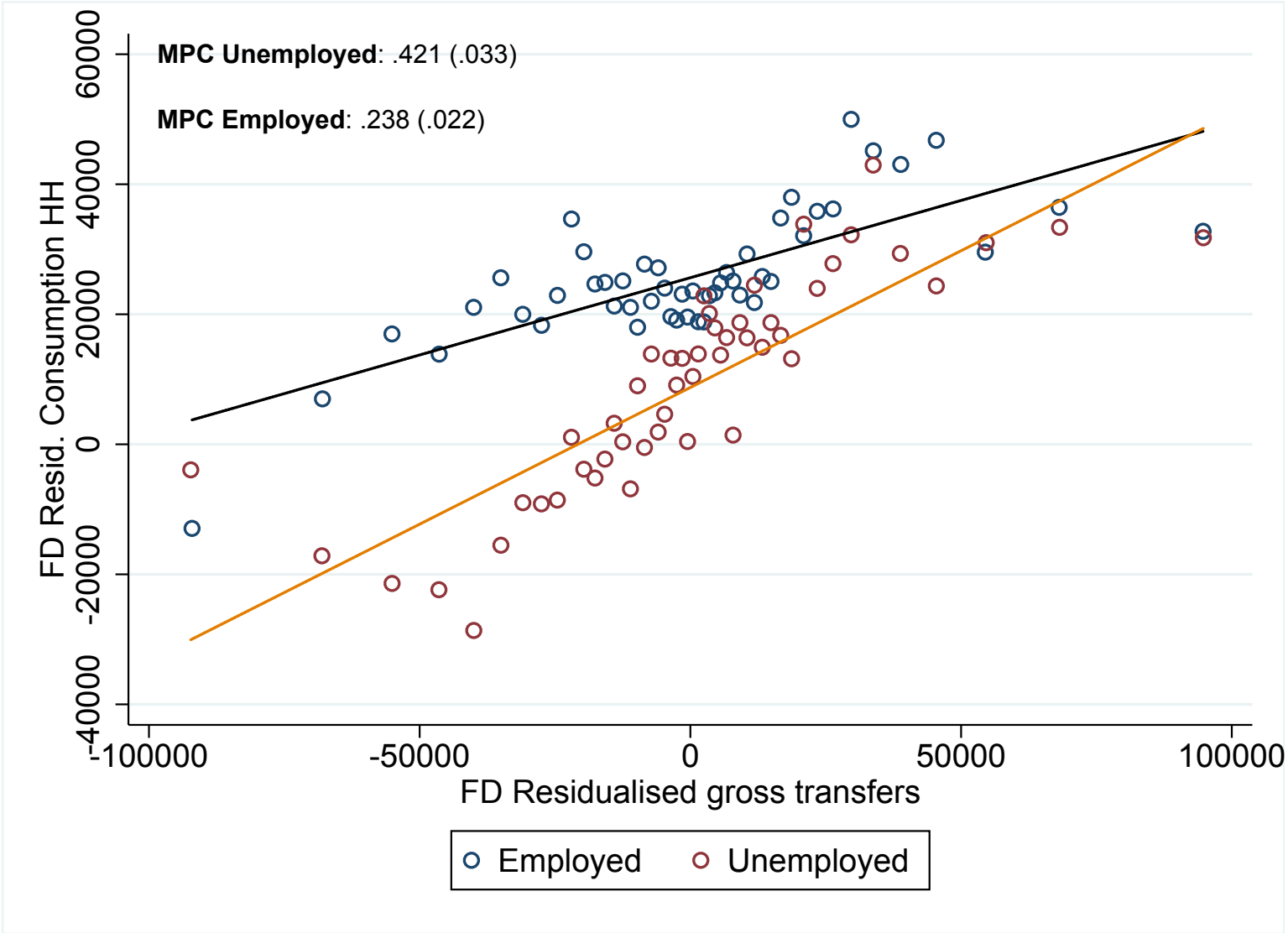
MPC: Variation in Local Transfers

- **Challenge:** need comparable exogenous variation in income when employed vs. unemployed
- Use variation in local transfers
  - Local transfers = large fraction of HH transfers
    - Means-tested/categorical transfers, housing benefits, ...
    - Regulated at national level, large discretion at municipality level
  - Large variation across municipalities / over time / across HH types Examples
    - Use interaction of sources of transfer variation in FD approach

$$C_{ijt} = \alpha_i + \eta_j + \delta_t + \gamma h_{ijt} + X'_{it}\beta$$

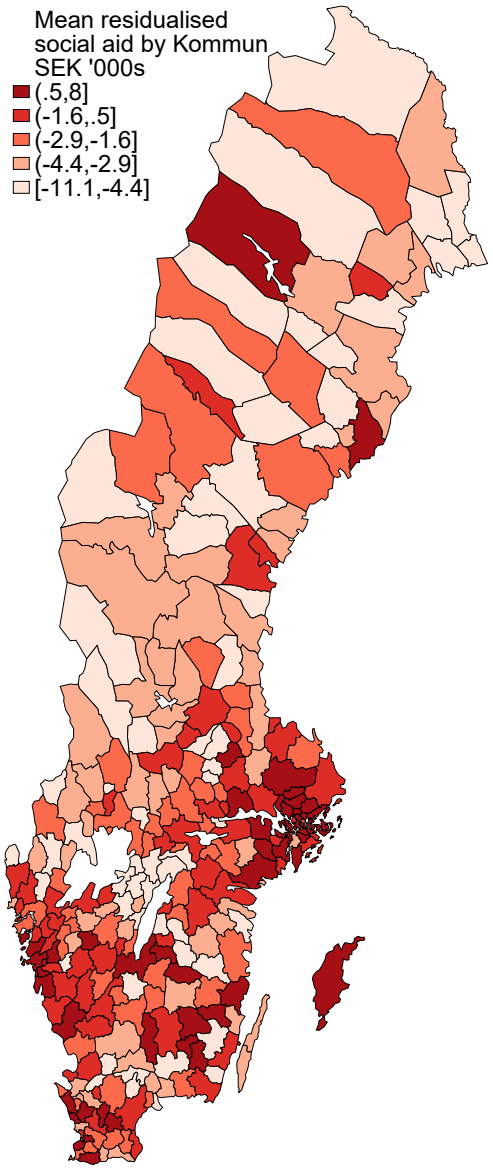
    - X: rich vector of characteristics determining transfers Details
- Estimate on sample of individuals who become unemployed
  - Compare them when employed vs unemployed

MPC: Transfer

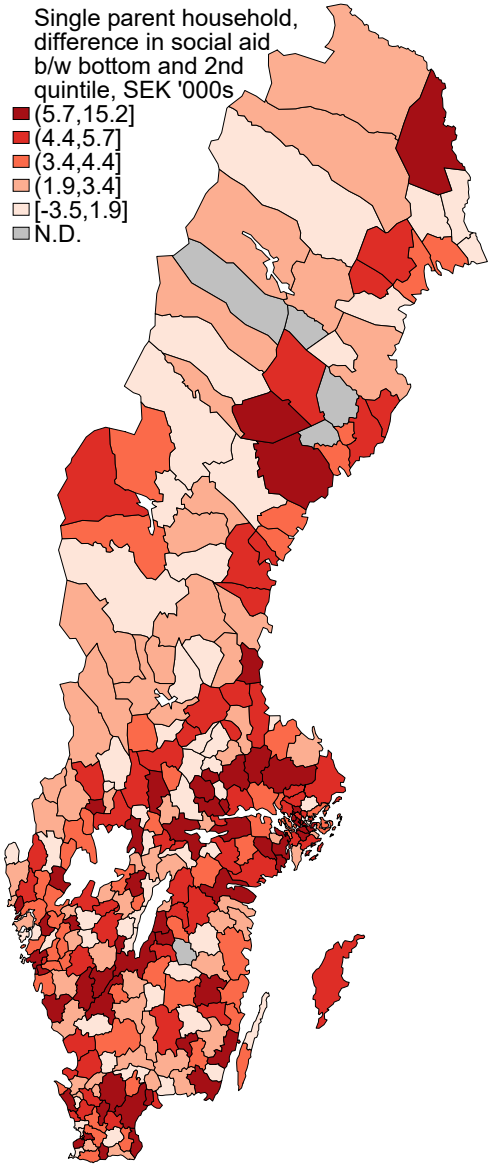


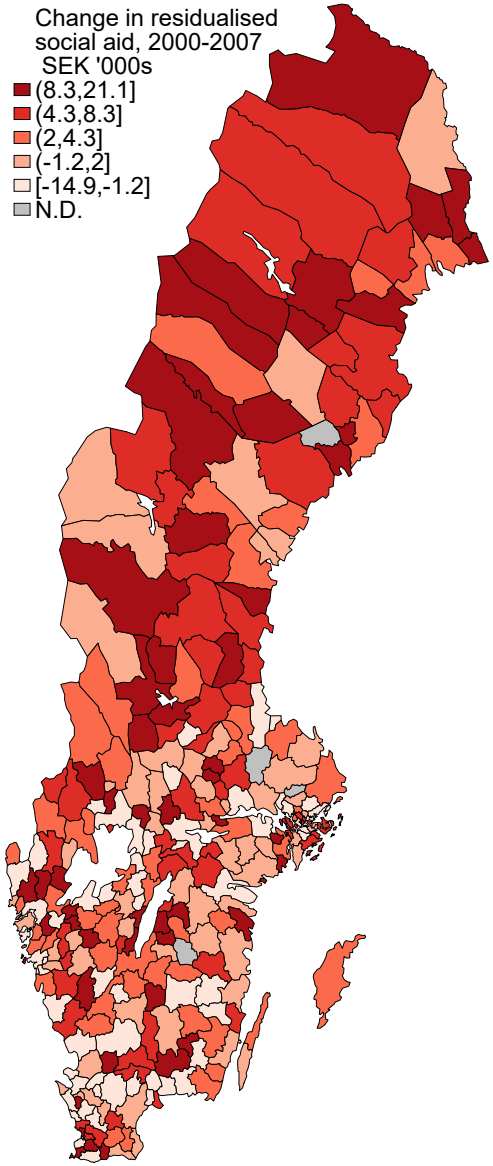
Additional Evidence - UI benefit kink
Additional Evidence - K income shock

Variation in Local Transfers:

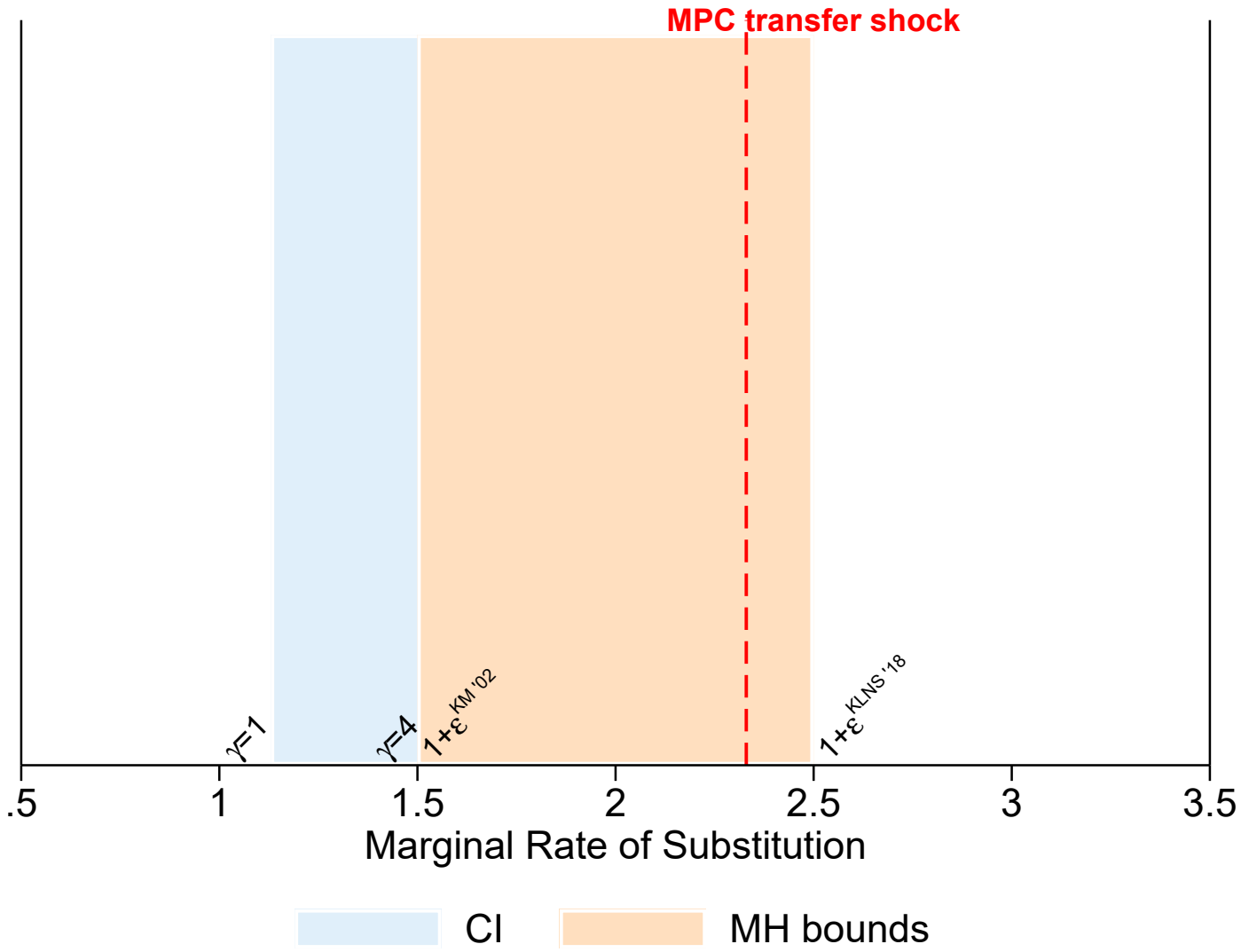


Variation in Local Transfers:





Estimates of MRS: CB vs. MPCs



Approach III: Revealed Preference Approach

RP approach

When offered insurance, choice reveals MRS given *expected* price per unit of coverage:

$$\frac{u'_u(c_u)}{u'_e(c_e)} \gtrless \frac{p_u}{p_e} \times \frac{[1-\pi]}{\pi}$$

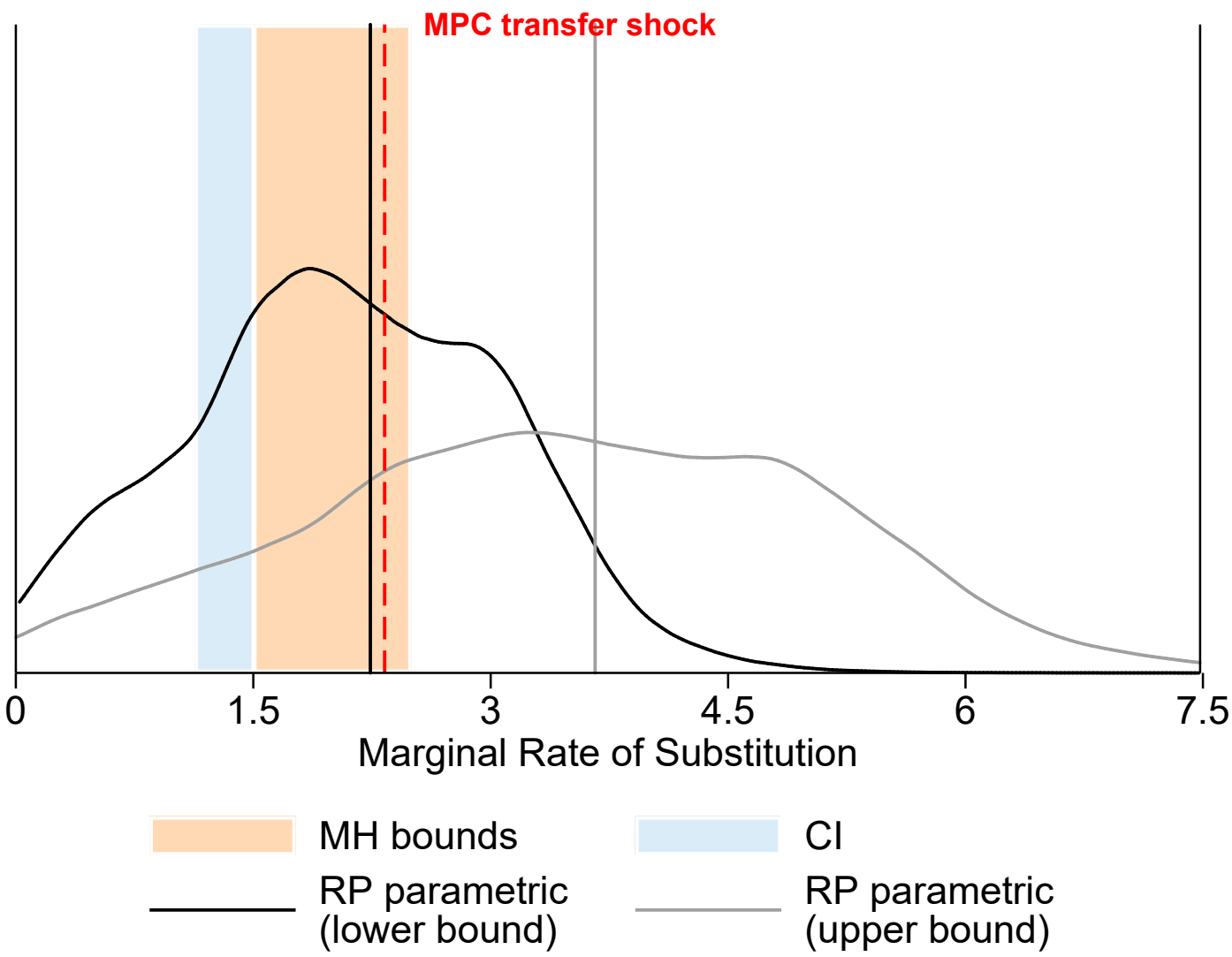
- Most direct approach?
  - When prices are known, could infer value from insurance choice
  - But ex-ante choice: need to account for unemployment risk π!
- Challenges:
  1. Requires data on choices and unemployment risk
  2. Need variation in 'expected' price to tighten bounds
  3. Tackle potential choice frictions: e.g., risk misperception, inertia

RP Approach: Implementation

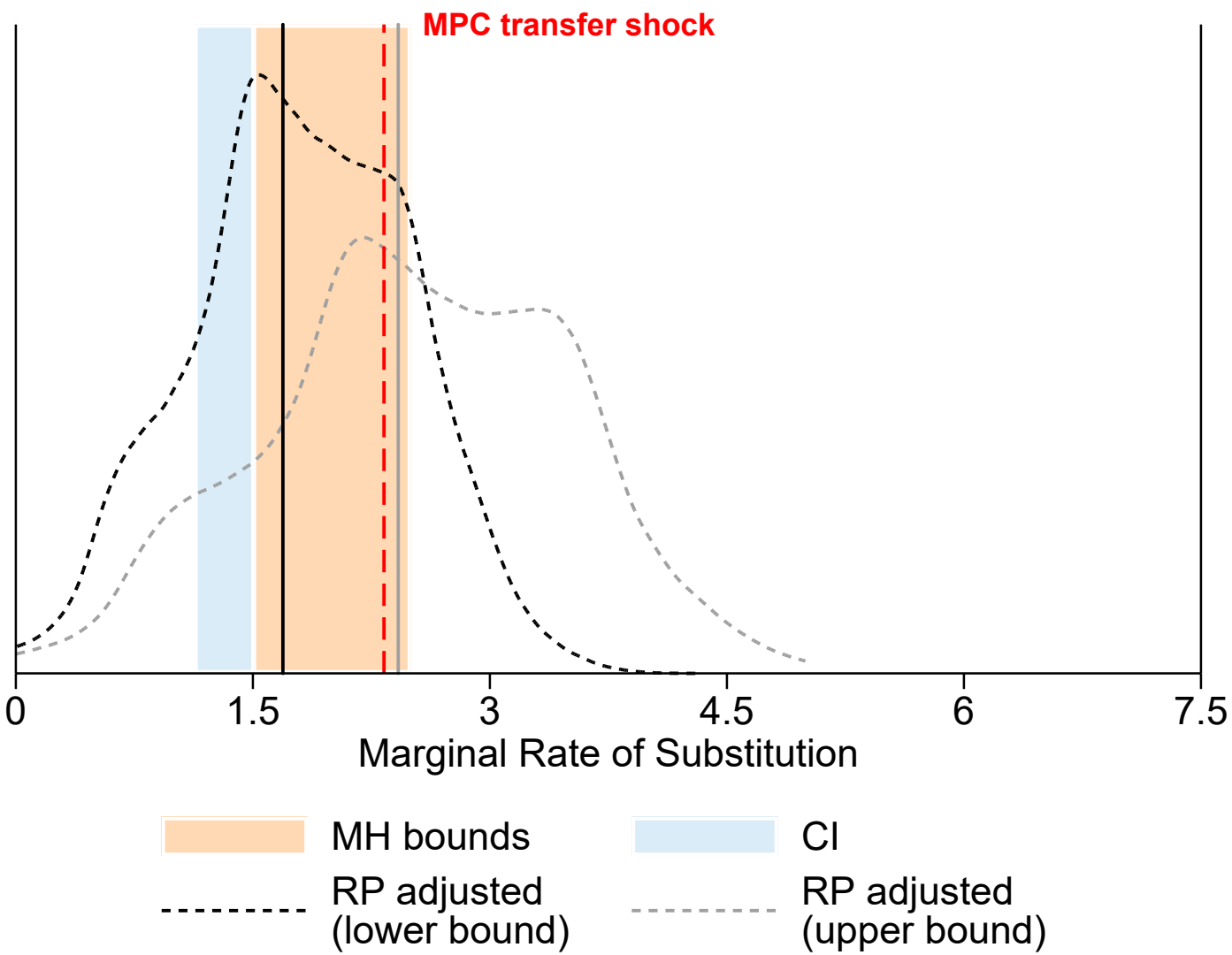
- Swedish Context:
  - Basic plan (b_0, τ_0) vs comprehensive plan (b_1, τ_1)
  - Expected price $E[P] = \frac{[1-\pi_i]\times[\tau_1-\tau_0]}{\pi_i\times[b_1-b_0]}$
- Use non-parametric approach to put bounds on MRS Example
- Use parametric approach to estimate MRS distribution:
  - Estimate random effect logit model:
    - 'insured' if $\underbrace{\text{MRS}}_{\alpha_i+X'\beta} - E[P]_{it} + \varepsilon_{it} \geq 0$
    - X: vector of observables affecting MRS (age, education, income, etc.)
  - Predict unemployment risk π_i based on $X + Z$:
    - Z: risk shifters ($\perp X$) (relative tenure rank, layoff notifications)
    - account for MH: estimate separately on 'insured' and 'uninsured'
    - account for frictions: (i) salient risk shifters, (ii) elicited beliefs

▸ Predicted Risk Model ▸ Moral Hazard ▸ Frictions

RP Parametric: MRS distributions



Adjusted RP Parametric: MRS distributions



Conclusion

- Revisited consumption-implementation using registry-based measure
  - find 'small' consumption drops which translate in low value of UI for standard preferences
  - limited consumption smoothing beyond (generous) social transfers
- Alternative approaches suggest high mean and variance in the value of UI
  - high mean: generous UI is desirable
  - high variance: allow for choice or differentiate UI policy
  - need caution when using CB approach to guide policy
- State-specific MPCs seem robust alternative to CB approach & extendible to other social insurance settings when no choice is available