Why Do Households Save and Work?

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- **Bequest motives,** important driver of
  - **Aggregate wealth**: Kotlikoff and Summers (1981) vs. Modigliani (1988), Gale and Scholz (1994), Lockwood (2012, 2018), Ameriks, Briggs, Caplin, Shapiro, and Tonetti (2020), De Nardi, French, Jones, McGee (2025)

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- **Marital risks,** key driver of
  - **(Mainly) wealth**: Cubeddu and Rios-Rull (2003)

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- Wage risk + **labor supply decisions**
- **Couples and singles + marital transitions**
- **Entire life cycle**
- **Medical expenses during retirement**
- **Bequest motives**
  - At death of last survivor
  - At death of first spouse: "side bequests"

Entire life cycle $\Rightarrow$ data requirements

Want to model both working period and retirement.

$\Rightarrow$ **Need data on a cohort that has already had many years in retirement**

- **Focus on cohort born in 1945**
- Use data from
  - Panel Study of Income Dynamics (PSID)
  - Health and Retirement Study (HRS)

Couples, singles, and their marital transitions. Why?

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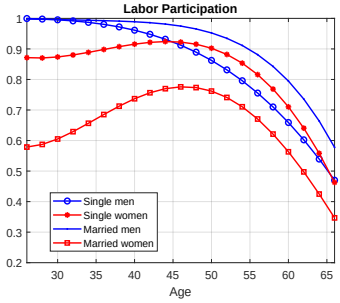
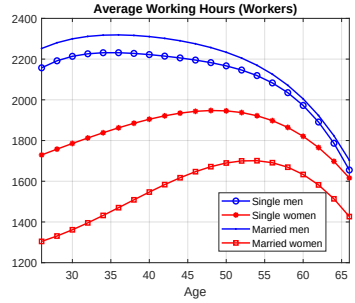
- **Couples and singles behave differently**

Couples and singles. Our 1945 birth cohort





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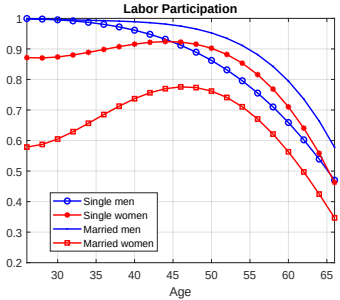

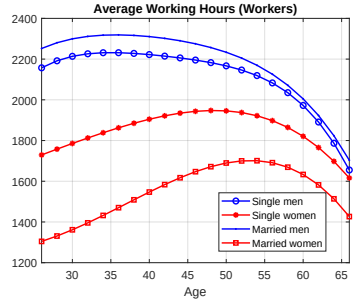

- **Profiles by groups reflect**
  - **Heterogeneity in behavior**
  - **Selection into marriage and divorce** (people with lower wages are less likely to marry and stay married)
- **Want a rich model that can capture both**

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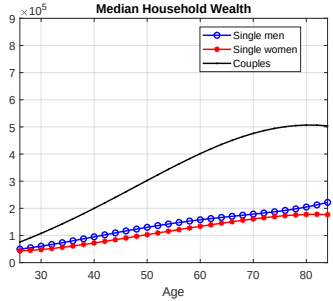

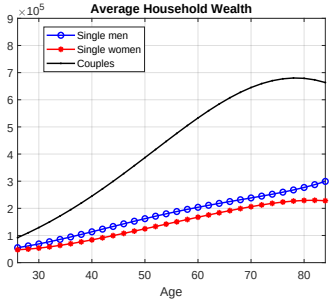

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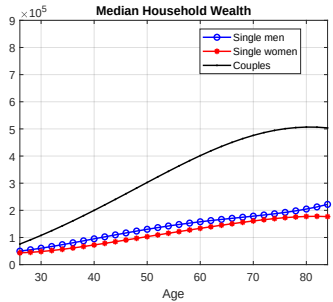

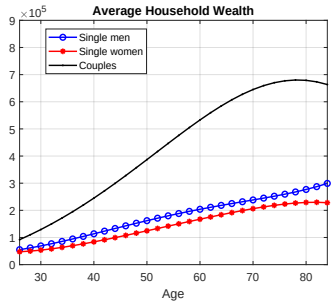

- **Profiles by groups reflect**
  - **Heterogeneity in behavior**
  - **Selection into marriage, divorce, and being alive** (people with lower wages are less likely to marry, more likely to divorce, and more likely to die earlier).

    ▸ No widows or widowers
- **Want a rich model that can capture both**

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Most previous work studies bequests when there is no surviving spouse, but

- **Bequest left to others when there is a surviving spouse**
  - Take place in over 30% of spousal deaths
  - Are large: 43% of estate, when positive
  - Are understudied
- This affect the wealth profiles of couples, singles, and widows and widowers

Want a rich model that can capture this

Approach

- Develop a rich life-cycle model with single and married people
- Partial equilibrium, cohort level analysis
- Estimate model using the Method of Simulated Moments (MSM)
- Use estimated model to quantify the effects of key factors on savings and labor supply for our cohort over all of its life cycle

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- Period length: two years
- Working stage (t_0=26 to 60)
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  - Wage shocks
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  - Risk divorce if married
  - Both spouses choose labor participation and hours

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- Retirement stage (66 to T=98)
  - Health shocks
  - Medical expenses shocks
  - Death shocks $\rightarrow$ Married people might lose their spouse

Wages

- i = gender, j = marital status, t = age (time)
- Wages functions of age and
  - Human capital, $\bar{y}_t^i$, measured as average past earnings
  - **Wage shocks,** ϵ_t^i, which follow an AR(1) that depends on gender

Marriage, divorce, and children

- **Marriage**
  - Probability of marrying: function of age, gender, and wage shock
  - Assortative mating: probability of meeting with a partner with a certain wage shock depends on your own wage shock

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- **Children**
  - Exogenous fertility. Number and age of children depends on maternal age and marital status
  - Time costs of raising children
  - Monetary costs of raising children

Health, medical expenses, and death shocks (after age 66)

- **Each person, at age 66**, has a health state (good, bad, and nursing home) which is a function of their gender, marital status, and human capital

Health, medical expenses, and death shocks (after age 66)

- **Each person, at age 66**, has a health state (good, bad, and nursing home) which is a function of their gender, marital status, and human capital
- **After that, gender, age, health, and human capital of both spouses affect**
  - **Medical expenses** (while alive and during period of death)
  - Health evolution
  - Survival

Government

- Taxes income of couples and singles progressively and differentially
- Taxes labor income to finance SS τ_t^{SS} up to Social Security cap
- Provides SS benefits (including marital ones) to retirees
- Provides a means-tested consumption floor (Medicaid and SSI) in old age
- We estimate these taxes and take them as given

Household preferences

- $\beta =$ discount factor
- Time endowment: $L^{i,j}$
- Leisure $l_t^{i,j} = L^{i,j} - n_t^{i,j} - P_t^{i,j} I_{n_t^{i,j}}$

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- Singles

$$v^i(c_t, l_t, \eta_t^{i,1}) = \frac{((c_t/\eta_t^{i,1})^\omega l_t^{1-\omega})^{1-\gamma} - 1}{1-\gamma} + b,$$

- Couples

$$w(c_t, l_t^1, l_t^2, \eta_t^{i,j}) = \frac{((c_t/\eta_t^{i,j})^\omega (l_t^1)^{1-\omega})^{1-\gamma} - 1}{1-\gamma} + b$$
$$\frac{((c_t/\eta_t^{i,j})^\omega (l_t^2)^{1-\omega})^{1-\gamma} - 1}{1-\gamma} + b$$

Bequest motives

- **Terminal bequests** to non-spousal heirs when there is no surviving spouse

$$\theta_0(e) = \phi_0 \frac{(e + k_0)^{1-\gamma}}{1-\gamma},$$

- **Side bequests** to non-spousal heirs when there is a surviving spouse

$$\theta_1(e) = \phi_1 \frac{(e + k_1)^{1-\gamma}}{1-\gamma}$$

Recursive problems

- Value functions for singles
  - ▸ Working period
  - ▸ Early retirement
  - ▸ Retirement
- Value functions for couples
  - ▸ Working period
  - ▸ Early retirement
  - ▸ Retirement
- Value functions for people in couples
  - ▸ People in couples

Recursive problem for working-age singles ($j = 1$)

$$W^s(t, i, a_t^i, \epsilon_t^i, \bar{y}_t^i) = \max_{c_t, a_{t+1}^i, n_t^i} \Bigg(v^i(c_t, l_t^{i,j}, \eta_t^{i,j}) + \beta(1 - \nu_{t+1}(\cdot)) E_t W^s(t+1, i, a_{t+1}^i, \epsilon_{t+1}^i), \bar{y}_{t+1}^i) + \beta \nu_{t+1}(\cdot) E_t \xi_{t+1}(\cdot) \iota_{t+1}(\cdot) \hat{W}^c(t+1, i, a_{t+1}^i + a_{t+1}^p, \epsilon_{t+1}^i, \epsilon_{t+1}^p, \bar{y}_{t+1}^i, \bar{y}_{t+1}^p) \Bigg)$$

- t : Age
- i : Gender
- a_t^i : Net worth from previous period
- ϵ_t^i : Current productivity shock
- $\bar{y}_t^i$: Annual accumulated Social Security earnings
- $\hat{W}^c$: Individual's discounted present value of being in a marriage ▸ People in couples

Recursive problem for working-age singles ($j = 1$)

Budget constraint	$c_t + a^i_{t+1} = (1+r)a^i_t + Y^i_t(1-\tau_c(i,j,t)) - \tau^{SS}_t \min(Y^i_t, \widetilde{y}_t) - T(\cdot)$
Earnings	$Y^i_t = z^i_t(\bar{y}^i_t)\epsilon^i_t n^i_t$
Leisure	$l^{i,j}_t = L^{i,j} - n^i_t - P^{i,j}_t I_{n^i_t}$
Tax	$T(\cdot) = T(ra^i_t + Y^i_t, i, j, t)$
Child care costs	$\tau_c(i,j,t) = \tau^{0,5}_c f^{0,5}_t(i,j) + \tau^{6,11}_c f^{6,11}_t(i,j)$
Human capital	$\bar{y}^i_{t+1} = (\bar{y}^i_t(t-t_0) + (\min(Y^i_t, \widetilde{y}_t)))/(t+1-t_0)$

$$a^i_{t+1} \geq 0, \qquad n^i_t \geq 0$$

▸ Early retirement ▸ Retirement

Recursive problem for retired singles ($j = 1$)

$$R^s(t, i, a_t^i, h_t^i, \bar{y}_r^i, tr) = \max_{c_t, a_{t+1}^i} \Bigg(v^i(c_t, L^{i,j}, \eta_t^{i,j}) + \beta(1 - s_t^{i,j}(\cdot))\theta_0[max(0, (a_{t+1}^i - d_t^{i,j}(\cdot))] + \beta s_t^{i,j}(\cdot) E_t R^s(t+1, i, a_{t+1}^i, h_{t+1}^i, \bar{y}_r^i, tr) \Bigg)$$

$$c_t + a_{t+1}^i = (1 + r)a_t^i + Y_t^i + B(\cdot) - m_t^{i,j}(\cdot) - T(\cdot)$$

$$Y_t^i = SS(\bar{y}_r^i, tr), \qquad T(\cdot) = T(Y_t^i + ra_t^i, i, j, t)$$

$$B(\cdot) = \max\Big\{0, \underline{c}(j) - \big[(1 + r)a_t^i + Y_t - m_t^{i,j}(\cdot) - T(\cdot)\big]\Big\}$$

$$a_{t+1}^i \geq 0, \qquad a_{t+1}^i = 0 \quad \text{if} \quad B(\cdot) > 0.$$

▸ Working period

Recursive problem for working-age couples ($j = 2$)

$$W^c(t, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = \max_{c_t, a_{t+1}, n_t^1, n_t^2} \Bigg(w(c_t, l_t^{1,j}, l_t^{2,j}, \eta_t^{i,j}) + (1 - \zeta_{t+1}(\cdot))\beta E_t W^c(t+1, a_{t+1}, \epsilon_{t+1}^1, \epsilon_{t+1}^2, \bar{y}_{t+1}^1, \bar{y}_{t+1}^2) + \zeta_{t+1}(\cdot)\beta \sum_{i=1}^{2} \Big(E_t W^s(t+1, i, a_{t+1}/2, \epsilon_{t+1}^i, \bar{y}_{t+1}^i) \Big) \Bigg)$$

- t : Age
- a_t : Net worth from previous period
- ϵ_t^i : Current productivity shock for each spouse
- $\bar{y}_t^i$: Annual accumulated SS earnings for each spouse
- Divorce probability : $\zeta_t(\cdot) = \zeta_t(\epsilon_t^1, \epsilon_t^2)$

Recursive problem for working-age couples ($j = 2$)

Budget constraint
$$c_t + a_{t+1} = (1+r)a_t + Y_t^1 + Y_t^2(1 - \tau_c(2,2,t)) - \tau_t^{SS}(\min(Y_t^1, \widetilde{y}_t) + \min(Y_t^2, \widetilde{y}_t)) - T(\cdot)$$

Earnings
$$Y_t^i = z_t^i(\bar{y}_t^i)\epsilon_t^i n_t^i \qquad i = 1,2$$

Leisure
$$l_t^{i,j} = L^{i,j} - n_t^i - P_t^{i,j} I_{n_t^i} \qquad i = 1,2$$

Human capital
$$\bar{y}_{t+1}^i = (\bar{y}_t^i(t - t_0) + (\min(Y_t^i, \widetilde{y}_t)))/(t + 1 - t_0) \qquad i = 1,2$$

Tax
$$T(\cdot) = T(ra_t + Y_t^1 + Y_t^2, i, j, t)$$

Child care
$$\tau_c(i,j,t) = \tau_c^{0,5} f_t^{0,5}(i,j) + \tau_c^{6,11} f_t^{6,11}(i,j) \qquad i = 2$$

$$a_{t+1} \geq 0, \qquad n_t^1, n_t^2 \geq 0$$

▸ Early retirement

Recursive problem for retired couples ($j = 2$)

$$R^c(t, a_t, h_t^1, h_t^2, \bar{y}_r^1, \bar{y}_r^2, tr) = \max_{c_t, a_{t+1}, e_t^1, e_t^2} \Big(w(c_t, L^{1,j}, L^{2,j}, \eta_t^{i,j}) +$$

$$\beta s_t^{1,j}(\cdot) s_t^{2,j}(\cdot) E_t R^c(t+1, a_{t+1}, h_{t+1}^1, h_{t+1}^2, \bar{y}_r^1, \bar{y}_r^2, tr) +$$

$$\beta s_t^{1,j}(\cdot)(1 - s_t^{2,j}(\cdot)) \Big(\theta_1(e_t^2) + E_t R^s(t+1, 1, a_{t+1} - e_t^2 - d_t^{2,j}(\cdot), h_{t+1}^1, \bar{\bar{y}}_r^1, tr) \Big) +$$

$$\beta s_t^{2,j}(\cdot)(1 - s_t^{1,j}(\cdot)) \Big(\theta_1(e_t^1) + E_t R^s(t+1, 2, a_{t+1} - e_t^1 - d_t^{1,j}(\cdot), h_{t+1}^2, \bar{\bar{y}}_r^2, tr) \Big) +$$

$$2\beta(1 - s_t^{1,j}(\cdot))(1 - s_t^{2,j}(\cdot)) \theta_0(\max(0, (a_{t+1} - d_t^{1,j}(\cdot) - d_t^{2,j}(\cdot))/2)) \Big)$$

- a_t : Net worth from previous period
- h_t^i : Health status (good, bad, or in a nursing home) for each spouse
- $\bar{y}_r^i$: Annual accumulated social security earnings for each spouse
- tr : Retirement age
- $d_t^{i,j}(\cdot)$: expenses during the period before death

Recursive problem for retired couples ($j = 2$)

Budget constraint $$c_t + a_{t+1} = (1 + r)a_t + Y_t + B(\cdot) - m_t^{1,j}(\cdot) - m_t^{2,j}(\cdot) - T(\cdot)$$

Transfer $$B(a_t, Y_t, \cdot, \cdot, \underline{c}(j)) = \max\Big\{0, \underline{c}(j) - \big[(1 + r)a_t + Y_t - m_t^{1,j}(\cdot) - m_t^{2,j}(\cdot) - T(\cdot)\big]\Big\}$$

SS income $$Y_t^i = \max\Big\{SS(\bar{y}_r^i, tr), \frac{1}{2}SS(\bar{y}_r^P, tr)\Big\} \qquad i = 1, 2$$

$$Y_t = Y_t^1 + Y_t^2$$

Tax $$T(\cdot) = T(ra_t + Y_t, i, j, t)$$

$$a_{t+1} - e_t^i \geq 0, \qquad e_t^i \geq 0$$

Estimation and model fit

Two-step estimation strategy

- First-step inputs
  - Fix some parameters to calibrated or estimated values (externally to model)
  - Estimate from data directly

▸ Taxes ▸ Marriage ▸ Divorce ▸ Children ▸ Wages ▸ Health ▸ Survival ▸ Medical expenses

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- Second-step estimation
  - Estimate 21 parameters: patience, weight on leisure, utility curvature, available time, fixed costs of working, and bequest parameters

▸ Estimated parameters

Targets and model fit

The model fits our 334 data targets well. They are:

- Participation over the life cycle for single and married men and women
- Hours worked over the life cycle, conditional on working, for single and married men and women ▸ Fit
- Median and average wealth over the life cycle for couples and single men and women ▸ Fit

▸ Elasticities

What drives savings and earnings?

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- Compute counterfactuals: shut down key aspects of the model
  - Bequest motives
  - Medical expenses during retirement
  - Wage risk
  - Marriage and divorce

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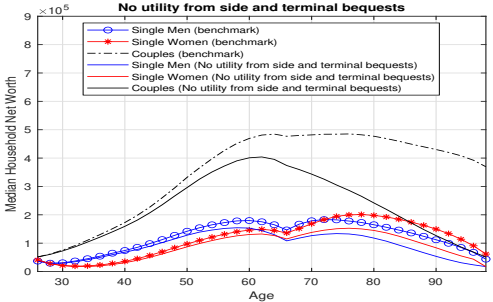
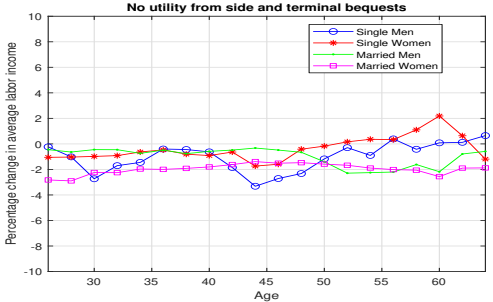
- Compute counterfactuals: shut down key aspects of the model
  - Bequest motives
  - Medical expenses during retirement
  - Wage risk
  - Marriage and divorce
- Compare benchmark and counterfactuals' implications for wealth and earnings
  - For our groups of households by age
  - For our cohort's lifetime (and the aggregate economy under a demographic steady state)

The effects of bequest motives





- Very important reason why couples and singles accumulate wealth for retirement and hold it afterwards
- Married men and women work less without bequest motives

▸ Side bequests or terminal bequest on wealth , ▸ Side bequests or terminal bequests on income

The effects of bequest motives over all of the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No utility from bequests	-25.0%	-21.0%	-18.6%	**-23.8%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
No utility from bequests	-1.0%	-1.9%	-1.1%	-0.3%	**-1.2%**

MM: married men, MW: married women, SM: single men, SW: single women.

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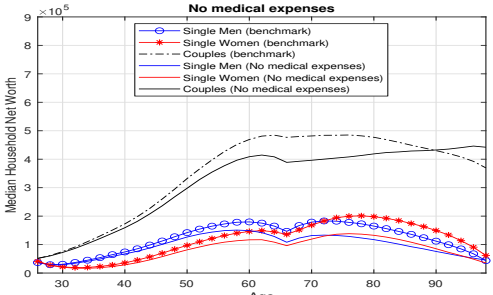
No utility from bequests	-1.0%	-1.9%	-1.1%	-0.3%	**-1.2%**

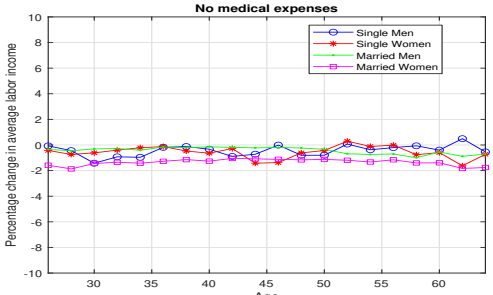
MM: married men, MW: married women, SM: single men, SW: single women.

Effects on wealth, previous literature: 20% (Kotlikoff and Summers), 80% (Modigliani). De Nardi, French, Jones, McGee - 14.8%

▸ Side bequests or terminal bequests

The effects of retirement medical expenses





- Important reason why couples and singles accumulate wealth for retirement and hold it afterwards
- Married men and women work less without medical expenses

The effects of retirement medical expenses over all of the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No medical expenses	-11.3%	-16.0%	-21.9%	**-13.1%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
No medical expenses	-0.4%	-1.3%	-0.4%	-0.6%	**-0.7%**

MM: married men, MW: married women, SM: single men, SW: single women.

The effects of retirement medical expenses over all of the life cycle

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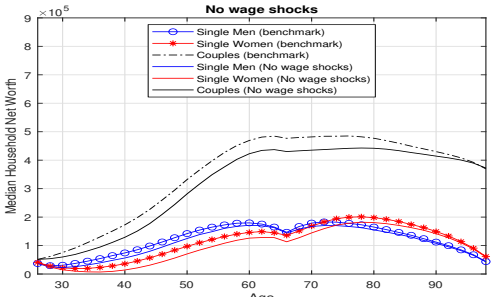
No medical expenses	-0.4%	-1.3%	-0.4%	-0.6%	**-0.7%**

MM: married men, MW: married women, SM: single men, SW: single women.

Effects on wealth, previous literature: De Nardi, French, Jones, and McGee -3.1%. Kopecky and Koreshkova -13.5%

The effects of wage risk



- Wage shocks
  - Large decrease in wealth holdings for all groups, especially during working age
  - People work less when young and more when older.

▸ No effects of wages on marital dynamics ▸ No effects of wages on marital dynamics, no wage shocks

The effects of wage risk over all of the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No wage shocks	-10.3%	-9.4%	-11.8%	**-10.4%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
No wage shocks	2.3%	1.5%	4.2%	3.0%	**2.3%**

MM: married men, MW: married women, SM: single men, SW: single women.

The effects of wage risk over all of the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No wage shocks	-10.3%	-9.4%	-11.8%	**-10.4%**

Changes in average labor earnings

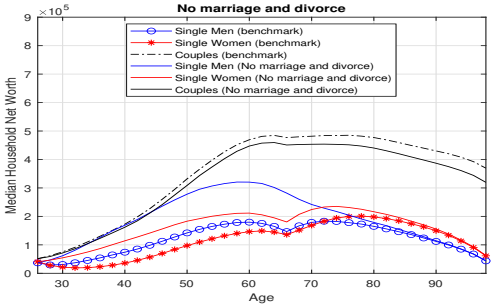
Counterfactual	MM	MW	SM	SW	All
No wage shocks	2.3%	1.5%	4.2%	3.0%	**2.3%**

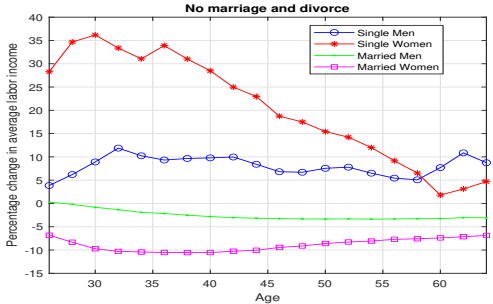
MM: married men, MW: married women, SM: single men, SW: single women.

Effects on wealth, previous literature: Ayiagari -5.0 to -14%, Hubbard, Skinner, and Zeldes -30% to -50%, Carroll and Samwich -32% to -50%, Gourinchas and Parker -60% to -70% during working age, Cagetti -50%

▸ No effects of wages on marital dynamics

The effects of marriage and divorce





- Couples save and work less: no more divorce risk
- Singles save and work more: No hope of marrying + lack of selection out of group

▸ No effects of wages on marital dynamics

No effects of marriage and divorce over the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No marriage and divorce	-7.2%	41.4%	24.1%	**0.7%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
No marriage and divorce	-2.9%	-10.1%	7.4%	19.3%	**-2.0%**

MM: married men, MW: married women, SM: single men, SW: single women.

▸ No effects of wages on marital dynamics

Summarizing our results and taking stock

Changes in average wealth and labor earnings over all of the life cycle

Counterfactual	**Wealth**	**Labor earnings**
No bequest motives	-23.8%	-1.2%
No medical expenses	-13.1%	-0.7%
No wage shocks	-10.4%	2.3%
No marriage and divorce	0.7%	-2.0%
None of the above	-56.9%	-2.7%

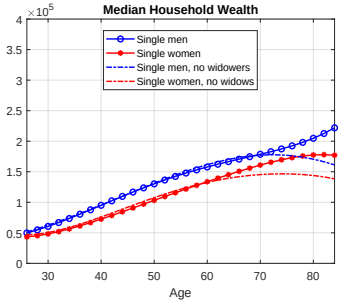
Conclusions

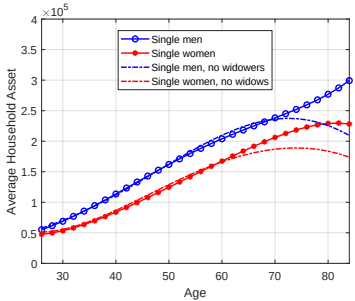
- Estimate a rich life-cycle model of couples and singles with richer bequests motives
- Use model to understand why households save and work

Conclusions

- Estimate a rich life-cycle model of couples and singles with richer bequests motives
- Use model to understand why households save and work
  - Bequest motives key saving motives
  - Earnings risk much less of a factor in driving wealth than previously thought
  - Wage risk and marital dynamics have largest effects on earnings
  - Most of the savings are due to these savings motives

Couples and singles. Our 1945 birth cohort





Back

Early retirement stage, singles

- Single individuals don't get married anymore
- No dependent children
- Decide whether to retire or not

$$V^s(t,i,a_t^i,\epsilon_t^i,\bar{y}_t^i) = \max_{D_t^i}\Big((1-D_t^i)N^s(t,i,a_t^i,\epsilon_t^i,\bar{y}_t^i) + D_t^i S^s(t,i,a_t^i,\bar{y}_t^i,t)\Big),$$

▸ Working period ▸ Back

- If retired, no longer able to work

Early retirement stage, singles who decided not to claim SS ($j = 1$)

$$N^s(t, i, a_t^i, \epsilon_t^i, \bar{y}_t^i) = \max_{c_t, a_{t+1}^i, n_t^i} \left(v^i(c_t, l_t^{i,j}, \eta_t^{i,j}) + \beta E_t V^s(t+1, i, a_{t+1}^i, \epsilon_{t+1}^i, \bar{y}_{t+1}^i) \right)$$

$$Y_t^i = z_t^i(\bar{y}_t^i)\epsilon_t^i n_t^i,$$

$$T(\cdot) = T(Y_t^i + r a_t^i, i, j, t)$$

$$\bar{y}_{t+1}^i = (\bar{y}_t^i(t - t_0) + (\min(Y_t^i, \widetilde{y}_t)))/(t + 1 - t_0)$$

$$c_t + a_{t+1}^i = (1 + r)a_t^i + Y_t^i - \tau_t^{SS} \min(Y_t^i, \widetilde{y}_t) - T(\cdot)$$

$$a_{t+1}^i \geq 0$$

Working period, Back

Early retirement stage, singles who have claimed SS ($j = 1$)

- $\bar{y}_r^i$: Annual accumulated social security earnings (PI)
- tr: Retirement age

$$S^s(t, i, a_t^i, \bar{y}_r^i, tr) = \max_{c_t, a_{t+1}^i} \left(v^i(c_t, L^{i,j}, \eta_t^{i,j}) + \beta E_t S^s(t+1, i, a_{t+1}^i, \bar{y}_r^i, tr) \right)$$

$$Y_t^i = SS(\bar{y}_r^i, tr)$$

$$T(\cdot) = T(Y_t^i + r a_t^i, i, j, t)$$

$$c_t + a_{t+1}^i = (1 + r) a_t^i + Y_t^i - T(\cdot)$$

$$a_{t+1}^i \geq 0$$

▸ Working period, ▸ Back

Early retirement stage, couples

- Couples don't get divorced anymore
- Decide whether to retire or not at the same time
- If retired, no longer able to work

$$V^c(t, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = \max_{D_t} \Big((1 - D_t) N^c(t, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) + D_t S^c(t, a_t, \bar{y}_t^1, \bar{y}_t^2, t) \Big)$$

▸ Early retirement, do not retire ▸ Early retirement, retire ▸ Back

Early retirement stage, couples who decided not to claim SS ($j = 2$)

$$N^c(t, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = \max_{c_t, a_{t+1}, n_t^1, n_t^2} \Bigg(w(c_t, l_t^{1,j}, l_t^{2,j}, \eta_t^{i,j}) + \beta E_t V^c(t+1, a_{t+1}, \epsilon_{t+1}^1, \epsilon_{t+1}^2, \bar{y}_{t+1}^1, \bar{y}_{t+1}^2) \Bigg),$$

$$l_t^{i,j} = L^{i,j} - n_t^i - P_t^{i,j} I_{n_t^i}$$

$$Y_t^i = z_t^i(\bar{y}_t^i)\epsilon_t^i n_t^i$$

$$T(\cdot) = T(ra_t + Y_t^1 + Y_t^2, i, j, t)$$

$$c_t + a_{t+1} = (1+r)a_t + Y_t^1 + Y_t^2 - \tau_t^{SS}(\min(Y_t^1, \widetilde{y}_t) + \min(Y_t^2, \widetilde{y}_t)) - T(\cdot)$$

$$\bar{y}_{t+1}^i = (\bar{y}_t^i(t - t_0) + (\min(Y_t^i, \widetilde{y}_t)))/(t + 1 - t_0)$$

$$a_{t+1} \geq 0, \qquad n_t^1, n_t^2 \geq 0$$

▸ Working stage ▸ Back

Early retirement stage, couples who decided to claim SS ($j = 2$)

$$S^c(t, a_t, \bar{y}_r^1, \bar{y}_r^2, tr) = \max_{c_t, a_{t+1}} \left(w(c_t, L^{1,j}, L^{2,j}, \eta_t^{i,j}) + \beta E_t S^c(t+1, a_{t+1}, \bar{y}_r^1, \bar{y}_r^2, tr) \right),$$

$$Y_t^i = \max\left\{ SS(\bar{y}_r^i, tr), \frac{1}{2} SS(\bar{y}_r^P, tr) \right\} i = 1, 2$$

$$Y_t = Y_t^1 + Y_t^2$$

$$T(\cdot) = T(ra_t + Y_t, i, j, t)$$

$$c_t + a_{t+1} = (1 + r)a_t + Y_t - T(\cdot)$$

$$a_{t+1} \geq 0$$

Working stage, Back

Individual's Discounted Present Value of Being in a Marriage ($j = 2$)

Evaluated under optimal policies

$$\hat{W}^c(t, i, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = v^i(\hat{c}_t(\cdot), \hat{l}_t^{i,j}, \eta_t^{i,j}) +$$
$$\beta(1 - \zeta(\cdot)) E_t \hat{W}^c(t+1, i, \hat{a}_{t+1}(\cdot), \epsilon_{t+1}^1, \epsilon_{t+1}^2, \bar{y}_{t+1}^1, \bar{y}_{t+1}^2) +$$
$$\beta\zeta(\cdot) E_t W^s(t+1, i, \hat{a}_{t+1}(\cdot)/2, \epsilon_{t+1}^i, \bar{y}_{t+1}^i)$$

$$\hat{R}^c(t, i, a_t, h_t^1, h_t^2, \bar{y}_r^2, \bar{y}_r^1, \bar{y}_r^2, tr) = v^i(\hat{c}_t(\cdot), L^{i,j}, \eta_t^{i,j}) +$$
$$\beta s_t^{i,j}(\cdot) s_t^{p,j}(\cdot) E_t \hat{R}^c(t+1, i, \hat{a}_{t+1}(\cdot), h_{t+1}^1, h_{t+1}^2, \bar{y}_r^1, \bar{y}_r^2, tr) +$$
$$\beta s_t^{i,j}(\cdot)(1 - s_t^{p,j}(\cdot)) E_t R^s(t+1, i, \hat{a}_{t+1}(\cdot) - \hat{e}_t^p(\cdot) - d_t^{p,j}(\cdot), h_{t+1}^i, \bar{\bar{y}}_r^i, tr) +$$
$$\beta(1 - s_t^{i,j}(\cdot)) s_t^{p,j}(\cdot) \theta_1(\hat{e}_t^i(\cdot)) +$$
$$\beta(1 - s_t^{i,j}(\cdot))(1 - s_t^{p,j}(\cdot)) \theta_0(\max(0, (\hat{a}_{t+1} - d_t^{i,j}(\cdot) - d_t^{p,j}(\cdot))/2))$$

Working period, Back

Individual's Discounted Present Value of Being in a Marriage ($j = 2$)

Evaluated under optimal policies

$$\hat{N}^c(t, i, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = v^i(\hat{c}_t(\cdot), \hat{l}_t^{i,j}, \eta_t^{i,j}) + \beta E_t \hat{V}^c(t+1, i, \hat{a}_{t+1}(\cdot), \epsilon_{t+1}^1, \epsilon_{t+1}^2, \bar{y}_{t+1}^1, \bar{y}_{t+1}^2)$$

$$\hat{S}^c(t, i, a_t, \bar{y}_r^1, \bar{y}_r^2, tr) = v^i(\hat{c}_t(\cdot), L^{i,j}, \eta_t^{i,j}) + \beta E_t S^c(t+1, i, \hat{a}_{t+1}(\cdot), \bar{y}_r^1, \bar{y}_r^2, tr)$$

$$\hat{V}^c(t, i, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) = (1 - \hat{D}_t(\cdot))\hat{N}^c(t, i, a_t, \epsilon_t^1, \epsilon_t^2, \bar{y}_t^1, \bar{y}_t^2) + \hat{D}_t(\cdot)\hat{S}^c(t, i, a_t, \bar{y}_r^1, \bar{y}_r^2, t)$$

▸ Working period, ▸ Back

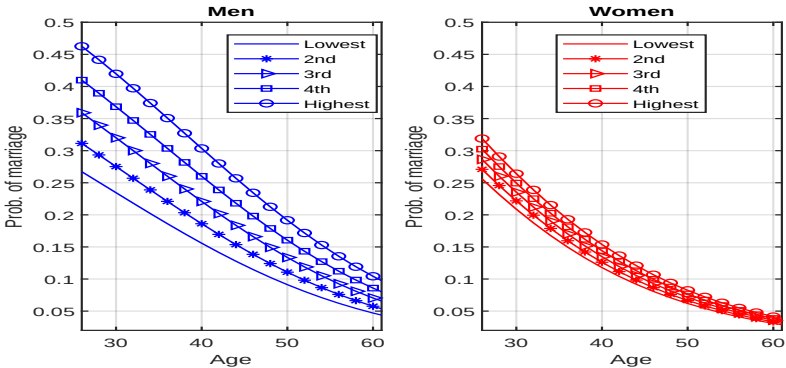
Wage processes (PSID)

Parameter	Men	Women
Persistence	0.936	0.948
Variance prod. shock	0.031	0.021
Initial variance	0.107	0.109

Table: Estimated processes for the wage shocks for men and women, PSID data

back

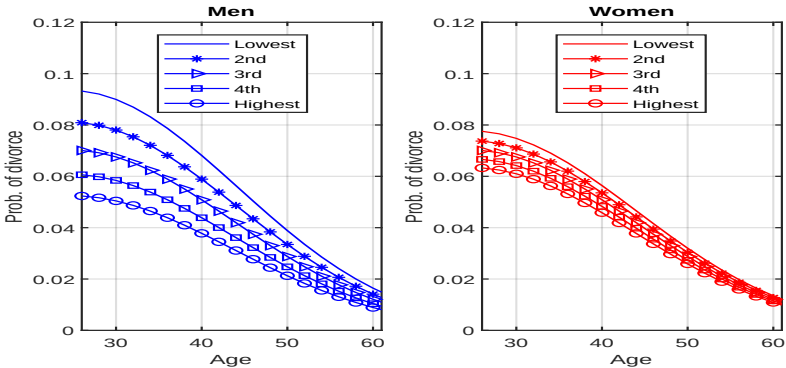
Marriage probability by wage shocks, age, and gender (PSID)



- Men with higher wage shocks are more likely to marry
- Wage shocks have smaller effects on marriage probabilities of women

back

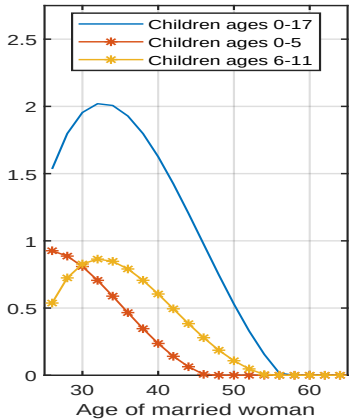
Divorce probability by wage shocks, age, and gender (PSID)

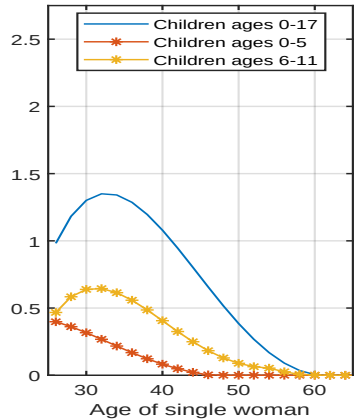


- Men with higher wage shocks are less likely to divorce
- Wage shocks have smaller effects on the divorce probabilities of women

back

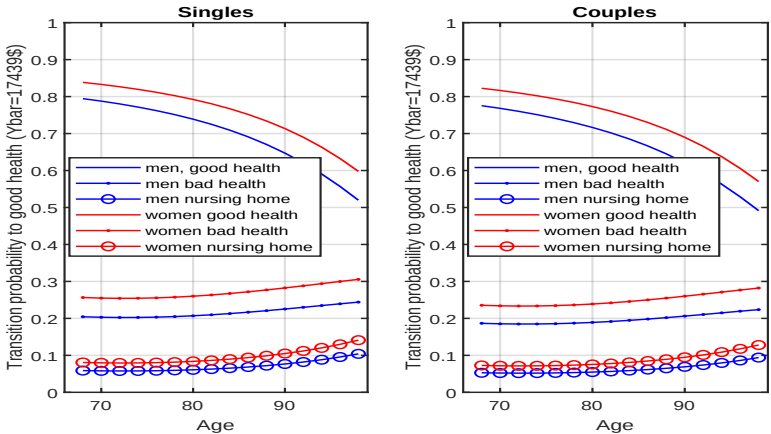
Number of children by age and marital status (PSID)





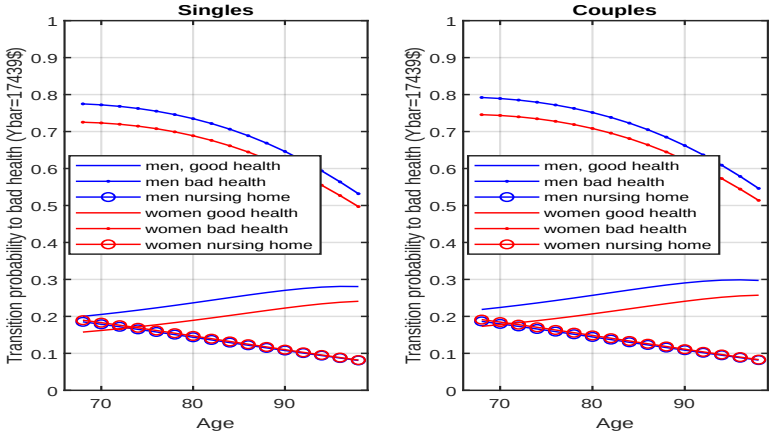
back

Transition probabilities to good health (HRS)



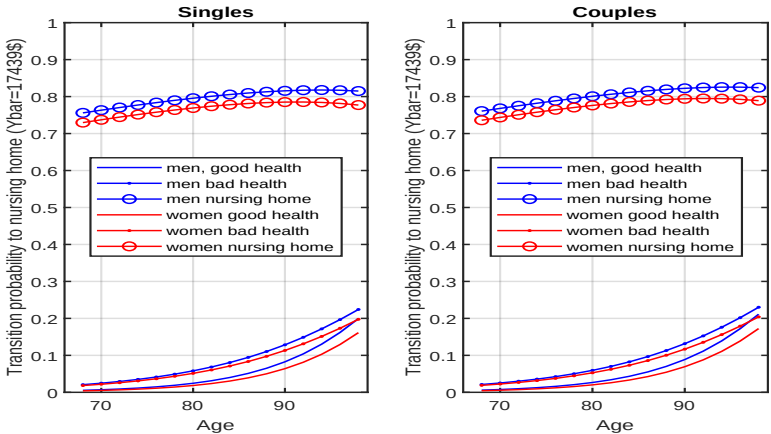
back

Transition probabilities to bad health (HRS)



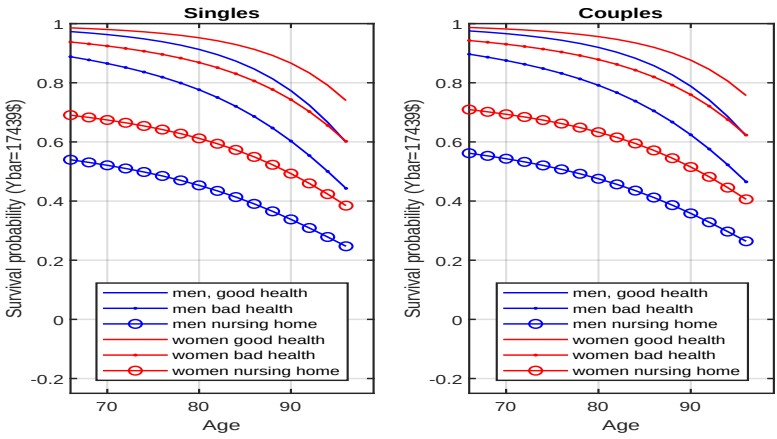
back

Transition probabilities to nursing home (HRS)



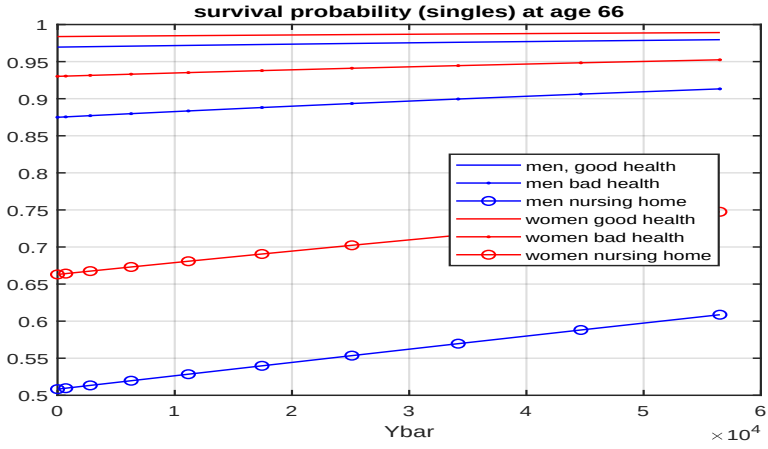
back

Survival rates (HRS)



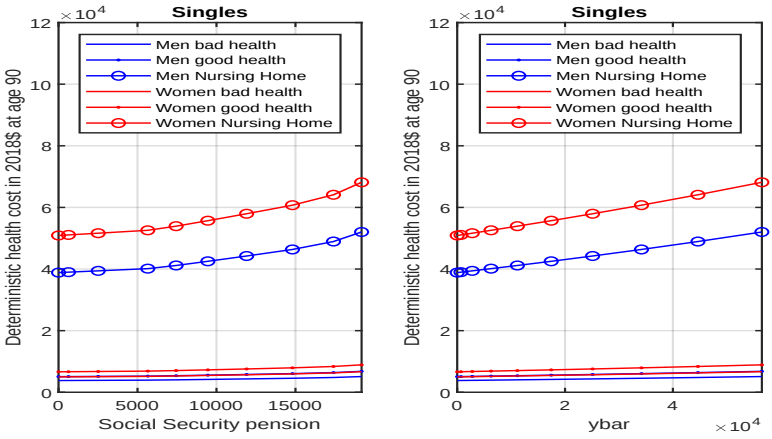
back

Survival rates by Permanent Income (HRS)



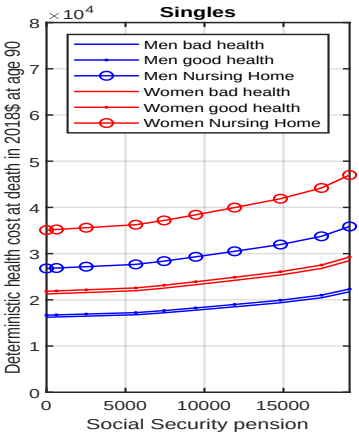
back

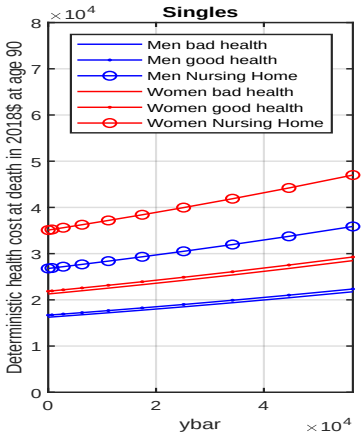
Medical costs while alive (HRS)



back

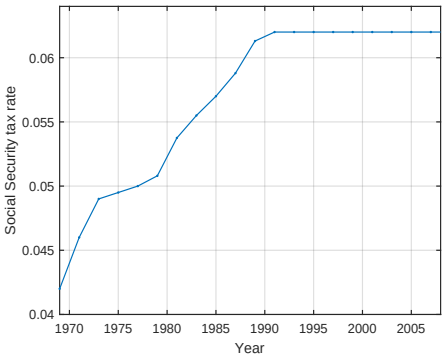
Medical costs at death (HRS)

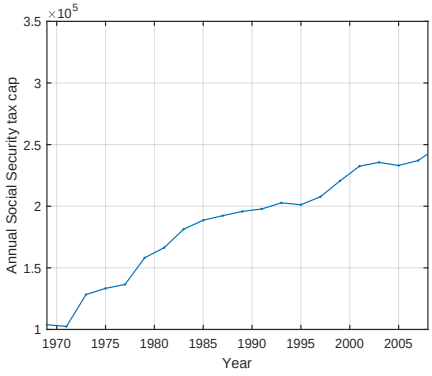




back

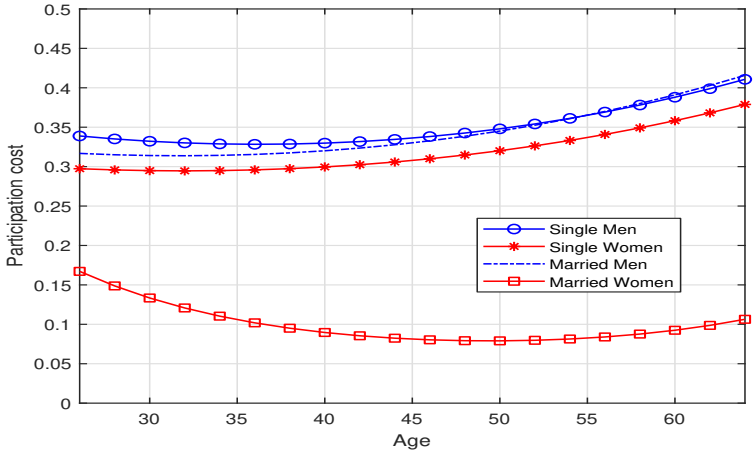
Social Security tax and cap





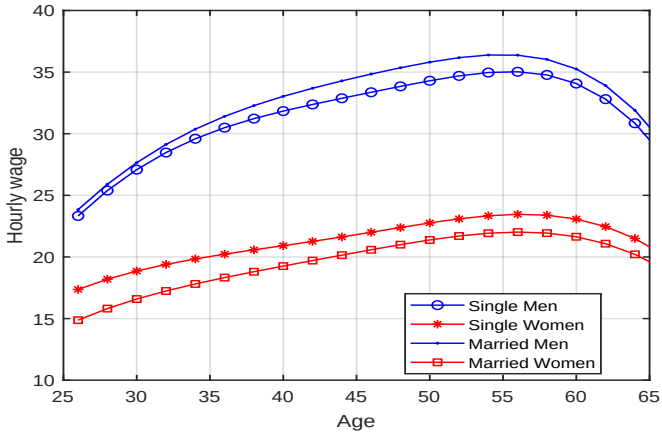
back

Second-step participation cost estimates



back

Average wage profiles (PSID)



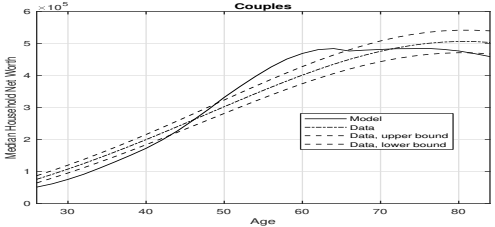
Back

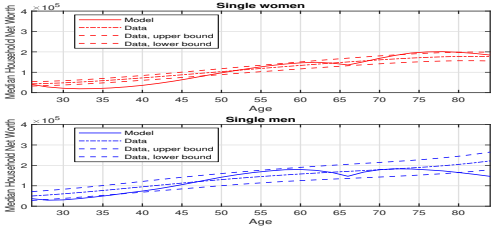
Second-step estimated model parameters

Estimated parameters	Value
β: Discount factor	0.9958
ω: Consumption weight	0.4478
$L^{2,1}$: Time endowment (weekly hours), single women	104
$L^{1,2}$: Time endowment (weekly hours), married men	108
$L^{2,2}$: Time endowment (weekly hours), married women	74
$P_t^{i,j}$: Partic. cost	
ϕ_0: Terminal bequest, strength	1,902,590
k_0: Terminal bequest, shifter	975,581
ϕ_1: Side bequest, strength	38,703,874
k_1: Side bequest, shifter	2,826,257

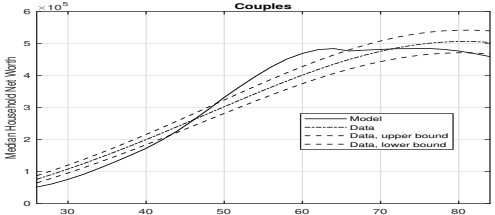
Participation costs, Back

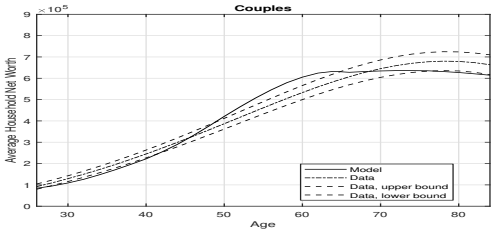
Model fit: median and average wealth

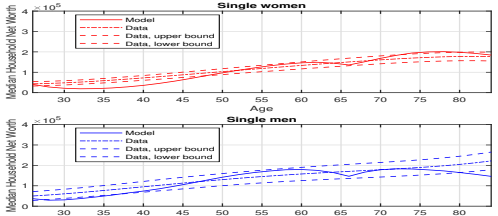


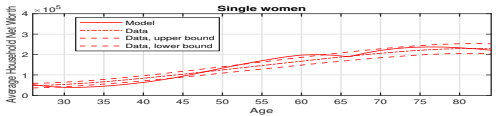


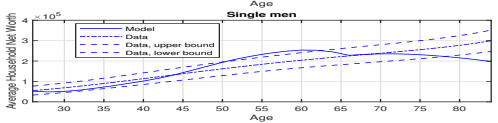
Model fit: median and average wealth











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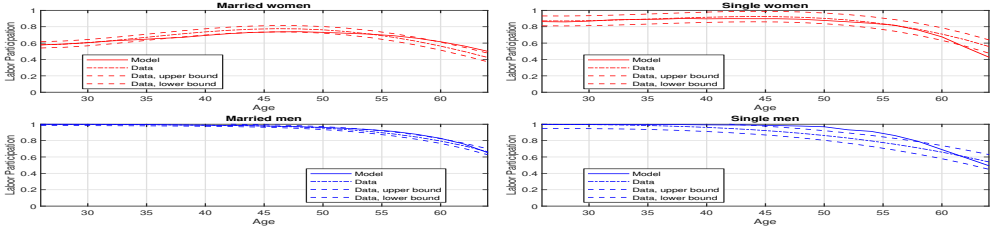
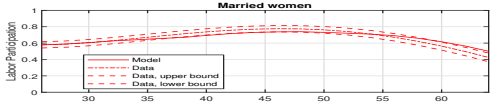
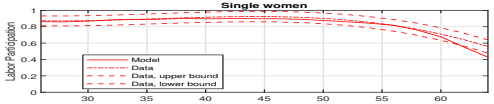
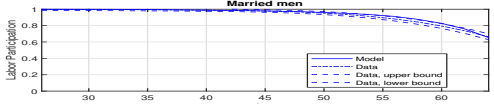
Model fit: participation and hours

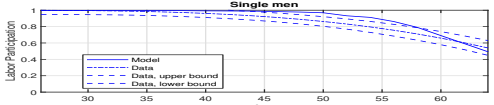


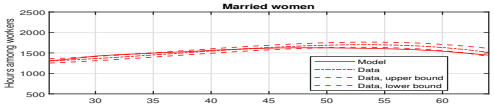
Model fit: participation and hours

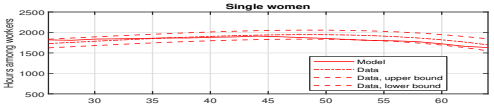


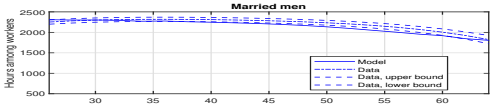


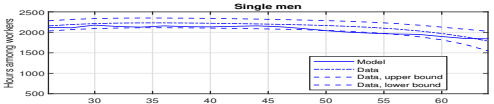












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Labor supply elasticity, temporary wage change

	Participation				Hours among workers			
	Married		Single		Married		Single	
	W	M	W	M	W	M	W	M
40	0.6	0.1	0.4	0.1	0.2	0.1	0.4	0.3
50	0.5	0.2	0.5	0.3	0.2	0.1	0.5	0.3
60	1.0	0.5	1.6	1.7	0.2	0.0	0.3	0.1

Labor supply elasticity, temporary wage change. W: women, M: men.

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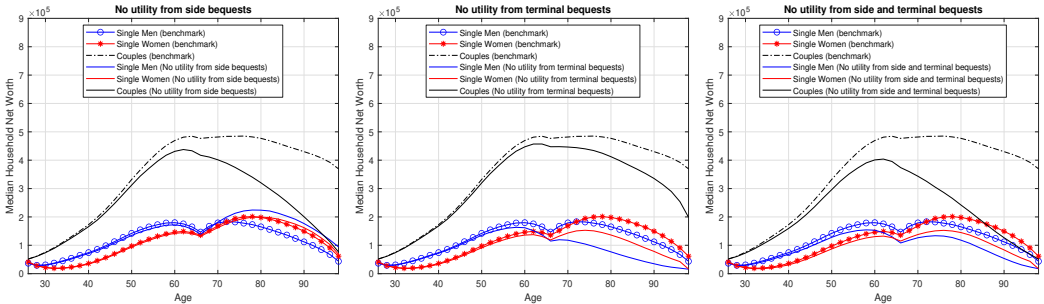
The effects of bequest motives on median wealth



- **Side and terminal bequests** very important determinant of savings of couples and singles

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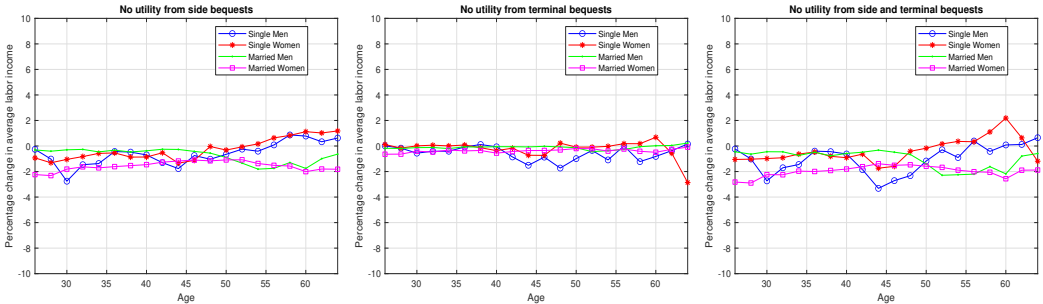
The effects of bequest motives on average household labor income



- **Side and terminal bequests** especially increase the average labor income of married women

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The effects of bequest motives over all of the life cycle

Changes in average wealth

Counterfactual	Couples	SM	SW	All
Counterfactual	Couples	SM	SW	All
No utility from side bequests	-16.5%	15.9%	14.4%	-9.6 %
No utility from terminal bequests	-6.6%	-32.5%	-28.5%	-11.7 %
No utility from bequests	-25.0%	-21.0%	-18.6%	**-23.8%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
Counterfactual	MM	MW	SM	SW	All
No utility from side bequests	-0.8%	-1.5%	-0.6%	-0.2%	-0.9%
No utility from terminal bequests	-0.1%	-0.4%	-0.6%	-0.2%	-0.2%
No utility from bequests	-1.0%	-1.9%	-1.1%	-0.3%	**-1.2%**

MM: married men, MW: married women, SM: single men, SW: single women.

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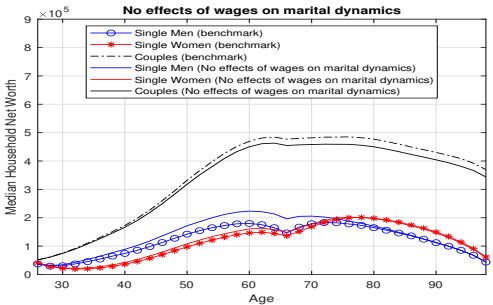
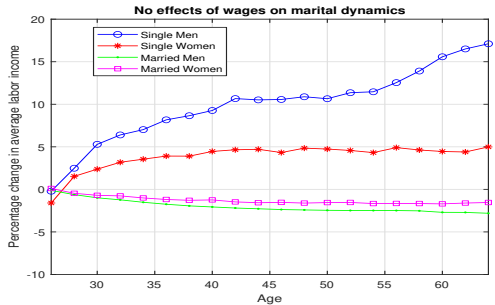
The effects of wages on marital dynamics





- Couples save and work less: less productive couples more likely to stay married
- Singles save and work more: more productive singles less likely to marry

▸ No wage shocks ▸ No marriage and divorce

The effects of wages on marital dynamics

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No wages in marital dynamics	-3.6%	12.3%	2.5%	**-1.4%**
No marriage and divorce	-7.2%	41.4%	24.1%	**0.7%**

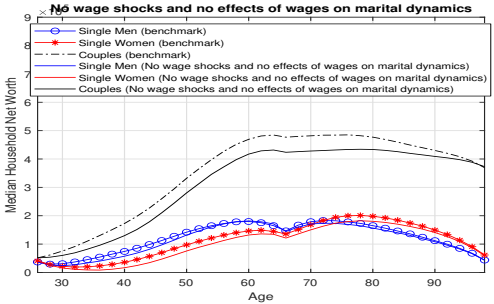
Changes in average labor earnings

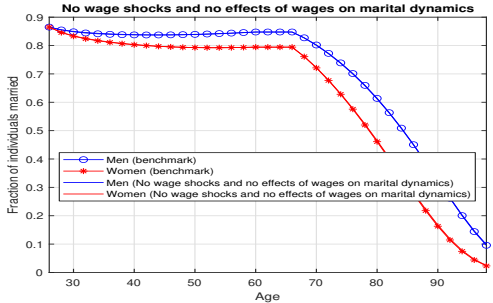
Counterfactual	MM	MW	SM	SW	All
No wages in marital dynamics	-2.1%	-1.4%	10.2%	4.2%	**-0.4%**
No marriage and divorce	-2.9%	-10.1%	7.4%	19.3%	**-2.0%**

MM: married men, MW: married women, SM: single men, SW: single women.

▸ No wage shocks ▸ No marriage and divorce

No effects of wages on marital dynamics, no wage shocks





- Couples save and work less: less productive couples more likely to stay married
- Singles save and work more: more productive singles less likely to marry

▸ No wage shocks ▸ No marriage and divorce

No effects of wages on marital dynamics, no wage shocks

Changes in average wealth

Counterfactual	Couples	SM	SW	All
No wage shocks	-10.3%	-9.4%	-11.8%	**-10.4%**
No wages in marital dynamics	-3.6%	12.3%	2.5%	**-1.4%**
No wage shocks, no effects of wages on mari, dyn.	-10.4%	-6.1%	-9.9%	**-9.9%**

Changes in average labor earnings

Counterfactual	MM	MW	SM	SW	All
No wage shocks	2.3%	1.5%	4.2%	3.0%	**2.3%**
No wages in marital dynamics	-2.1%	-1.4%	10.2%	4.2%	**-0.4%**
No wage shocks, no effects of wages on mari, dyn.	1.8%	1.7%	5.5%	2.3%	**2.2%**

MM: married men, MW: married women, SM: single men, SW: single women.

▸ No wage shocks