How Will Persistent Low Expected Returns Shape Household Saving, Investment, and Retirement Behavior?

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Life Cycle Investing, Retirement and Low Returns

- ✓ Low interest rates now a long-term reality.
  - Nominal bond yields: US ~2%, Germany ~0%, Japan negative
  - Real returns on government bonds: zero or negative
- ✓ Impacts on financial decision of private households
  - Accumulation and Decumulation of Assets
  - Asset Allocation (stocks vs bonds)
  - ➢ Asset Location (in-/outside tax qualified plans)
  - ➢ Claiming of Social Security benefits
- ➢ Answer using a micro lifecycle model.

Lifecycle Investing, Retirement, Low Returns

✓ *Mean Wealth of US Baby Boomer 40% EPV Social Security Benefits*
- *30% home equity*
- *30% financial + pension assets*
- HOW to accumulate & decumulate, WHERE to invest ?

✓ Claiming Social Security *benefits for* many households' *most important financial decision (~ 10,000 Americans/day)*
- Mandatory state organized deferred life annuity with complex claiming options & cash flow pattern
- WHEN retire, WHEN claim benefits (= financial decision)

Our Focus: How will long-term low returns shape *<u>heterogeneous</u>* population behavior?

Calibrated LC model for U.S. households:
- Stock market & labor market uncertainty
- Uncertain lifetimes, medical and housing costs
- U.S. tax rules
- Rules for tax-qualified 401(k) DC retirement plans, and
- Real-world Social Security formulas.

Outcomes for different return scenarios:
- Saving / Consumption
- Asset Location (in/outside tax-qualified plans);
- Asset Allocation (stocks vs bonds);
- Work hours
- Claiming of Social Security old age benefits.

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Heterogeneity & Institutional Rules:

- ✓ Survival probabilities (M and F): US Life Tables.
- ✓ Wage rates for 6 Groups: <HS, HS, Coll+ (M and F) permanent & transitory shocks estimated from PSID,
- ✓ Nonlinear (realistic) tax rules:
  - Payroll taxes (Social Security, Medicare)
  - Income taxes (as per U.S. tax rules)
    - Labor income, investment returns, retirement payouts
  - Tax-qualified 401(k) account EET

DC pensions/401(k) plans

- ✓ Tax-qualified retirement accounts (EET)
  - $5Tr assets held by~50% of workforce
- ✓ Before-tax contributions
  - Employee to $18K/yr (+6K after from age 50)
  - Matching contributions by employer up to 5% of pay
- ✓ Investment returns accumulate tax free
- ✓ Payouts from age 60 are taxable
  - 10% penalty early w/drawal before age 59.5
  - Required minimum distributions after age 70.5

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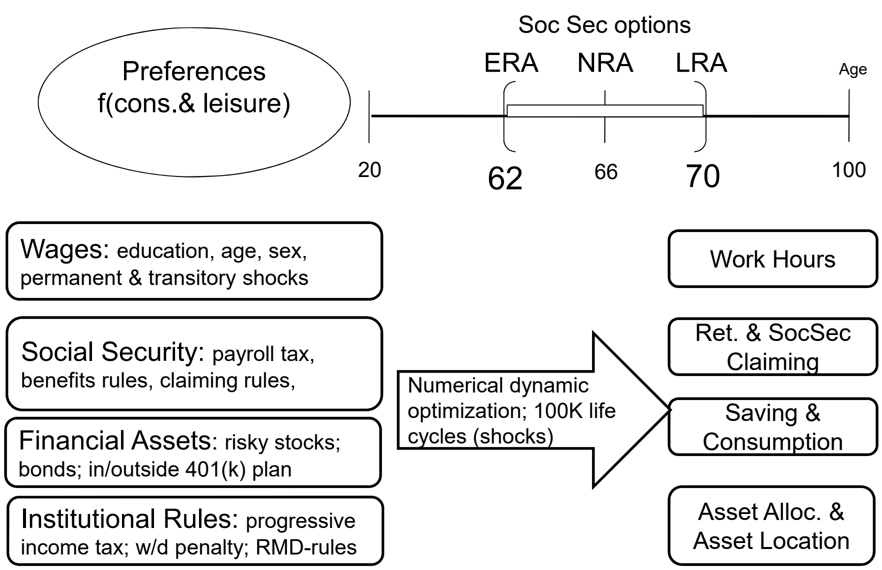
US Social Security System

✓Most employees covered (95% of workforce).

✓Social Security benefits depend on

- Av. lifetime earnings (best 35 years)
- Nonlinear replacement formula (90%, 32%, 15%)
- Claiming age window 62 and 70
  - Reduction (~6%) for early claiming (before NRA = 66)
  - Increase (~ 8%) for delayed claiming (after NRA =66)

Life-Cycle Model: Structure



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We review 3 return scenarios

	Bonds	Stocks (Vol)
2%	2%	5% (18%)
0%	0%	5% (18%)
Japan	0%	2% (18%)

Step 1: Solve model for each 6 wage rate groups and simulate 100,000 optimal lifecycles

Step 2: Calibrate preference parameters (leisure, risk aversion, time preferences) on data

Step 3: Solve for other return scenarios and compare

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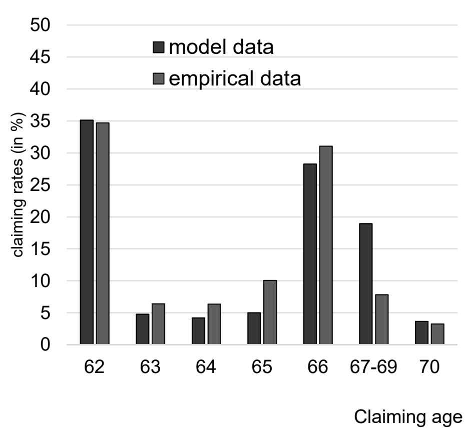
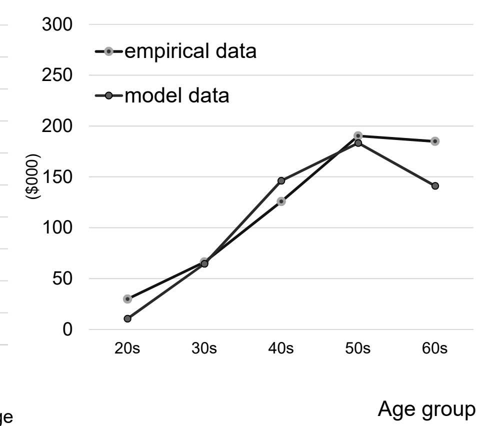
Our calibrated model replicates real world

Sim. Model vs Empirical Data in 'Normal' Return World

Social Security Claiming Rates by Age



Average 401(k) Account Values by Age



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Asset Totals & Location: @0% vs 2% return

	Female			Male	
Interest Rate	0%	←	2%	0%	2%
Panel A: Tax-qualified 401(k) Assets in $000					
Age 25-44	59		68	66	76
Age 45-64	138		167	164	211
Age 65-74	77		119	78	138
Panel B: Non-Qualified Assets in $000					
Age 25-44	6	~	6	8 (~/+)	8
Age 45-64	14		14	23	19
Age 65-74	11		10	16	16

Lower Returns: Most save less, especially in tax-qualified plans 401(k) plans.

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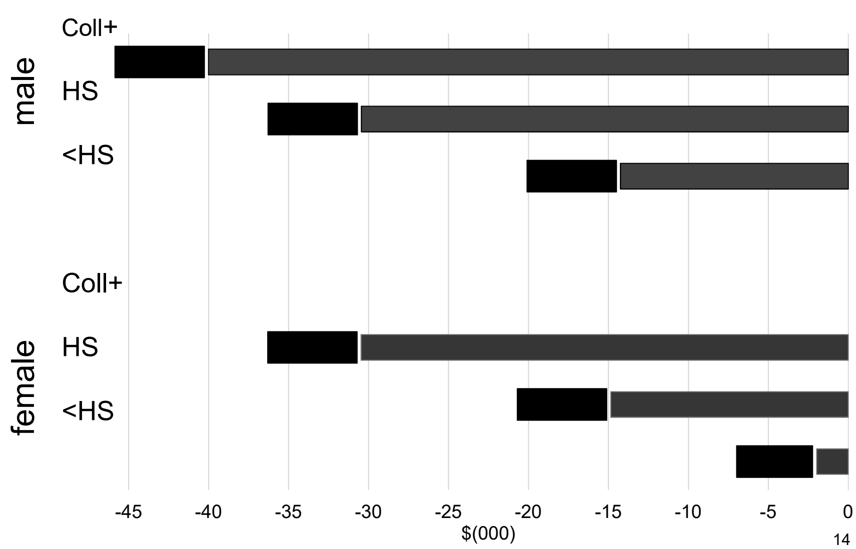
Average Decline in 401(k) Asset Values ($000) @real 0% vs 2% return



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Asset Totals & Location: @Japanese Scenario

	Female		Male	
Interest Rate	Jap.	← 2%	Jap.	← 2%
Panel A: Tax-qualified 401(k) Assets in $000				
Age 25-44	42	68	48	76
Age 45-64	87	167	106	211
Age 65-84	27	119	23	138
Panel B: Non-Qualified Assets in $000				
Age 25-44	8	6	11	8
Age 45-64	19	14	24	19
Age 65-74	10	10	16	16

Lower Returns: Most save less in tax-qualified 401(k)-type plans. Overall saving down.

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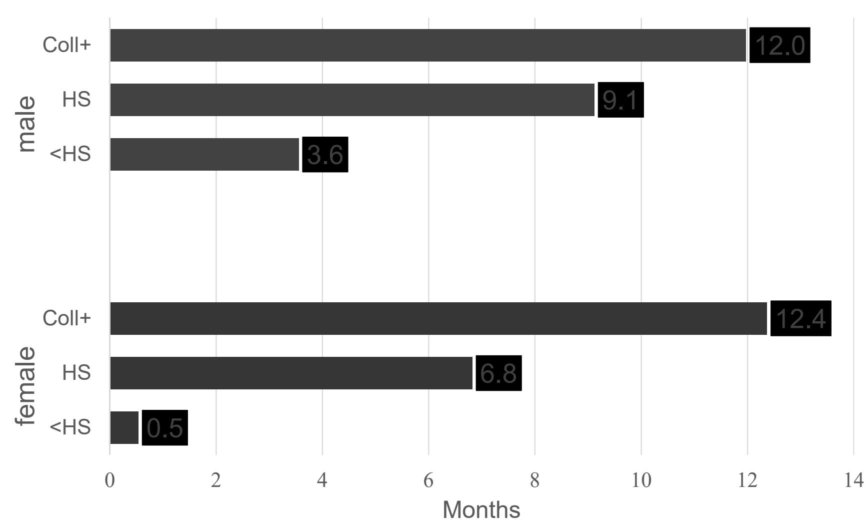
Average Delay in Social Security Claiming Age @real 0% instead of 2% return



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↑ Average lifetime work hours per week:
@2% return vs real 0% vs Japan Scenario

	Females	Males
2%	32.0	38.2
0%	33.3	39.8
Japan	35.2	41.8

Lower Returns: Work longer and more

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Conclusions:

- People *save less* in low return periods.
- People finance consumption in low rate environment by drawing down 401(k) assets sooner, delaying claiming more, and working longer.
- Low returns also change *where* people save. During low-return periods, workers save less in tax-qualified accounts and more outside tax-qualified plans.

- Work longer, save less, and invest differently.
- Policy implication: Flexible retirement ages and appropriate incentives to work longer can be very important.