The Effect of Social Security Auxiliary Spouse and Survivor Benefits on the Household Retirement Decision

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CONTRIBUTION

- This study answers the question:
  How responsive are household retirement decisions to spouse and survivor benefits?

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- This study answers the question:
  How responsive are household retirement decisions to spouse and survivor benefits?
  - Work
  - Benefit Claiming
  - Savings

Spousal Benefit Example

		Individual Entitlement
Single Income	Husband	$2000
	Wife	$0
Dual Income	Husband	$1000
	Wife	$1000

Spousal Benefit Example

With no Spouse Benefits

		Individual Entitlement	Household Entitlement
Single Income	Husband	$2000	$2000
	Wife	$0	
Dual Income	Husband	$1000	$2000
	Wife	$1000	

SPOUSAL BENEFIT EXAMPLE

Spousal Benefit = max {**own benefit , 50% spouse's benefit**}

		Individual Entitlement	Spouse Benefit	Household Entitlement
Single Income	Husband	\$2000	\$1000	\$3000 (↑)
	Wife	\$0		
Dual Income	Husband	\$1000		
	Wife	\$1000		

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	Wife	\$0		
Dual Income	Husband	\$1000	\$0	\$2000 (no Δ)
	Wife	\$1000		

SURVIVOR'S BENEFIT EXAMPLE

Survivor Benefit = max {**own benefit , deceased's benefit**}

		Individual Entitlement	Survivor Benefit	Household Entitlement
Single Income	Husband	\$2000	\$2000	\$2000
	Wife	\$0		
Dual Income	Husband	\$1000		
	Wife	\$1000		

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Single Income	Husband	$2000	$2000	$2000
	Wife	$0		
Dual Income	Husband	$1000	$1000	$1000
	Wife	$1000		

SPOUSAL AND SURVIVOR'S BENEFIT EXAMPLE

- **Spouse Benefit:** Can only claim if spouse has claimed benefit.
- **Survivor Benefit:** Reduced based on when the deceased claimed benefit

Spouse and Survivor Benefits

In 2012,

- Survivor Benefits = 14% of Social Security Expenditures
- Spouse Benefits = 4%

Future Knowledge

Spouse and Survivor Benefits

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  - Larger than Canada's 2013 total military expenditures ($22.5b)

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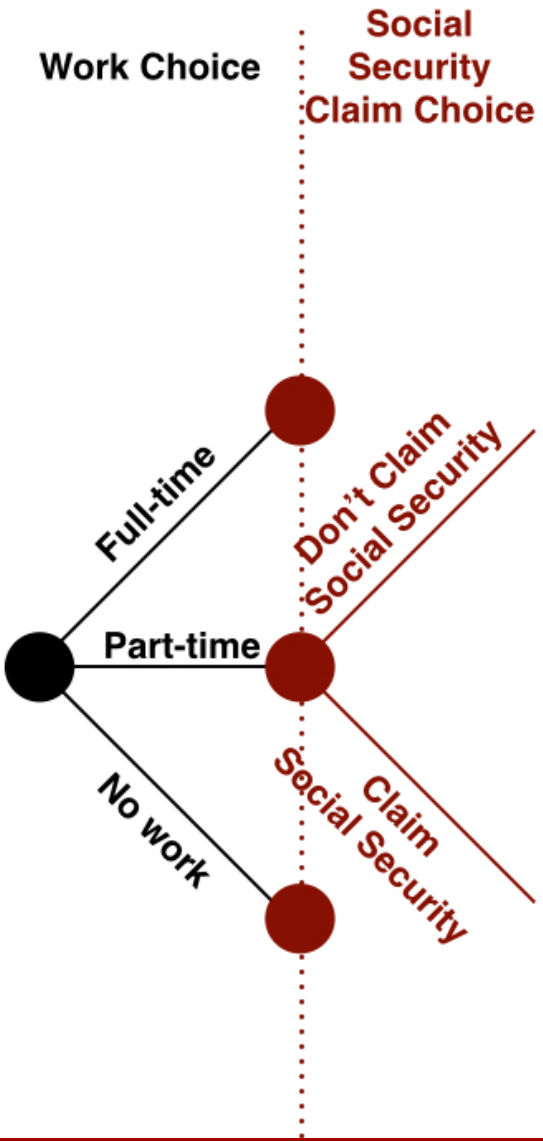
  - Larger than total amount of money spend of aid to families with dependent children (TANF - $17b, 2012)
  - Larger than Canada's 2013 total military expenditures ($22.5b)
- Social Security checks make up the majority of monthly incomes for 53% of couples and 74% of non-married individuals (SSA, 2011)

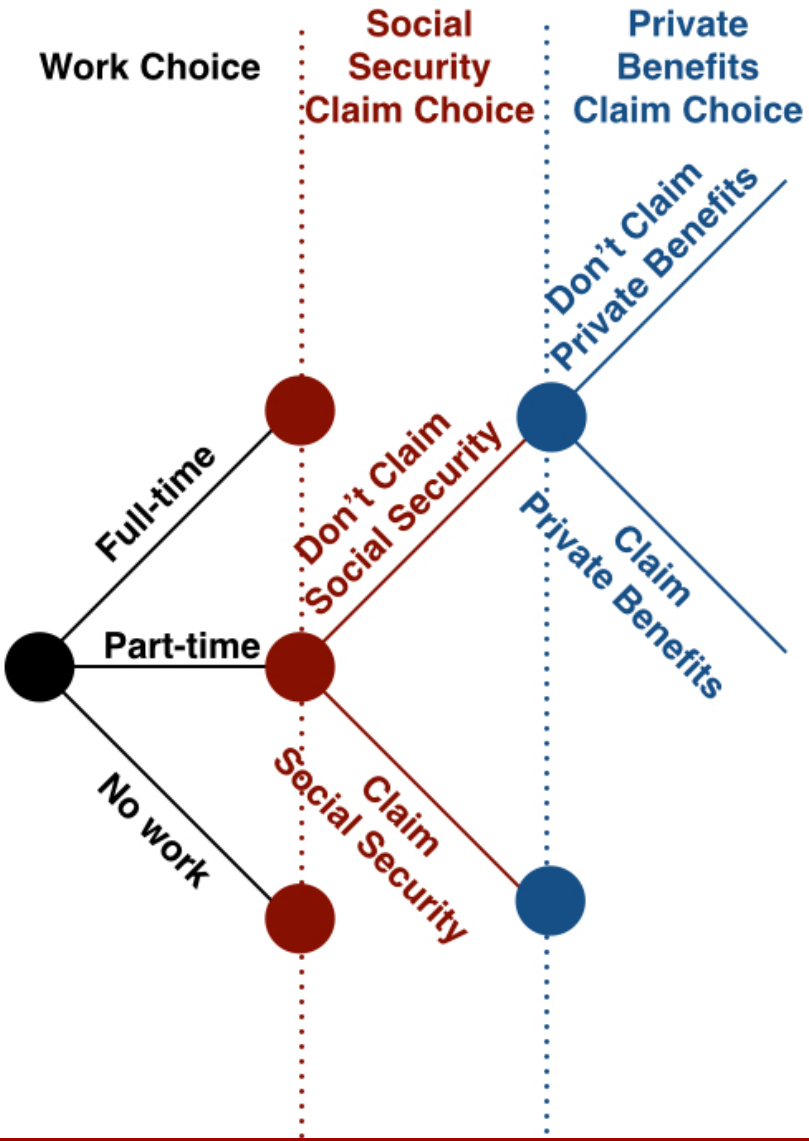
Future Knowledge

DECISIONS

Decisions


Work Choice
Social Security Claim Choice
Full-time
Part-time
No work
Don't Claim Social Security
Claim Social Security

Decisions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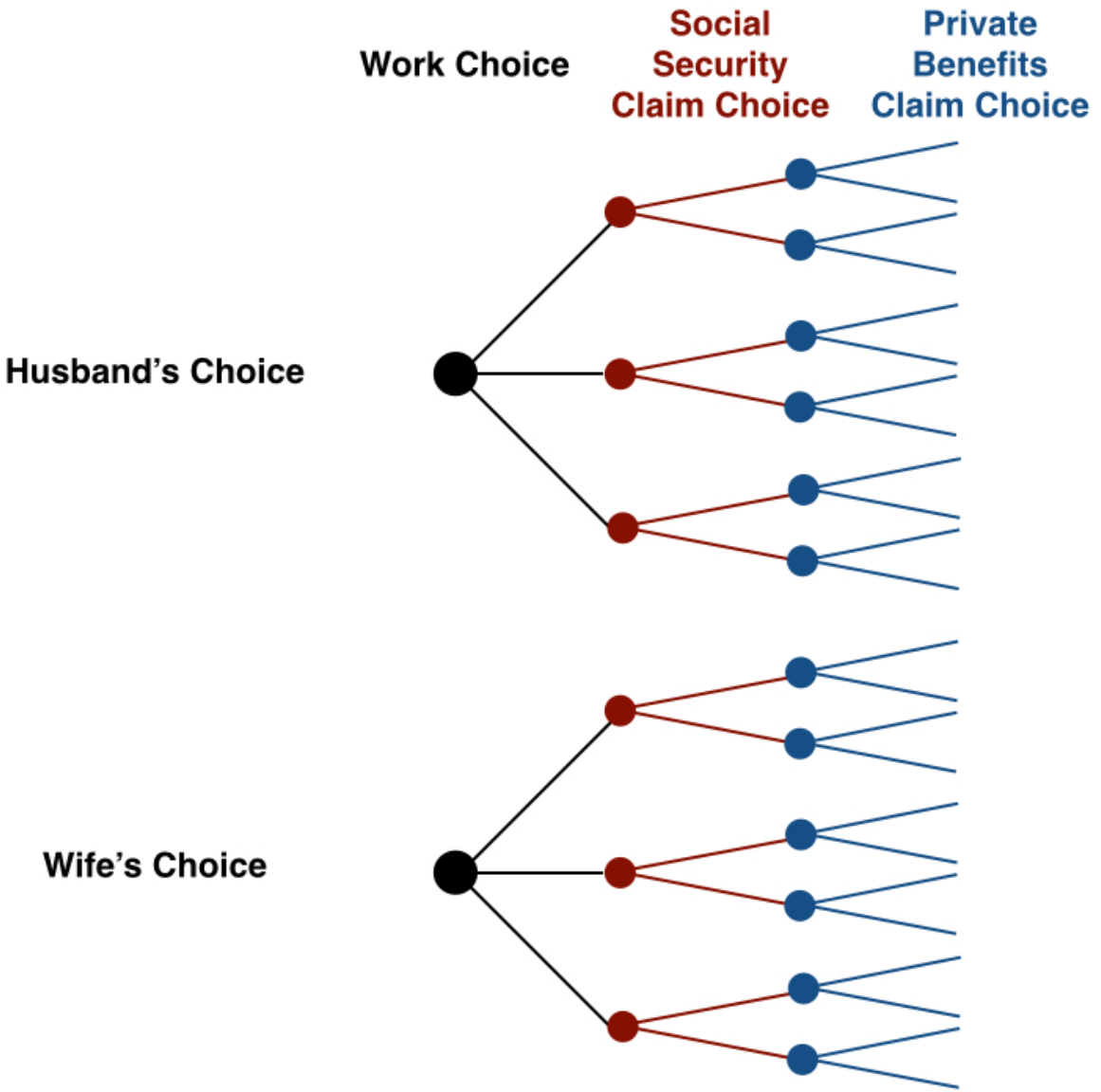
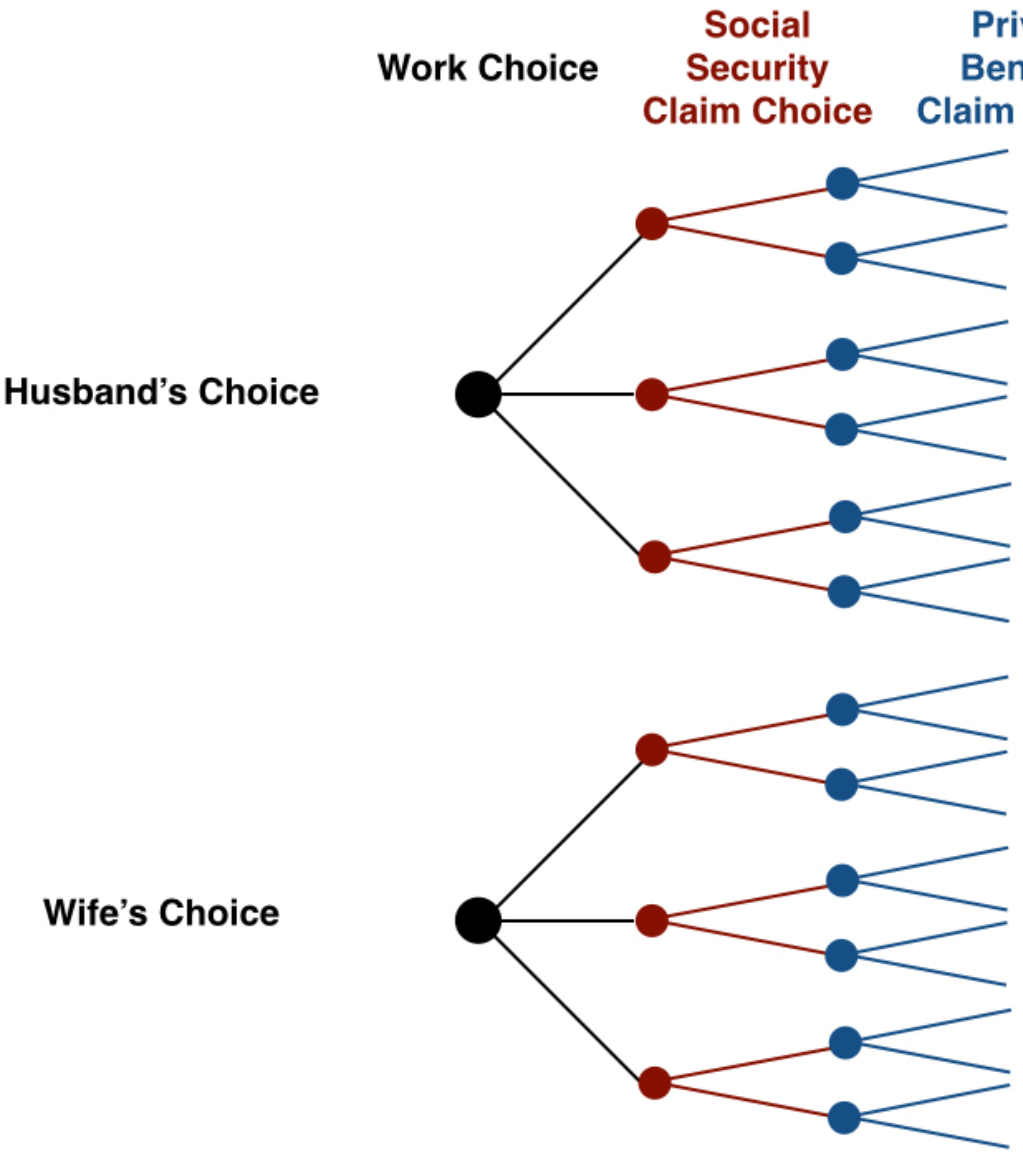

Work Choice
Social Security Claim Choice
Private Benefits Claim Choice
Husband's Choice
Wife's Choice

DECISIONS



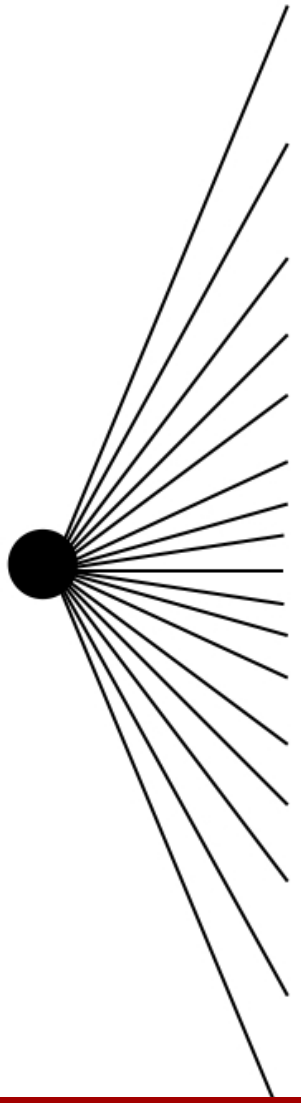
Other things to consider:

1. **Savings Choice**
2. **Simultaneous Decisions**

DECISIONS - SIMULTANEOUSLY

Household's Choices

1. **Savings**
2. **Work (both)**
3. **Social Security Claiming (both)**
4. **Private Benefit Claiming (both)**



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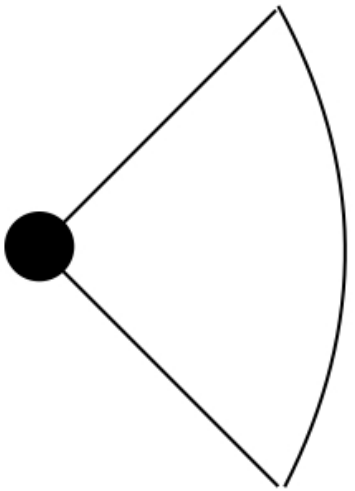
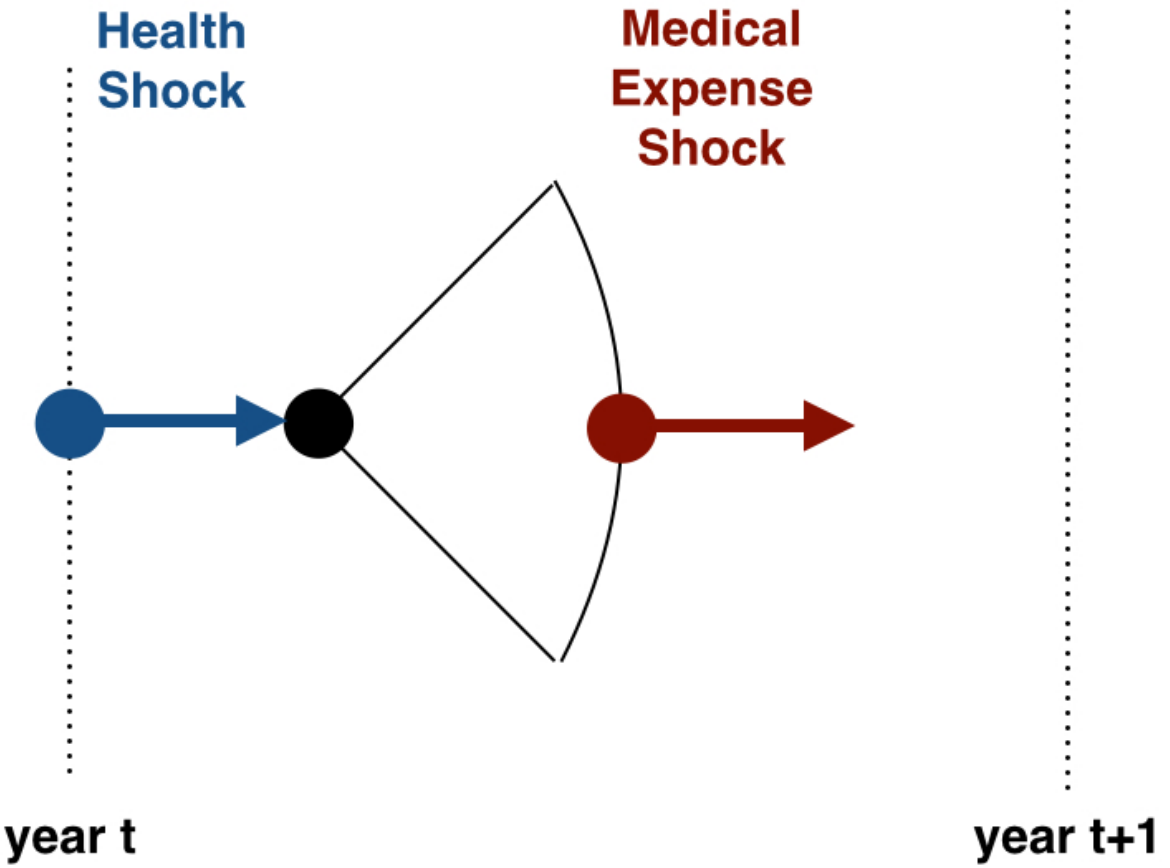
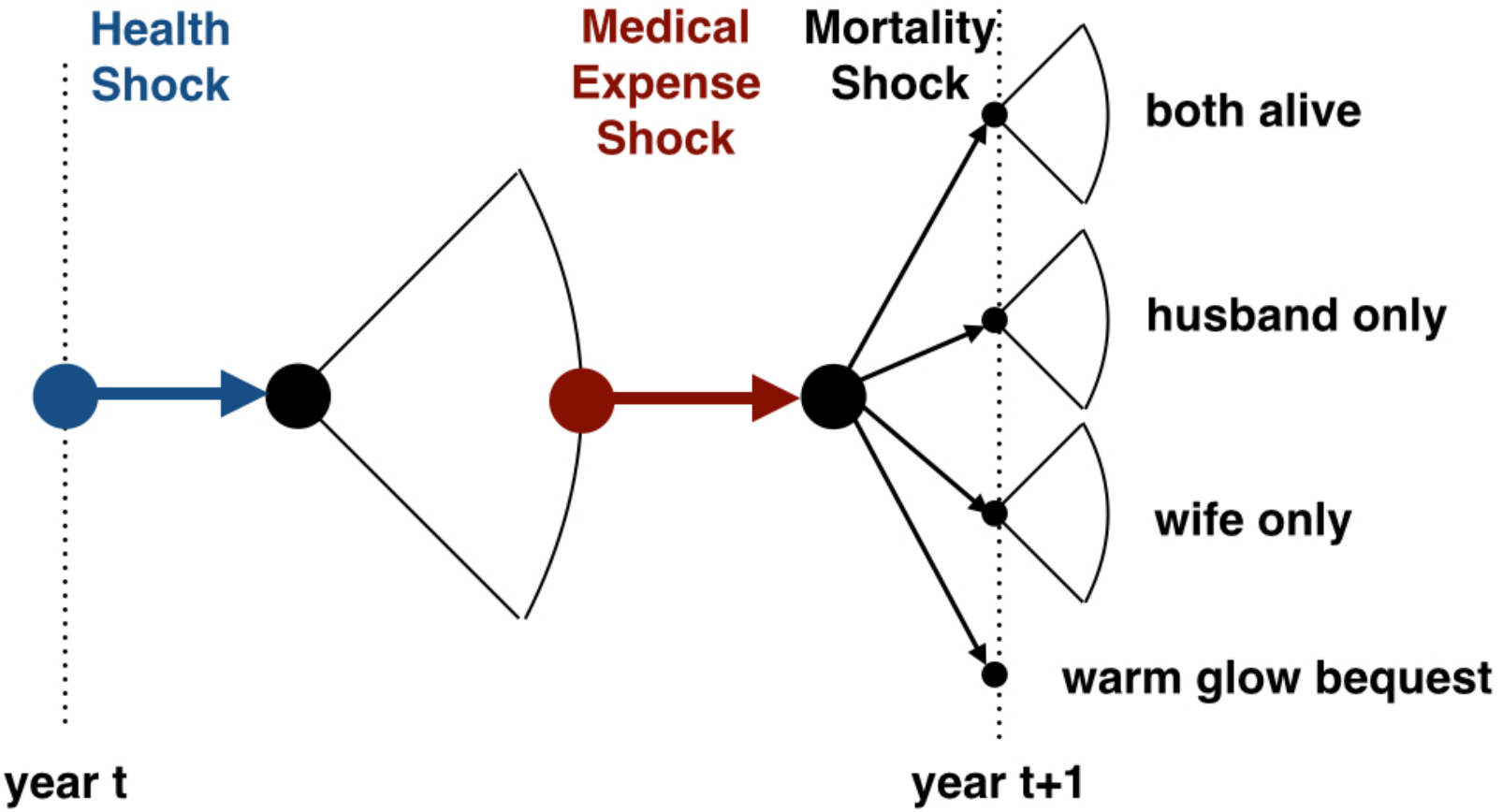


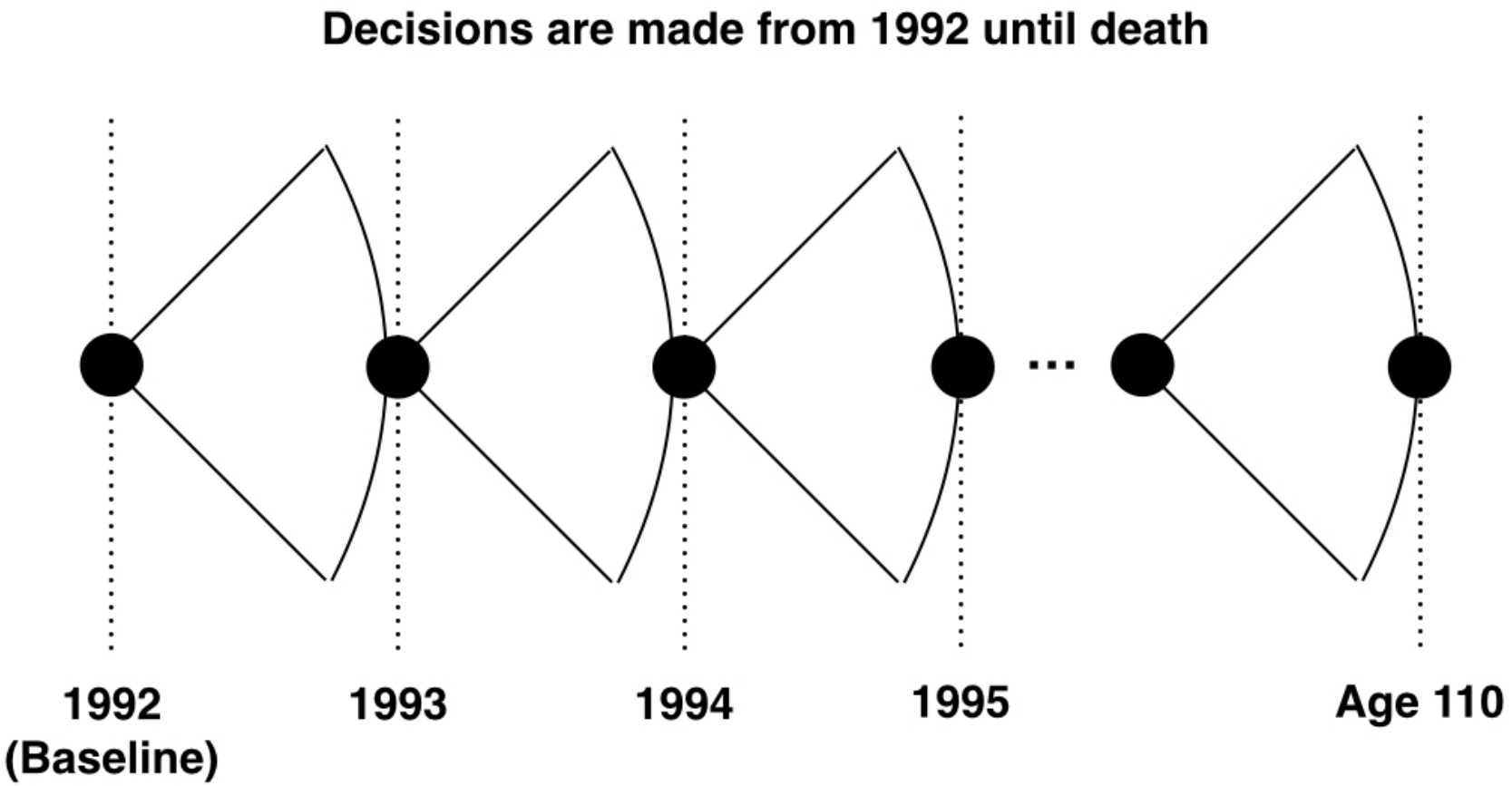
UNCERTAINTY



Uncertainty

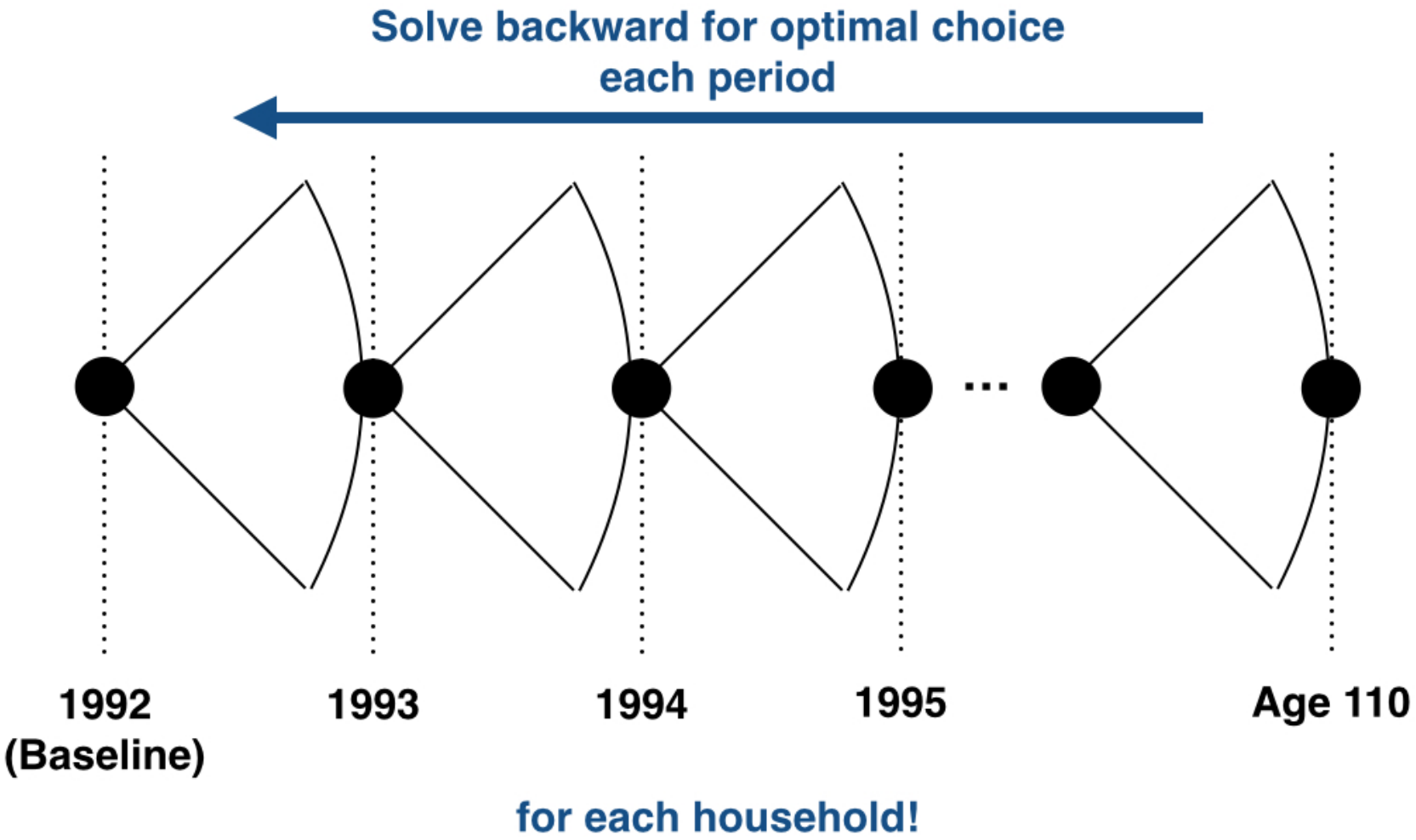


Dynamic Decisions



▶ Recursive Form

Dynamic Decisions



▶ Recursive Form

Data

Health and Retirement Study (1992 - 2010)

- 12,652 individuals and 4,844 married households in 1992
  - Reduced sample will be 1,728 married households
  - Elimination: Ever applied for disability & missing Pension or Social Security
  - **Estimation**: 948 households (born between 1931-35)
  - **Validation**: 1,081 households (born between 1936-41)

▸ Data Selection

- Collects Social Security earnings histories and W-2 earnings
- Collected Pension Plan information from employers
- Up to 10 interviews for a household

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▸ Data Selection

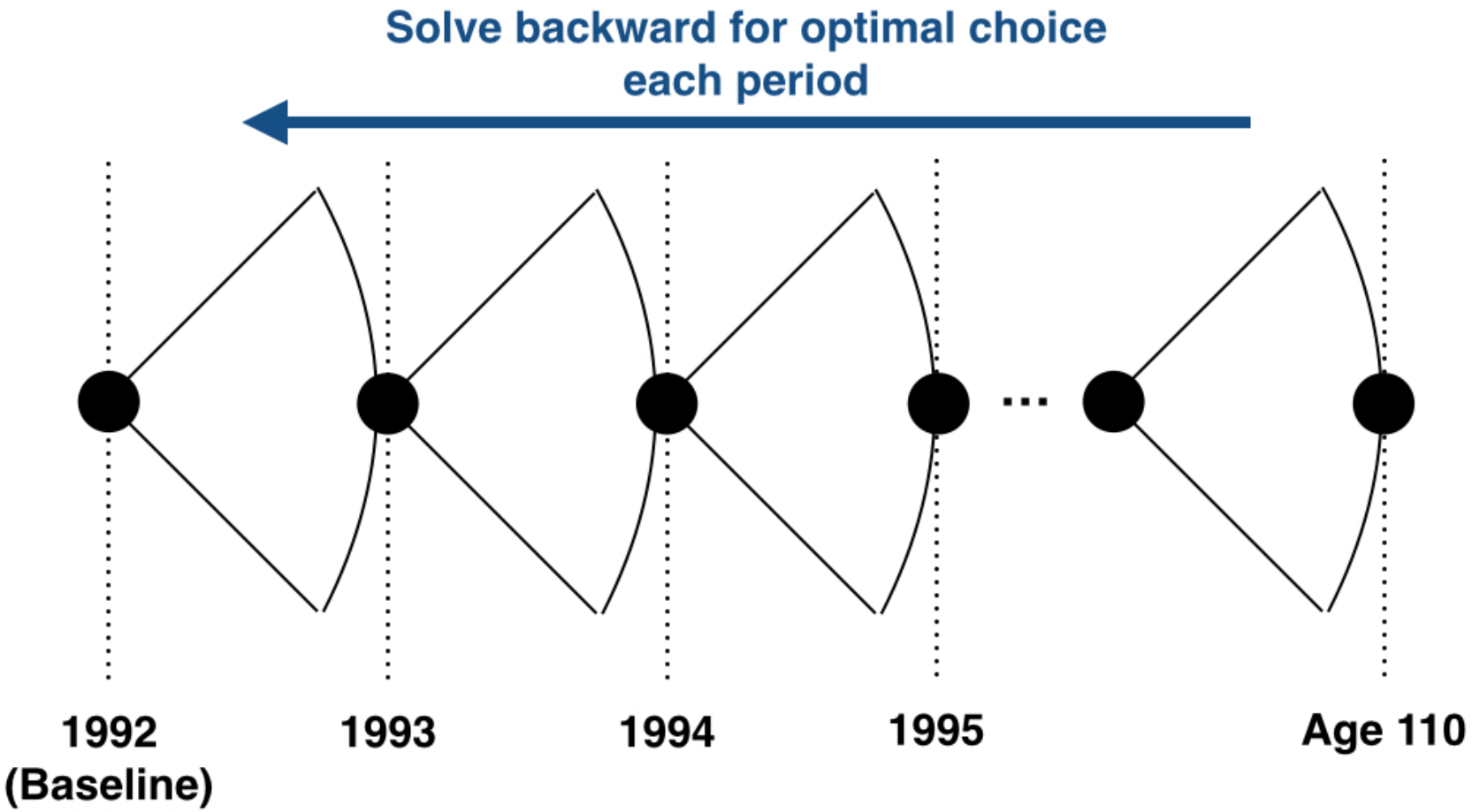
- Collects Social Security earnings histories and W-2 earnings
- Collected Pension Plan information from employers
  - Able to capture each household's unique incentives
  - Estimation procedure chosen to capture this richness
- Up to 10 interviews for a household

Data

Health and Retirement Study (1992 - 2010)

- 12,652 individuals and 4,844 married households in 1992
- Collects Social Security earnings histories and W-2 earnings
- Collected Pension Plan information from employers
- Up to 10 interviews for a household
  - Average of 14.95 annual observations
  - My sample uses a more extensive longitudinal history than most structural papers
    e.g. van der Klaauw and Wolpin (2008) use three waves
  - Most of the sample will be older than 70 by 2010

Solution Concept - Method of Simulated Moments



▸ Method of Simulated Moments

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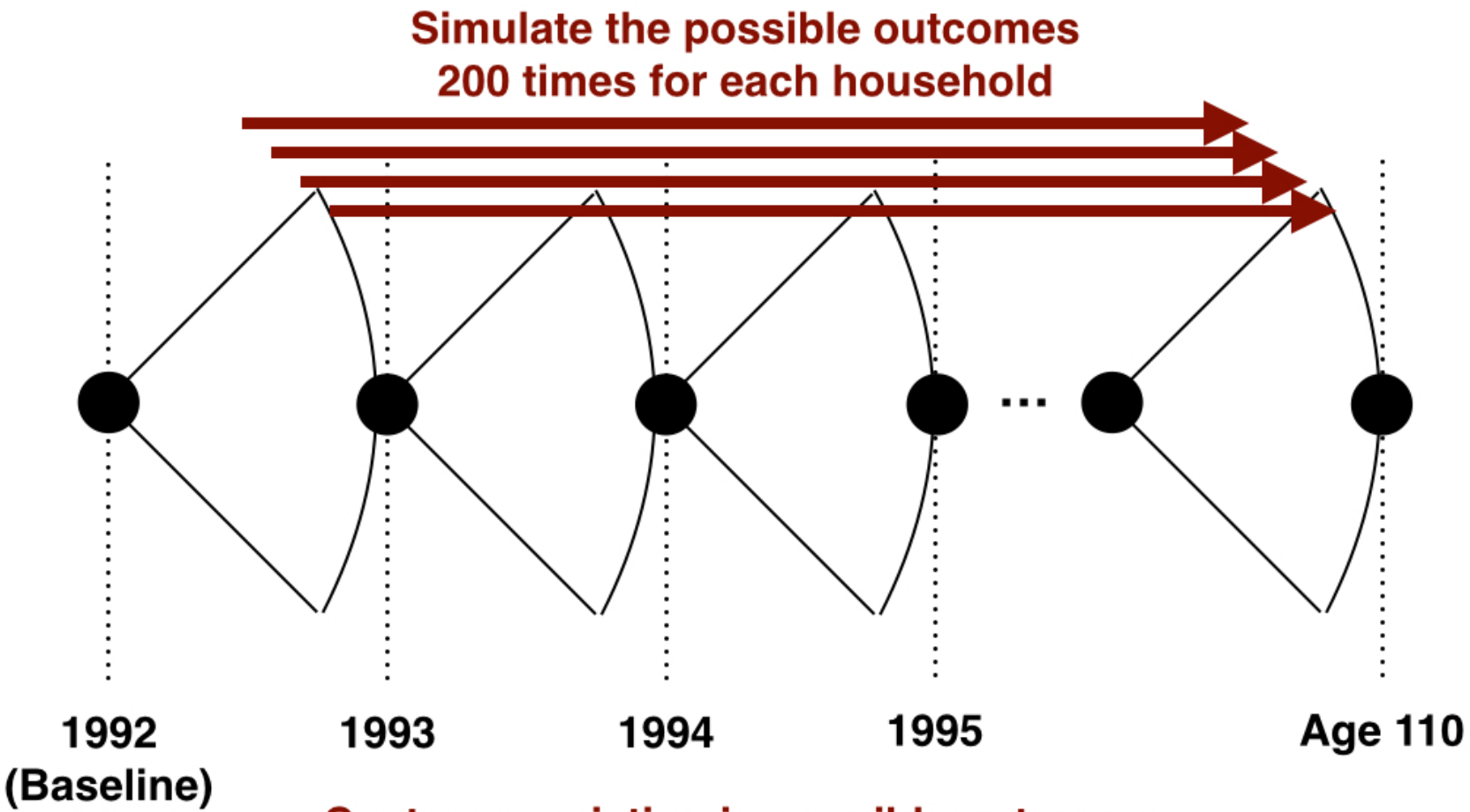
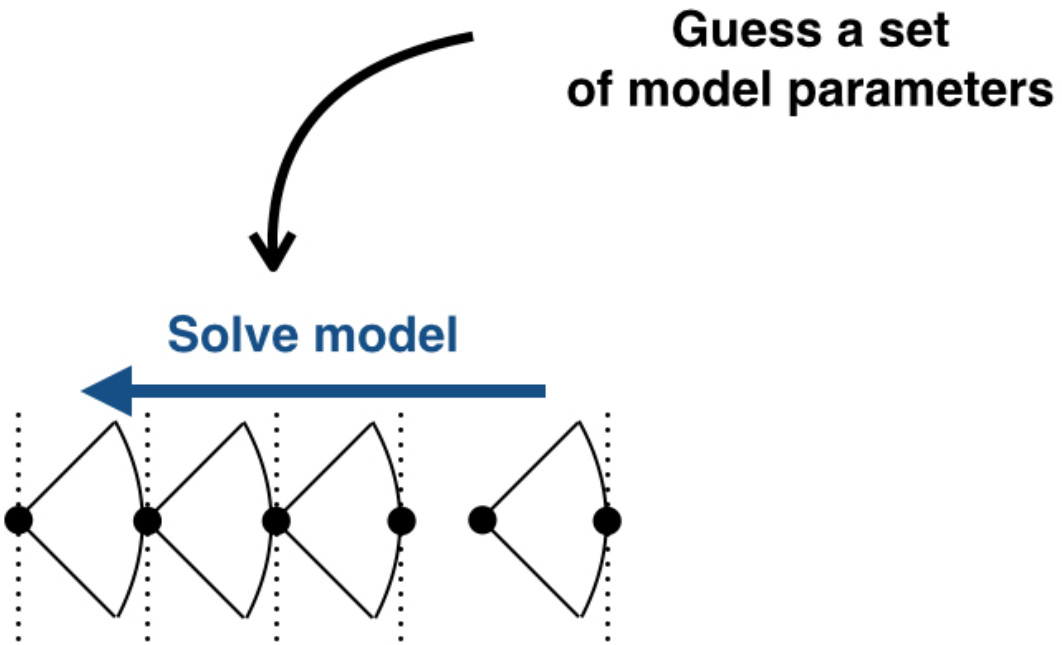


SOLUTION CONCEPT - METHOD OF SIMULATED MOMENTS

Guess a set of model parameters

Solution Concept - Method of Simulated Moments



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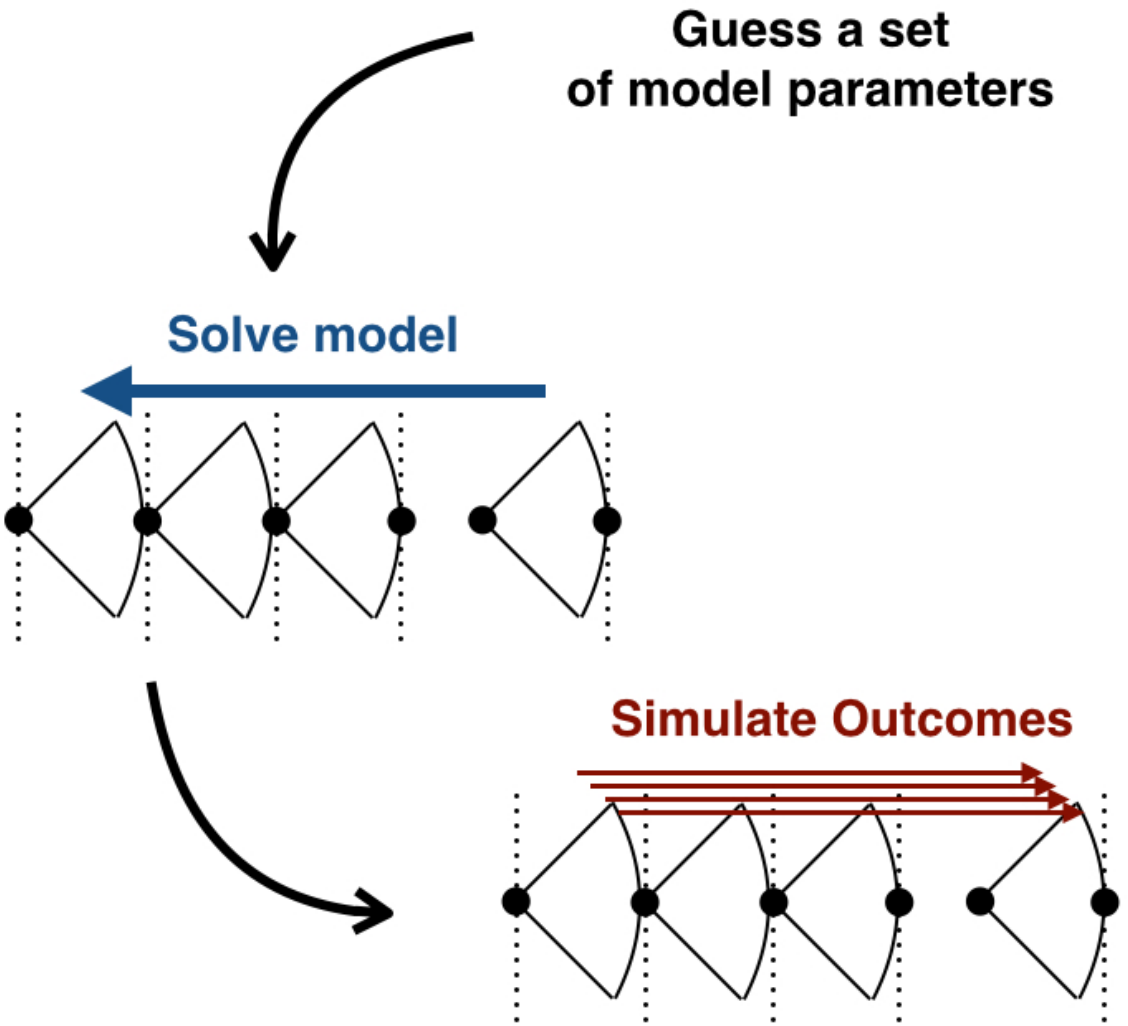

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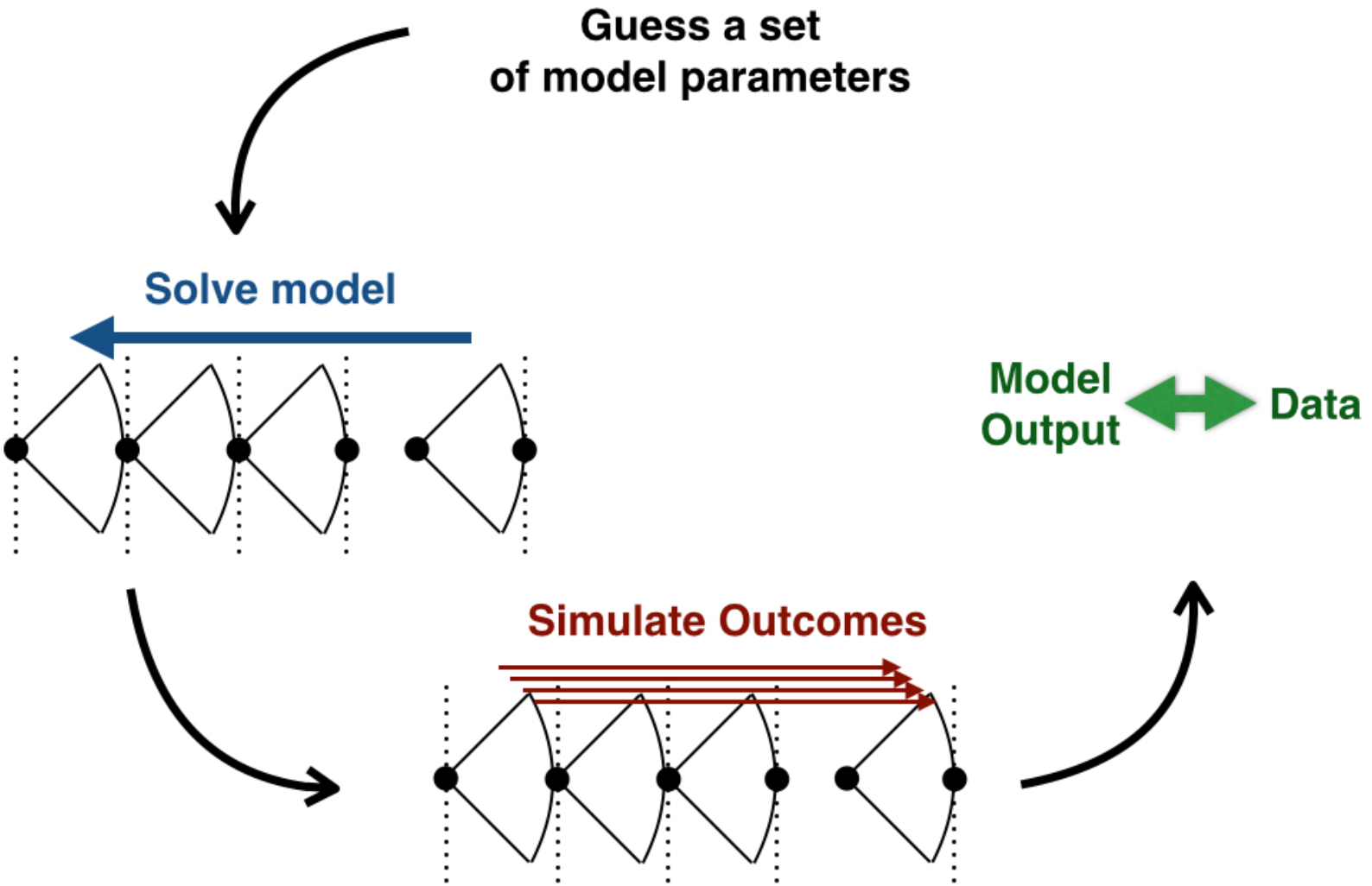

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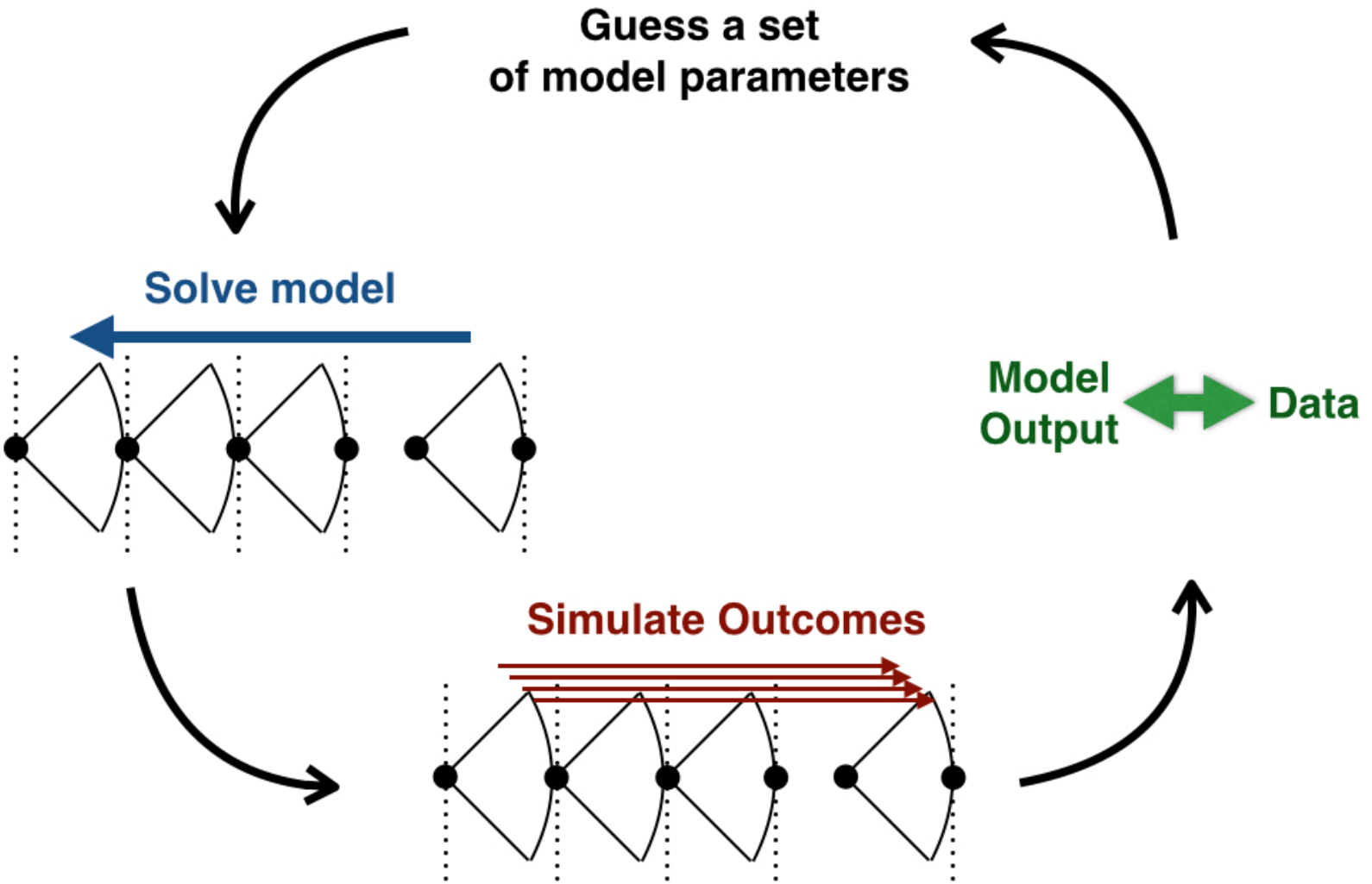


▸ Method of Simulated Moments

Model Fit

Baseline Results Model Fit

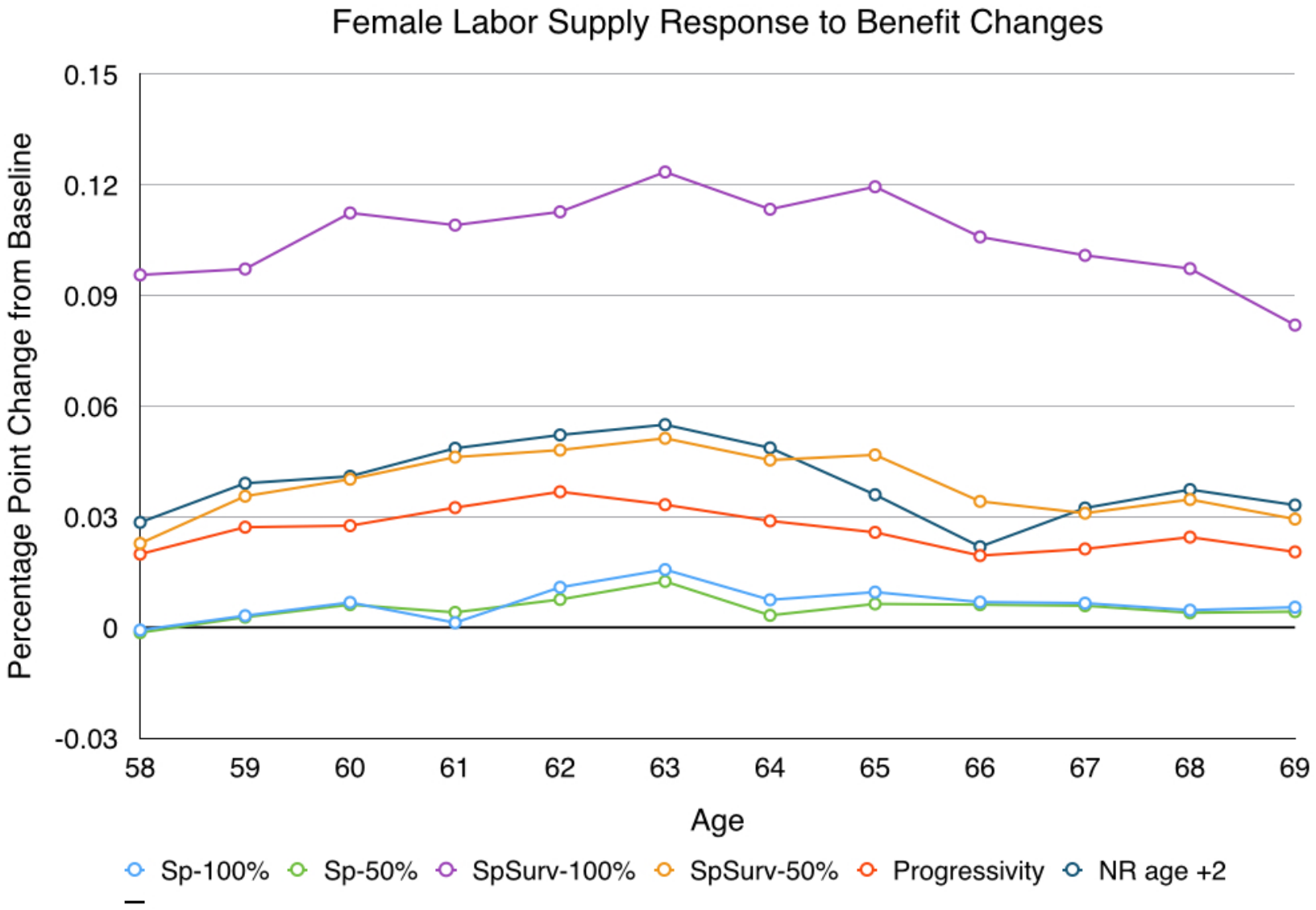
- The model can capture many of the important details of the data:
  - Asset accumulation with age
  - Decline in Labor force participation with age
  - Capture spikes in male labor force exit at 62 & 65
  - Capture significant benefit claiming at age 62
  - Capture joint retirement spike

EXPERIMENTS

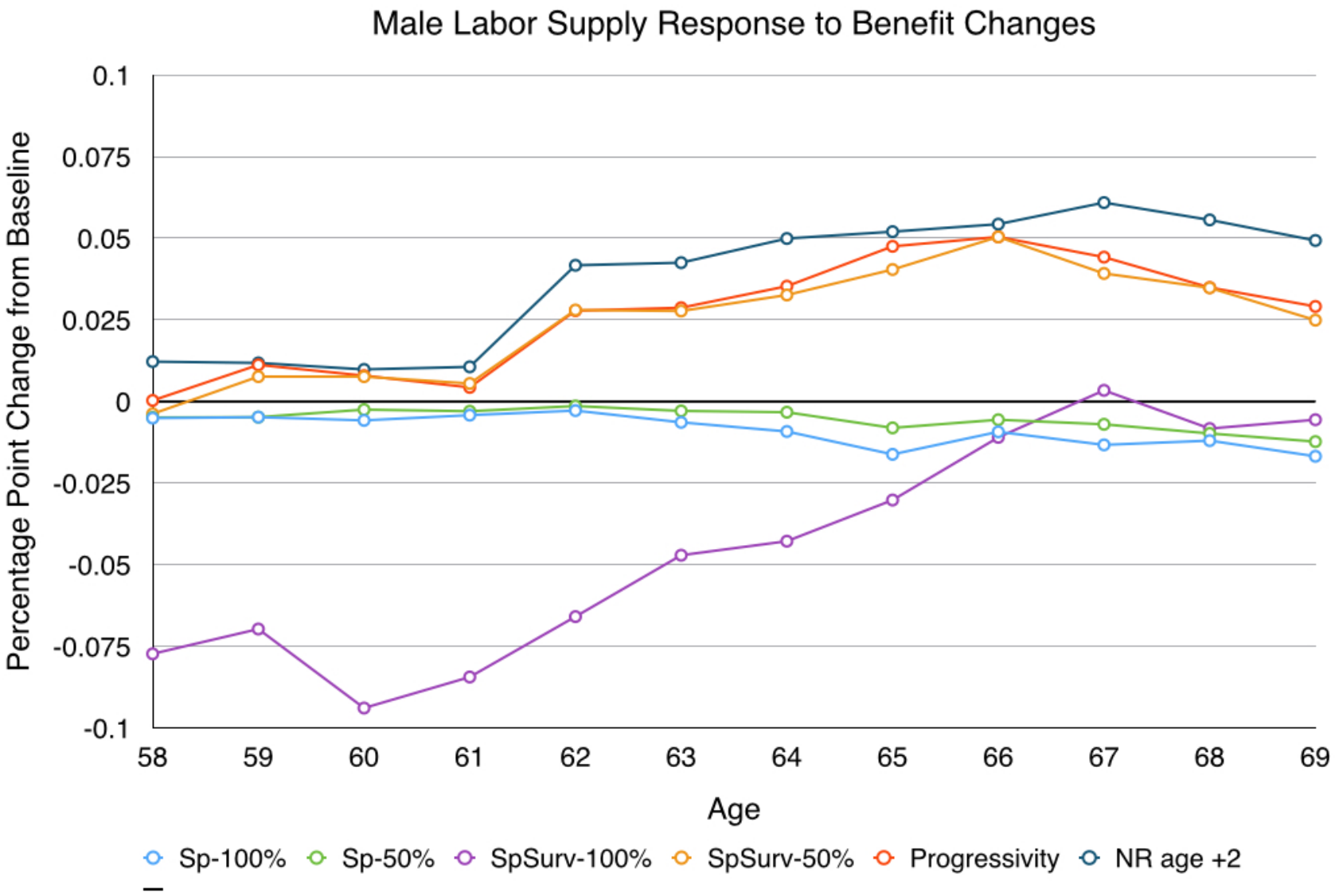
Conduct counterfactual experiments, such as:

1. Reduce or Eliminate the Spousal Benefit
2. Reduce or Eliminate Spouse and Survivor Benefits
3. Increase Progressivity of Social Security from 90%-32%-15% to 90%-22.4%-10.5%
   - One of the proposals from the 1994-96 Social Security Advisory Council ▸ Primary Benefit Example
4. Increase Normal Retirement Age by two years.

Effect on Women



Effect on Men



Conclusion

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- Findings:
  - **Spousal benefits:** Small effect (about $\frac{1}{2}$-2 months) on women $(\uparrow)$ *and men* $(\downarrow)$
  - **Spousal benefits:** Substitution effect of dominates the income effect for men.
  - **Spouse and survivor benefits:** Large, heterogenous participation effects!

WOMEN: $\uparrow$ 5-16 months
MEN: $\downarrow$ 6 months, when eliminated

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  - **Spouse and survivor benefits:** Large, heterogenous participation effects!

WOMEN: $\uparrow$ 5-16 months
MEN: $\downarrow$ 6 months, when eliminated,
$\uparrow$ 3 months when reduced 50%

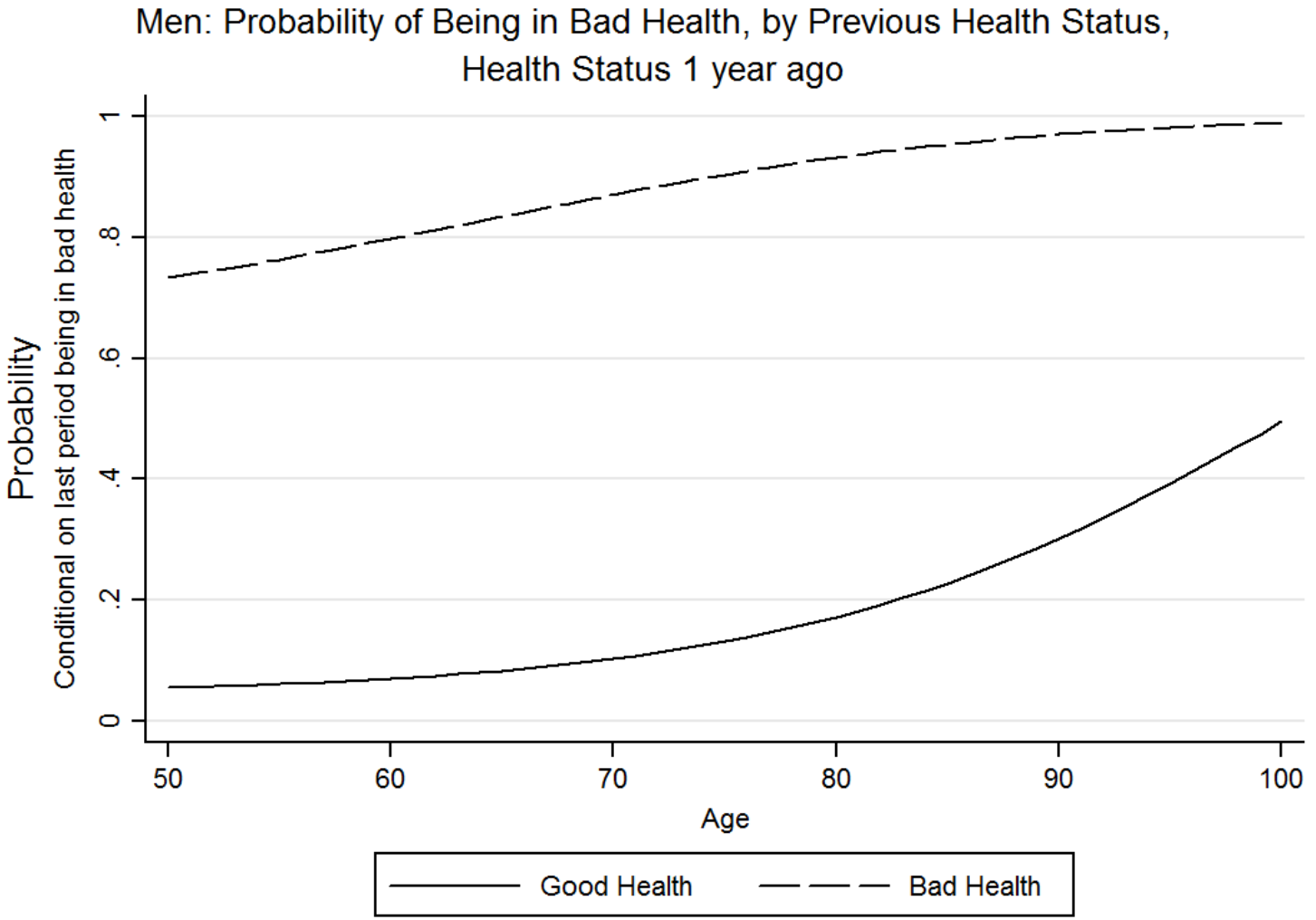
CONCLUSION

- This study answers the question:
  How responsive are household retirement decisions to spouse and survivor benefits?

- Findings:
  - **Heterogeneous effects** of these policies on labor force participation.
    - Up to 1.53 years in highest asset tertile $\Rightarrow$ Large annuity demand
  - **Claiming:** $\downarrow$ 3-5% at age 62
  - **Savings** to the Social Security Trust Fund:
    Reducing 50% = 74.1% savings from elimination

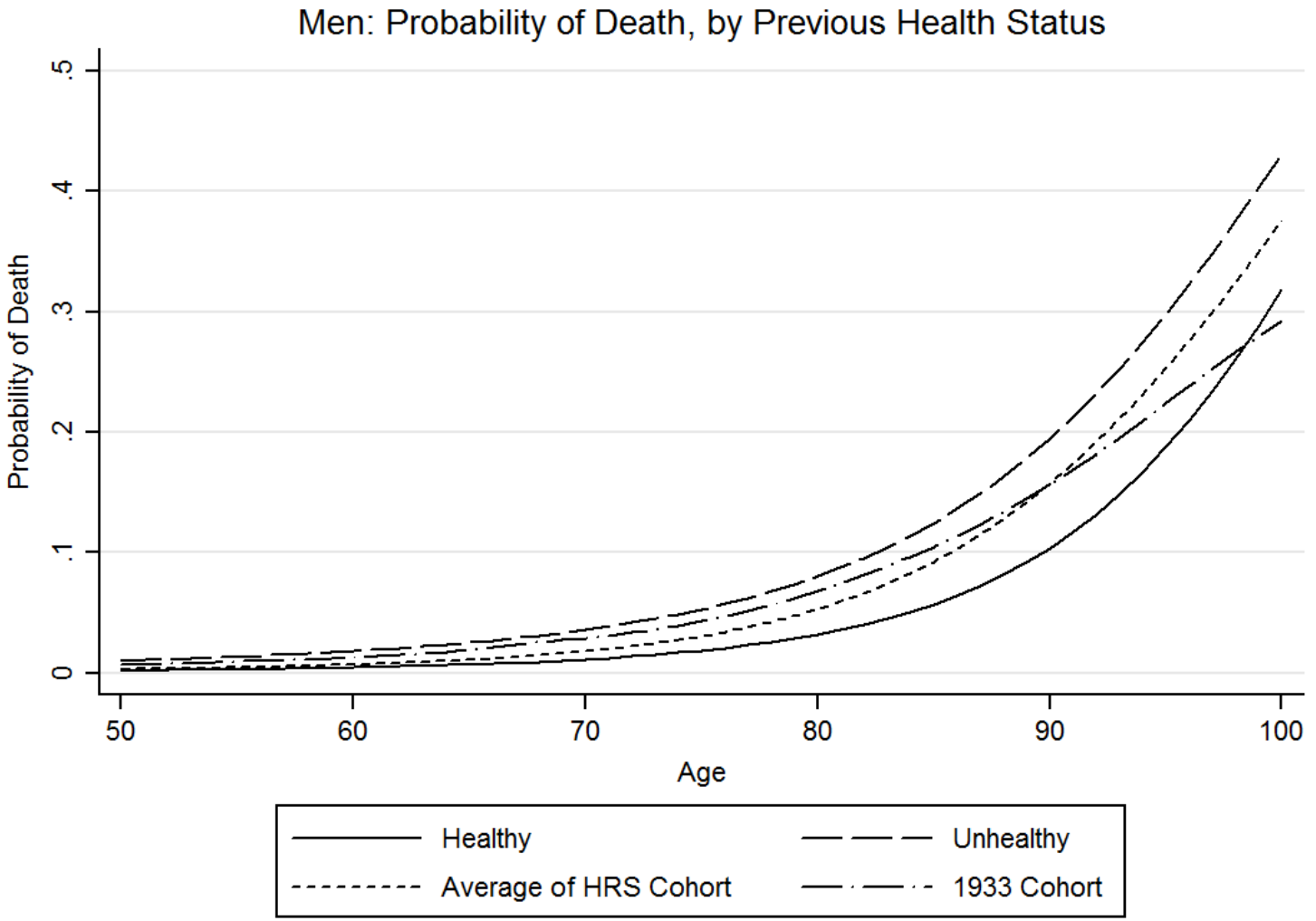
Thank you

Evolution of Health Status



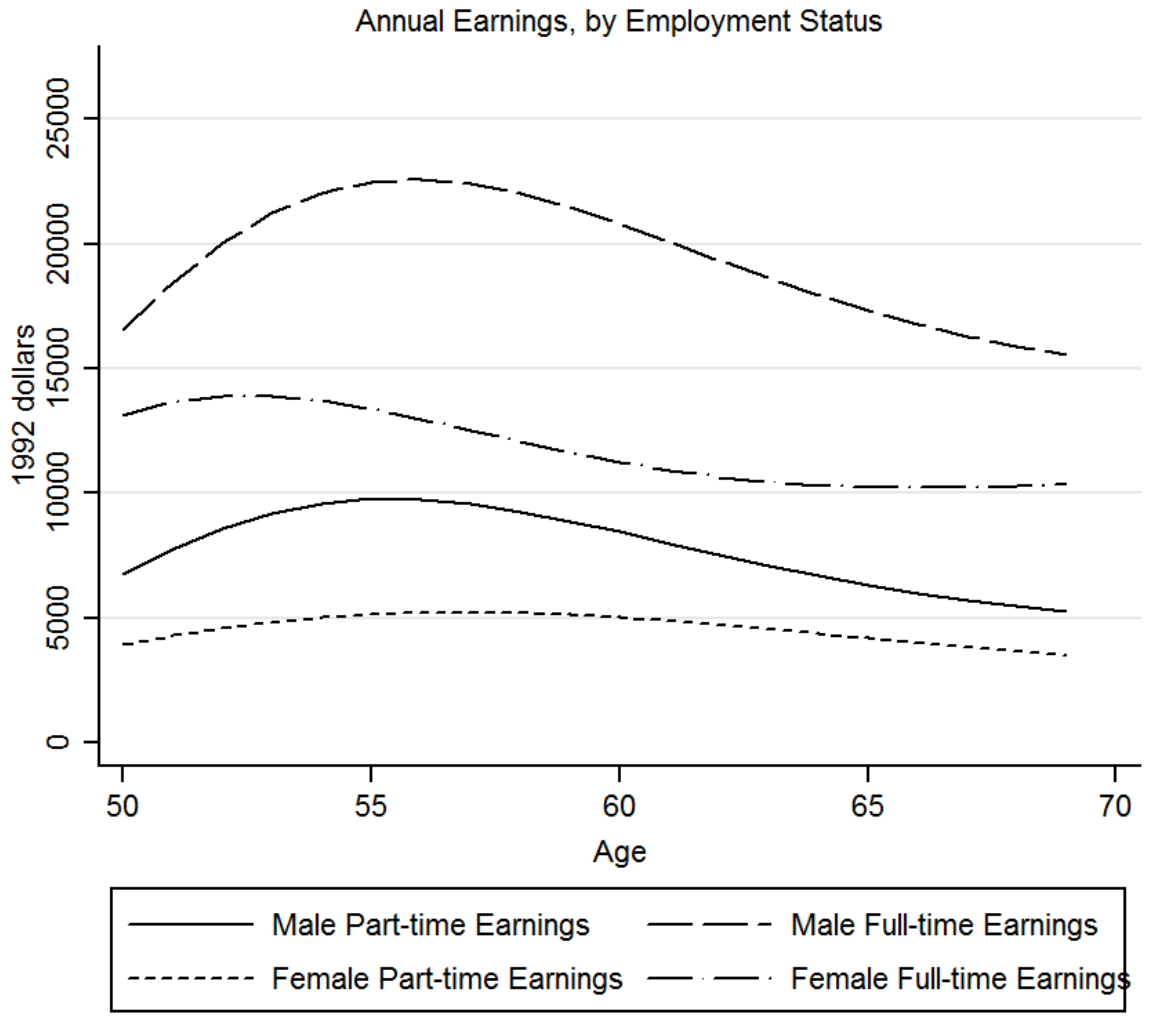
Back

Mortality Rates based on Health Status



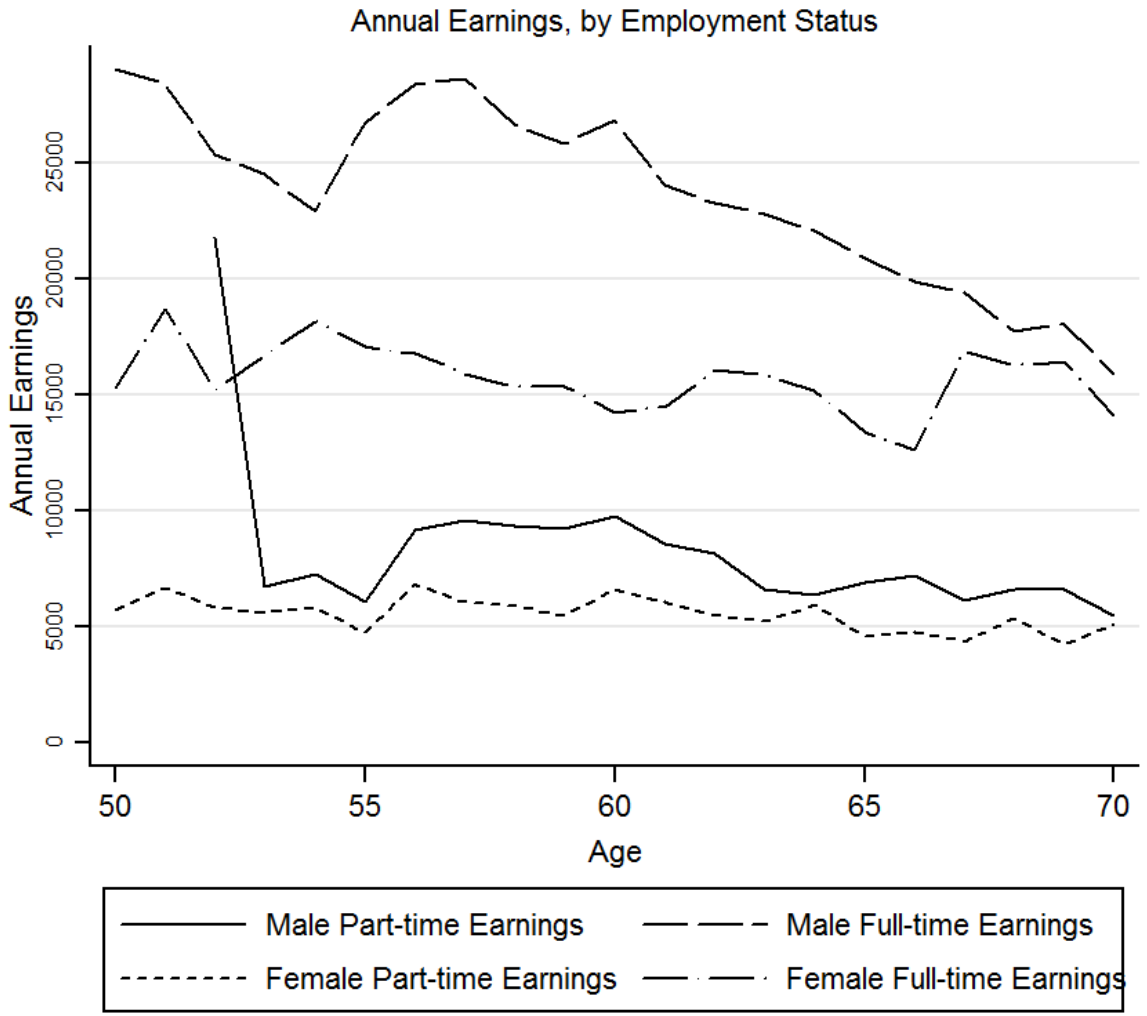
Back

Evolution of Non-tenured Wages



Back

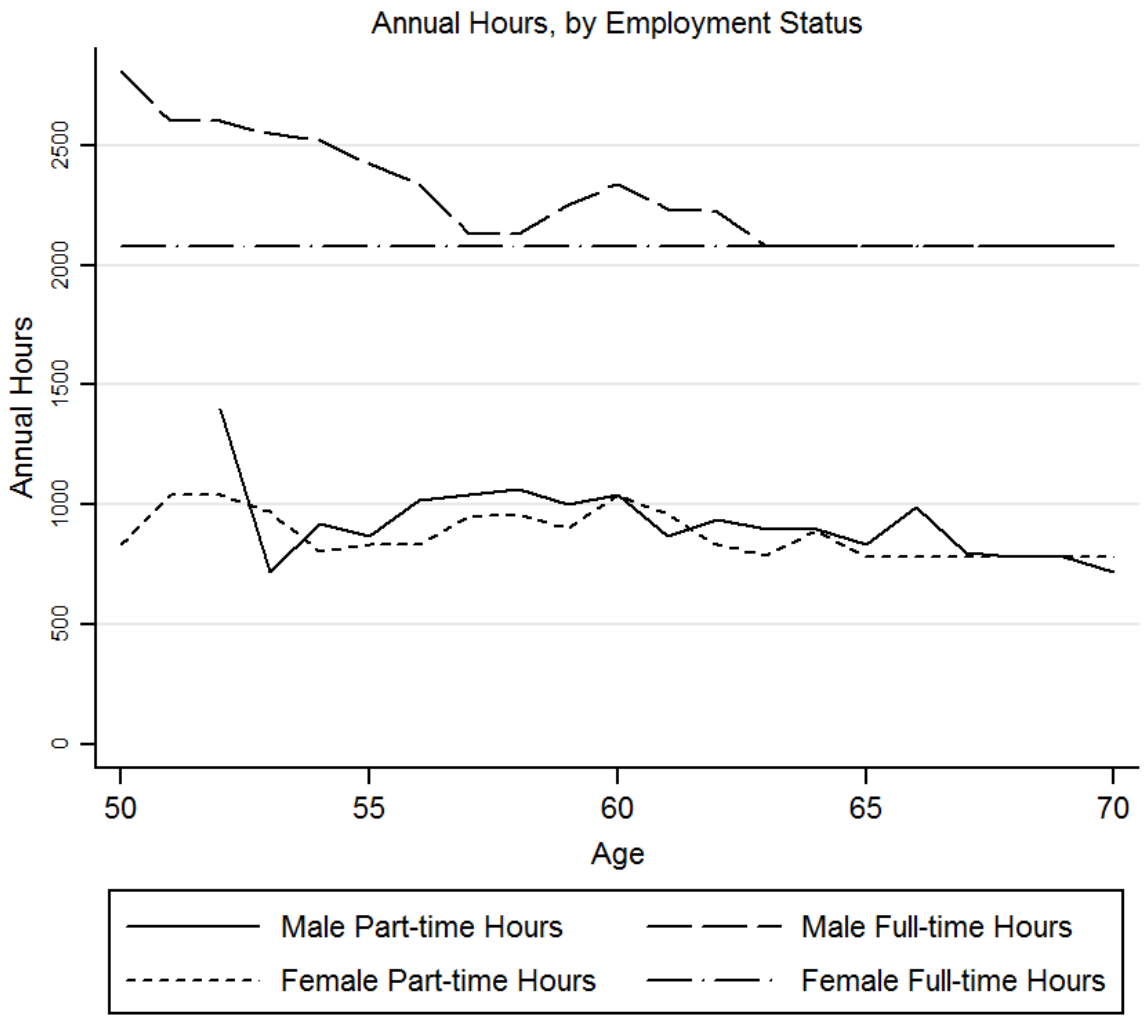
Median Annual Earnings, Data



*Non-baseline Jobs

Back

Median Annual Hours, Data



*Non-baseline Jobs

Back

Benefits of Delayed Claiming

Average Yearly Income over lifetime		Claim at 62	Claim at 70	Difference
(50% U.S. Avg. Wage)	$21,489.81	$705	$1,249	$544
(100% U.S. Avg. Wage)	$42,979.61	$1,106	$1,959	$853
(200% U.S. Avg. Wage)	$85,959.22	$1,593	$2,823	$1,230

Table : Approximate Social Security Benefit based on Claim Age

Back

Primary Benefit Example

- A worker, born in 1942, reaches age 60 in 2002.
- Average Indexed Monthly Earnings (AIME) =

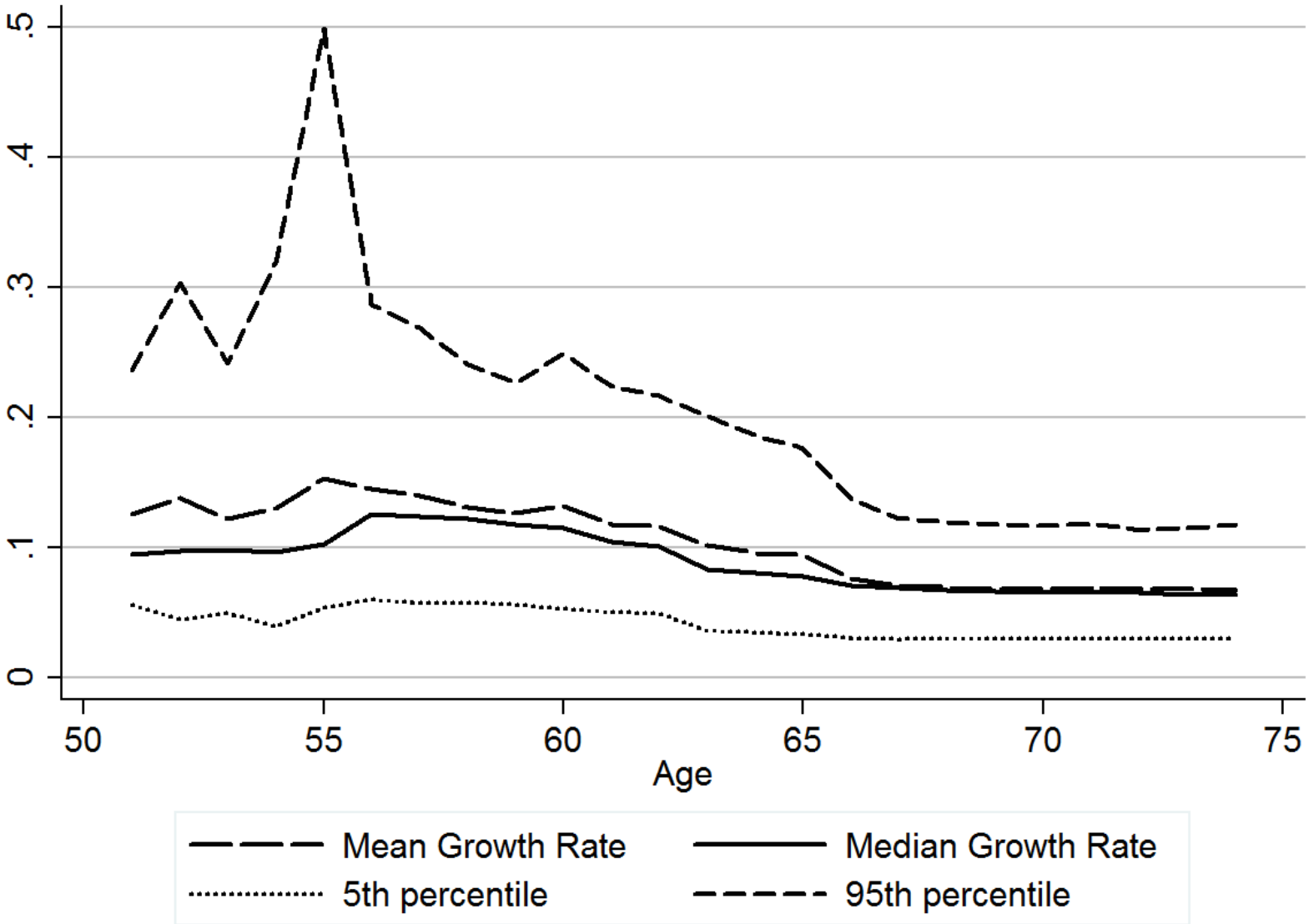
$$\frac{\sum \text{Best 35 years of Indexed Earnings}}{35 \text{ years } \times 12 \text{ months}} = \$6787$$

- Monthly benefit if worker retires at Normal Retirement age (65 and 10 months for this worker) then he receives:
  - 90% of his first \$612
  - 32% of his next $\$3,689 - \$612 = \$3,077$
  - 15% of the rest.
- Primary Insurance Amount (PIA) =

$$(\$612 \times 0.9) + (3077 \times 0.32) + (3098 \times 0.15) = \$2000$$

Back to Intro Back to Experiments

Pension Benefit Growth by Age



Back

Change in Average Male Labor Supply

Age	Baseline	Reduce Spousal Benefits		Reduce Sp. & Surv. Benefits		Increase SS
		by 100%	by 50%	by 100%	by 50%	Progressivity
58	0.8644	0.8593	0.8595	0.7871	0.8606	0.8647
59	0.8301	0.8253	0.8253	0.7604	0.8377	0.8413
60	0.7953	0.7895	0.7928	0.7014	0.8029	0.8032
61	0.7701	0.7659	0.7671	0.6857	0.7756	0.7744
62	0.6708	0.6680	0.6694	0.6049	0.6988	0.6986
63	0.6325	0.6261	0.6296	0.5854	0.6602	0.6612
64	0.5856	0.5764	0.5823	0.5428	0.6182	0.6209
65	0.5084	0.4922	0.5003	0.4782	0.5488	0.5559
66	0.4494	0.4401	0.4438	0.4384	0.4998	0.4998
67	0.3905	0.3772	0.3835	0.3939	0.4297	0.4347
68	0.3525	0.3405	0.3427	0.3442	0.3873	0.3874
69	0.3058	0.2890	0.2935	0.3002	0.3307	0.3349
Avg. Years Worked (58-69)	7.1554	7.0495	7.0897	6.6228	7.4501	7.477
Difference		-0.1059	-0.06570	-0.5326	0.2946	0.3216

Back

Change in Average Male Labor Supply

Age	Baseline	Reduce Spousal Benefits by 100%	Reduce Spousal Benefits by 50%	Reduce Sp. & Surv. Benefits by 100%	Reduce Sp. & Surv. Benefits by 50%	Increase SS Progressivity
Average Years Worked between 58-70 (Difference with Baseline)						
Type 0		0.0190	-0.0003	0.1194	0.0266	0.0164
Type 1		-0.0732	-0.0293	-0.8957	0.3484	0.3454
Type 2		-0.2063	-0.1204	-0.7149	0.1402	0.2499
Type 3		-0.1940	-0.1271	-0.9649	0.3952	0.4358
Type 4		-0.0669	-0.0534	0.0625	0.4639	0.4708
Asset Quantile 1		-0.0483	-0.0405	-0.9304	0.1564	0.1675
Asset Quantile 2		-0.2028	-0.1273	-0.4900	0.2961	0.4018
Asset Quantile 3		-0.0589	-0.0235	-0.2483	0.3723	0.3500

Back

Change in Average Male Claiming

Age	Reduce Spousal Benefits		Reduce Sp. & Surv. Benefits		Increase SS
	by 100%	by 50%	by 100%	by 50%	Progressivity
62	-0.0338	-0.0099	-0.0489	-0.0665	-0.0532
63	-0.0094	-0.0104	-0.0318	-0.0188	-0.0088
64	-0.0062	0.0015	-0.0193	-0.0084	-0.0067
65	0.0186	0.0124	0.0481	0.0572	0.0478
66	0.0024	-0.0014	0.0096	0.0125	0.0107
67	0.0064	0.0065	0.0152	0.0154	0.0037
68	0.0015	0.0015	0.0056	0.0067	0.0051
69	-0.0008	-0.0003	0.0008	0.0017	0.0009
70	0.0213	0.00010	0.0208	0.00030	0.0003

Back

Change in Average Female Labor Supply

Age	Baseline	Reduce Spouse Benefits		Reduce Sp. & Surv. Benefits		Increase SS
		by 100%	by 50%	by 100%	by 50%	Progressivity
58	0.5943	0.5936	0.5929	0.6899	0.6171	0.6142
59	0.5468	0.55	0.5496	0.644	0.5824	0.574
60	0.4943	0.5011	0.5005	0.6067	0.5345	0.5219
61	0.4436	0.4449	0.4477	0.5527	0.4898	0.4761
62	0.3731	0.384	0.3807	0.4858	0.4212	0.4099
63	0.313	0.3287	0.3255	0.4365	0.3643	0.3463
64	0.2723	0.2798	0.2756	0.3857	0.3177	0.3012
65	0.2405	0.2501	0.2469	0.36	0.2873	0.2663
66	0.2192	0.2261	0.2254	0.3251	0.2534	0.2387
67	0.188	0.1946	0.1939	0.2889	0.219	0.2093
68	0.1684	0.1731	0.1724	0.2657	0.2031	0.1929
69	0.1462	0.1517	0.1505	0.2282	0.1756	0.1667
Avg. Years Worked (58-69)	3.9997	4.0776	4.0616	5.2693	4.4653	4.3174
Difference		0.0779	0.0619	1.2697	0.4657	0.3178

Back

Change in Average Female Labor Supply

Age	Baseline	Reduce Spousal Benefits by 100%	Reduce Spousal Benefits by 50%	Reduce Sp. & Surv. Benefits by 100%	Reduce Sp. & Surv. Benefits by 50%	Increase SS Progressivity
Average Years Worked between 58-69 (Difference with Baseline)						
Type 0		-0.0059	-0.00020	1.5332	0.0424	-0.0022
Type 1		0.1008	0.0765	1.6577	0.6056	0.3958
Type 2		0.0772	0.056	0.5913	0.4124	0.2918
Type 3		0.1472	0.1128	1.8492	0.6341	0.4198
Type 4		0.0565	0.0549	0.678	0.5245	0.4059
Asset Quantile 1		0.1338	0.1014	0.9549	0.4602	0.3060
Asset Quantile 2		0.1015	0.0820	1.2185	0.6398	0.4332
Asset Quantile 3		0.0088	0.0091	1.5345	0.1991	0.1385

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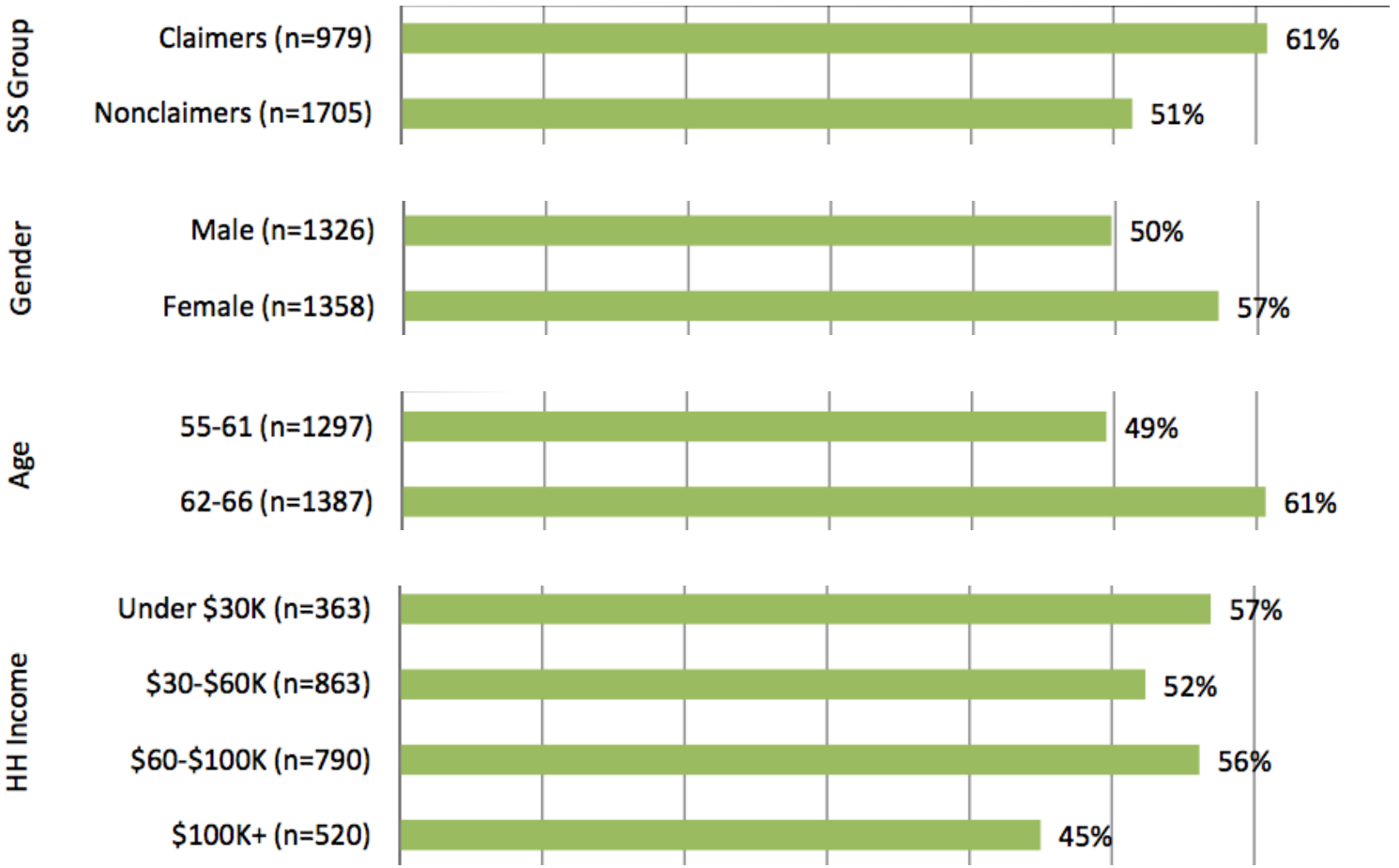
Change in Average Female Claiming

Age	Reduce Spouse Benefits		Reduce Sp. & Surv. Benefits		Increase SS
	by 100%	by 50%	by 100%	by 50%	Progressivity
62	-0.0526	-0.0073	-0.057	-0.023	-0.0166
63	0.0014	-0.0003	0.0119	0.0099	0.0073
64	0.0033	0.0031	0.0063	0.0041	0.0007
65	0.0067	0.0044	0.0091	0.012	0.0069
66	0.0013	0	0.0035	0.0013	0.0004
67	0.0011	0	0.0041	0.0017	0.0009
68	0.0008	0	0.0046	-0.0004	-0.0005
69	0.0007	0	0.0048	0.0009	0.0006
70	0.0373	0	0.0127	-0.0064	0.0004

Back

Knowledge of Spouse Eligibility to Collect Social Security Benefits



Note: From AARP study: Assessing Current and Future Beneficiaries' Knowledge of Social Security Benefits, 2011. Reported results based on focus groups of individuals from a suburb of Chicago, Illinois and Baltimore, Maryland. This table is restricted to only individuals who are married, widowed, divorced, or separated. This study also shows that 97% of individuals are aware of the survivor benefit.

Back

Knowledge of Spousal benefits by Income, Work history, and Sex (conditional on not claiming)

Household Income	Men	Women
$x < \$30,000$	42%	64%
$\$30,000 \leq x < \$60,000$	46%	54%
$\$60,000 \leq x < \$100,000$	59%	49%
$\$100,000 \leq x$	40%	50%
Respondent has less than 20 work years	.	62%
Respondent has at least 20 work years	48%	53%
Spouse with less than 20 work years	60%	.
Spouse with at least 20 work years	46%	54%

Note: Author's Calculations using data from the AARP study: Assessing Current and Future Beneficiaries' Knowledge of Social Security Benefits, 2011. Reported results based on focus groups of individuals from a suburb of Chicago, Illinois and Baltimore, Maryland. This table is restricted to only individuals who are married, widowed, divorced, or separated. This study also shows that 97% of individuals are aware of the survivor benefit.

Back

Expected Change in Spousal Benefit Eligibility by Cohort

Table 7. *Characteristics for Individuals When First Claimed Benefits, MINT by Birth Cohort*

	Depression 1931-1935	Depression 1936-1941	War Baby	Early Boomers	Middle Boomers	Late Boomers	Generation Xers
Benefit type (all women)							
Retired worker	44.20 %	55.30 %	59.47 %	67.91 %	70.50 %	71.77 %	75.17 %
Dually entitled	31.31	28.34	27.91	23.92	21.62	20.57	17.73
Auxiliary only	24.50	16.35	12.62	8.16	7.87	7.66	7.10

Note: From Wu, Karamcheva, Munnell, and Purcell. CRR Working Paper 2013-16, Table 7. Projections based on The Urban Institute's Modeling Income in the Near Term (MINT) simulation program produced for the Social Security Administration.

Back

Different Approaches

Back

	Solves Model for:	
	Representative Individual	Each Household
Wages	Permit Wage Uncertainty (most)	Fixed Wage Paths (Gustman & Steinmeier, this paper)
Social Security	Simplified Transition Function (most)	Individual Earnings Histories (Gustman & Steinmeier, this paper)
Pensions	Based on Social Security (French & Jones, 2011)	Individual's Employer Reports (Gustman & Steinmeier, this paper)
Medical Expenses & Health Insurance	Rust & Phelan, 1997 Blau & Gilleskie, 2006	(this paper)
Bequests	Denardi, French, & Jones, 2011	(this paper)
Consumption Floors	Hubbard, Skinner, & Zeldes, 1995	(this paper)
Preference Heterogeneity	van der Klaauw & Wolpin, 2008 French & Jones, 2011	(this paper)

Different Approaches

Back

	This paper	French & Jones 2011	van der Klaauw & Wolpin 2008	Gustman & Steinmeier, 1986-?	Blau & Gilleskie, 2006
Estimation Method	MSM	MSM	II	MSM	ML
Solve Individually	X			X	
Interview waves used in sample	10	8	3	5-6	4
Moments Matched on Asset Levels	X	X	X		
Include Married Households	X		X	$\frac{1}{2}$	X
Individuals Choose when to Claim Benefits	X	X			
Individuals face uncertain Medical Expenses	X	X			X
Wage Uncertainty		X	X		X
Job Search			X		
Preference Heterogeneity	Fixed, by Own & Joint Leisure Pref.	Predicted, by Own Leisure Pref.	Predicted, by Sex	Based on Self-Rpt Retirement	None

What happens when we die?

Back to Preferences

When one member of the household dies, I must make an assumption for what happens to the household utility.

- **Economies of scale:**
  $1 of consumption in a two person household = $1.50 of consumption in a widowed household
  i.e. $C_{single} = 1.5 \times C_{married}$
- **Consumption Floor:** follows a similar rule
- **Preferences:**
  - $U\left(C_{h,t}, L_{W,t}\right) = \frac{C_{h(single),t}^{1-\alpha_\tau} - 1}{1-\alpha_\tau} + \frac{D_{W,t} L_{W,t}^{1-\gamma_{W,\tau}} - 1}{1-\gamma_{W,\tau}}$
  - $\beta_{H,SP,\tau(s)} \mathbf{1}\left[\text{Wife works}\right] + \beta_{H,SFT,\tau(s)} \mathbf{1}\left[\text{Wife works full-time}\right] = 0$
  - Preference Type remains unchanged
- **Pensions and Social Security:** The deceased's DB pension plan ends, and Social Security converts to a widow benefit (if applicable)

Method of Simulated Moments

Back to MSM

I use a two-step Method of Simulated Moment (MSM) procedure (Gourchinas & Parker, 2002; French, 2005)

- First step (χ):
  - The earnings profiles and health & mortality transitions are estimated from the data
  - Other parameters are calibrated:
    $r = 4\%$,
    Leisure Endowment $(L) = 4$,
    Economies of Scale: $C_{single} = 1.5 \times C_{married}$

Method of Simulated Moments

Back to MSM

I use a two-step Method of Simulated Moment (MSM) procedure (Gourchinas & Parker, 2002; French, 2005)

- Second step:
  Given $\hat{\chi}$, preference parameters $\theta = \{\alpha_\tau, \delta_\tau, \kappa, \theta_B, c_{min}, \gamma_{i,\tau}, \beta_{i,\tau(s)}, \beta_{i,age}, \beta_{i,health}, \beta_{i,SP,\tau(s)}, \beta_{i,SFT,\tau(s)}\}$, are estimated, using MSM:
  - solve for each household's optimal set of decision rules, by backward recursion, then
  - simulate 200 life cycle histories per household for random realizations of health, mortality, and medical expenses (189,600 life cycle profiles), then
  - match moments from the simulated life cycles with moments from the data.

Data

Back

- Data comes from the Health and Retirement Study (HRS), 1992-2010.
- From the original HRS sample of 4,844 married households at baseline, I keep households that
  1. are not missing spousal information in wave 1 [4,584],
  2. are not missing information on their labor force participation or birth year in wave 1 [4,575],
  3. never apply for Social Security disability benefits [3,300],
  4. are without missing pension or Social Security information [2,197],
  5. have a spousal age difference of less than 10 years [1,943], and
  6. are not missing information on individual earnings if household members report working [1,898].
  7. have no more than one pension [1,728].
- After this sample selection, I am left with 1,728 married households.
- I will use only households with at least one member born between 1931-35 for main analysis: 948 married households.
- I use the rest of the sample for a validation test.

Health and Mortality

Back

- Individuals can take on one of two state possible health states:
  - Good (self reported in Excellent, Very good, or Good health)
  - Bad (self reported in Fair or Poor health)

- Construct transition probabilities using a logit model, where
  - Probability of transitioning health states is a function of previous health status, gender, and age Health
  - Probability of survival is a function of previous health status, gender, and age Mortality

Health Insurance and Medical Expenses

Back

Households can have one of three types of health insurance (HI) through their baseline job:

- Retiree - if he or she leaves baseline job, then HI is preserved
- Tied - if he or she leaves baseline job, then HI is lost
- None

Medical expenses take on a log-normal distribution

- Stochastic and transitory
  (not persistent like in French and Jones, 2011)
- Depend on age, health, health insurance, and work status.

Bequests

Back

As in De Nardi (2004), households value their bequests from assets, A_T, in the last period T according to the function

$$b(A_t) = \frac{\theta_B}{1-\alpha_\tau} \cdot (A_T + \kappa)^{1-\alpha_\tau}$$

where κ is a bequest shifter and θ_B is a measure of bequest intensity.

Annual Earnings

Back

- Earnings are known to the individual (i.e. there is no wage uncertainty)
- Baseline Jobs:
  - Assume 0% nominal wage growth - consistent with data
  - Must be fixed in order to use pension calculator
- Non-baseline Jobs (NB):
  - Every individual, regardless of baseline is eligible for a full-time (FT) or part-time (PT) job
  - FT-NB earnings: determined from a fixed-effect regression of log wages on a quartic in age and quadratic in tenure, conditional on FT-NB
  - PT-NB earnings: determined from a fixed-effect regression of log wages on a quartic in age, conditional on PT-NB.

Mean Annual Earnings Profiles

Baseline Results

Back

Parameters based on type

Preference Type (Work,Spouse)	Type 0 (Out)	Type 1 (Low , Low)	Type 2 (High , Low)	Type 3 (Low , High)	Type 4 (High , High)
α_τ Consumption	3.1480 (0.0924)	2.8592 (0.0085)	2.8193 (0.0096)	2.9502 (0.0102)	2.8736 (0.0082)
δ_τ Discount Rate	0.9072 (0.0205)	0.8903 (0.0079)	0.9242 (0.0095)	0.9414 (0.0089)	0.9013 (0.0083)
$\gamma_{H,\tau}$ Husband's Leisure	1.7676 (0.1173)	1.5762 (0.0521)	1.6042 (0.0666)	1.7080 (0.0492)	1.5685 (0.0440)
$\gamma_{W,\tau}$ Wife's Leisure	1.2338 (0.0913)	1.0051 (0.0682)	1.0065 (0.0246)	1.0595 (0.0343)	1.1624 (0.0518)

Baseline Results

Back

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Baseline Results

Back

Parameters based on type

	Preference Type (Work,Spouse)	Type 0 (Out)	Type 1 (Low , Low)	Type 2 (High , Low)	Type 3 (Low , High)	Type 4 (High , High)
Husband	$\beta_{H,\tau(s)}$ Leisure Weight	-18.8057 (0.6725)	-19.8134 (0.1032)		-19.9252 (0.1237)	
	$\beta_{W,\tau(s)}$ Leisure Weight	-19.7558 (1.4704)	-19.7589 (0.1018)		-20.2805 (0.1207)	
	$\beta_{H,SP,\tau(s)}$ Participation	-0.0910 (0.8783)	-0.0203 (0.0015)		-0.0201 (0.0010)	
	$\beta_{H,SFT,\tau(s)}$ Full-time work	-0.0661 (0.7060)	-0.1411 (0.0089)		-0.0817 (0.0039)	
Wife	$\beta_{W,SP,\tau(s)}$ Participation	-0.0698 (0.0023)	-0.0055 (0.0005)		-0.0222 (0.0014)	
	$\beta_{W,SFT,\tau(s)}$ Full-time work	-0.0845 (0.2974)	-0.0857 (0.0071)		-0.1224 (0.0042)	

Baseline Results

Back

Parameters common to all types

$\beta_{H,age}$ Husband's Age-60	0.1852 (0.0039)	κ Bequest Shifter	297,050 (3464.7198)
$\beta_{W,age}$ Wife's Age-60	0.1904 (0.0046)	θ_B Bequest intensity	114,364 (2708.1382)
$\beta_{H,health}$ Husband's Health	1.1037 (0.0262)		
$\beta_{W,health}$ Wife's Health	0.9233 (0.0367)	c_{min} Consumption Floor	5,667 (70.5925)

Recall,

$$D_{H,t} = exp\Big(\beta_{H,\tau(s)} + \beta_{H,age} age_{H,t} + \beta_{H,health} health_{H,t} + \beta_{H,SP,\tau(s)} \mathbf{1}\left[\text{Wife works}\right] + \beta_{H,SFT,\tau(s)} \mathbf{1}\left[\text{Wife works full-time}\right]\Big)$$

Baseline Results

Back

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$\beta_{H,age}$ Husband's Age-60	0.1852 (0.0039)	κ Bequest Shifter	297,050 (3464.7198)
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- $\beta_{i,age} > 0 \Rightarrow$ As i ages, he or she substitutes towards more leisure
- $\beta_{i,health} > 0 \Rightarrow$ If i falls into poor health, he or she substitutes towards more leisure

Baseline Results

Back

Parameters common to all types

$\beta_{H,age}$ Husband's Age-60	0.1852 (0.0039)	κ Bequest Shifter	297,050 (3464.7198)
$\beta_{W,age}$ Wife's Age-60	0.1904 (0.0046)	θ_B Bequest intensity	114,364 (2708.1382)
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c_{min} is the consumption floor

- \$7,687 - annual value of 2012 SSI benefits discounted to 1992 \$
- French and Jones (2011) = \$4,380
- Households at all levels are sensitive to this parameter (Hubbard, Skinner, and Zeldes, 1995)

Baseline Results

Back

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θ_B, κ can be hard to interpret

- Individual's have a significant incentive to bequeath final assets
- Marginal propensity to consume is only \$0.02 out of last \$1
- Similar to French and Jones, 2011 but the bequest motive is operational for people in the top two-thirds of the asset distribution

Preference Types

Back

Households can take on 1 of five discrete preference types, based on

- Preference for own leisure (High or Low)
- Preference for joint leisure (High or Low)
- If no one in the household worked the first period, then they are treated as part of a separate "out" group

Preference Types

Back

- Regress individual labor force participation in post-1998 on
  - quartic in age,
  - individual health status (1992),
  - assets (1992),
  - earnings (1992),
  - health insurance status (1992),
  - the individual's AIME (1992),
  - defined benefit flow (if eligible - 1992),
  - marital status, and
  - a full set of interactions of these terms.

Preference Types

Back

- Regress individual labor force participation in post-1998 on
  - three variables pertaining to the individual's preference for work:
    1. Even if I didn't need the money, I would probably keep on working. (Agree or disagree)
    2. When you think about the time when you and your husband or wife will retire, are you looking forward to it, are you uneasy about it, or what?
    3. On a scale of 1 to 10, how much do you enjoy your job?

Preference Types

Back

- Regress individual labor force participation in post-1998 on
  - Four more variables the pertain to the individual's preference for his or her spouse:
    1. Generally speaking, would you say that the time you spend together with your husband or wife is extremely enjoyable, very enjoyable, somewhat enjoyable, or not too enjoyable?
    2. When it comes to making major family decisions, who has the final say – you or your husband or wife?
    3. Some couples like to spend their free time doing things together, while others like to do different things in their free time. What about you and your husband or wife? (together, separate, or sometimes together and sometimes separate)
    4. I am going to read you a list of things that some people say are good about retirement. For each one, please tell me if, for you, they are very important, moderately important, somewhat important, or not important at all. Having more time with husband or wife.

Preference Types

Back

- Estimated separately for men and women.
- For each individual, the work preference index is the sum of the work preference coefficients multiplied by their respective independent variables,
- Similarly for the spouse preference index.
- The household's work or spouse preference index is simply the equally weighted sum for each household member's respective preference indices.
- The household preference indices are then converted into binary measures by partitioning them at each measures' median.

Preference Types

Back

Work preference index is

- positively correlated with marriage, earnings, assets, AIME, defined-benefit pension flows
- negatively correlated with health

Spouse preference index is

- positively correlated with assets and health,
- negatively correlated with earnings and AIME

Recursive Formulation

Back

Households, h, maximize the present value of their discounted lifetime utility

$$\begin{aligned} V_t(X_t) = \max_{C_t, L_t, B_t} \Big\{ & U(C_{h,t}, L_{h,t}) + \delta_\tau \left(1 - s^H_{t+1}\right)\left(1 - s^W_{t+1}\right) b(A_{t+1}) \\ & + \delta_\tau \left(1 - s^H_{t+1}\right) s^W_{t+1} \mathbb{E}\left[V_{t+1}(X_{t+1} \mid X_t, t, C_t, B_t, N_t, \text{ wife survives})\right] \\ & + \delta_\tau s^H_{t+1} \left(1 - s^W_{t+1}\right) \mathbb{E}\left[V_{t+1}(X_{t+1} \mid X_t, t, C_t, B_t, N_t, \text{ husband survives})\right] \\ & + \delta_\tau s^H_{t+1} s^W_{t+1} \mathbb{E}\left[V_{t+1}(X_{t+1} \mid X_t, t, C_t, B_t, N_t, \text{ both survive})\right] \Big\} \end{aligned}$$

subject to the budget constraint and the consumption floor.

- δ_τ is the discount factor
- s^i_{t+1} is the probability of surviving to period $t+1$ conditional on surviving to t Details
- $b(A_{t+1})$ is a warm glow bequest (De Nardi, 2004) Details

Recursive Formulation

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METHOD OF SIMULATED MOMENTS

MSM Detail Back

I match the following moments predicted by the model for ages 58-69:

1. **Mean assets by tertile, for the first two "thirds",**
   (thirds $\times$ age $= 2 \times 12$ moments)
2. **Share of households within each asset tertile by prefence type,**
   ($\tau \times$ thirds $\times$ age $= 5 \times 2 \times 12$ moments)
3. **Labor force participation by preference type,**
   ($\tau \times$ sex $\times$ age $= 5 \times 2 \times 12$ moments)
4. **Percent working full-time,**
   $((\tau - 1) \times$ sex $\times$ age $= 4 \times 2 \times 12$ moments)
   - excludes "out" type which does not work in the first period
5. **Labor force participation by health status,**
   (health status $\times$ sex $\times$ age $= 2 \times 2 \times 12$ moments)

for a total of $34 \times 12 = 408$ moments.

METHOD OF SIMULATED MOMENTS

▸ MSM Detail ▸ Back

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   $((\tau - 1) \times$ sex $\times$ age $= 4 \times 2 \times 12$ moments)
   - excludes "out" type which does not work in the first period
5. **Labor force participation by health status,**
   (health status $\times$ sex $\times$ age $= 2 \times 2 \times 12$ moments)

for a total of $34 \times 12 = 408$ moments.

METHOD OF SIMULATED MOMENTS

▸ MSM Detail ▸ Back

I match the following moments predicted by the model for ages 58-69:

1. **Mean assets by tertile, for the first two "thirds",**
   (thirds $\times$ age $= 2 \times 12$ moments)
2. **Share of households within each asset tertile by prefence type,**
   ($\tau \times$ thirds $\times$ age $= 5 \times 2 \times 12$ moments)
3. **Labor force participation by preference type,**
   ($\tau \times$ sex $\times$ age $= 5 \times 2 \times 12$ moments)
4. **Percent working full-time,**
   $((\tau - 1) \times$ sex $\times$ age $= 4 \times 2 \times 12$ moments)
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Baseline Results

Detail Back

Parameters based on type			
α_τ Consumption	$(2.81, 3.15)$	$\gamma_{H,\tau}$ Husband's Leisure	$(1.65, 1.77)$
δ_τ Discount Rate	$(0.890, 0.942)$	$\gamma_{W,\tau}$ Wife's Leisure	$(1.00, 1.24)$

**all significant at 1%*

Recall,

$$U\left(C_{h,t}, L_{H,t}, L_{W,t}\right) = \frac{C_{h,t}^{1-\alpha_\tau} - 1}{1-\alpha_\tau} + \frac{D_{H,t} L_{H,t}^{1-\gamma_{H,\tau}} - 1}{1-\gamma_{H,\tau}} + \frac{D_{W,t} L_{W,t}^{1-\gamma_{W,\tau}} - 1}{1-\gamma_{W,\tau}}$$

Baseline Results

Detail Back

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**all significant at 1%*

Constant Relative Risk Aversion coefficient (CRRA):

$$\alpha_\tau \in (2.81, 3.15)$$

Baseline Results

Detail Back

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α_τ Consumption	$(2.81, 3.15)$	$\gamma_{H,\tau}$ Husband's Leisure	$(1.65, 1.77)$
δ_τ Discount Rate	$(0.890, 0.942)$	$\gamma_{W,\tau}$ Wife's Leisure	$(1.00, 1.24)$

**all significant at 1%*

CRRA: $\alpha_\tau \in (2.81, 3.15)$

- Compared to close to 1 in most of the literature that does not include assets in moment matching
- Compared to > 3 in macro literature on CRRA and French & Jones, 2011

Baseline Results

Detail Back

Parameters based on type

	Preference for Joint Leisure:	Out	Low	High
Husband	$\beta_{H,SP,\tau(s)}$	-0.0910	-0.0203	-0.0201
	Participation	(0.8783)	(0.0015)	(0.0010)
	$\beta_{H,SFT,\tau(s)}$	-0.0661	-0.1411	-0.0817
	Full-time work	(0.7060)	(0.0089)	(0.0039)
Wife	$\beta_{W,SP,\tau(s)}$	-0.0698	-0.0055	-0.0222
	Participation	(0.0023)	(0.0005)	(0.0014)
	$\beta_{W,SFT,\tau(s)}$	-0.0845	-0.0857	-0.1224
	Full-time work	(0.2974)	(0.0071)	(0.0042)

$$D_{H,t} = exp\Big(\beta_{H,\tau(s)} + \beta_{H,age} age_{H,t} + \beta_{H,health} health_{H,t} + \beta_{H,SP,\tau(s)} \mathbf{1}\left[\text{Wife works}\right] + \beta_{H,SFT,\tau(s)} \mathbf{1}\left[\text{Wife works full-time}\right]\Big)$$

Baseline Results

Detail Back

Parameters based on type

	Preference for Joint Leisure:	Out	Low	High
Husband	$\beta_{H,SP,\tau(s)}$	-0.0910	-0.0203	-0.0201
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	Full-time work	(0.2974)	(0.0071)	(0.0042)

$\beta_{H,SP,\tau(s)} < 0 \Rightarrow$Spousal Leisure is complementary

Baseline Results

Detail Back

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	Preference for Joint Leisure:	Out	Low	High
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Only comparison is Gustman & Steinmeier (2000,2004,2009): Strong complementary effects for wife's labor force participation on husband. No significant effect for wives.

Baseline Results

Detail Back

Parameters common to all types

$\beta_{H,age}$ Husband's Age-60	0.1852 (0.0039)	$\beta_{H,health}$ Husband's Health	1.1037 (0.0262)
$\beta_{W,age}$ Wife's Age-60	0.1904 (0.0046)	$\beta_{W,health}$ Wife's Health	0.9233 (0.0367)

Recall,

$$D_{H,t} = exp\Big(\beta_{H,\tau(s)} + \beta_{H,age} age_{H,t} + \beta_{H,health} health_{H,t} + \beta_{H,SP,\tau(s)} \mathbf{1}\left[\text{Wife works}\right] + \beta_{H,SFT,\tau(s)} \mathbf{1}\left[\text{Wife works full-time}\right]\Big)$$

Baseline Results

Detail Back

Parameters common to all types

$\beta_{H,age}$	0.1852	$\beta_{H,health}$	1.1037
Husband's Age-60	(0.0039)	Husband's Health	(0.0262)
$\beta_{W,age}$	0.1904	$\beta_{W,health}$	0.9233
Wife's Age-60	(0.0046)	Wife's Health	(0.0367)

- $\beta_{i,age} > 0 \Rightarrow$ As i ages, he or she substitutes towards more leisure
- $\beta_{i,health} > 0 \Rightarrow$ If i falls into poor health, he or she substitutes towards more leisure

Model Fit

Back

- An over-identification test is rejected:

$$q\left(\hat{\theta}, \hat{\chi}\right) = 2552.6$$

  - 5% level: 408.4
- Tough test to beat (Gourinchas & Parker, 2002; French & Jones, 2011)
- The model can capture many of the important details of the data:
  - Asset accumulation with age
  - Decline in Labor force participation with age
  - Capture spikes in male labor force exit at 62 & 65
  - Capture significant benefit claiming at age 62
  - Capture joint retirement spike