Why Do Couples and Singles Save during Retirement? Household Differences and their Aggregate Implications

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The opinions and conclusions are solely those of the authors, and do not necessarily reflect the views of the Federal Reserve Bank of Minneapolis, the Federal Reserve Bank of Richmond, or the Federal Reserve System.

Motivating Questions

- What drives the retirement saving of
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- Couples provide a distinct source of identification.

Previous Work on Couples and Our Contributions

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  - Data on bequests at death of first spouse
  - Measure and model risks, heterogeneity and social insurance well

Facts

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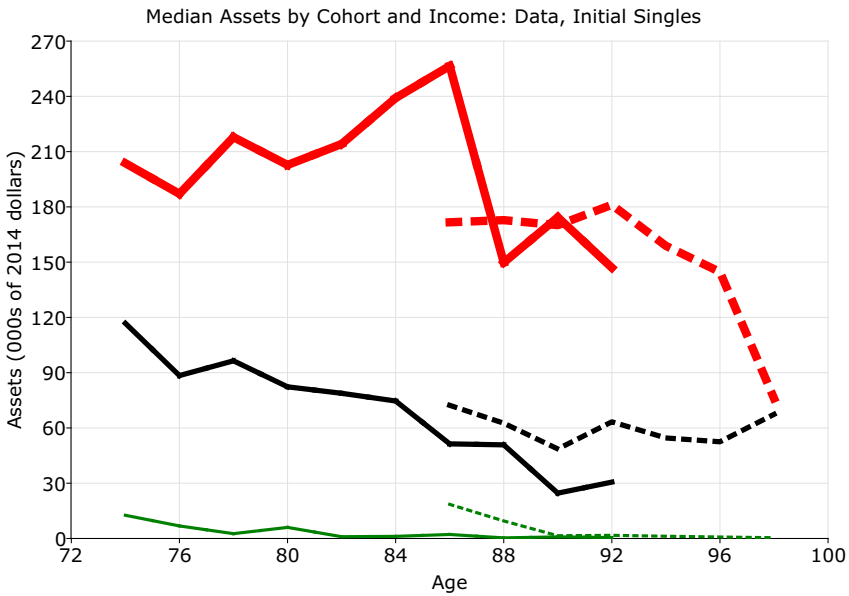
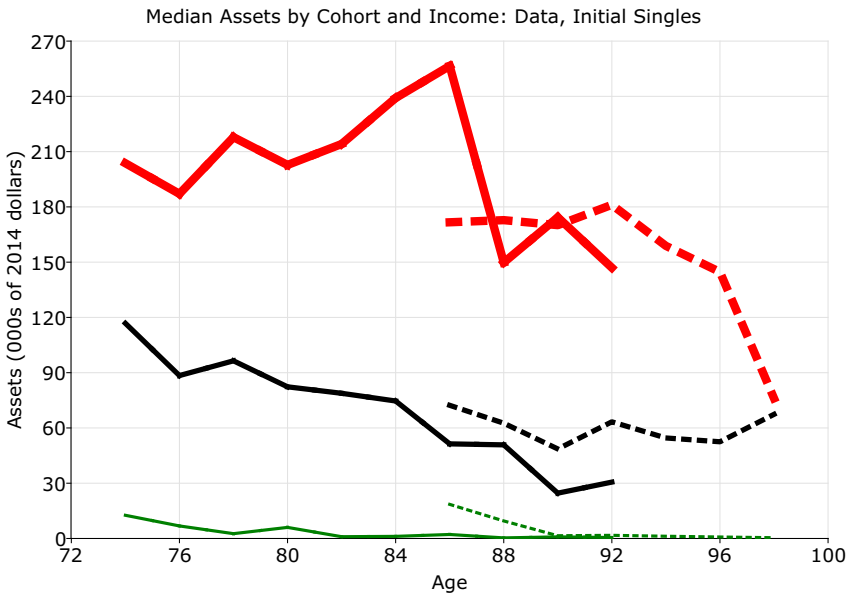
- Consider only the retired: 4,634 households. Of those, 1,388 are (initially) couples and 3,246 are singles
- Use exit interviews
  - Estates
  - End-of-life expenses
  - Wealth transfers to spouse+other heirs

Household Wealth



(a) Initial Singles

Household Wealth



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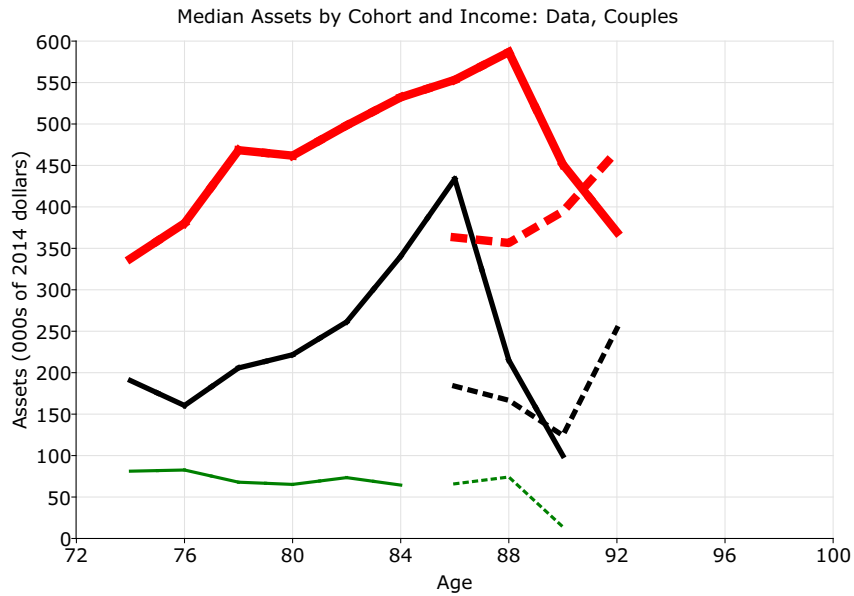

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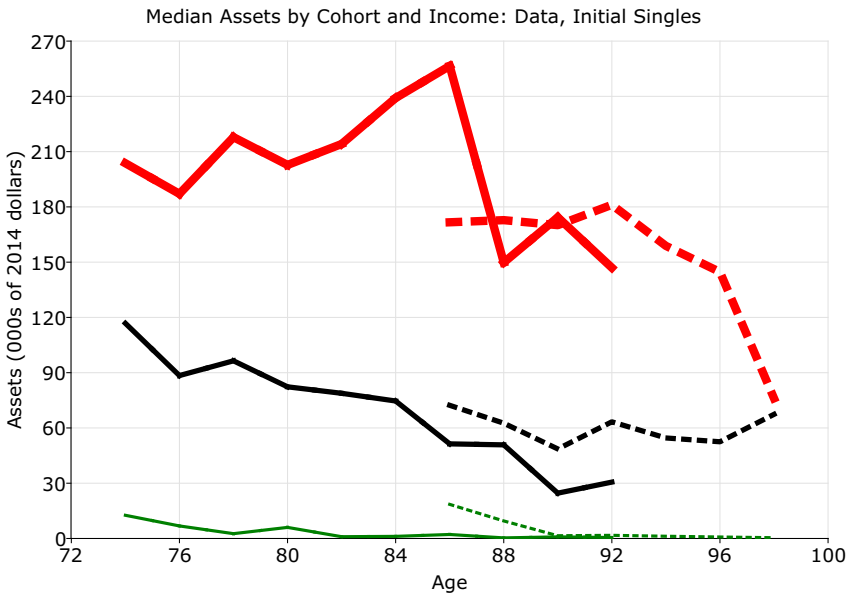

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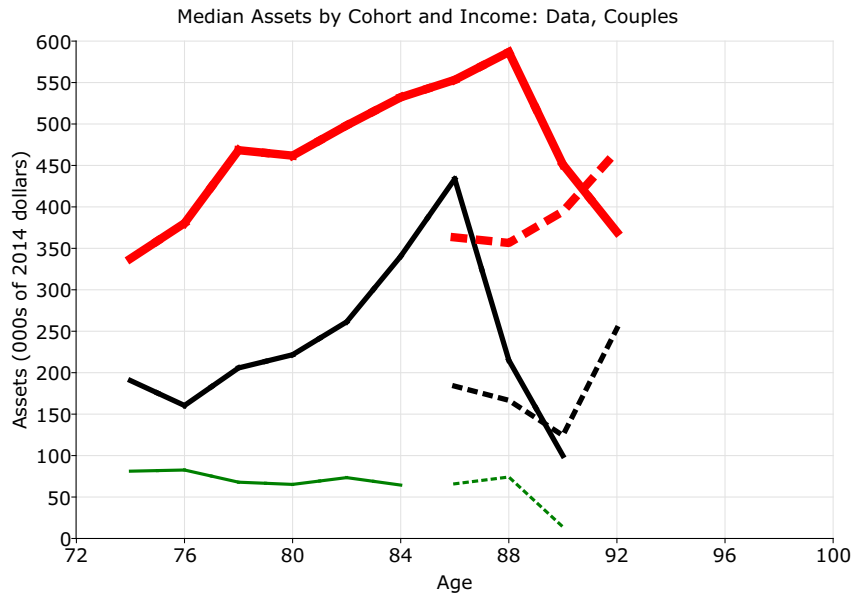
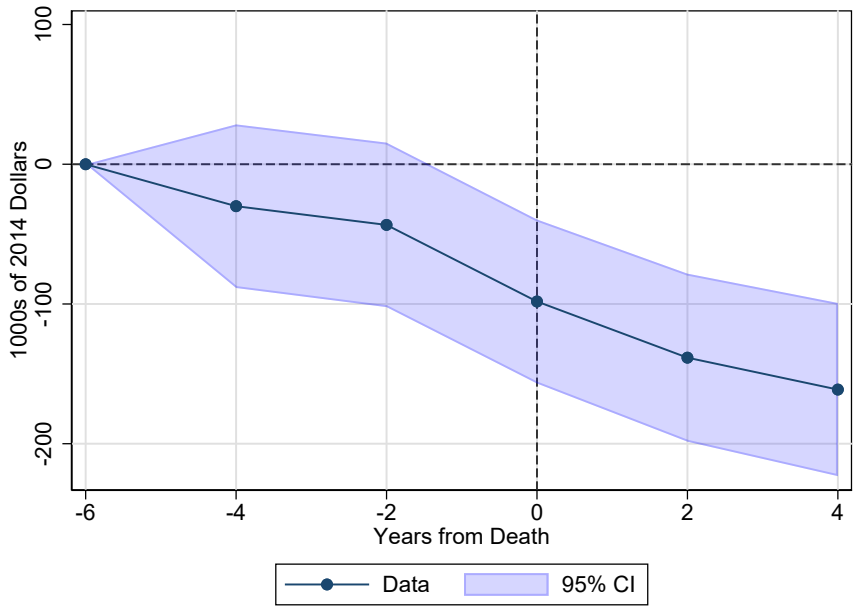


(b) Current Couples

- Singles (especially low income singles) decumulate wealth
- Couples accumulate wealth

Event Study: Wealth and Medical Expenses Couple-to-Single Transitions



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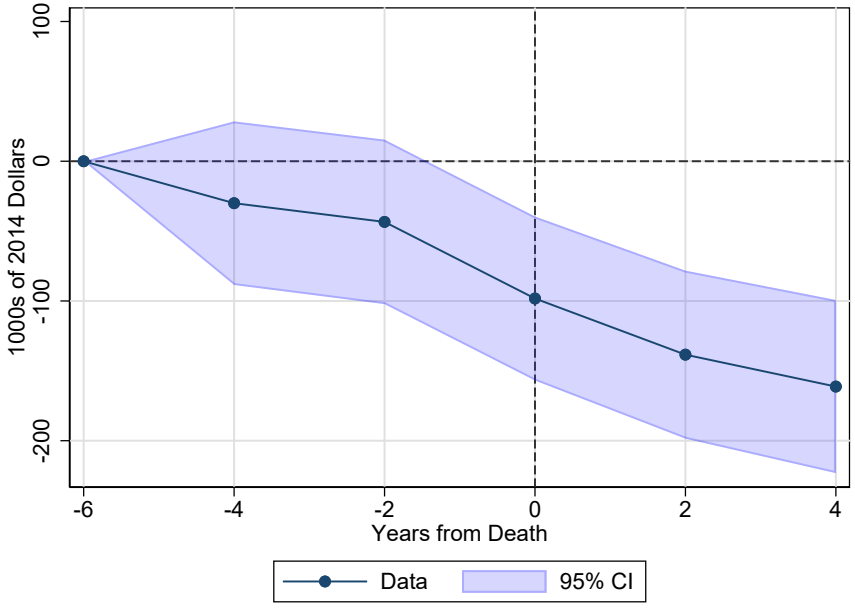

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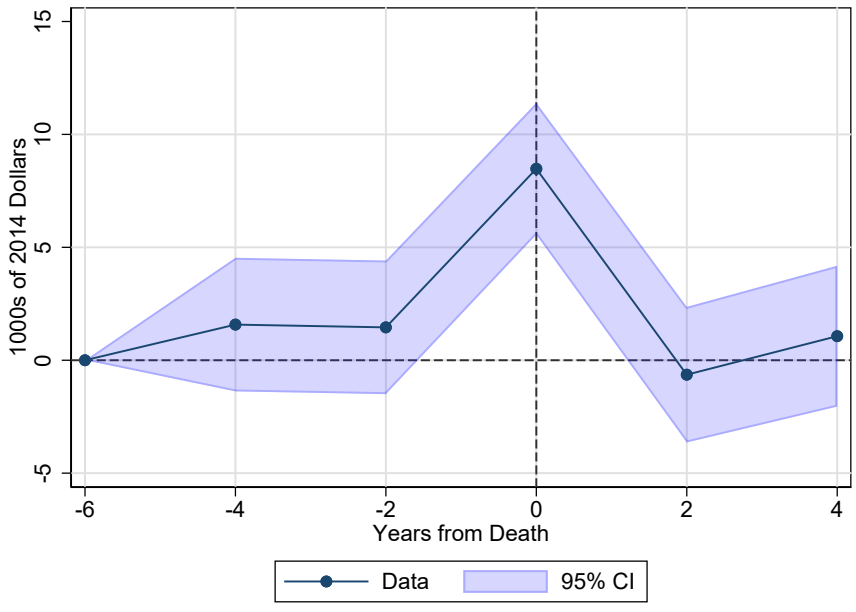

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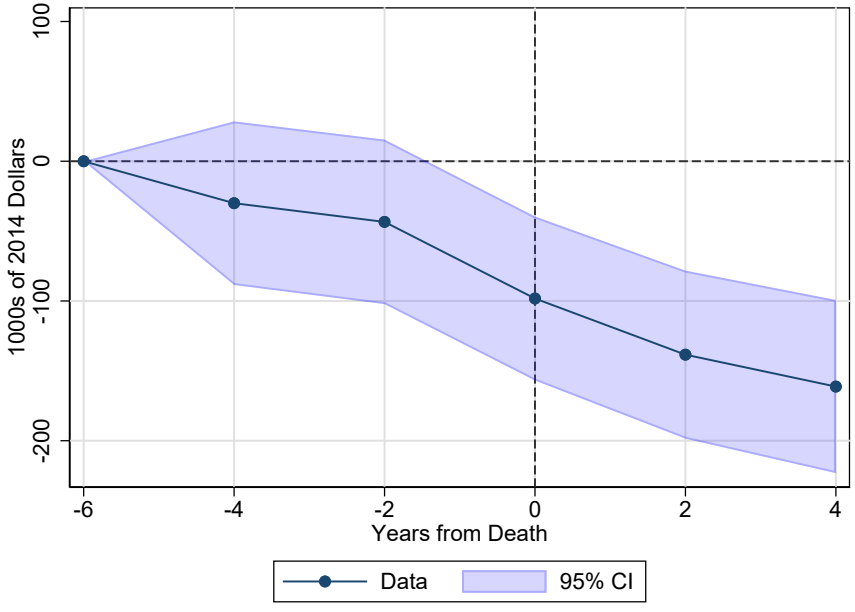

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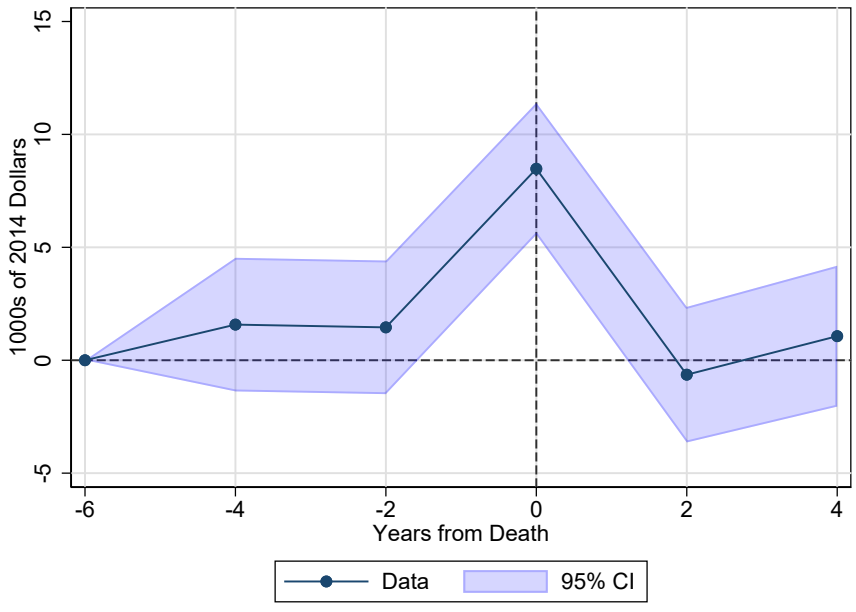

(b) OOP medical spending

- Household wealth drops $160,000 around first spousal death
- Medical spending jumps $27,000
- Transfers to non-spousal heirs average $79,000

Couple-to-Single Transitions: Non-spousal Bequests

	Share of Sample	Fraction Positive	Values when Positive: Mean ($000s)	Values when Positive: Share of Bequests
Permanent Income Tercile				
Bottom PI Tercile	18.8%	26.6%	165.5	53.1%
Middle PI Tercile	35.5%	32.7%	211.5	45.5%
Top PI Tercile	45.8%	29.3%	301.6	37.6%
Number of Children				
No Children	6.4%	38.0%	402.9	43.6%
Children	93.3%	30.0%	236.7	42.8%
2+ Children	77.2%	29.8%	231.1	43.2%
Homeownership Status				
Not a Homeowner	22.4%	24.4%	257.9	58.1%
Homeowner	77.6%	32.4%	246.2	39.6%

Note: Calculated from AHEAD data and exit interviews. When calculating conditional means we winsorize values above the 99th percentile of the overall sample. We define homeownership status prior to the death of the spouse.

Model

Model Overview

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- Health and longevity: Rich, married, healthy live longer
- Permanent Income

Preferences

- Utility for singles and couples:

$$
\begin{aligned}
u^S(c) &= \frac{(c)^{1-\nu}}{1-\nu}, \\
u^C(c) &= 2\frac{(c/\eta)^{1-\nu}}{1-\nu}.
\end{aligned}
$$

$\eta =$ equivalence scale.

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  $\eta =$ equivalence scale.

- Warm glow from bequests (b) to non-spousal heirs

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

$$j = \begin{cases} 1, & \text{if first spouse dies} \\ 0, & \text{if there are no survivors.} \end{cases}$$

Uncertainty

- Health (and survival) $\in \{$good, bad, nursing home, dead$\}$: age, gender, marital status, and PI-specific Markov chain
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  - Mean & variance functions of: age, PI, family structure & health
  - Includes beginning and end of period family structure & health
    $\Rightarrow$ Captures end-of-life medical spending

Value Function for Singles

$$V_t^g(x_t, h_t, I, \zeta_t) = \max_{c_t, x_{t+1}} \Big\{ u^S(c_t) + \beta s_t^g(h_t, I) \times E_t\Big(V_{t+1}^g(x_{t+1}, h_{t+1}, I, \zeta_{t+1}) \Big) + \beta[1 - s_t^g(h_t, I)] E_t \theta_0(x_{t+1}) \Big\},$$

- **state vector**: $g =$ gender, $x_t =$ cash on hand, $h_t =$ health status, $I =$ permanent income, $\zeta_t =$ persistent medical spending shock
- $s_t^g(h_t, I) =$ survival probability
- $\theta_0(x_{t+1}) =$ bequest motive

Budget Constraints

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

$$\begin{aligned} x_t &= a_t + \Upsilon(r\, a_t + y_t(\cdot), \tau) + t_t(\cdot), \\ a_{t+1} &= x_t - c_t - m_t, \\ c_{min}(f_t) &\leq c_t \leq x_t. \end{aligned}$$

- $\Upsilon(\cdot, \tau)$ converts pre-tax to post-tax income
- $t_t(\cdot)$: means-tested transfers implementing a minimum consumption floor

Value Functions for Couples and New Widow(ers)

- Couples:

$$
\begin{aligned}
V_t^c(x_t, h_t^h, h_t^w, I, \zeta_t) = \max_{c_t, x_{t+1}} \Big\{ & u^c(c_t, h_t^h, h_t^w) \\
& + \beta s_t^w(h_t, I) s_t^h(h_t, I) E_t\big(V_{t+1}^c(x_{t+1}, h_{t+1}^h, h_{t+1}^w, I, \zeta_{t+1})\big) \\
& + \beta s_t^w(h_t, I)\big(1 - s_t^h(h_t, I)\big) E_t\big(V_{t+1}^{nw}(x_{t+1}^w, h_{t+1}^w, I, \zeta_{t+1})\big) \\
& + \beta\big(1 - s_t^w(h_t, I)\big) s_t^h(h_t, I) E_t\big(V_{t+1}^{nh}(x_{t+1}^h, h_{t+1}^h, I, \zeta_{t+1})\big) \\
& + \beta\big(1 - s_t^w(h_t, I)\big)\big(1 - s_t^h(h_t, I)\big)\theta_0(x_t - c_t - m_t) \Big\},
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\end{aligned}
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- New Widow(er)s:

$$
V_t^{ng}(x_t, h_t, I, \zeta_t) = \max_{b_t \le x_t - c_{min}} \Big\{ V_t^g(x_t - b_t, h_t, I, \zeta_t) + \theta_1(b_t) \Big\},
$$

Estimation

Two-step Estimation Strategy

- First step: estimate parameters of the processes for income, health, mortality, and medical expenses
- Second step: choose preference parameters and consumption floor using the method of simulated moments (MSM) to match
  - The 25th percentile, median, and 75th percentile of wealth by PI tercile, cohort and age, for singles and couples
  - Medicaid recipiency rates, by PI tercile, cohort and age

First-Stage Estimates

Permanent Income

- Need measure that is invariant to spousal death
- Fixed effects regression

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

  - y_{it} = annuitized income for household i at age t
  - $f_{it} \in \{\text{single male, single female, couple}\}$
  - α_i: household fixed effect
  - Sort $\widehat{\alpha}_i$'s
  - Permanent income (PI) = percentile rank of $\widehat{\alpha}_i$

Life Expectancy as of Age 70

Income Percentile	Men: Nursing Home	Men: Bad Health	Men: Good Health	Women: Nursing Home	Women: Bad Health	Women: Good Health	All
Singles							
10	**3.0**	6.9	8.7	4.1	11.3	13.2	10.2
50	3.0	7.8	10.3	4.1	12.3	14.9	11.5
90	2.9	8.1	10.9	3.8	12.5	15.4	12.0
Couples							
10	2.7	7.8	9.8	4.0	12.1	14.1	11.3
50	2.8	9.4	12.2	4.0	13.7	16.3	13.4
90	2.7	10.4	13.5	3.9	14.6	**17.3**	14.5
Single Men							9.0
Married Men							11.5
Single Women							13.9
Married Women							15.8
Oldest Survivor							**17.9**
Probability that Oldest Survivor is Woman							63.7%

Second-Stage Estimates

Parameter Estimates

$$u^S(c) = \frac{(c)^{1-\nu}}{1-\nu},$$
$$u^C(c) = 2\frac{(c/\eta)^{1-\nu}}{1-\nu}$$

ν: coefficient of RRA	3.70
	(0.09)
η: consumption equivalence scale	1.51
	(0.20)
$c_{min}(f=1)$: annual consumption floor, singles	4,110
	(114)

Fix: $\beta = 0.97$; $c_{min}(f=2) = 1.5 \cdot c_{min}(f=1)$.

Estimated Bequest Motives

Estimate the bequest function

$$\phi_j \frac{(b + \kappa_j)^{(1-\nu)}}{1 - \nu},$$

operative when first ($j = 1$) and final ($j = 0$) spouse dies.

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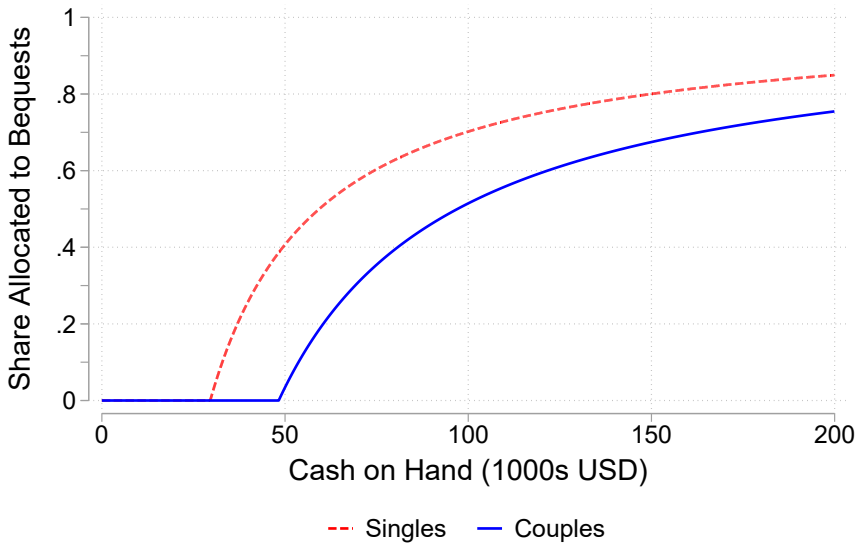

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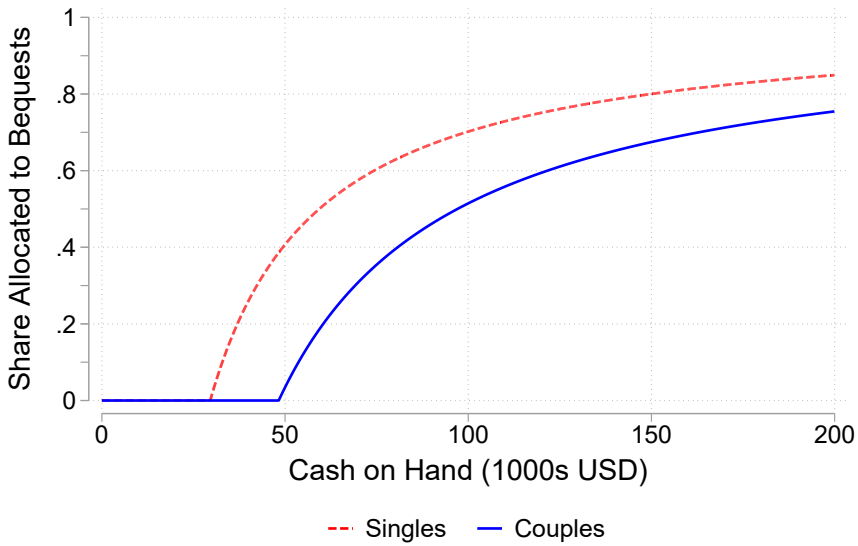

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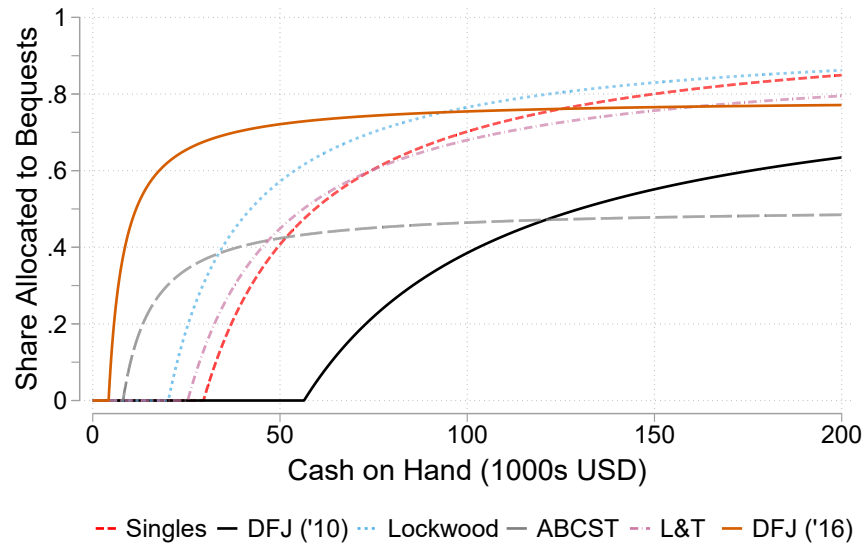
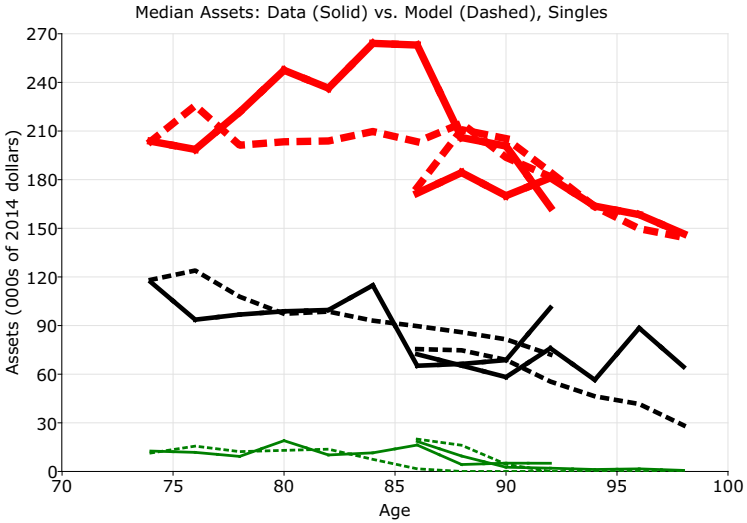


Literature

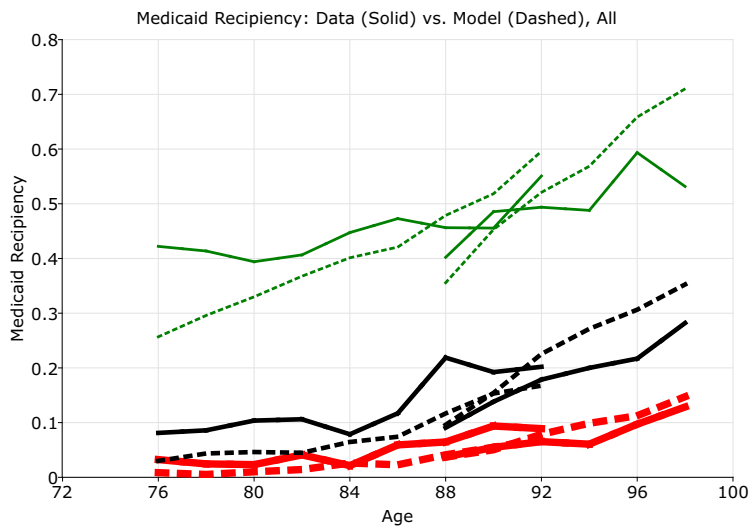
Model Fit and Validation

Model Fit: Wealth and Medicaid



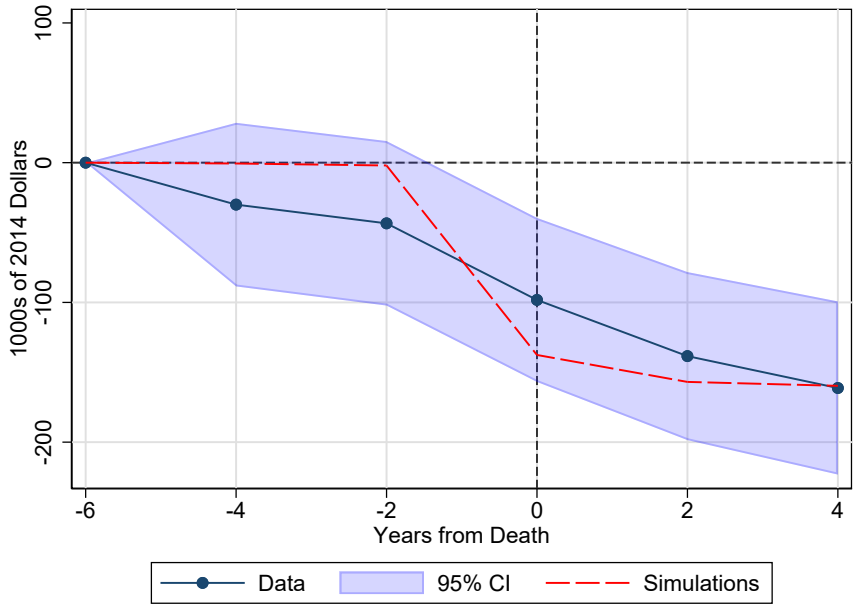
(a) Wealth Singles

(b) Wealth Couples



(c) Medicaid

Validation: Wealth and OOP Around Death



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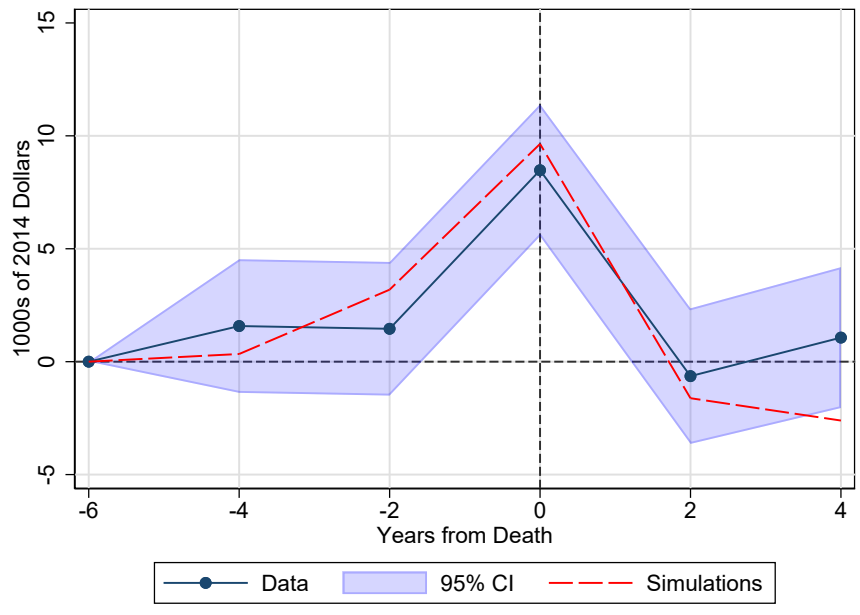


(b) OOP Medical Spending

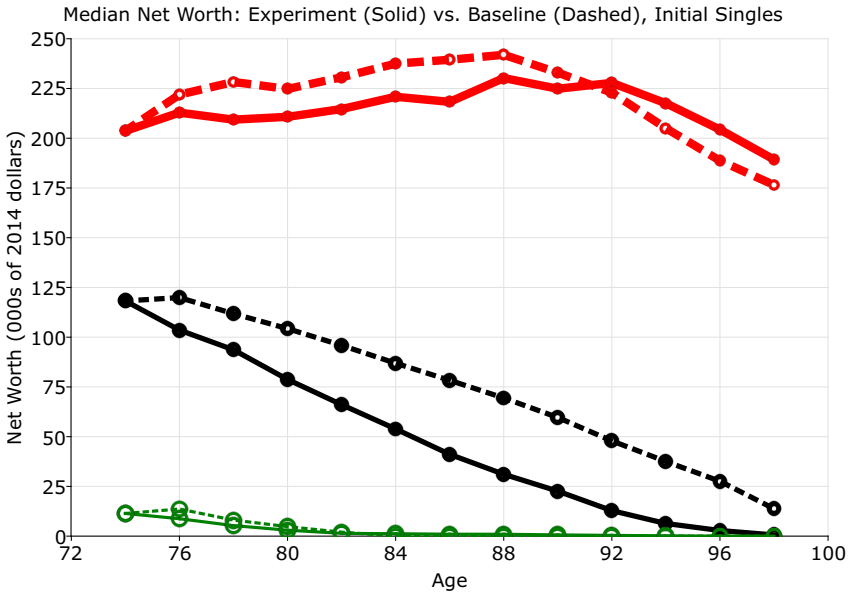
Model fits wealth drops and medical spending around death

Why Do Retirees Save?

Understanding Saving Motives

- Experiments: re-solve and re-simulate model
  1. Set medical spending to zero
  2. Eliminate bequest motives
  3. No medical spending and no bequest motives
  4. No weight on surviving spouse
- Fix age-74 distribution of state variables and utility parameters

What is the Role of Medical Expenses?



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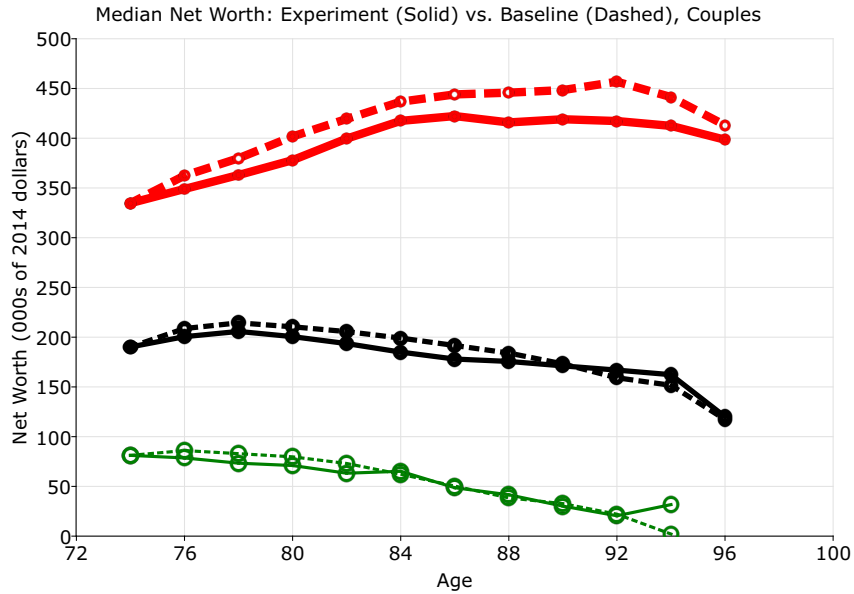
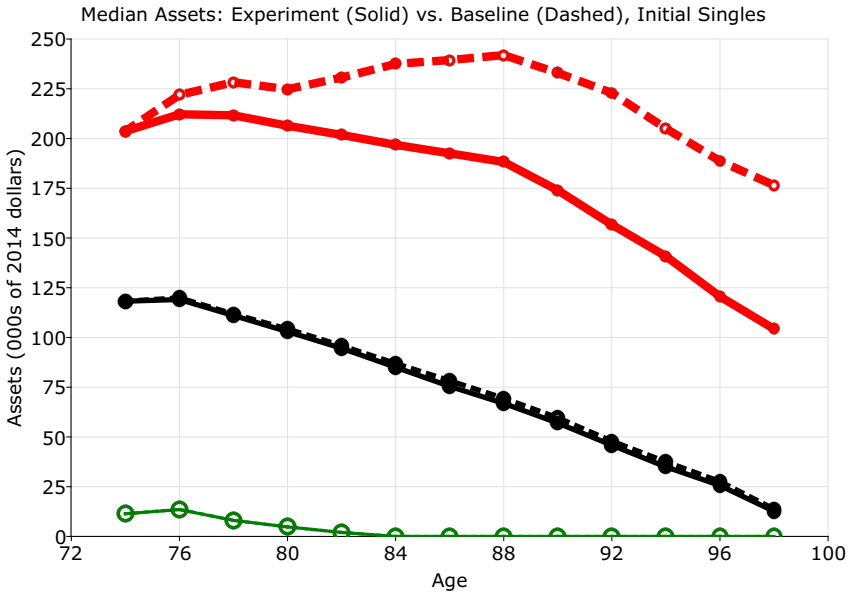


(b) Couples

- Singles: Medical expenses important
- Couples: Small effects on savings

What is the Role of Bequest Motives?



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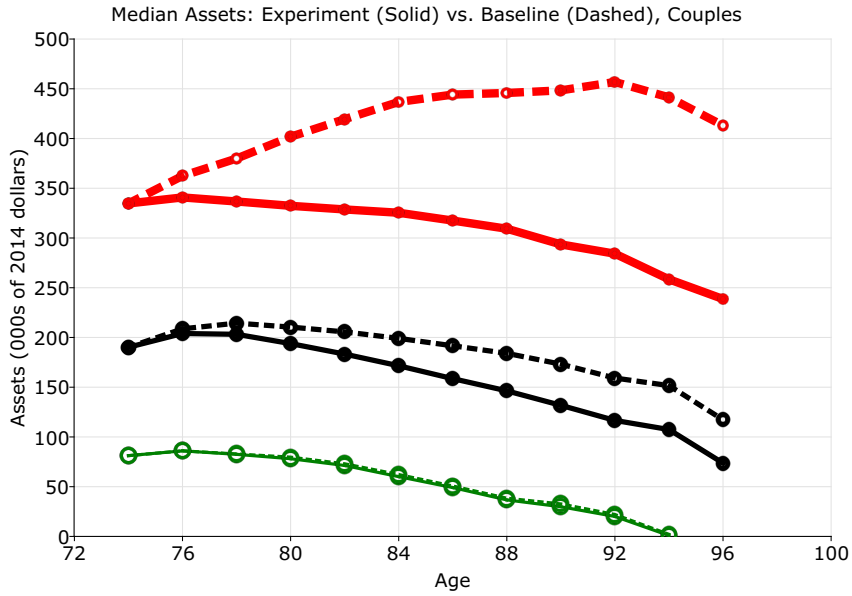
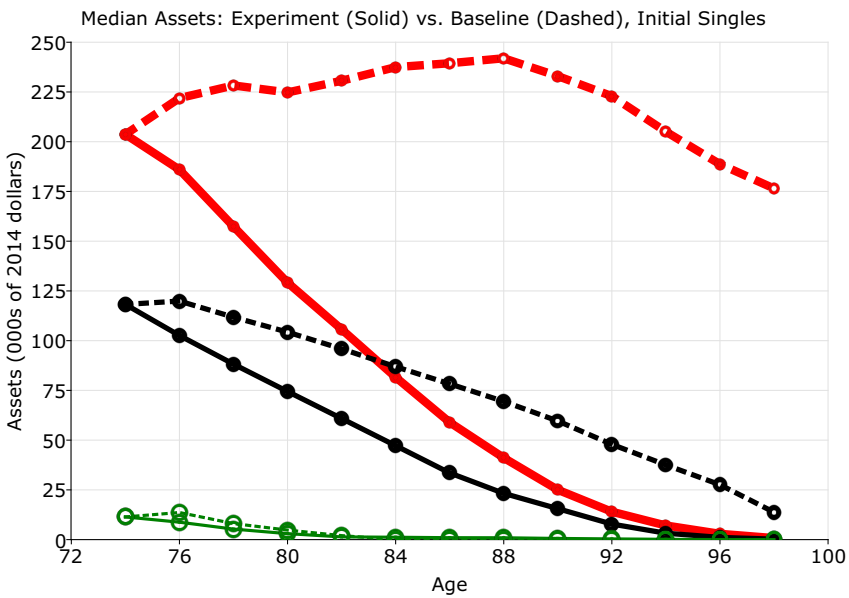


(b) Couples

- Singles: bequest motives more important for high income
- Couples: important for middle income as well

How does Medical Spending Interact with Bequest Motives?



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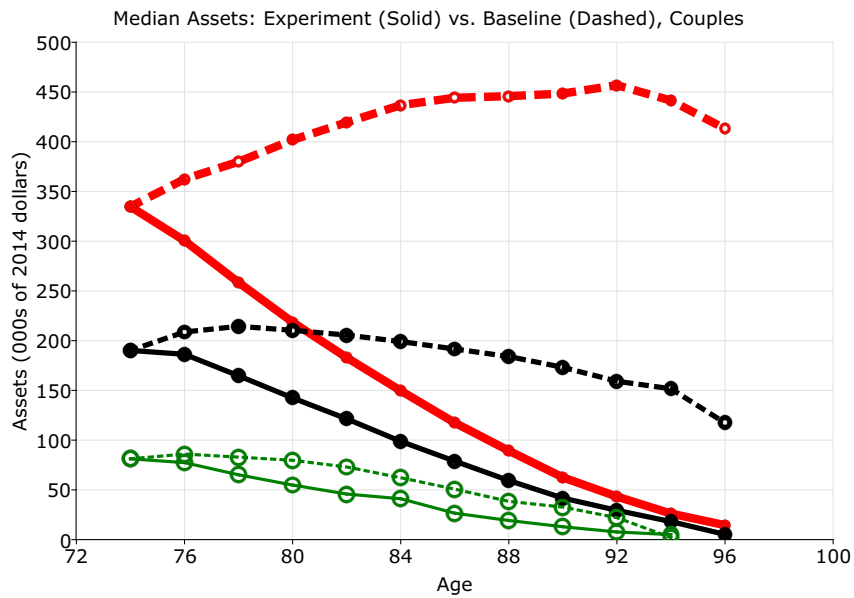

(b) Couples

Aggregate Savings Implications with and without Couples

		Percentage Change from Baseline			
	Baseline Wealth	No Medical Expenses	No Bequest Motives	No Bequests or Medical Expenses	No Weight on Surviving Spouse
Couples and Singles					
25th Percentile	47.1	-69.7%	14.9%	-59.7%	-89.1%
Median	145.5	-22.5%	10.2%	-43.9%	-42.3%
75th Percentile	388.7	-2.4%	-7.6%	-42.3%	-25.2%
Mean	369.5	-3.1%	-16.8%	-43.8%	-28.2%

Aggregate Savings Implications with and without Couples

		Percentage Change from Baseline			
	Baseline Wealth	No Medical Expenses	No Bequest Motives	No Bequests or Medical Expenses	No Weight on Surviving Spouse
Couples and Singles					
25th Percentile	47.1	-69.7%	14.9%	-59.7%	-89.1%
Median	145.5	-22.5%	10.2%	-43.9%	-42.3%
75th Percentile	388.7	-2.4%	-7.6%	-42.3%	-25.2%
Mean	369.5	-3.1%	-16.8%	-43.8%	-28.2%
Initial Singles Only					
25th Percentile	14.5	-78.7%	-1.1%	-85.4%	n/a
Median	92.1	-29.6%	-3.8%	-50.6%	n/a
75th Percentile	263.0	-6.1%	-12.1%	-45.4%	n/a
Mean	253.1	-3.2%	-21.8%	-46.3%	n/a

Conclusion

- We estimate a rich model of savings that matches key aspects of the data, such as
  - Singles decumulate wealth as they age
  - Couples accumulate wealth as they age
  - Wealth drops significantly at the death of a spouse

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  - The behavior of aggregate savings is driven by the rich
  - Rich couples and rich singles behave similarly

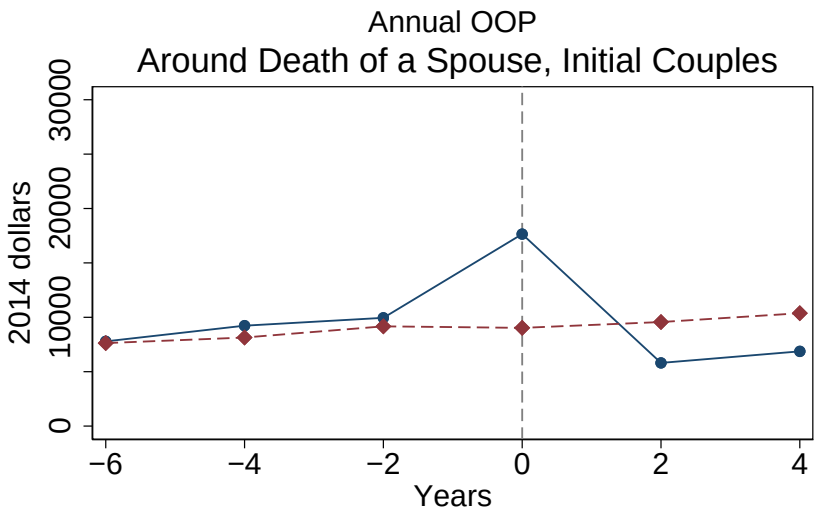
Additional Material

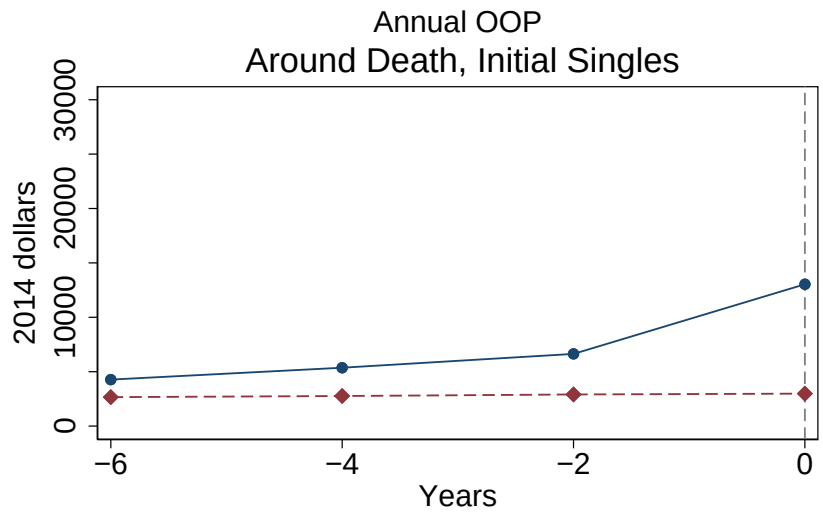
Imputing Medicaid Payments

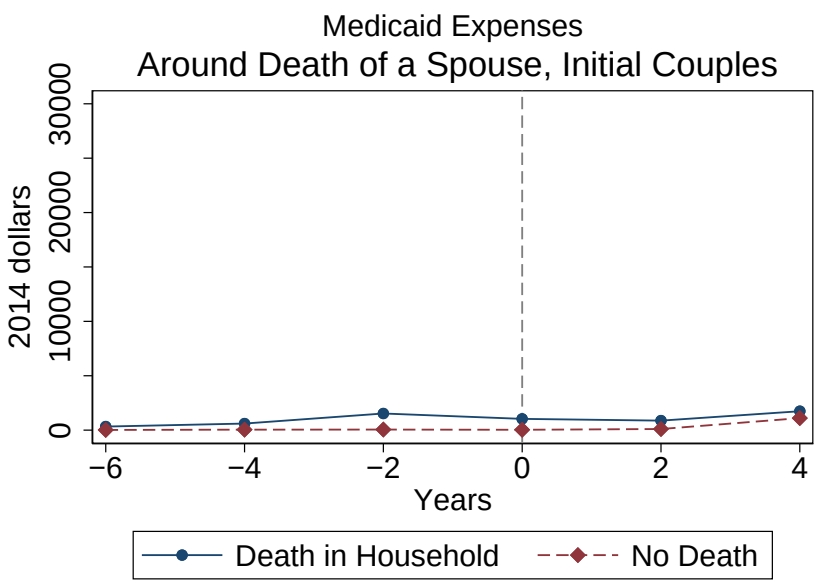
- Use Medicare Current Beneficiary Survey (MCBS) to impute Medicaid transfers
- A Conditional Mean Matching Approach
  - In MCBS, regress Medicaid against income, age, health status, Dr visits etc.
  - Apply regression coefficients to AHEAD data to find predicted Medicaid spending
  - Randomly assign 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

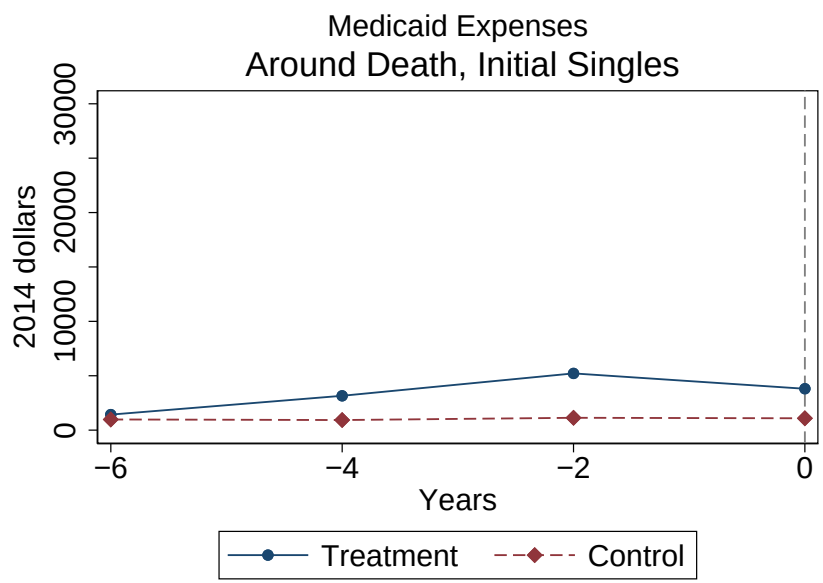
◂ Back

Decomposing Medical Spending









Back

Life Transitions: Establishing Facts

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



Life Transitions: Establishing Facts

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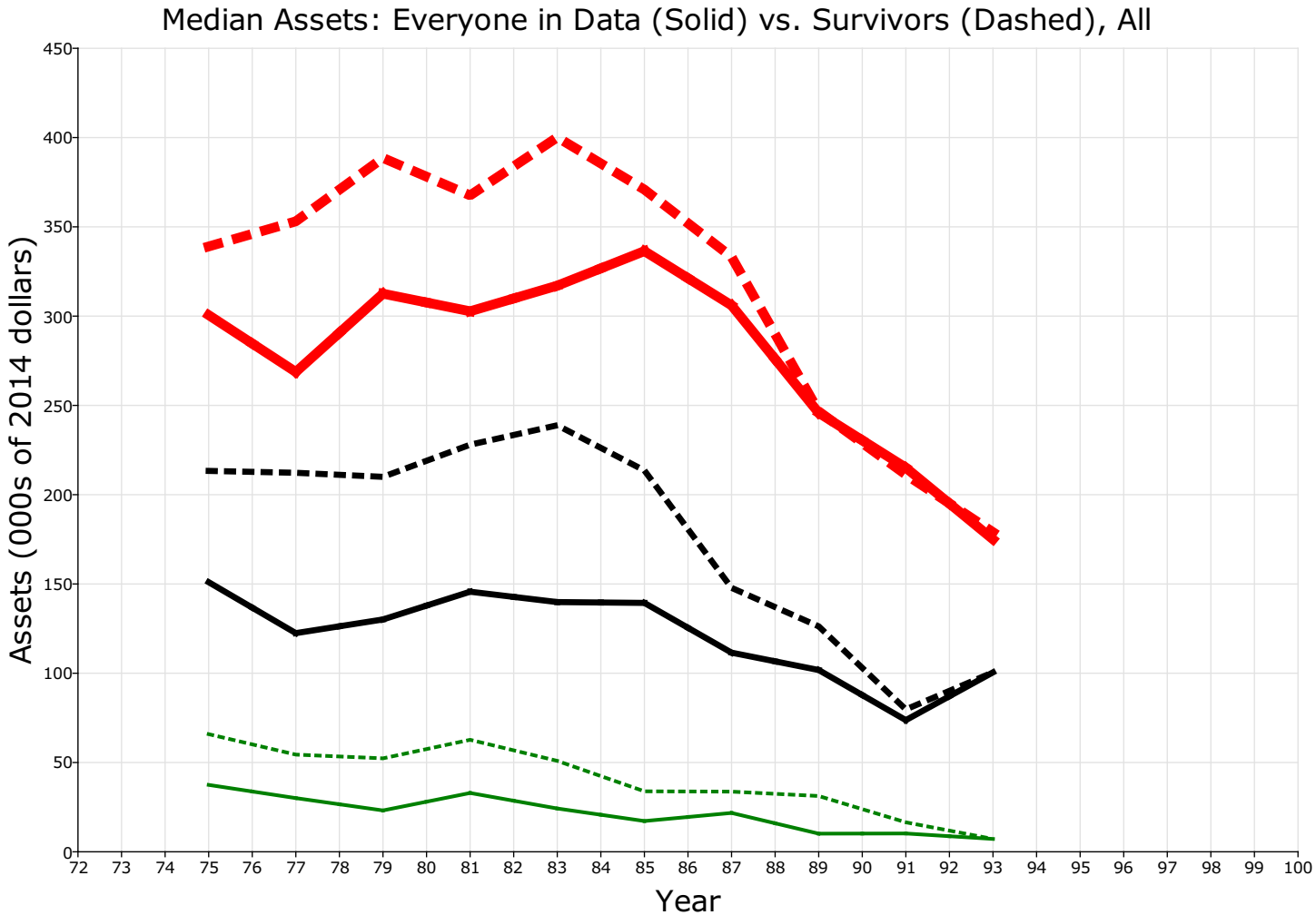
- High income people and women live longer



- Leads to mortality bias: observed wealth tends to **increase** with age

Life Transitions: Mortality Bias Important



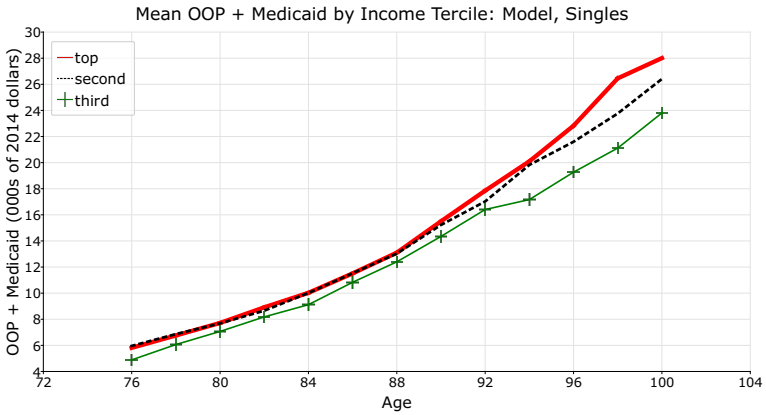
- Modelling attrition is key

Probability of Ever Entering a Nursing Home

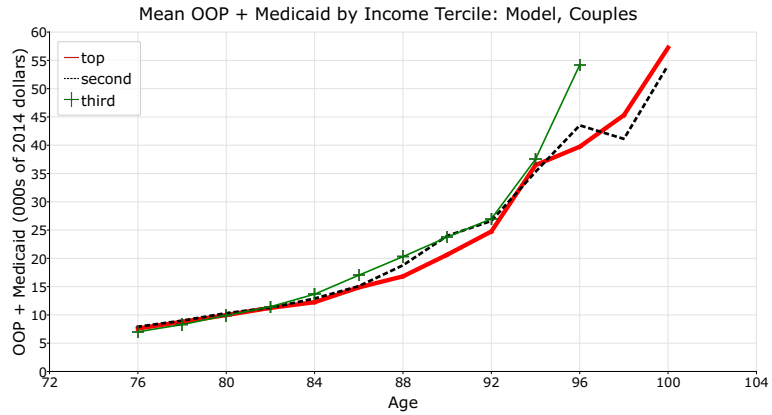
Income Percentile	Men: Bad Health	Men: Good Health	Women: Bad Health	Women: Good Health	All
Singles					
10	23.6	25.3	35.8	37.9	32.8
50	22.8	24.8	35.5	38.2	32.5
90	20.3	22.8	32.2	35.8	30.1
Couples					
10	17.3	19.2	34.4	37.0	28.7
50	16.6	18.8	34.1	37.3	28.7
90	14.6	16.8	31.4	34.5	26.3
Single Men					**26.4**
Married Men					**19.5**
Single Women					37.2
Married Women					36.3

Probabilities conditional on being alive at age 70.

Medicaid ↓ Medical Expenses for Poor and Elderly

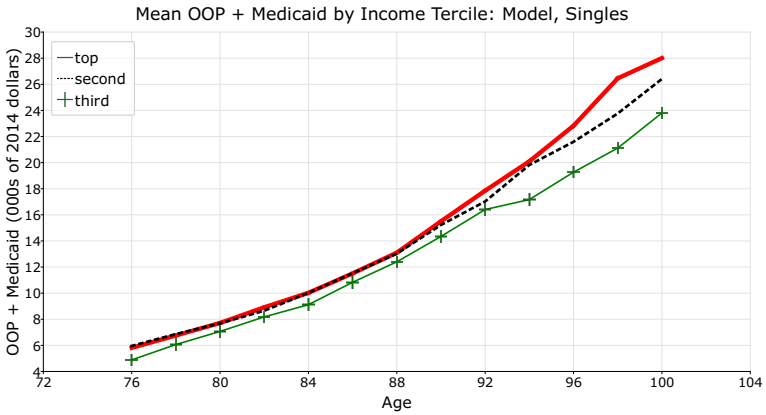


(a) Singles (OOP+Medicaid)



(b) Couples (OOP+Medicaid)

Medicaid ↓ Medical Expenses for Poor and Elderly



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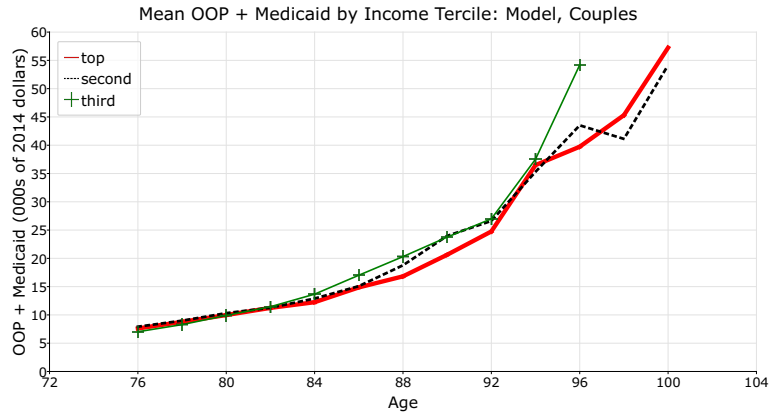
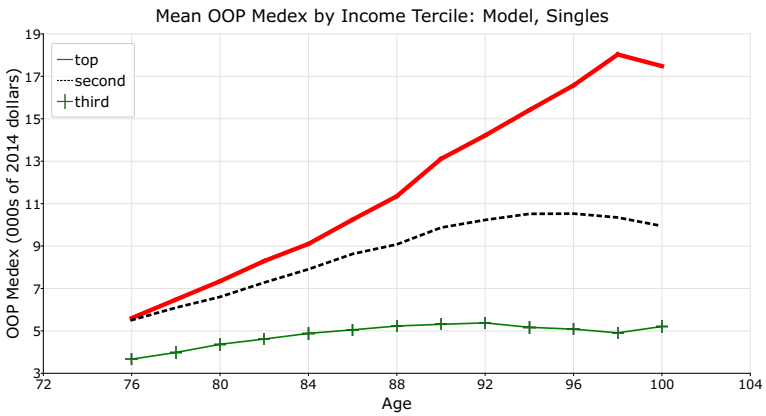
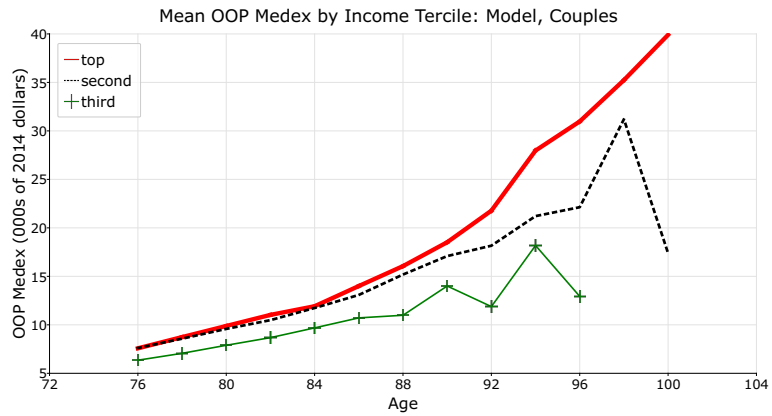


(b) Couples (OOP+Medicaid)



(c) Singles (OOP)



(d) Couples (OOP)

What is the Role of a Surviving Spouse's needs?

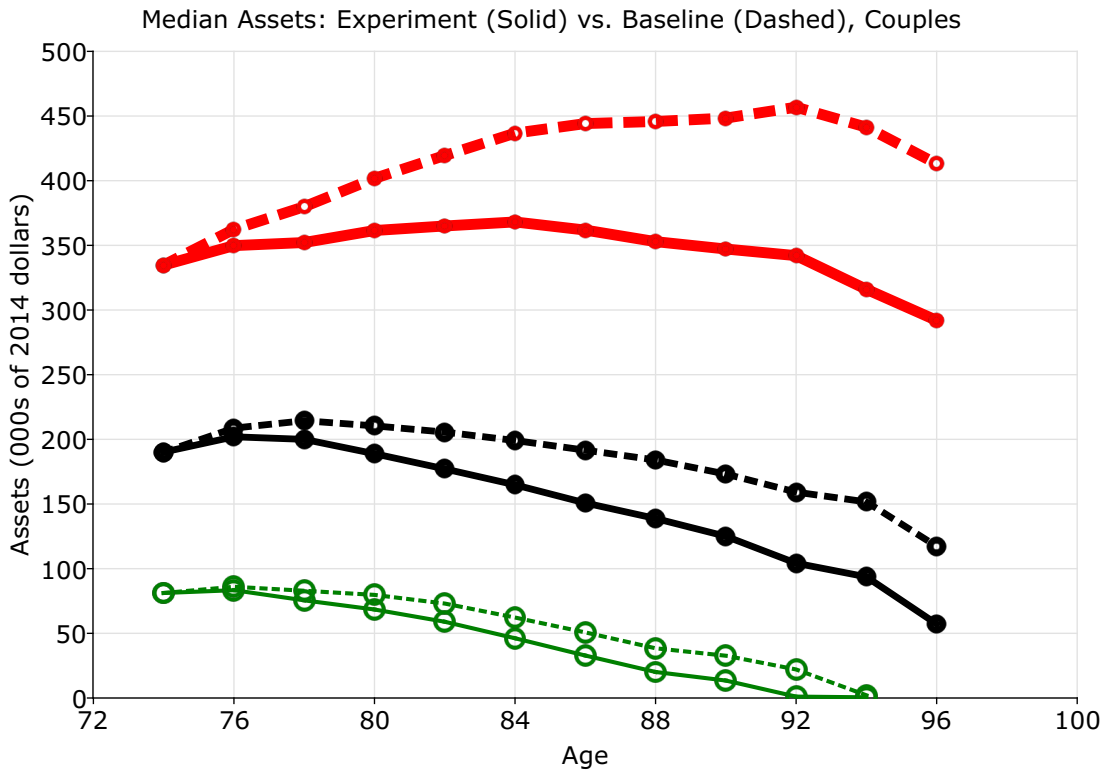
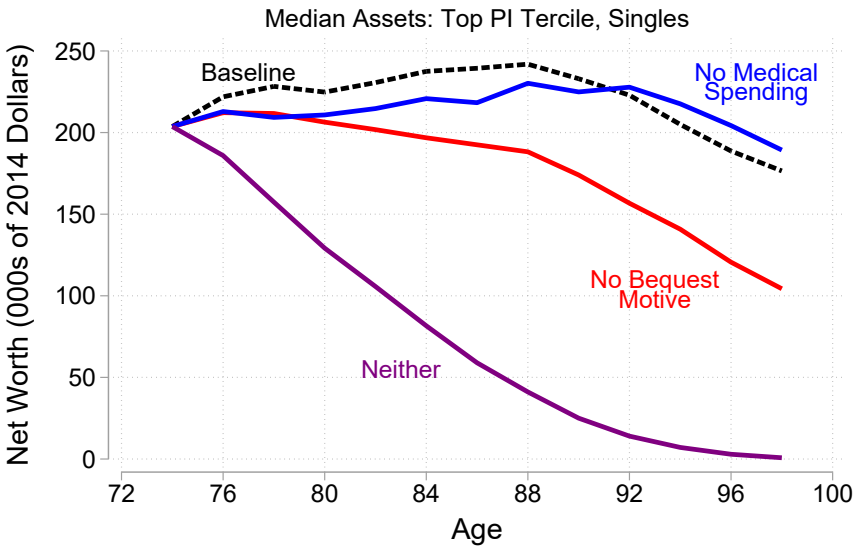
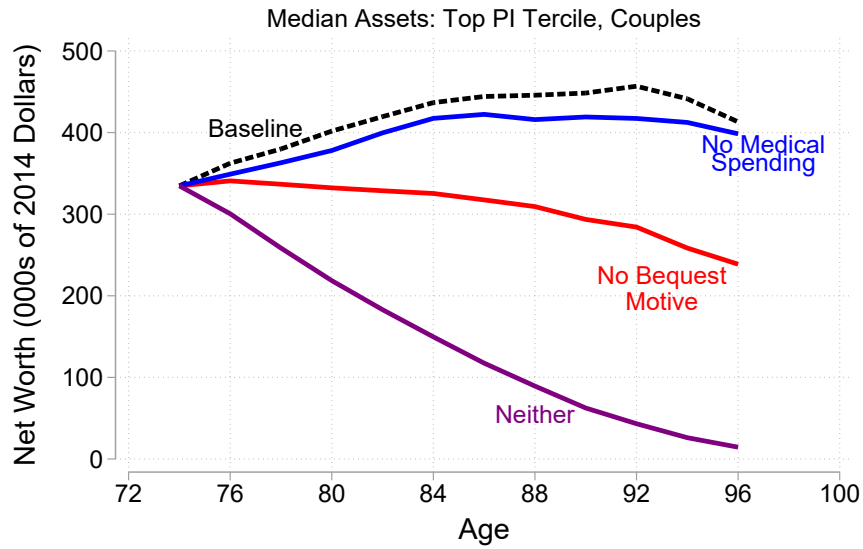


Figure: Couples

The Interaction of Medical Spending and Bequest Motives



(a) Singles



(b) Couples