Couples' and Singles' Savings After Retirement

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Our Question

How do life transitions affect the wealth of older households?

Life Transitions

- Women live longer than men
- $\frac{1}{3}$ of all women, $\frac{1}{5}$ of all men experience a long nursing home stay



Life Transitions: Establishing Facts

- AHEAD Cohort of the HRS
- Households with heads aged 72 or older in 1996, data every 2 years until 2014

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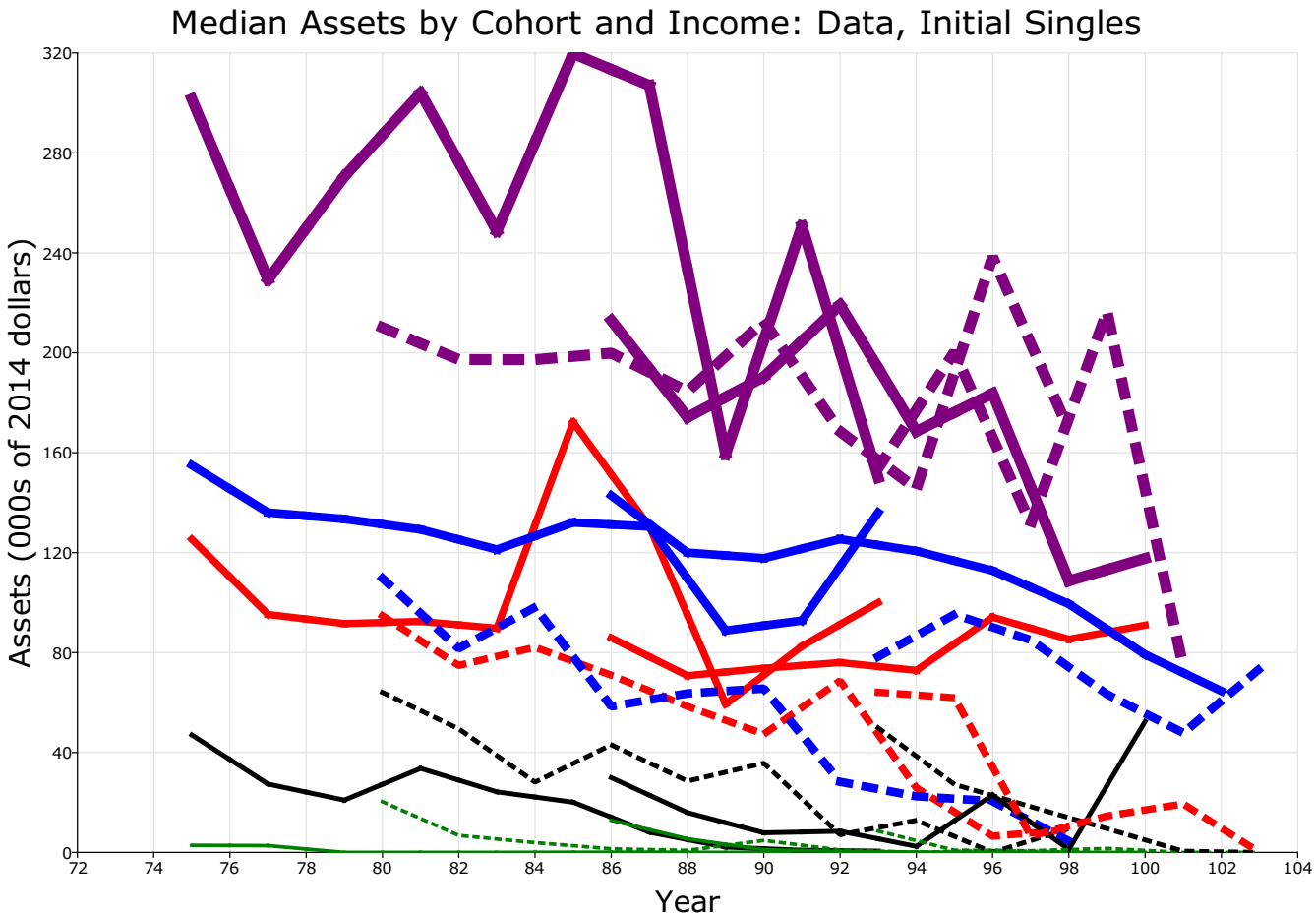
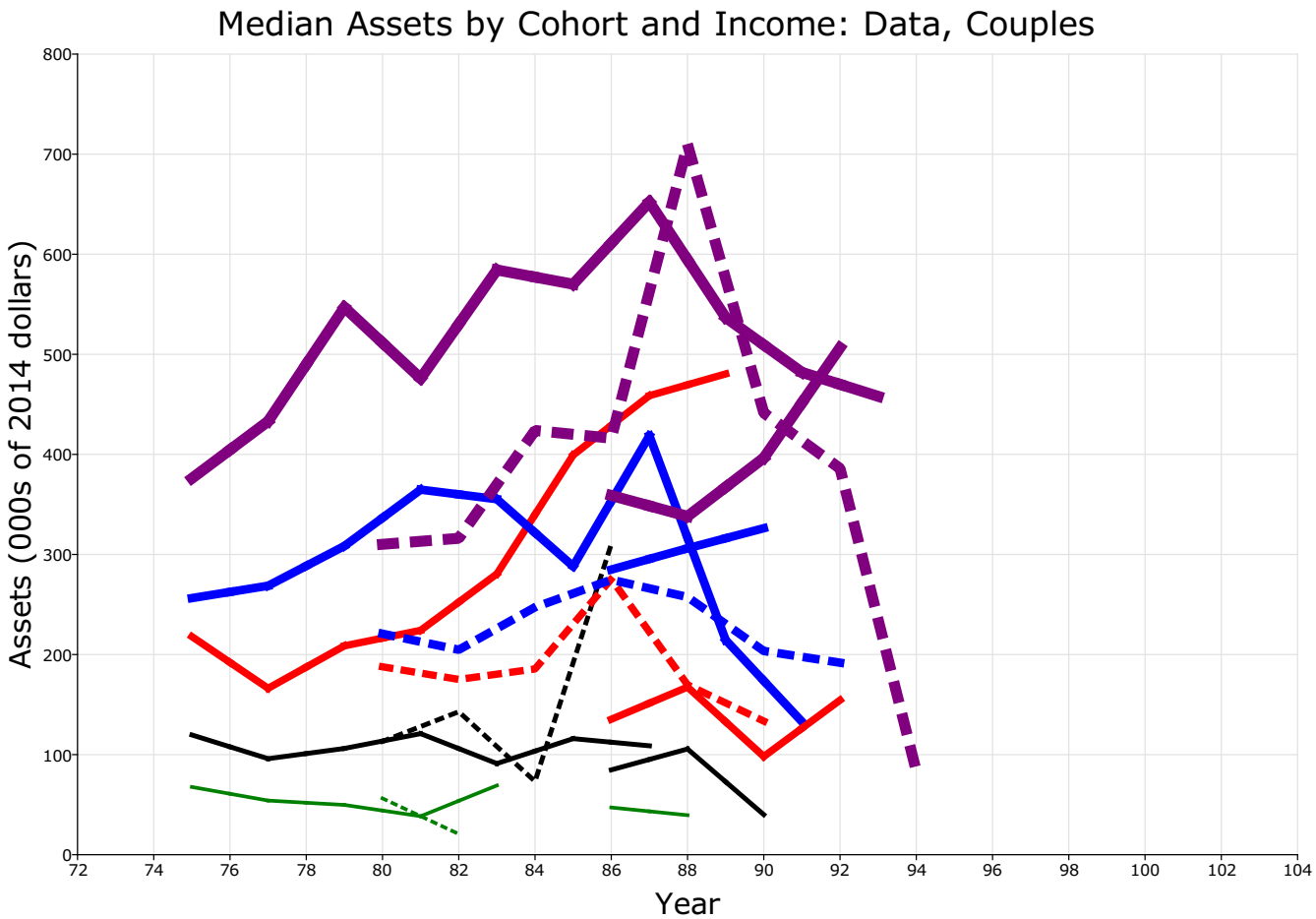
- Households with heads aged 72 or older in 1996, data every 2 years until 2014
- Disaggregate assets by age, permanent income, and cohort.
  - Permanent income = a measure of average annuitized household income over the time we observe them, constructed using fixed effects (details later)

Initial Singles' Savings



- High-income singles decumulate assets slowly
  - Middle-income singles, more quickly
- Low-income singles, no retirement savings

Current Couples' Savings



- Retired couples tend to accumulate assets

Life Transitions: Establishing Facts

- Sample composition changes due to mortality
- High income people and women live longer



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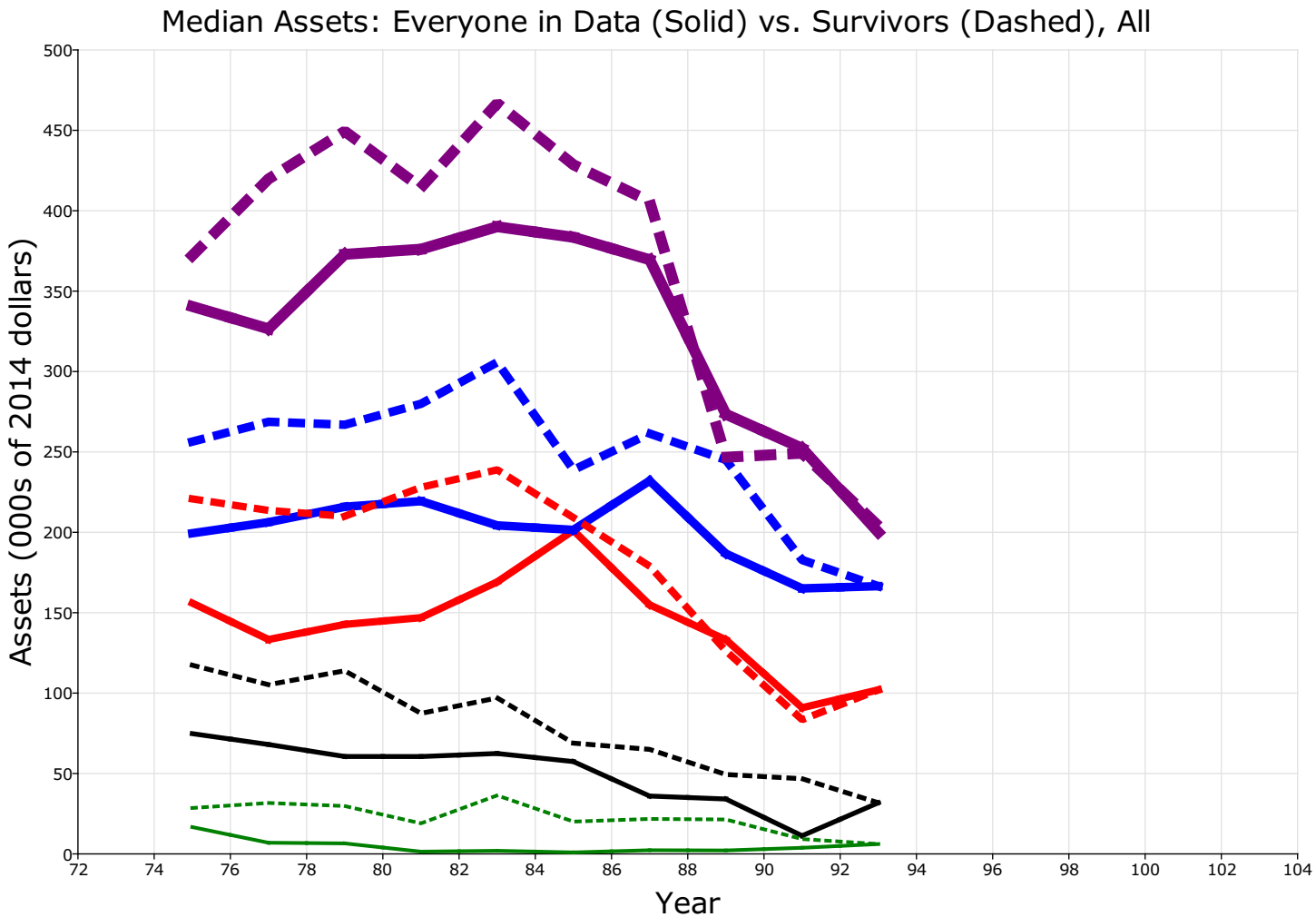
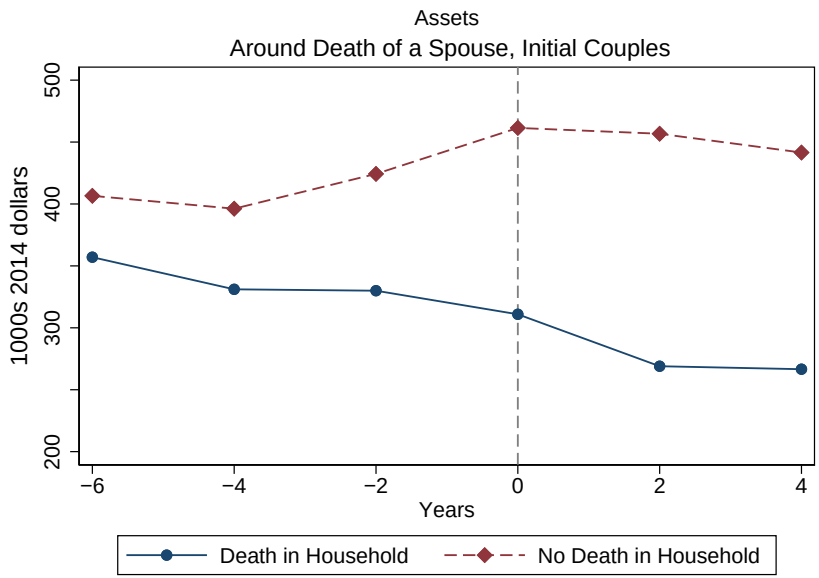
- Leads to mortality bias: observed assets tend to **increase** with age

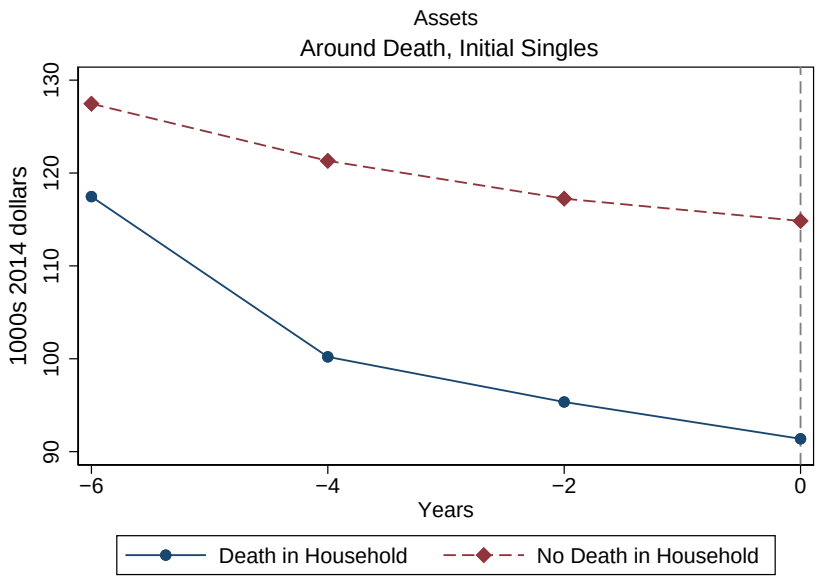
Life Transitions: Mortality Bias Important



- Modelling attrition is key

Life transitions: Assets Drops at death





Consistent with French et al., 2006; Poterba et al., 2011.

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- Altruism toward surviving spouse
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- Spouses can provide valuable insurance...
  - An individual medical expense shock can be spread across two people
  - Spouses can care for each other – substitute for formal care
- ...but they can also be a source of risk
  - Exposure to other spouse's medical expense risks
  - End-of-life expenses and income loss when one spouse dies (Braun et al., 2017)

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  - End-of-life expenses
- Bequest motives

Previous work on singles

- Saving Motives for Older Singles
- Two prevailing explanations for the slow run down of assets at older ages
  - Precautionary motives: risk of living long and having high medical expenses (De Nardi et al., 2009 & 2010; Ameriks et al., 2011 and 2017)
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  - Bequest motives (De Nardi, 2004; Lockwood, 2018)
- Hard to disentangle without additional data targets (Dynan et al., 2002; De Nardi et al., 2016)
  - In addition we match Medicaid (asset tested health insurance program) recipiency rates
  - Valuable for identifying precautionary motive

Previous work on couples

- Previous structural models of couples' saving
  - Braun et al. (2017); Nakajima and Telyukova (2013, 2015, 2017); Cassanova (2014); Borella et al. (2017)
  - But use simpler models of health and medical spending

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  - But use simpler models of health and medical spending
- Our contributions
  - Richer models of health and medical spending heterogeneity
  - Methodological innovation 1: permanent income measure that is invariant to household structure
  - Methodological innovation 2: enrich AHEAD medical spending data to include imputed Medicaid payments

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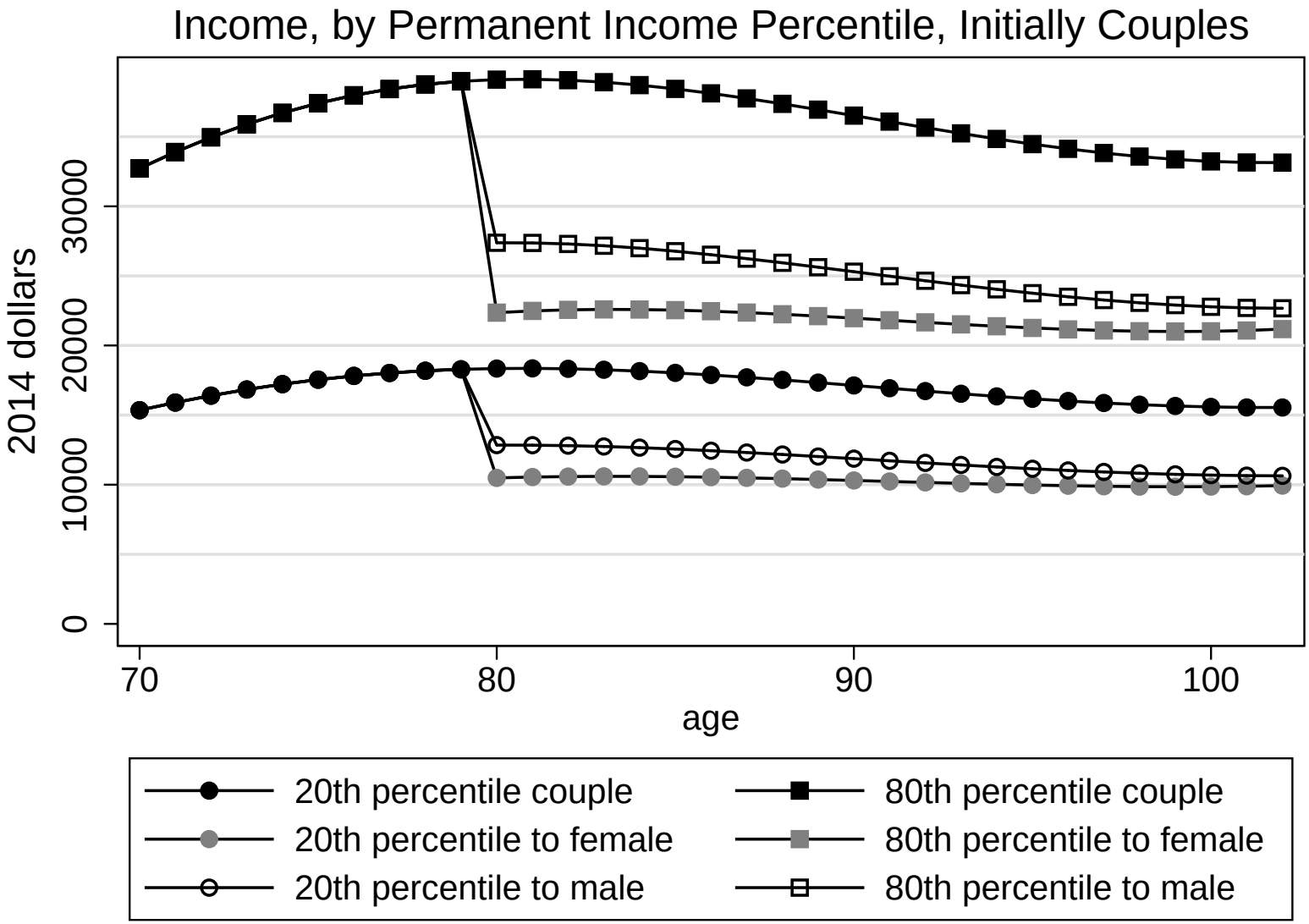
- Goal: construct time-invariant measure of permanent income (I_i) that does not change when a spouse dies
  - Problem: current income changes with age and household composition
- Solution: fixed effects regression

$$\ln y_{it} = \kappa(t, f_{it}) + \alpha_i + \omega_{it}$$

  - $f_{it} \in \{\text{single male, single female, couple}\}$ denotes family structure; α_i is a household-specific effect.
  - sort the $\widehat{\alpha}_i$'s
  - $\widehat{I}_i$ = percentile rank of $\widehat{\alpha}_i$

Income Drops by $\frac{1}{3}$ when a Spouse Dies



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Medical Spending

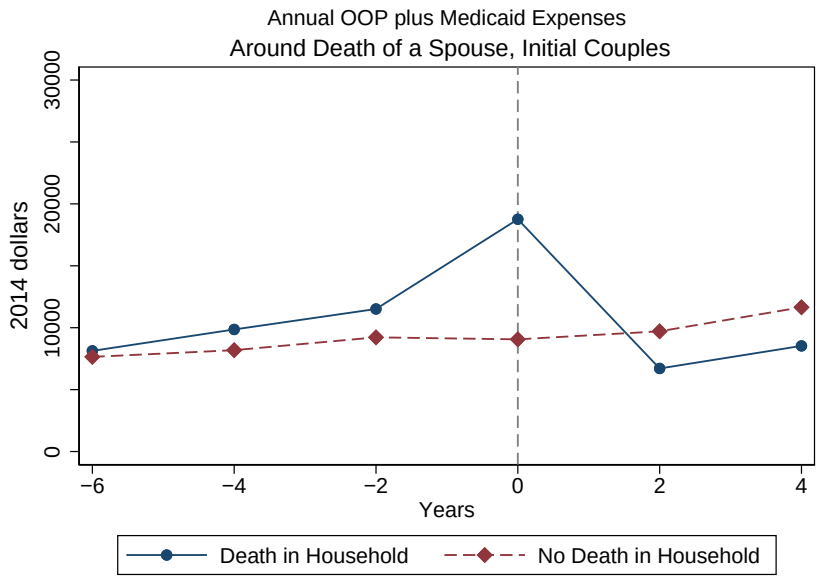
- Goal: model household medical spending risk
- Problem 1: measuring **lifetime** medical spending risk
  - Solution 1: exploit panel data – estimate dynamics of medical spending
- Problem 2: savings choices determine means-tested Medicaid transfers $\Rightarrow$ out-of-pocket spending is a choice
  - Solution 2: Use Medicare Current Beneficiary Survey (MCBS) to impute Medicaid transfers in HRS
    - Estimate Medicaid transfers as a function of state variables using Medicare Current Beneficiary Survey
    - Use conditional mean matching to impute Medicaid transfers in HRS
    - ▸ Additional Details

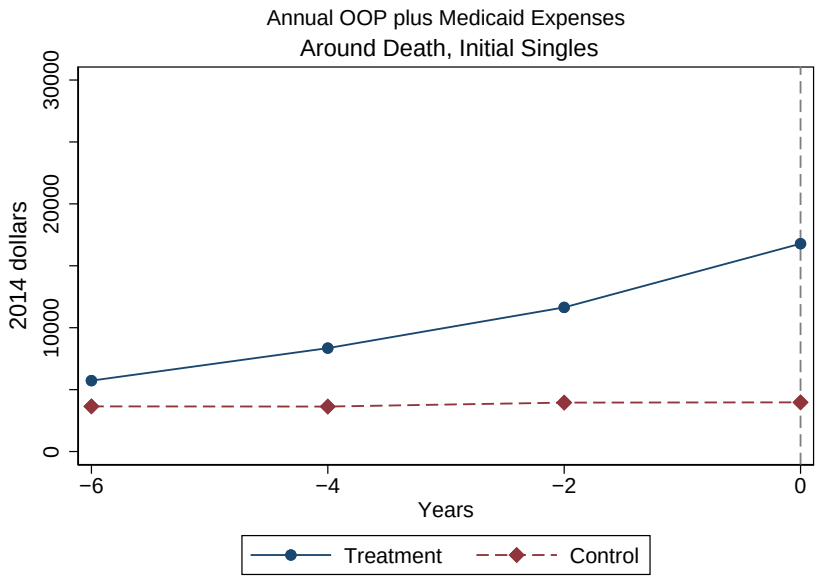
The Model: Medical Spending

- Let m_t denote medical expenses incurred between ages t and $t+2$.
  - In the HRS, m_t is reported at time $t+2$
- Medical spending depends on age, PI, health, family structure and idiosyncratic shocks:

$$
\begin{aligned}
\ln m_t &= m(I, t+2, hs_t^h, hs_t^w, hs_{t+2}^h, hs_{t+2}^w, f_t, f_{t+2}) \\
&\quad + \sigma(I, t+2, hs_t^h, hs_t^w, hs_{t+2}^h, hs_{t+2}^w, f_t, f_{t+2}) \times \psi_{t+2}, \\
\psi_t &= \zeta_t + \xi_t, \\
\zeta_t &= \text{AR(1) shock}, \\
\xi_t &= \text{white noise shock}.
\end{aligned}
$$

Medical Spending Jumps at the Death of a Spouse





Mean medical expenditures + death expenses (out-of-pocket + Medicaid)

▸ Decomposition

The Model: Preferences

- Flow utility for singles and couples:

$$u(c, hs) = (1 + \delta(hs)) \frac{(c)^{1-\nu}}{1-\nu},$$

$$u^c(c, hs^h, hs^w) = \left[1 + \delta(hs^h) + 1 + \delta(hs^w)\right] \frac{(c/\eta)^{1-\nu}}{1-\nu}$$

  - $hs \in \{\text{dead}, \text{nursing home}, \text{bad}, \text{good}\}$ denotes health
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- Warm glow utility from bequests (b) to non-spousal heirs

$$\theta_j(b) = \phi_j\frac{(b + k_j)^{(1-\nu)}}{1-\nu},$$

  - $j \in \{\text{one spouse dies}, \text{both spouses die}, \text{widow/er dies}\}$ denotes the type of bequest.
  - altruism toward widow/ers captured in continuation values

The Model: Health and Mortality

- $\pi_{jk} = \Pr\left(hs^g_{t+2} = k \,\middle|\, hs^g_t = j; t, f_t, l, g\right)$
  - Couple with age 70 man:
    - Man lives 11.5 years,
    - Woman lives 15.8 years,
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  - High PI people live longer than low PI people
    - 90th percentile: live 2 1/2 years longer than 10th percentile, conditional on age 70 health, marital status, and gender
  - Married people live longer
    - Much of this is explained by health status, income
  - Over $\frac{1}{3}$ of women, $\frac{1}{5}$ of men have long nursing home stay

The Model: Budget Constraints

- Assets (a_t) and cash-on-hand (x_t) follow

$$\begin{aligned} x_t &= a_t + \Upsilon(r\, a_t + y_t(\cdot), \tau) + tr_t(\cdot), \\ a_{t+2} &= x_t - b_t - c_t - m_t, \\ c_t + b_t &\leq x_t, \\ x_{t+2} &= a_{t+2} + \Upsilon\left(r\, a_{t+2} + y_{t+2}(\cdot), \tau\right) + tr_{t+2}(\cdot). \end{aligned}$$

  - $\Upsilon(\cdot, \tau)$ converts pre-tax to post-tax income
  - $tr_t(x_t - tr_t, f_t)$ denotes means-tested transfers (consumption floor)

$$tr_{t+2}(\cdot) = \max\left\{0, c_{min}(f_{t+2}) - a_{t+2} + \Upsilon\left(r\, a_{t+2} + y_{t+2}(\cdot), \tau\right)\right\},$$

  - b_t are "side bequests", available only to **new** widow/ers

Model: Recursive Formulation for Couples

$$
\begin{aligned}
V_t^c(x_t, hs_t^h, hs_t^w, I, \zeta_t) = \max_{c_t} \Big\{ & u^c(c_t, hs_t^h, hs_t^w) \\
& + \beta s^w(\cdot) s^h(\cdot) E_t\big(V_{t+2}^c(x_{t+2}, hs_{t+2}^h, hs_{t+2}^w, I, \zeta_{t+2})\big) \\
& + \beta s^w(\cdot)\big(1 - s^h(\cdot)\big)\omega E_t\big(V_{t+2}^{new,w}(x_{t+2}^w, hs_{t+2}^w, I, \zeta_{t+2})\big) \\
& + \beta\big(1 - s^w(\cdot)\big) s^h(\cdot)\omega E_t\big(V_{t+2}^{new,h}(x_{t+2}^h, hs_{t+2}^h, I, \zeta_{t+2})\big) \\
& + \beta\big(1 - s^w(\cdot)\big)\big(1 - s^h(\cdot)\big)\theta_2(x_t - c_t - m_t) \Big\},
\end{aligned}
$$

$s.t.$ the constraints given above.

- $s^h(\cdot)$ and $s^w(\cdot)$ are survival rates for men and women
- ω determines degree of altruism

Two-step Estimation Strategy

- First step: estimate parameters of income, health, mortality, and medical expense processes.
- Second step: taking as given the first-step parameters, choose preference parameters and consumption floors to match
  - Median assets, by PI quintile, cohort and age, for singles and for couples
  - Medicaid recipiency rates, by PI quintile, cohort and age

  using the method of simulated moments (MSM).

Estimation Issues

- Correct for cohort-effects by:
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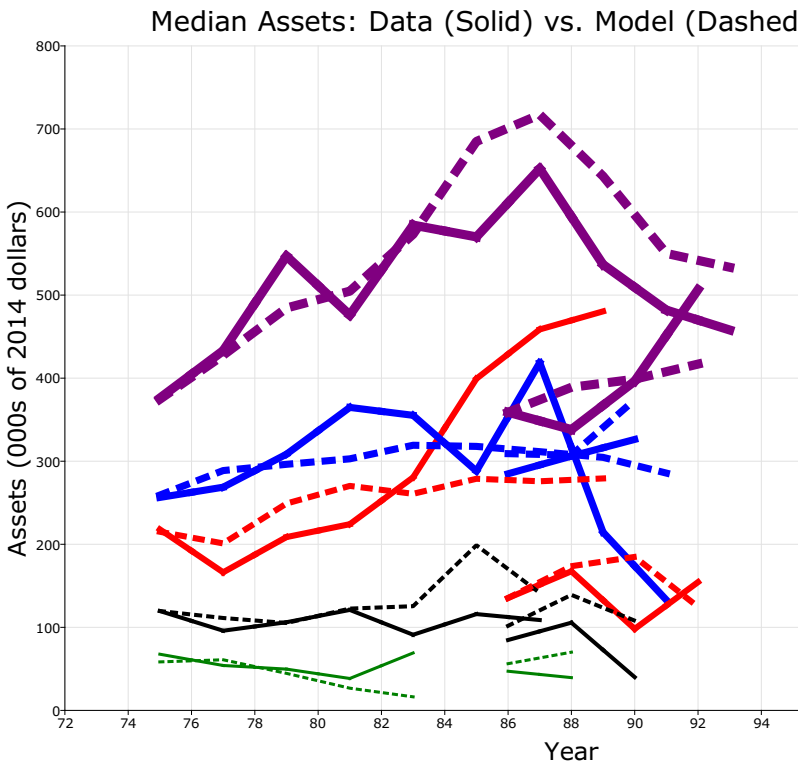
- Correct for cohort-effects by:
  - using cohort-specific moments and initial conditions
- Correct for mortality bias (rich people live longer) by:
  - allow mortality rates to depend on permanent income, marital status, and gender
  - simulate observed paths for demographic transitions and mortality (simulated individuals die off at exactly the same age as individuals in the data)

Preliminary Results

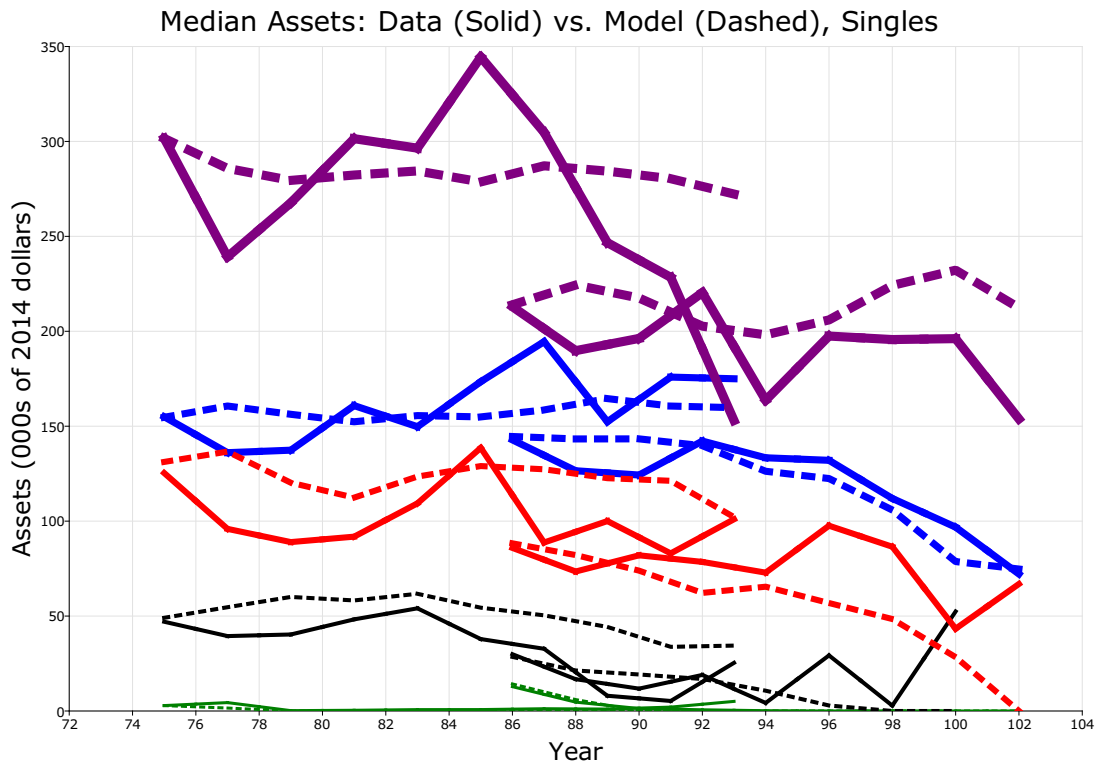
- A specification that fits well
  - estimate: $\nu = 2.54$, consumption floor $= \$1,670$ per year (for singles)
  - estimate: bequest motives of moderate strength, kicking in at low levels of wealth

Assets: Model vs Data

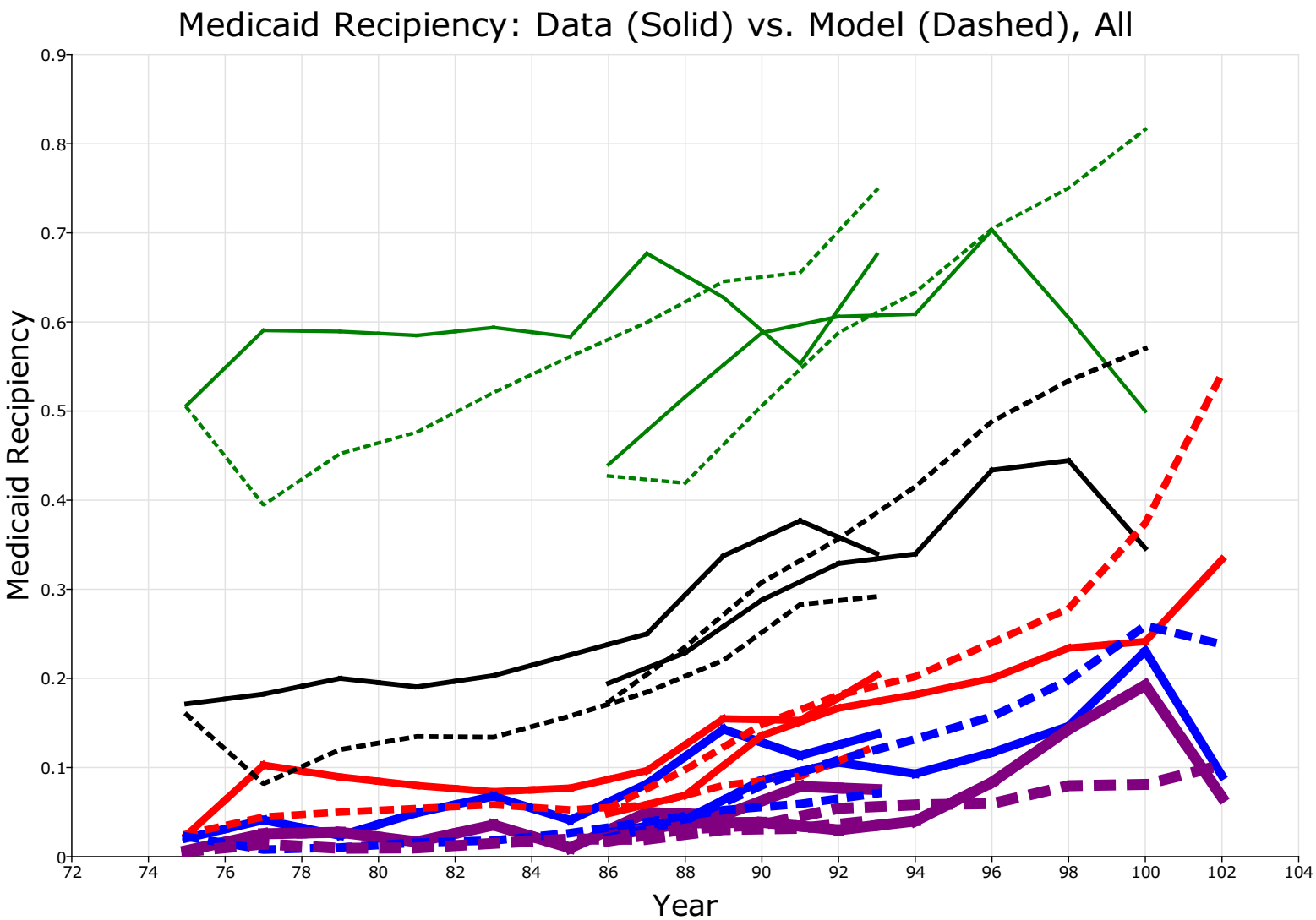
couples



singles

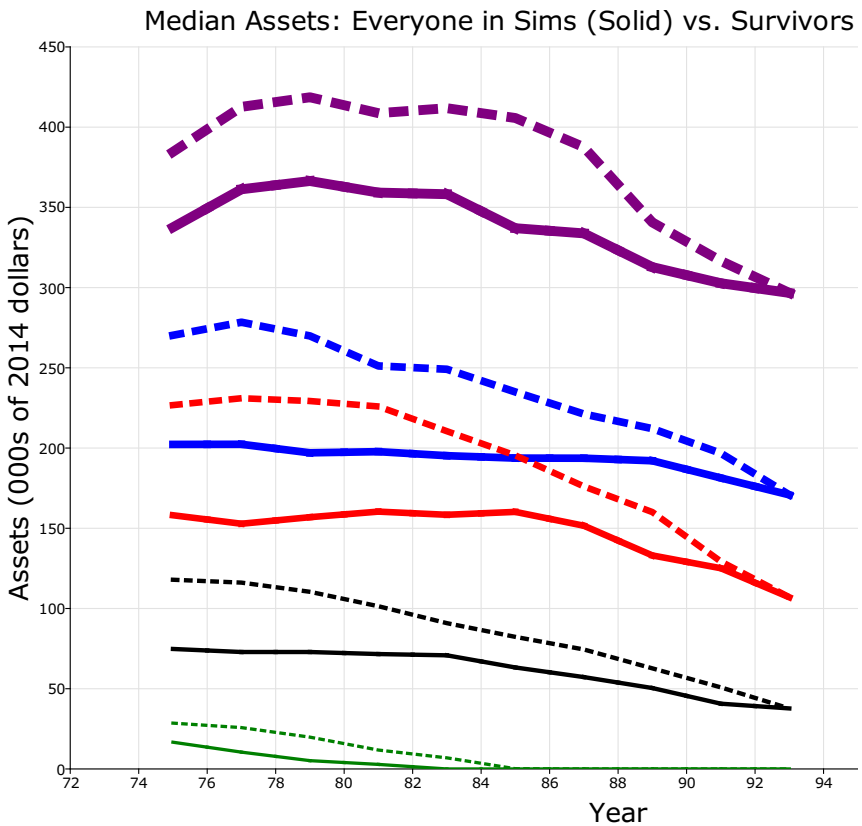


Medicaid Recipiency: Model vs Data

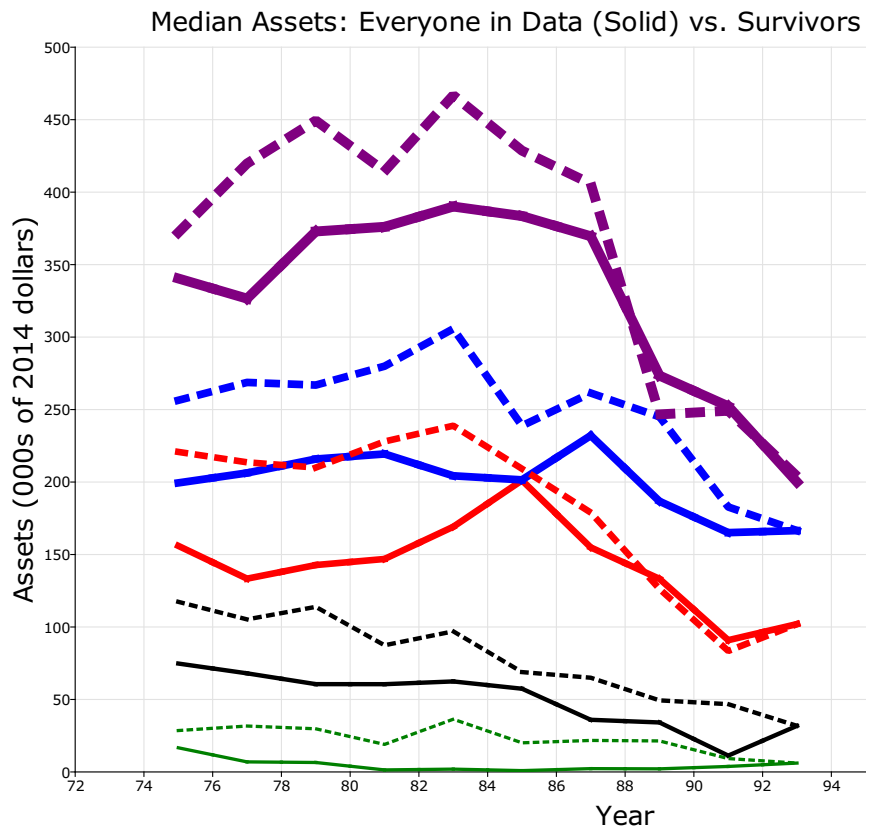


Mortality Bias: Model vs. Data

model



data



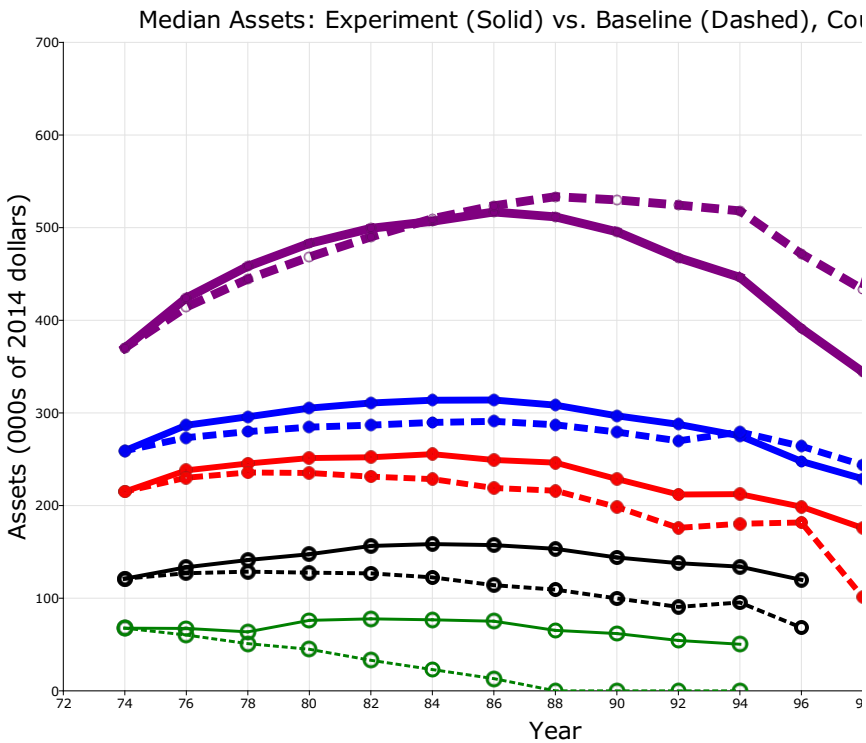
- Replicate demographic transitions & observed attrition patterns

Preliminary Results

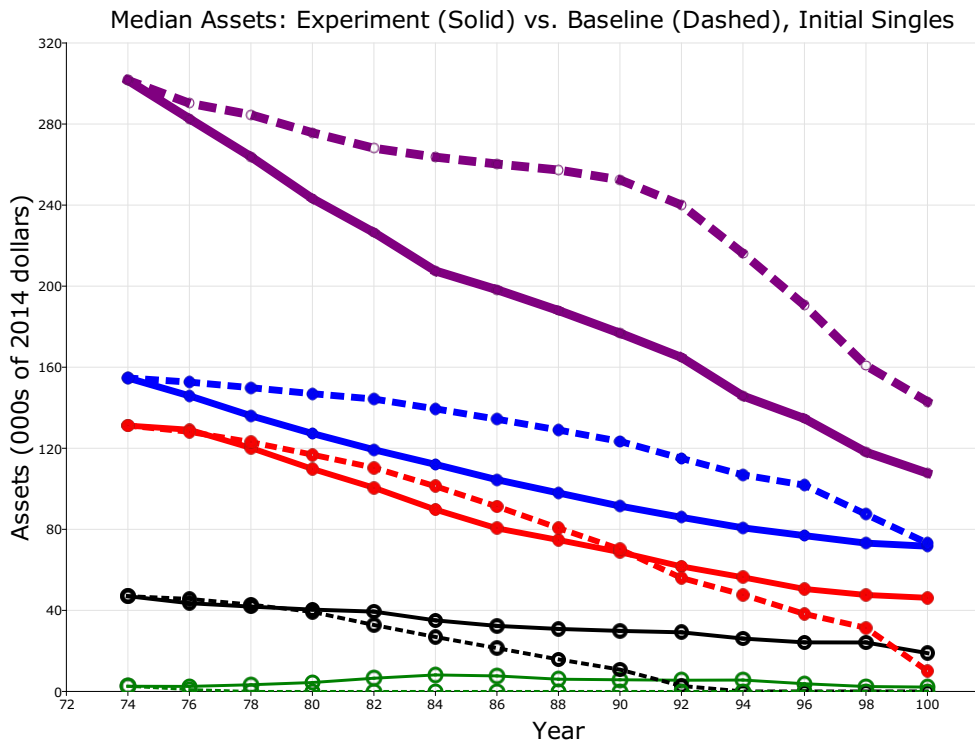
- Experiments: we re-solve and re-simulate the model
  1. Set medical spending to zero
  2. No medical spending or bequest motives
- Holding age-74 distribution of state variables, utility function parameters, fixed

Experiment 1: No Medical Spending

couples

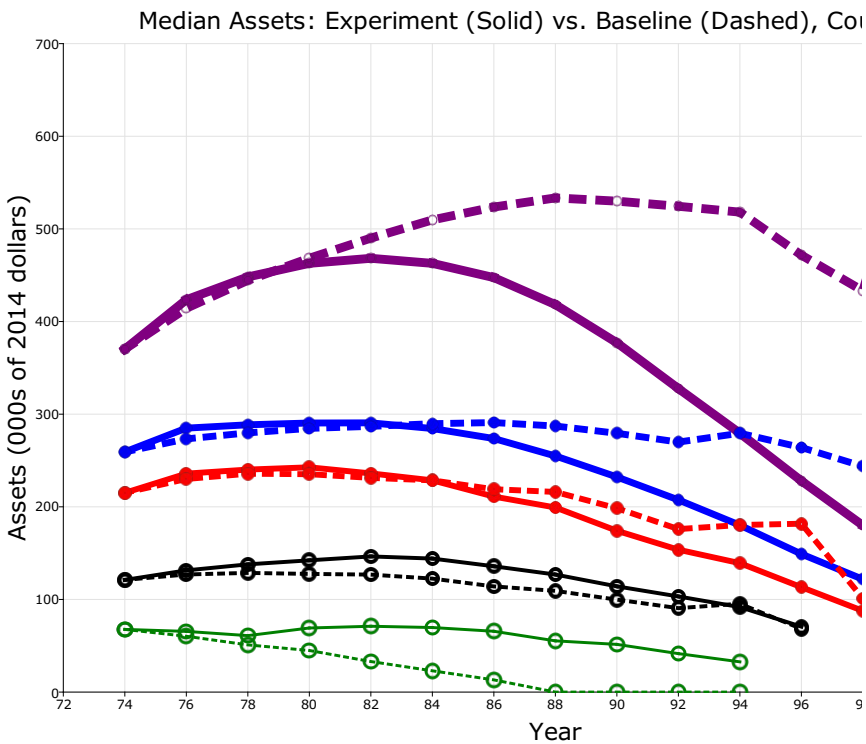


initial singles



Experiment 2: No Medical Spending and No Bequest Motives

couples



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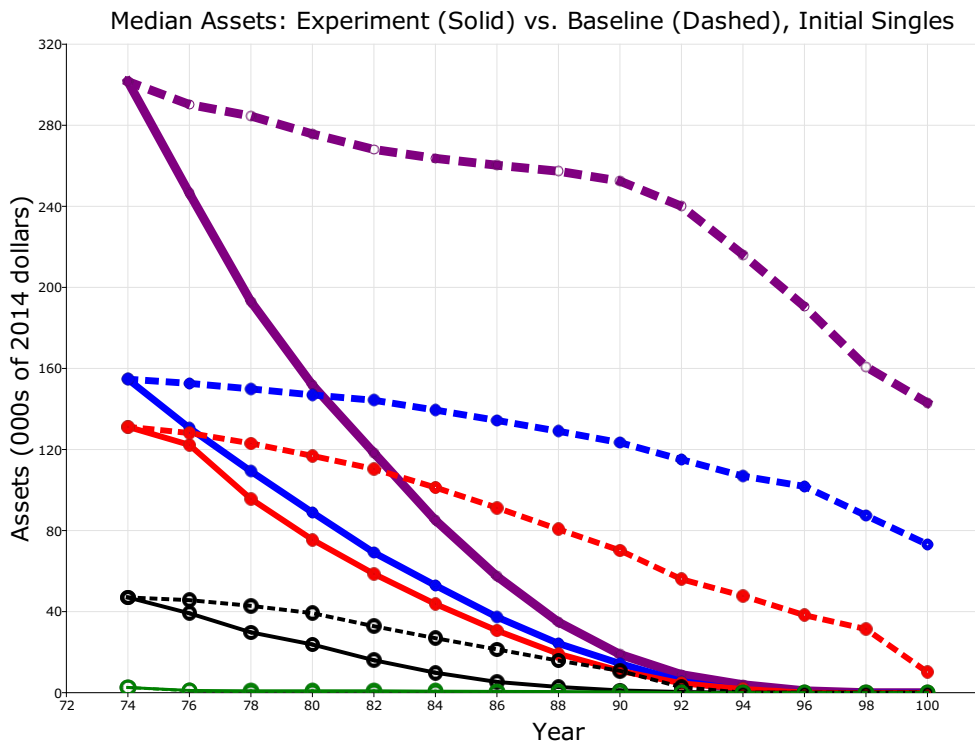


Key Findings

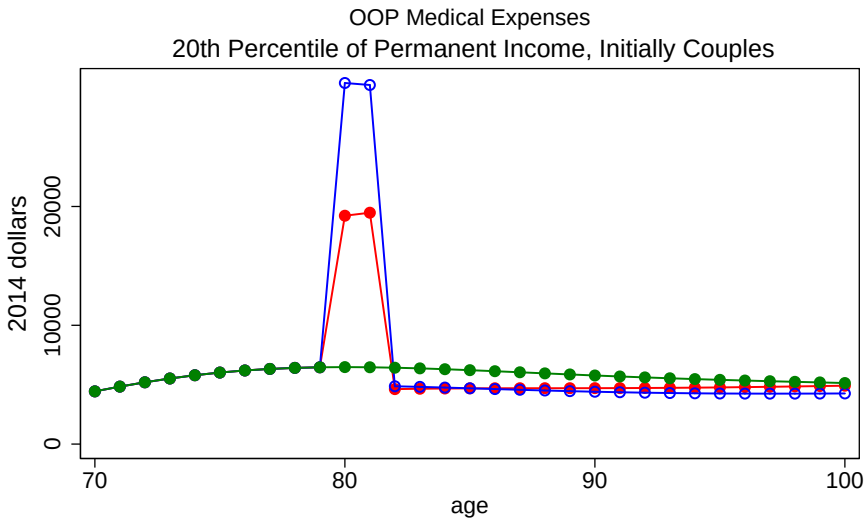
- The asset data show that
  - Relative to singles, intact couples are more likely to accumulate assets at older ages
  - Wealth drops significantly at the death of a spouse
  - Wealth at the death of the final spouse is low
- Our model attributes these dynamics to
  - Medical expenses, including end-of-life and burial expenses
  - Concern about the surviving spouse
  - Transfers to other heirs

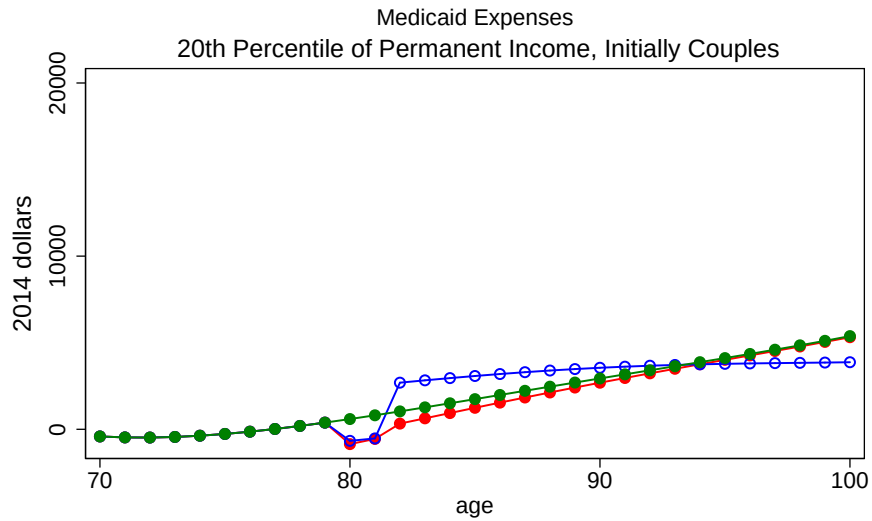
Imputing Medicaid Payments

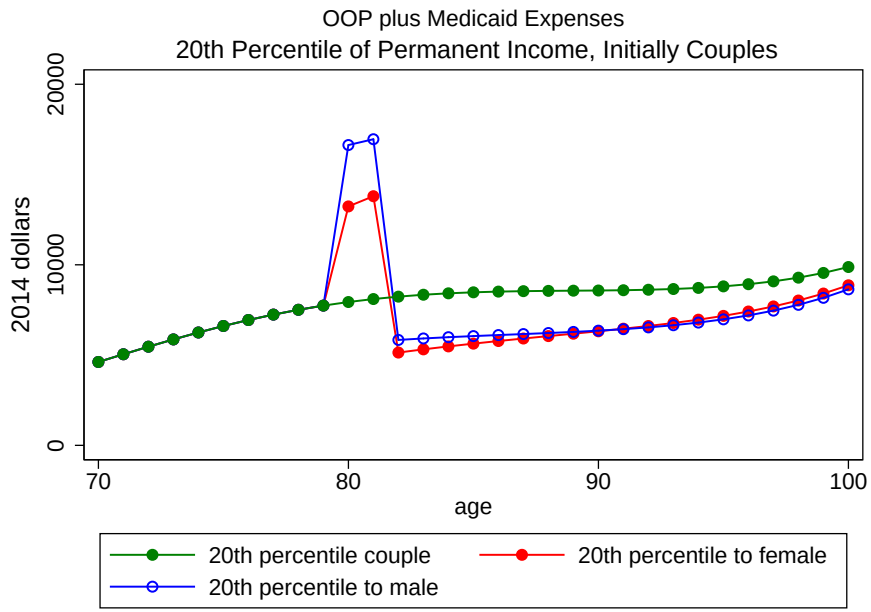
- Use Medicare Current Beneficiary Survey (MCBS) to impute Medicaid transfers
- A Conditional Mean Matching Approach
  - In MCBS, regress Medicaid against income, age, health status, Dr visits etc.
  - Apply regression coefficients to AHEAD data to find predicted Medicaid spending
  - Randomly assign to each HRS observation the residual from an MCBS observation with similar predicted Medicaid spending
  - Combine predicted Medicaid spending and residual, add to HRS out-of-pocket spending

◂ Back

Decomposing Medical Spending







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